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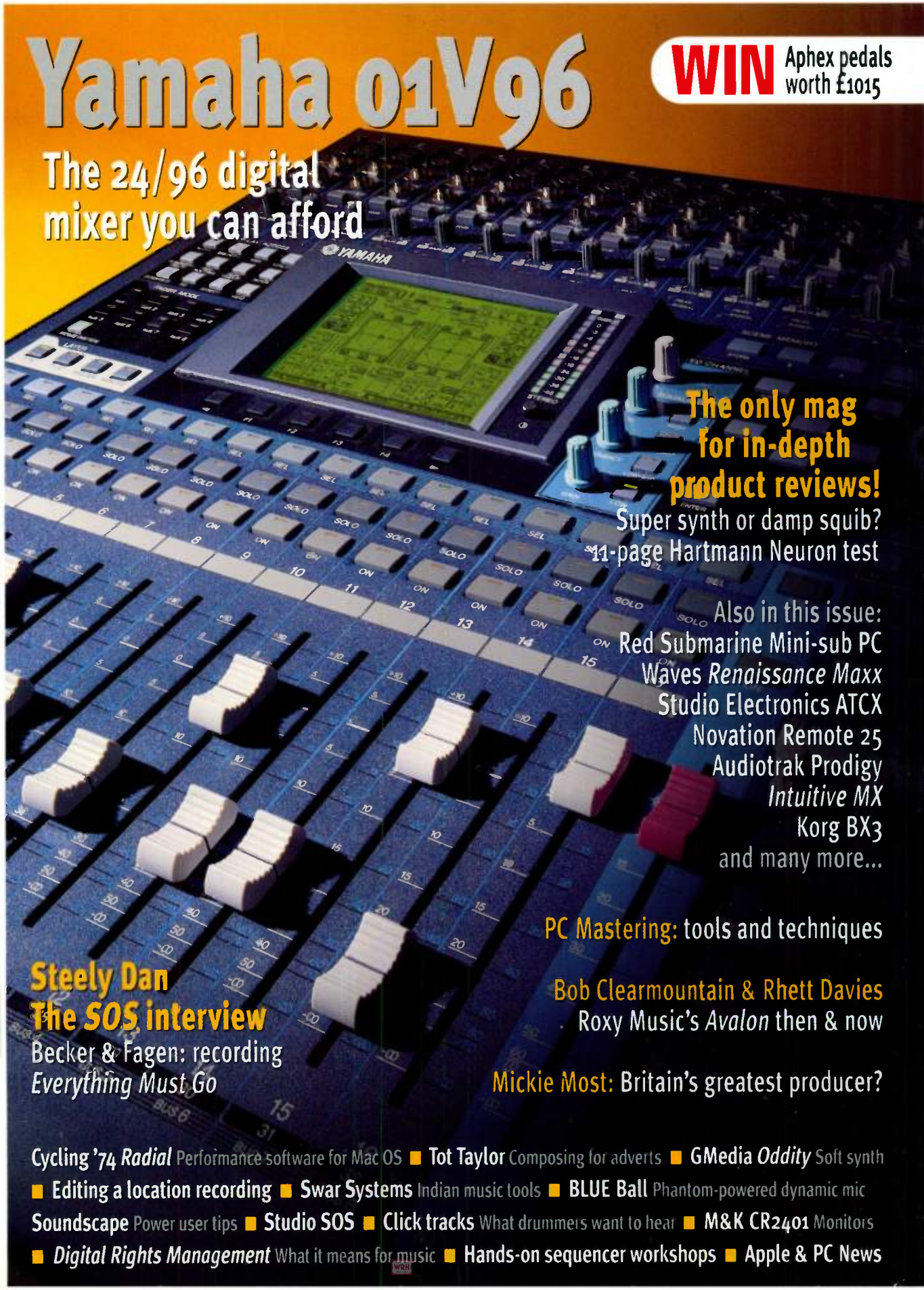

Yamaha 01V96

The 24/96 digital mixer you can afford

WIN Aphex pedals worth £1015

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Super synth or damp squib?
11-page Hartmann Neuron test

Also in this issue:
Red Submarine Mini-sub PC
Waves *Renaissance Maxx*
Studio Electronics ATCX
Novation Remote 25
Audiotrak Prodigy
Intuitive MX
Korg BX3
and many more...

PC Mastering: tools and techniques

Bob Clearmountain & Rhett Davies
Roxy Music's *Avalon* then & now

Mickie Most: Britain's greatest producer?

Steely Dan
The *SOS* interview
Becker & Fagen: recording *Everything Must Go*

Cycling '74 *Radial* Performance software for Mac OS ■ **Tot Taylor** Composing for adverts ■ **GMedia *Oddity*** Soft synth ■ **Editing a location recording** ■ **Swar Systems** Indian music tools ■ **BLUE Ball** Phantom-powered dynamic mic **Soundscape** Power user tips ■ **Studio SOS** ■ **Click tracks** What drummers want to hear ■ **M&K CR2401** Monitors ■ ***Digital Rights Management*** What it means for music ■ **Hands-on sequencer workshops** ■ **Apple & PC News**

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Introducing the 828mkII

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828mkII feature highlights

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- **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.
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- **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.

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Quality Begins At Ohm

Recording quality is a big issue amongst project studio owners, which seems odd insomuch as you can almost take quality for granted these days. While esoteric A-D/D-A converters definitely sound better than the more affordable devices used in typical home multitrack gear and computer audio interfaces, the sound quality of a relatively low-end soundcard can still be noticeably better than the converters the professionals had access to only a decade ago. We have also seen an unprecedented growth in the number of cheap, seriously decent capacitor mics on the market, and it seems that users often prefer to team one of these with a dedicated voice channel rather than rely on the perfunctory mic preamps in their mixer. Every link in the project studio audio chain has got better and, in many cases, cheaper too. Choosing good quality equipment and integrating it into a system of well-chosen components is a major step towards achieving better sound quality, though it's still true that the way the equipment is used has more of a bearing on the end result than the equipment itself.

While most project studio owners would acknowledge these facts, when it comes to wiring these components together, standards often fall dramatically. Now, I'm the last person likely to be convinced by ludicrously expensive designer cables, but passive speakers need to be connected using heavy-gauge, low-resistance cable, not bell wire or guitar leads, and digital equipment needs digital cable of the correct impedance, not moulded phono leads! Wiping the metalwork of jack plugs from time to time with Deoxit will help minimise contact resistance, which in serious cases can cause signal intermittency and even distortion.

Views on cabling differ widely. Some people are convinced it makes no difference at all while others believe every cable has its own sound. In reality there is often an audible difference in quality between budget cable and adequate cable, whether used for speakers or line-level signals. This can be due to a number of factors, from resistance to cable capacitance to screening. The quality of mic cables can make a difference too, though because of the low impedances involved, the effect may not be dramatic. I wouldn't advocate buying fancy cables that cost more than the mic you're plugging into them, but at the same time, don't expect optimum performance from the cheapest mic cables either.

Problems invariably arise when connecting unbalanced sources, such as synthesizers, to mixers with balanced inputs, as suitable off-the-shelf cables may not be readily available. In this situation, the best results are usually achieved by using a properly wired unbalanced-to-balanced jack cable, as described in the Audio Cables & Wiring FAQ on the *SOS* web site (www.sospubs.co.uk/sos/jan02/articles/faq0102.asp) and various other articles on studio wiring. If this means you have to get out your soldering iron or pay someone else to make the cables for you, then so be it — it's well worth it.

Ultimately, any recording system is a chain and any points of weakness will affect the whole system. Today's studio systems are simpler than ever, with fewer separate boxes and fewer interconnections, so it makes sense to pay attention to the way in which they are put together and to respect your interconnections as being a vital part of the system, not just a necessary inconvenience.

Paul White *Editor In Chief*

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Model shown: SM6P passive monitor

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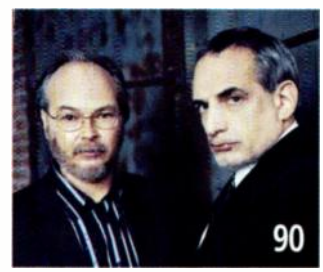

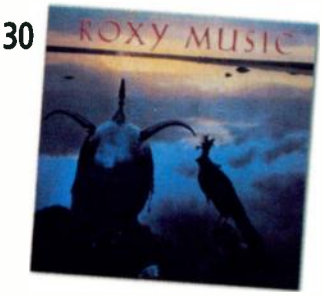

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Modern vintage from Unity Audio

Unity Audio have taken on UK distribution for Soundelux microphones and Thermionic Culture studio hardware. Soundelux's range of 'vintage reissue' mics aims to accurately recreate the unique qualities of some of the most sought-after vintage mics using modern components and workmanship. Their Elux 251 (pictured) is based on the Telefunken Elam 251, while the variable-pattern Soundelux E47 is based on the revered '50s-era Neumann U47. Thermionic Culture are a UK company specialising in all-valve outboard. Their product range includes the Culture Vulture, reviewed on page 42 of this issue, and the Phoenix, a stereo valve compressor.

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W www.unityaudio.co.uk

Tascam take control

Tascam, whose parent company TEAC are celebrating their 50th anniversary this year, have produced a combined Firewire audio/MIDI interface and DAW control surface — the FW1884. At the heart of the system is a fully featured 18:8:2 mixer, incorporating technology from Tascam's DM24 console. The FW1884 is capable of stand-alone operation as a digital audio mixer, and is equipped with eight analogue mic/line inputs with high-quality preamps, phantom power and inserts on each channel. All analogue channels utilise 24-bit/96kHz A-D/D-A conversion and the system is capable of 96kHz operation throughout. To cater for digital audio, there are eight-channel ADAT and stereo S/PDIF inputs and outputs. There are eight analogue outputs on balanced quarter-inch jacks and a four-in, four-out MIDI interface completes the I/O feature set. Word clock I/O ensures accurate synchronisation. When connected to a computer-based DAW via one of its two Firewire ports, the FW1884 provides a versatile control surface, with nine motorised 100mm faders (eight channel faders and one master), 11 rotary encoders to adjust EQ, pan and the like, transport controls, a jog wheel and an array of assignable function and shortcut keys. The system can be expanded with the addition of one or more FE8 expansion modules, giving an extra eight channel strips, including motorised faders and assignable encoders and buttons. The FW1884 supports Windows 2000 and XP, and Mac OS 9 and OS X, with ASIO, WDM, MME and GSIF drivers, making it compatible with all major workstation software packages. It also features a Mackie Control emulation mode for use with software that offers specific support for that hardware controller, such as Digidesign's *Pro Tools* and MOTU's *Digital Performer*. The Tascam FW1884 should be available soon, and is expected to cost £1299.

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Portable audio I/O from Audiotrak

The Maya44 USB is the latest PC audio interface from Audiotrak. It features four analogue inputs and outputs on unbalanced RCA jacks, plus a headphone socket which doubles as an optical digital out. Audio can be recorded at 16-bit resolution, and at sample rates switchable between 44.1 and 48kHz. The Maya44 USB is powered by the USB buss and, with ASIO 2 (four-in, four-out) and WDM (two-in, two-out) drivers, it looks like a promising option for the laptop musician. It's available now and costs £119.99.

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Kingston College offer honours degree in Music Technology

Kingston College have announced that they are to offer a BA (Hons) Music Technology degree in partnership with Thames Valley University. The degree course complements the college's established courses, which include a BTEC National Diploma and A- and AS-levels in Music Technology. On the 24th of June Kingston College's new purpose-built recording complex was opened by Jeremy Godfrey, one half of the Wise Buddha production team, whose credits include Blue, Westlife and Atomic Kitten. The new facility features two 24-track studios based around Mackie SDR24/96 hard disk recorders, two project studios with Apple Mac G4s, Emagic *Logic*, Steinberg *Cubase* and Digidesign *Pro Tools*, Akai Z4 samplers and Korg Triton keyboards, and a MIDI sequencing and software room.

T Kingston College +44 (0)20 8939 4631.
E design.studies@kingston-college.ac.uk
W www.kingston-college.ac.uk

Lewisham College install digital studio

Lewisham College in South-east London have installed a new digital studio to meet the demand for their music-production courses. The studio is based around a Yamaha 02R96 console and features Focusrite and TC Electronic outboard, Korg Triton and Access Virus C synths, and a MOTU 2408 MkIII interface. Studio software includes Steinberg *Cubase SX* and *Wavelab 4*, Propellerhead *Reason 2.5* and *Recycle 2*, and Native Instruments *Absynth 2*. There are also an extra eight workstations equipped with Yamaha 01V96 consoles, Korg Triton LE keyboards, *Cubase SX* and *Reason*. These workstations are all hard-wired to the main live room. In addition to the full-time courses on offer, the college are planning to run evening courses in digital audio recording and music production in the near future.

T Lewisham College +44 (0)800 834 545.
W www.lewisham.ac.uk

Stop press! Apple launch G5 Macs

Just as *SOS*'s News pages were going to press, Apple announced the launch of the G5 Power Macintosh range of desktop computers. Scheduled to appear in August, the three new 64-bit machines offer 1.6, 1.8 and dual 2GHz G5 processors, each CPU in the dual-processor machine having its own independent front-side buss to prevent data bottlenecking. The new machines can address up to 8GB of RAM. There are three PCI-X slots to incorporate expansion cards, and the front panels sport Firewire 800, Firewire 400, and USB 2.0 connectors. Built-in optical digital audio I/O is also promised, presumably in the S/PDIF format.

Rumours abound that for the first time, the new IBM processors were specifically designed not just for processing graphics and video, but also audio, possibly the first tangible fruits for musicians of Apple's buyout of Emagic in September last year. Whether this is true or not, *Logic* was certainly used as one of the test applications at the launch of the new G5s at June's Apple Worldwide Developers Conference in San Francisco, the most high-profile appearance of the Emagic sequencer at an Apple event since the buyout.

Prices for the new G5s are due to start at around £1500 including VAT for entry-level 1.6GHz machines, with the top-flight 2GHz model costing around £2300. We'll have a more detailed report on the capabilities of the new machines from the musician's perspective in next month's Apple Notes.

W www.apple.com/uk/powermac

Carillon release genre-specific music-production systems

Carillon Audio Systems have produced a range of PC music systems featuring integrated hardware and software components chosen to suit specific styles of music and methods of composition. There are three new systems designed for guitarists and three tailored for producing what they call 'urban' music. Of the latter, the Carillon Fruity system (from £1099) is the simplest, featuring a PC, soundcard and *Fruity Loops* software. The Carillon SL Battery Beats system (from £1569) includes a Carillon music PC with Carillon's RK8 module (which adds eight MIDI control knobs to the PC's front panel), as well as Steinberg's *Cubase SL* MIDI + audio software, Native Instruments' *Battery* drum sampler software and an Akai MPD16 pad controller. The third 'urban' setup is the Carillon SX Beat Sampler (from £2279), which features the same components as the Battery Beats system, plus Native Instruments' *Kontakt* sampler, the M Audio Delta 1010LT soundcard and Carillon's RTM1 remote transport control. Three further systems are aimed at 'the songwriter and recording guitarist'. The Guitarist Foundation system (from £999) features an Audiotrak Prodigy 192 audio card, Steinberg's *Cubasis VST* recording software and DSound's *GT Player* guitar effects software. The Guitarist Combo (from £1799) features Steinberg's *Cubase SL*, *Groove Agent* virtual drummer and *Warp VST* amp simulator, the RK8 knob controller, and an M Audio Omni Studio audio interface. Finally, the Guitarist Control Station (from £2499) features Steinberg *Cubase SX* and *Groove Agent*, *Warp VST*, IK Multimedia's *Amplitube* guitar amp simulator, Edirol's DA2496 audio interface and the Behringer FCB1010 floorboard controller. All systems are supplied with a manual featuring tutorials specific to each setup.

T Carillon +44 (0)800 0850 452.
E info@carillondirect.com
W www.carillondirect.com

Linplug drums go fourth

Linplug have produced a new VST drum machine for Mac and PC. *RM IV* is their fourth-generation drum module, and it combines analogue-style drum synthesis with a percussion sampler module. The user has 10 synthesis modules to play with and *RM IV* is bundled with over 120 synthesized and sampled kits. It's also backwards-compatible with kit formats from previous Linplug drum machines, such as *RM III*. Samples can be loaded in WAV or AIFF formats at up to 32-bit resolution, and multisamples, velocity layers and crossfades are supported. The instrument also features an AHDSR-controlled multi-mode filter, a compressor designed for percussion sounds, a six-by-six modulation matrix and a humaniser effect. *RM IV* requires a VST 2.0-compatible host, running on Mac OS X or Windows 95 and above. It's available to download now from the Linplug web site.

W www.linplug.com

New OS turns VS2480 into a control surface

Roland have released an OS update for their flagship VS2480HD and VS2480CD workstations. The version 2.011 system software, available as a free download from the Roland US web site, adds a control-surface mode, allowing the 2480's buttons, knobs and motorised faders to control computer-based sequencing and recording software. Included are several templates for use with Emagic *Logic 5*, Steinberg *Cubase*, and a Mackie HUI template for applications like Digidesign *Pro Tools* and MOTU *Digital Peformer* which have settings for use with Mackie's control surface. Users can design their own templates for controlling any hardware or software that responds to MIDI control. The update also allows the 2480 to open sessions created by the VS2400, and to save its own sessions as VS2400 projects.

W www.rolandus.com/support/updatesdrivers

Erratum

A couple of digits went astray from the telephone number accompanying last month's news item about Safe Sound Audio's P1 compressor. Here's how it should have read.

T Safe Sound Audio +44 (0)1422 883848.

Eventide resurrect classic reverb

Eventide have launched a hardware recreation of their classic SP2016 reverb unit, which dates back to 1980. The new Reverb 2016, designed and produced in collaboration with Princeton Digital, features faithful emulations of the original unit's Stereo Room, Room Reverb and High Density Plate algorithms, courtesy of modern 24-bit DSP technology. These emulations were carefully modelled on the performance of the few original SP2016s still in operation. There are also updated, enhanced versions of each algorithm designed to take full advantage of the processing power available. The 1U rackmount unit has dedicated controls for all parameters, allowing menu-free operation, and a total of 99 user presets can be saved. 24-bit A-D/D-A converters cater for the analogue I/O, and the unit also features digital I/O and a MIDI interface for remote control. Princeton Digital was founded in 2001 by Tony Agnello, who worked for Eventide in the '70s and '80s and developed a number of products including the SP2016, so authenticity should be assured. Princeton Digital also apparently plan to eventually offer the Reverb 2016's modelled algorithms in plug-in format. The Reverb 2016 should be available by the time you read this, with an estimated price of £1798.

Eventide are offering users of Mac-based Pro Tools Mix and HD systems a free seven-day trial of their *Clockworks Legacy* plug-ins, available for download from www.eventide.com. The plug-ins, which featured in April's *SOS* News, recreate Eventide's celebrated analogue processors of the '70s and '80s. The demo set includes the *Omnipressor*, *Instant Phaser*, *H910 Harmonizer*, *Instant Flanger* and *H949 Pitch Changer* plug-ins, which support sample rates up to 192kHz (96kHz in the case of *H910* and *H949*) with full parameter automation and integration with Pro Tools control surfaces.

T HHB Communications +44 (0)20 8962 5000.
F +44 (0)20 8962 5050.
E sales@hhb.co.uk
W www.hhb.co.uk
W www.eventide.com

Five readers bag a Virsyn virtual synth

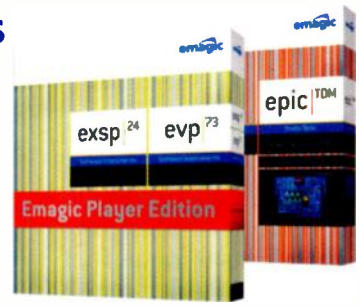
March 2003's reader competition saw us giving away five copies of Virsyn's *Tera* virtual synth worth £189 each, courtesy of UK distributors Dark Horse Distribution (+44 (0)20 8204 4943/www.dark-horse.biz). *Tera* is a virtual modular synth for Mac and PC with its own built-in step sequencer and virtual mixer, three oscillators with 64 waveforms and multi-mode and formant filters. The five winners were: Daniel McEntee, a teacher from Shrewsbury (pictured above); Oliver Haggarty, an engineer from London; Paul Sharp from Bassendean, Western Australia (which is also Rolf Harris's home town, he informs us); Rufus Casey, a student from Bristol (pictured below); and Matt Jarman of Digital Deluxe Studios in London. If you're a guitarist, don't miss this month's competition; we're giving away three sets of three Aphex Xciter pedals (the Acoustic Xciter, Electric Xciter and Bass Xciter) worth £115 each. Turn to page 276 for more details.

SAE launch Liverpool college

The SAE Institute have officially opened their Liverpool campus. Located opposite the Liver Building in central Liverpool, the college features all-new equipment and facilities and modern studio design. Centered around an open-plan practical work area, there are two classrooms, three studios with accompanying live rooms, and a creative media room for the study of web design, digital art and 3D animation. Studio One is based around a 32-channel Soundtracs Jade console, while Studio Two houses a Digidesign/Focusrite Control 24 desk and Pro Tools Mix system. Studio Three offers 5.1 surround mixing via a Mackie D8b mixing console and HDR2496 hard disk recorder. The college's extensive list of other equipment includes Mackie HR824 monitors, numerous Apple Mac G4s and G3s, an Otari 24-track two-inch tape recorder, Emu samplers and a range of studio outboard gear from Focusrite and TC Electronic, amongst others. The next open day is on Sunday August 17th.

W www.sae.edu

Emagic release virtual instruments in Audio Units format



Emagic's popular *EXSP24* 24-bit sample player and *EVP73* Rhodes electric piano emulation are now available for OS X in Audio Units format. The instruments, available in a single package as the *Player Edition* (£159), will run under any Audio Units-compatible host. Emagic have also been busy producing TDM software to run under OS X. *Epic TDM* (£499) is a collection of 15 Emagic plug-ins taken from *Logic Platinum*, including delay, modulation and distortion effects, and the *ES1* virtual synth, designed to use the DSP resources of Pro Tools TDM and HTDM systems running under Mac OS X. *HostTDM Enabler* for Mac OS X (£299) allows users of OS X-based Pro Tools 24, Mix and HD systems to insert their existing Emagic software instruments into the aux channels of their TDM mixers. The software will run under any TDM-compatible host (*Logic Platinum*, Digidesign *Pro Tools*, or MOTU *Digital Performer*) and supports up to 32 mono channels.

T Sound Technology +44 (0)1462 480000.
F +44 (0)1462 480800.
E info@soundtech.co.uk
W www.soundtech.co.uk
W www.emagic.de

HRS150
15" Active Subwoofer

HRS120
12" Active Subwoofer

HRS150 — Twice the output of the HRS120. Perfect for hip hop mixes or extra-large control rooms. Ideal for bass management apps.

HRS120 — a fine choice to be the ".1" in surround mixing applications.

HR624
6.7" Active Studio Monitor

The 6.7-inch, 2-way nearfield monitor that's more than just a smaller version of the HR824. The perfect monitor for those who need incredible midrange accuracy for lead vocal placement within the mix and for dialog replacement in post.

HR824
8.75" Active Studio Monitor

As the industry-standard studio monitor, the 8.75-inch 2-way nearfield HR824 is ideal for those who need lots of bottom end, as well as comfortable high end for long sessions of general mixing.

HR626
Dual 6.7" Active Studio Monitor

The new HR626 has Phase-accurate D'Appolito driver alignment design with bi-amplification. Superb bass and midrange accuracy for mixing and vocal placement. Also an ideal choice for horizontal placement in center channel applications.

TECHNICAL EXCELLENCE & CREATIVITY

2002 WINNER!
HR624 Studio Monitor Technology

HR824 1998 winner, Studio Monitor Technology

PRECISION RUNS IN THE FAMILY.

With the new HRS150 and HR626, there are now 5 ways to have Mackie studio accuracy.

LUCASFILM THX pm3

No matter what your application — from 7.1 surround to stereo monitoring, there's now a Mackie active monitor and subwoofer that will give you exactly what you want: unflinchingly accuracy.

Our new HR626 has ten more square inches of active cone area than the HR824 for even mo' bass extension, yet is as tight and fast as the compact HR624. It makes a great main stereo monitor *or* center channel for surround mixing.

And speaking of mo' bass, the new HRS150 uses a 15-inch active driver, *two* 12-inch passive radiators and 950 watts of FR Series power to achieve frequency response that's only 0.5dB down at 10Hz. Yes, you read that right. Ten Hertz!

Hear the whole precise Mackie family, including the new HR626 and HRS150, at your nearest Mackie dealer today.

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Wizoo symphonic strings sample library available via the Web

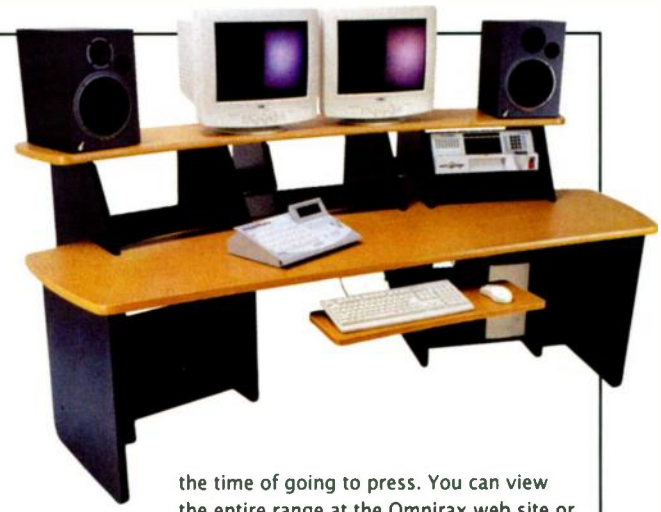
Wizoo Sound Design have released *Claudius Bruese String Section Pack*, the little brother of the *Halion String Edition* library, and it's now available online from www.wizoosounds.com. The sample library, available in *Halion*, *EXS24* and *Gigasampler* formats, features a symphony orchestra-sized string section comprised of 16 violins, 12 violas, 10 cellos and eight double basses. The instruments were recorded with natural room ambience at 24-bit, and a wide range of string articulations is represented, including legato, pizzicato, spiccato and tremolo playing styles and whole-tone and semitone trills.

Claudius Bruese String Section Pack costs $129 and its component parts (*Violin Section Legato*, *Cello Section Pizzicato* and so on) can also be purchased separately. The library is available as a download (file sizes range from 537MB for the *EXS24* version to 614MB for the *Gigasampler* version) or can be dispatched on a CD-ROM.

Meanwhile, Wizoo have also released two new books, one on Steinberg *Cubase SX/SL* and one on Emagic *Logic*. *Cubase SX/SL — Mixing & Mastering* is intended as a guide to arranging, mixing and mastering features in Steinberg's software and includes a basic introduction to sound engineering as well as advanced tricks and tips. The book also comes with a CD of audio examples and tutorial projects. *Logic — Audio Workshop* is designed to show the reader how to use *Logic*'s audio features creatively and effectively, covering topics such as track automation, virtual instrument and effects plug-ins, mixing and EQ'ing, and using *Logic* with other applications and additional hardware. The included CD features a number of plug-ins, application demos, utilities and support materials. Both books are available now in bookshops or directly from Wizoo, priced at $40.

W www.wizoo.com

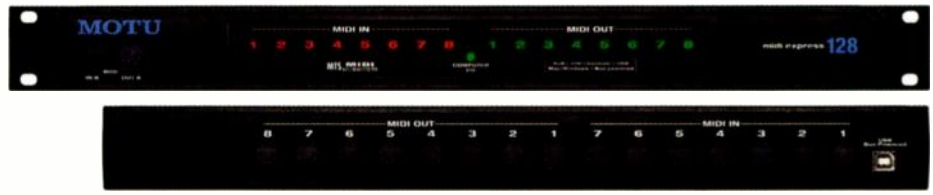
Omnirax studio furniture now available direct in the UK



Omnirax, a leading manufacturer of studio furniture in the USA, are now offering their complete product line to customers in the UK. Their extensive catalogue includes desks, racks and stands equipped for every conceivable setup, offering an elegant and professional solution to the task of positioning mixers, keyboards, monitors and rack gear without disappearing under a pile of tangled cables. Some units are designed around specific bits of equipment, such as Yamaha's 02R and DM2000 desks, Digidesign's Pro Control and Control 24, and Mackie's HUI, while others are generic, and a range of modular extension racks and shelves can be added as your studio grows. All products are available in a variety of colours and finishes, and Omnirax will perform modifications to an existing model and even design and build custom furniture to the customer's specifications. Products are delivered directly from Omnirax in California to the customer, with shipping times quoted as one to three weeks for the standard product line, and one to two months for semi-custom (modified) and custom designs. The model pictured here is the Force 12MP with a high-pressure laminate maple top, which costs $1790 including shipping to the UK, equivalent to £1070 at the time of going to press. You can view the entire range at the Omnirax web site or call (allowing for the fact that California is eight hours behind the UK) and speak directly to a consultant.

T Omnirax +1 415 332 3392.
F +1 415 332 2607.
E info@omnirax.com
W www.omnirax.com

New MOTU MIDI interfaces keep it simple



Following the announcement of the 828 MkII Firewire audio interface in last month's SOS News, MOTU are launching a pair of no-nonsense USB MIDI interfaces. The MIDI Express 128 and the Micro Lite are USB buss-powered, hot-swappable interfaces for Mac and PC. The MIDI Express 128 offers 128 channels of MIDI, with eight inputs and nine outputs. Seven of these inputs and eight outputs are to be found on the rear panel of the 1U rackmount device, while the eighth input and ninth output (a duplicate) are on the front. The half-rack Micro Lite provides five inputs and outputs, totalling 80 MIDI channels. Drivers for Mac OS 9 and OS X and Windows ME, 2000 and XP are included, and multiple interfaces can be used simultaneously, provided there are enough USB ports. The MOTU MIDI Express 128 costs £249, while the Micro Lite costs £149. Both units are available now.

T Musictrack +44 (0)1767 313447.
F +44 (0)1767 313557.
E info@musictrack.co.uk
W www.musictrack.co.uk
W www.motu.com

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The future is digital. And with 15 years' experience in digital audio mixing, Yamaha is the acknowledged industry standard.

Yamaha digital consoles are found in the majority of leading audio facilities, covering music recording, post, broadcast and live sound.

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Yamaha digital mixing consoles are chosen by the Liverpool Institute of Performing Arts, North Glasgow College, The Birmingham Conservatoire and many more leading educational establishments.

YAMAHA
Commercial Audio

New Mackie mixer taps into the budget market

The Tapco 6306 six-channel mixer is now available from Mackie, the first of a new family of affordable small mixers. It features two mono channels with low-noise mic preamps, switchable phantom power and XLR and high-impedance jack inputs, and two stereo channels with line inputs. There are separate main, monitor and tape outputs, plus a headphone socket. An eight-segment LED meter displays output level. Each channel is equipped with a two-band EQ (12kHz and 80Hz, ±15dB), two aux sends and a pan/balance control. The two aux sends route to a single stereo aux return, with separate controls for the level of the return sent to the main and monitor outputs. The Tapco 6306 is available now and costs just £99.

The Mackie Control C4, like the Tapco 6306, was announced at the Frankfurt Musikmesse in March and has now reached the UK. The C4 is a plug-in and virtual instrument controller which provides four rows of eight pots, giving control of up to 32 software parameters without the need for scrolling or bank switching. Each row is accompanied by a digital display strip to show parameter information, and 19 function and cursor buttons access a variety of sequencer features. The C4 will initially be supported by MOTU's *Digital Performer* and Emagic's *Logic*, though control templates for other applications are expected to follow shortly. The controller is expected to cost around £875 and is available from July.

Mackie have also released software updates for the UAD1 Powered Plug-in card and the Digital 8-Bus (D8b) recording console. Version 3.1 software for the UAD1 adds multi-card support for Mac users (multi-card support for Windows was present in v3.0), allowing the installation of up to four cards in one computer running Mac OS 9. OS X support will arrive later this year. The v3.1 software, a free download from the Mackie web site, also brings support for the new *Cambridge EQ* plug-in (£89), a five-band parametric EQ with a variety of filter types and curves. The version 5.1 software update for the D8b console, meanwhile, adds features including backwards compatibility with version 3 sessions, and improvements to the HUI mode, such as cut, copy, paste and undo buttons, and several new hot keys. A complete list of new features can be found on the Mackie web site, where you can download the update. It's free to anyone who purchased a D8b console after November 15th, 2002, or anyone who has already purchased the v5.0 upgrade. Otherwise, the v5.1 upgrade costs £179.

T Mackie UK +44 (0)1268 571212.
F +44 (0)1268 570809.
E mackie.uk@rcf-uk.com
W www.mackie.com

Dynaudio Air series monitors reach 192kHz

Dynaudio's state-of-the-art Air-series monitors, which utilise DSP technology from TC Electronic, have benefited from a software upgrade which makes them capable of receiving digital audio at sample rates up to 192kHz. The version 1.10 software can be downloaded from the Dynaudio Acoustics web site. An optional digital card is required for 192kHz operation, however, with a single card necessary for stereo setups, and more when working in surround. Other changes brought about by the update include the addition of a single parametric EQ to the subwoofer channel, the ability to store setup information to presets, and the option to choose crossover frequencies for monitors and subwoofers independently, via the *Air PC-IP* calibration software.

The newest addition to the Air range, the Air 20, is now available. The Air 20, unveiled at this year's Frankfurt Musikmesse, is a three-way active nearfield monitor with a 10-inch woofer, a 5.5-inch moulded mid-range speaker and a 1.1-inch soft-dome tweeter, and two forward-facing ports. Onboard DSP provides bass-management features (including selectable crossover points), acoustic placement compensation (which allows the user to tailor the monitors to their environment), and level adjustment in 0.1dB steps. Settings can be stored and recalled and the system and its parameters can be accessed using the remote-control software and hardware remote. In terms of pricing, a standard stereo setup, comprising a pair of Air 20s, digital and optional analogue input cards, and the hardware and software remote controls, costs £4355. Without the analogue card, the system costs £4190.

T Unity Audio +44 (0)1440 785843.
F +44 (0)1440 785845.
E sales@unityaudio.co.uk
W www.unityaudio.co.uk
W www.dynaudioacoustics.com

Advanced production course at Point Blank

Point Blank Record Production and DJ College are introducing a new three-month module in Advanced Record Production, starting in July. The new module means that it will now be possible to study record production at Point Blank for a total of nine months. The module will focus on digital mixing, live recording and use of Digidesign *Pro Tools*. Contact Point Blank for more information.

T Point Blank +44 (0)20 7729 4884.
E studio@point-blank.co.uk
W www.point-blank.co.uk

Mains — a warning

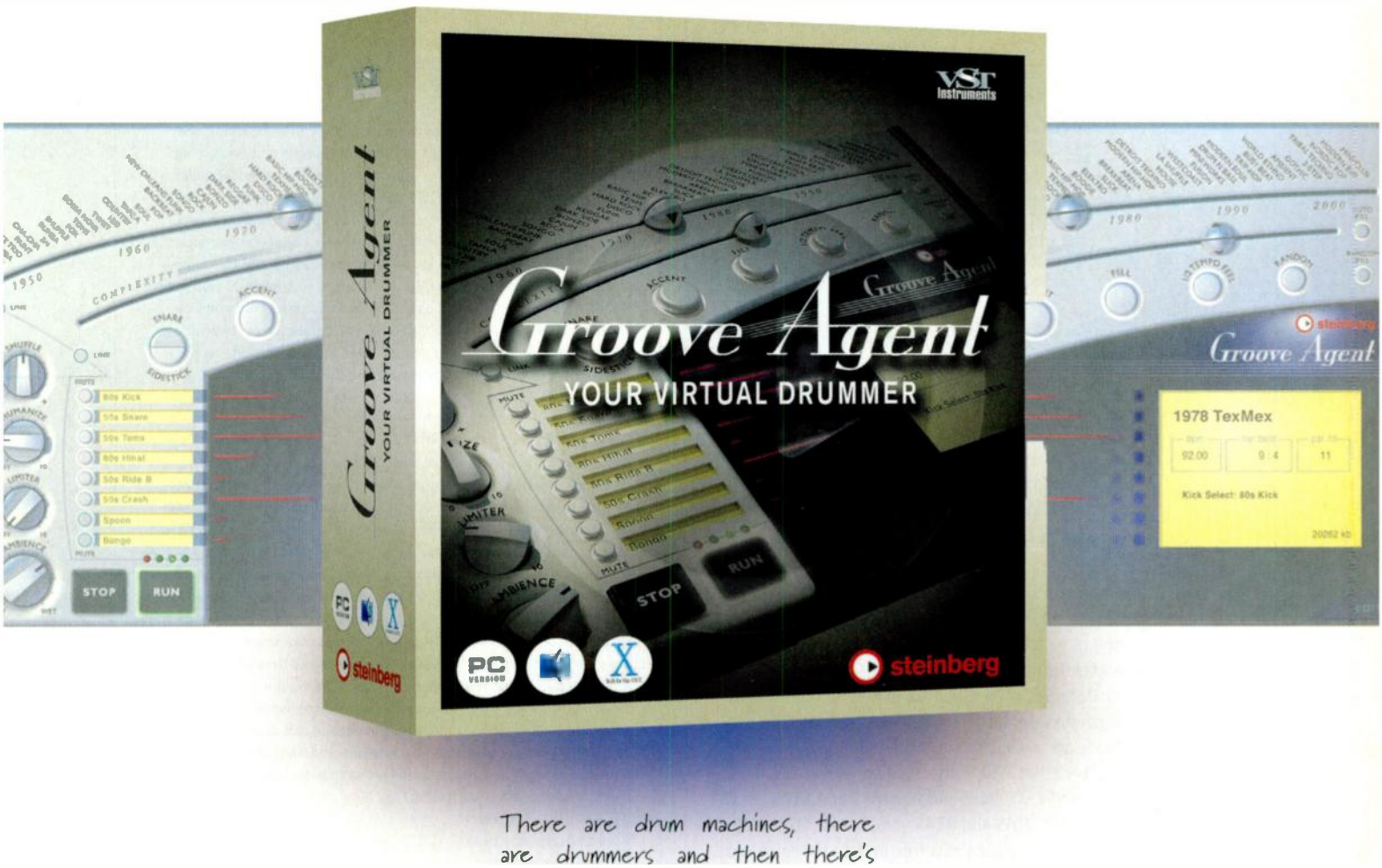
Thanks to the reader who pointed out that inserting a pair of metal scissors into a variable-voltage transformer, as shown on page 229 of the article on Mains last month, is not particularly wise! Of course, all adjustments to mains transformers should ideally be made when the power is firmly off (as was the case when the picture featuring the scissors was taken), but as a rule of thumb, an insulated screwdriver is a much better implement for making voltage adjustments!

DRUMMER NOT WANTED

Up and coming young band, major record label interest, imminent gigs and a track on a compilation album are not looking for a drummer. We don't need someone to play a lousy old kit out of time, turn up late and drunk or offer to sing lead vocals – even if you do have your own transport. Please don't call John or Andy on 020 8970 1909 nor should you email wevegota-grooveagent@nodrummersthanks.com

FOR SALE

Drum riser (24ft) and metronome. Will split. Call Anthony anytime on 020 8200



There are drum machines, there are drummers and then there's Steinberg's Groove Agent.

Just like a top producer, you simply instruct your Groove Agent to play in a certain style with a drum kit of your choosing at a given tempo and at any complexity level you desire.

That's it.

steinberg

arbiter

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WRH

More instruments than you can possibly imagine

Ultimate Sound Bank have released their new range of *Plugsound* sample-based virtual instruments. There are six individual instruments: *Keyboards*, *Fretted Instruments*, *Drums & Percussion*, *Hip-Hop Toolkit*, *Synth Collection* and *Global Plugsound*. Each collection of samples is presented as a self-contained sound module, based around the widely used UVI plug-in engine, with a user-friendly graphical interface, ADSR amp and filter controls, a range of filter types, and built-in effects. *Keyboards* features just that: a range of acoustic

and electric pianos, clavinets, organs and synth sounds to suit a diverse range of musical styles. *Fretted Instruments* is a collection of acoustic and electric guitar sounds, as well as some nylon-strung guitar and lute samples. *Drums & Percussion* features 6000 drum sounds to suit various genres, from jazz to rock to electronic. *Hip-Hop Toolkit* is a collection of loops, percussion kits and multisampled instruments to suit R&B and hip-hop styles, and is sorted into construction kits, with loops arranged by tempo and single-phrase patches. *Synth Collection* contains over 600MB of modern and retro synth sounds, featuring a range of pads, basses, leads and sweeps. Finally, *Global Plugsound* is designed as the 'ultimate GM module', with instruments in categories such as world, orchestral, keyboards, and drums and percussion, all arranged in GM format. The *Plugsound* libraries are available individually for £79.95 each, or as a set of six, for £399. The instruments are available for both Mac and PC, in VST 2.0 (Mac and PC), MAS and RTAS (Mac-only) formats. VST, MAS and RTAS versions for OS X are in the pipeline and will be provided as a free update to registered users.

T Time + Space +44 (0)1837 55200.
E sales@timespace.com
W www.timespace.com
W www.usbsounds.com

Anwida Soft VST plug-ins ported to OS X

Anwida Soft's range of VST plug-ins are now available for Mac OS X. The four plug-ins are the *CX1V* compressor/expander, *L1V* limiter/maximiser and the *GEQ15V* and *GEQ31V* 15- and 31-band graphic equalisers. They are available to download now from the Anwida Soft web site. *CX1V* and *GEQ31V* cost $69, while *L1V* costs $59 and *GEQ15V* costs $49.

W www.anwida.com

Minnetonka announce Dolby Pro Logic II encoder software

Minnetonka Audio Software have produced a software encoder for the Dolby Pro Logic II surround format, the first of its kind. *Surcode* is currently available as a stand-alone application for Windows but will soon be available as a VST plug-in and as a stand-alone application for Mac. Encoded audio can be decoded by Pro Logic II receivers and home theatre systems and the format is backwards-compatible with Dolby Pro Logic decoders. *Surcode* costs £869.50.

T Et Cetera Distribution +44 (0)1706 228039.
E sales@etcetera.co.uk
W www.etcetera.co.uk

TC-Helicon develop OS updates for vocal processors

TC-Helicon have released software updates for their Voice Works and Quintet vocal processors, and are working on an update to the Voice One, scheduled for release this Autumn. The version 2.0 software for the Voice One will include improvements to the Hybrid Shifting and Flex Time algorithms, plus new features including a new smoothing algorithm for pitch-shifting. OS updates for the Voice Works (which was reviewed in June's *SOS*) and Quintet are already available, free to download from the TC-Helicon web site. The updates feature a new MIDI Control Change mode, allowing extensive parameter manipulation using generic MIDI CC messages. There's also a new GM Basic mode, in which the Voice Works and Quintet respond to a smaller, core set of MIDI CC controls, simplifying operation and improving compatibility with Standard MIDI Files and MIDI sequencing software. Finally, TC-Helicon have also added a Global Chord mode which retains the last chord root and type entered when flipping through presets.

W www.tc-helicon.tc

BIAS release stand-alone edition of *Sound Soap*

BIAS' *Sound Soap* plug-in for Windows XP and Mac OS X, which combines powerful noise reduction with ease of use, is now available as a stand-alone application, *Sound Soap* v1.1. *Sound Soap* removes broad-band noise (like hiss and traffic noise), low-frequency rumble and hum (of the 50Hz and 60Hz varieties) via a simple user interface which offers a graphic display of noise being removed. Previously only available as a VST or Direct X plug-in, the new stand-alone *Sound Soap* can now be used with a wide range of audio and video applications and Quicktime, AIFF, DV, WAV and *SDII* file formats are supported. Audio clips can be loaded in *Sound Soap*, processed and then exported. Alternatively, *Sound Soap* can open a whole movie project, and a Quicktime movie window allows the user to monitor progress. *Sound Soap* v1.1 ships with the v1.0.1 plug-in version and costs £99. Both v1.1 and v1.0.1 are available as a free update to registered users of *Sound Soap* v1.0, and can be downloaded from the BIAS web site.

T SCV London +44 (0)20 8418 0778.
F +44 (0)20 8418 0624.
E mail@scvlondon.co.uk
W www.bias-inc.com

Pro audio restoration plug-in for Magix *Sequoia*

Algorithmix *Descratcher* is a new plug-in for the *Sequoia* digital audio workstation software. It's designed for cleaning up the clicks and crackle on old vinyl recordings that have been transferred to disk, as well as removing switching noise, crosstalk and distortion caused by clipping from digital audio. The plug-in is the result of cooperation between Magix and audio restoration specialists Algorithmix and is designed to combine effective noise removal with low CPU load. *Descratcher* is available now and costs £1426.10 including VAT.

T DACS +44 (0)191 438 2500.
F +44 (0)191 438 2511.
E info@magix.net
W www.dacs-audio.com

Disco DSP on voyage with *Discovery*

The latest release from Disco DSP is version 1.5 of their *Discovery* virtual analogue VST synth for PC. It features two oscillators with six waveforms, two LFOs, a resonant filter with six filter types, and an arpeggiator. There are ADSR amp and filter envelope controls and built-in delay and distortion effects. *Discovery* can store 128 patches, and each patch can have up to four layers which the user can combine or morph between. *Discovery* allows a maximum of 32-note polyphony, with each layer counting as one voice (so if a patch uses four layers, polyphony is reduced to eight). The synth can be controlled using MIDI controller messages and can import patches via SysEx from the Clavia Nord Lead 2. *Discovery*, which is compatible with Windows 9x, 2000 and XP, is available to download from the DiscoDSP web site and costs £66. You can also download a free trial version of the synth.

W **www.discodsp.com**

Concrete PC pad synth is *Ethereal* too

Concrete FX have produced a new version of their *Ethereal* PC VST pad synth. *Ethereal 2* allows the user to create evolving pad sounds, with three oscillators, two filters and 32-stage envelopes. The oscillators use 22 preset waveforms and six user-definable ones. These can be created using additive synthesis with 29 harmonics, or from waves drawn by the user. Each oscillator can be frequency-modulated using any of the waves, or the ouput of any of the oscillators, as a modulator. Oscillators two and three can be sync'ed to oscillator one and the two multi-mode filters can be arranged in series or parallel. The oscillator and filter parameters can also be controlled using 32-stage envelopes and each envelope has user-definable loop and release points for creating complex patterns. An LFO can be used to control pitch, volume, pan and filter frequency, and there are built-in chorus, reverb, delay and phaser effects. There's full MIDI automation of parameters and the soft synth is supplied with 128 presets and a full manual. *Ethereal 2* is available now from the Concrete FX web site, costing a very reasonable £25. It can also be purchased as part of Concrete FX's *Synth Pack 1*, which also includes their *Industry* and *Granite* instruments, for £47. A demo version is available for download.

W **www.concretefx.com**

Crane Song find a new nest

Crane Song, US manufacturers of high-end studio hardware, have appointed KMR Audio as their sole UK distributor. The range currently consists of the STC8 stereo compressor/limiter, the Ibis stereo equaliser, the Trakker mono compressor/limiter, the Hedd 192 stereo A-D/D-A converter, and the Spider and Flamingo mic preamps. Contact KMR Audio for more information.

T **KMR Audio**
+44 (0)20 8445 2446.
E **sales@kmraudio.com**
W **www.kmraudio.com**
W **www.cranesong.com**

Genelec correction

In a passing comment in his review of the ADAM S2.5A speakers in the June 2003 issue of *SOS*, Technical Editor Hugh Robjohns inadvertently created the impression that the Genelec S30 monitor's ribbon tweeter was "notoriously fragile and difficult to drive". As Hugh explains, "It was my intention to cite the S30 as an example of a monitor speaker using a 'simple' ribbon tweeter construction, as opposed to the more complex ART design employed in the ADAM loudspeaker. This I did, whilst also pointing out that simple ribbon drivers are generally fragile and difficult to drive. However, this comment inevitably reflects poorly on the S30, which was not my intention. Generally, ribbon drivers *are* rarely found in professional applications, partly because of their relative fragility. However, this is *not* the case with the ribbon driver employed in the Genelec S30 monitor. Genelec's fault records over the last 25 years show the S30 ribbon to be extremely reliable; what's more, in its operating band it presents a resistive load to the amplifier, and is hence very easy to drive.
I apologise for any confusion caused by my poor grammar!"

New OS X and Windows XP drivers for Presonus Firestation

New drivers from Presonus mean that their Firestation Firewire audio and MIDI interface is now compatible with OS X. In Mac OS 10.2.5 and higher, Firestation drivers are included in the Audio MIDI Setup menu, requiring no further installation. For Windows XP users, the v1.1 driver can be downloaded from www.presonus.com and adds multi-channel WDM support for software such as Cakewalk's *Sonar 2*. The Presonus Firestation, which was reviewed in *SOS* February 2003 (www.sound-on-sound.com/sos/feb03/articles/presonusfirestation.asp), offers eight channels of analogue audio I/O, as well as ADAT, S/PDIF and MIDI I/O, and uses Yamaha's mLAN protocol.

T www.presonus.com

TC Tools tool up for Pro Tools TDM

TC Works' *TC Tools* v3.6 plug-in set, comprising TC's *Mega Reverb*, *Chorus/Delay* and *EQsat* plug-ins, is now available for Pro Tools TDM systems running under Mac OS X and Windows XP, supporting sample rates up to 96kHz. *Mega Reverb* is based on the core technology of the TC Electronic M5000 studio processor, while *Chorus/Delay* provides a range of chorus, flanging, delay and slap echo effects, with flexible routing and filtering facilities and the ability to adjust modulation speed according to song tempo. *EQsat* is a mastering EQ with three parametric bands and two shelving bands, and a saturation emulation feature to add warmth. *TC Tools* for Pro Tools TDM systems (Pro Tools HD, Mix and 24 systems) is available now from Digidesign, priced at £650.

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32 PAGE CATALOGUE IN THIS ISSUE OF SOS

the buyer's

INDEX

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MODULAR RACK SYNTHESIZER

nord

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Rack synth version of the Nord Modular keyboard, for those with MIDI controllers more playable than the Nord's little 2 octave keyboard! The analogue modelling is based around core blocks such as oscillators, ADSR envelope generations, filters, modulators etc which are all modelled by the software. All patch editing is done via the computer and the result is loaded into the Nord. The architecture gives you virtually unlimited routing of modular synth blocks for analogue modelling, and it's all user definable and with more modular software blocks being created by Clavia, the upgrade potential is huge.

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With the new XP2 model the Darkstar analogue modelling desktop synth module gains 4 assignable outputs, headphone output, a new jog edit wheel, additional sine waveform and colourful purple highlighted finish! Retro analogue modelling comes from a 5 part 8 note poly 2 oscillator synth engine with hands-on joystick parameter control. A great tool for dance sounds.

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JBL

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JBL are one of the few companies to make significant advances in cabinet technology with their moulded enclosures, composites and aluminium baffles coupled to the woofer baskets to aid heat disspation. The entry level LSR25 benefits from some of these innovations with its rigid aluminium enclosure and integral tweeter waveguide. The front ported 2 way bi-ampd nearfield monitor sports a 5 inch woofer and 80 watt amp plus a 1 inch titanium tweeter and 40 watt amp. It has switchable 80Hz HPF (should you ever need it) and volume trim. -3dB @ 65 - 20kHz. Priced each.

RRP £799
£319.99
JBL-LSR25P

CUBASE SL MEGA BUNDLE

steinberg

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Steinberg announce the Mega-Bundle package deal putting together Cubase SL recording / sequencing sotfware with Halion software sampler offering 32 bit 96kHz and surround support, and the popular VST plug-in effects packages, GRM Tools 1 and 2. Furthermore you get three volumes of drumloops on CD from the Pocket Fuel series by Rhythmic Architectural Design Systems (RADS). These are Vol 1 - Acoustic Rock drumloops, Vol 2 - Acoustic Hip Hop drumloops and Vol 3 - Techno Rhythm and Loops. The Mega-Bundle elements complement each other perfectly and make this a great value offer!

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YAMAHA

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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!*

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E-6400 ULTRA SAMPLER

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This monophonic analogue synth is based on the original Model D from the 70's and is a truly authentic modern equivalent of it's classic ancestor. Featuring a velocity sensitive 44 note keyboard with aftertouch, an X-Y touch pad pressure controller, 3 oscillators, a noise generator, two LPF resonant filter stages and an LFO with selectable waveforms including two sample and hold types. The Voyager B model (shown) features illuminated blue pitch/mod wheels, while the top of the range Limited Edition Signature model features the blue wheels, gold name plate, a certificate of authenticity and the signature of Bob Moog himself. Voyager B Model £2249.99 Limited Edition Signature Model £2999.99

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- 2 oscillators, waves, FM, 4 effects, 2 envelopes

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12 note poly analogue modelling synth with 4 analogue outputs and S/PDIF digital. Oscillators can mix 3 waveforms including pulse width modulation and noise, and even have a ring modulator, dual multimode filters can be routed 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 ... EQ, reverb and that legendary fat Oberheim sound. *An incredible synth even at the old price, now it's unbelievable, with a saving of £200 !!*

FACTORY DIRECT — **£499** — OBER-OB12

VIRUS C SYNTHESIZER
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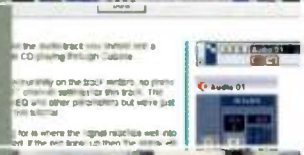

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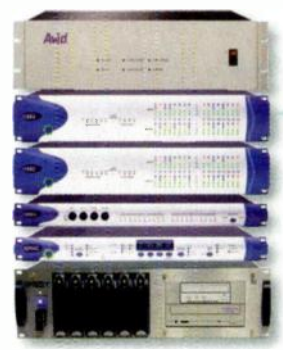

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Q&A

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Q How can I use VST instruments live?

I'm interested in using my VST instruments when performing live. What different ways are there to achieve this? How, in particular, can I change between different instruments during a song, and are there any pitfalls I should be aware of?
Malcolm Carpenter

***SOS* contributor Craig Anderton replies:**
There are many options for using VST instruments live, but your primary concern should be to 'bullet-proof' your setup for maximum reliability. If a computer crashes in the studio, you can just reboot and carry on. Playing live does not afford that luxury.

The three main issues that need to be discussed are the computer running your instruments, the software host (if any) under which they will be running, and how to deal with MIDI control, routing, layering, and signal processing. A laptop might seem like the most convenient option for running VST instruments due to the size, weight, built-in screen, and (thanks to its built-in battery) relative immunity from power problems.

However, soft synths can place tremendous demands on your CPU — far more than hard disk recording. There's no fixed equation for how many instruments can run for a given processor speed, but get the fastest CPU you can afford. You will also want lots of RAM if you plan to use samplers that load samples into RAM. If samples can be streamed from hard disk (as is the case with GigaSampler, Halion, *and* Kontakt*), be aware that many notebook hard drives spin at 5400 RPM rather than the desktop's usual, noisier 7200 RPM, making it harder to pull lots of samples off the drive simultaneously. Laptops can be fragile and won't tolerate too much rough and tumble, and the mini-jacks used for audio I/O are a disaster waiting to happen. For audio interfacing, a small USB box with (at least) a stereo out is probably your best bet.*

On balance, a small desktop computer might be a better choice than a laptop. While bulky, they're easier to fix on the road, and generally offer better performance for a given price. However, you will be stuck with carting around an external monitor. A 15-inch LCD screen should do the job, and offers the advantage of light weight. Make sure you also get a UPS (uninterruptible power supply). A USB audio interface is again a good option for audio interfacing, although most desktop computers will accept PCI cards, which can offer more extensive I/O.

Another possibility is a dedicated hardware box designed to run plug-ins, such as Plugzilla from Manifold Labs, and the Eko keyboard from Open Labs. Although neither is yet available as of this writing, they are essentially computers optimized for road use, and designed solely to host plug-in instruments and processors. While not cheap, they hold great promise for the performing musician. Meanwhile, there is an alternative hardware host which is available now — Creamware's Noah, reviewed in last month's SOS. *However, it runs only Creamware virtual instruments, not VST devices. Still, the packaging is roadworthy, and as anyone who has heard Creamware's* Minimax *and* Six String *can attest, their instruments sound great and have virtually no latency.*

Steinberg's *V-Stack* is designed not just for use with their System Link, but in stand-alone mode as a way to manage a 'rack' of virtual instruments for live use.

Speaking of latency, consider how you'll deal with it in a computer-based system. Ideally, you'd want to use the minimum possible latency for the best 'feel' and response when playing live. But the lower the latency, the greater the potential for processor overload, resulting in crackles, pops, and possible malfunctions. Even though many computers can produce latencies in the 1.5-3ms range, I'd recommend setting it for 5-10ms. The feel won't be compromised too much, but your system will be much more solid.

There are two programs designed specifically to host VST instruments: DSound's RT Player Pro *(Mac/Windows) and* Steinberg's V-Stack *(Windows only at the moment). You can download a demo of* RT Player Pro, *as well as read a review I wrote about it, at* www.dsound1.com. Steinberg's web site www.steinberg.net has info on V-Stack, *but no demo. Basically,* V-Stack *is like the VST instrument section of* Cubase SX *with a mixer, so it's no big mystery. Of course, you can use any VSTi-compatible program to host instruments. And don't forget products like Propellerhead's* Reason *and Cakewalk's* Project 5 *(the latter also accepts VSTi devices), as they have their own virtual instruments and might be the only 'rack' you really need. Furthermore, if you plan to run only a few devices, you may not even require a host if the instruments can run in stand-alone mode under ASIO. For example, when Native Instruments'* B4 *first appeared, quite a few people got a cheap laptop, loaded it up with* B4, *hooked up a MIDI interface and keyboard, and treated it as an instrument.*

The optimum way to select and play instruments varies greatly depending on your needs: how many instruments will you be using, and will you play one instrument at a time, or do you want to layer several? For example, you could set every instrument's MIDI in to Omni, and vary each device's level to change the balance of the instruments when layering, or to turn selected instruments off entirely. However, having all instruments playing notes, even if you have the levels down, is going to have a serious impact on the processor.

Probably the most flexible approach is to use a master keyboard with storable presets that determine splits, layers, MIDI channels, velocity curves, and so on. Then, you can set each instrument to respond to a unique MIDI channel, and call up a keyboard preset to send data to specific instruments. Instruments which are not being played will not generate notes, and therefore should not draw significant CPU power. If your keyboard can't store presets, you can almost always change channel assignments manually, but that may not be satisfactory if you have to do lightning-fast changes in the middle of a song. Also, consider what happens when you load a preset into a virtual instrument. With synths, the process is fairly instantaneous, but if you're loading a 100MB sample into a sampler, it can take quite some time, and slow down your system. Sometimes, you may need to think ahead and load one instrument while playing another.

If you're using a sequencer host like Cubase, Logic, *or* Sonar *(with a VST-DX*

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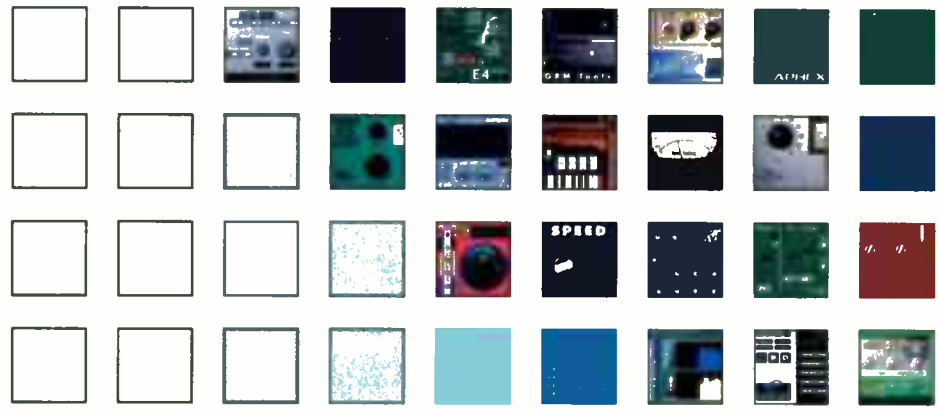

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Q&A

adaptor) you have the option of using a dedicated hardware controller, like the Kenton units or the Peavey PC1600X. You can program the faders to set levels, and the buttons to mute or solo channels. However, not all programs treat MIDI similarly. Sonar assumes you will always want to record to one MIDI instrument, so you can't layer instruments (Project 5 can, however). With Cubase, you can select multiple tracks and, when record-enabled, they will echo the MIDI data to whatever output(s) you have selected.

One particular pitfall to be aware of is MIDI notes 'sticking'. This can happen if you're playing into one track, then switch the output to a different instrument while your fingers are on the keys. The first instrument won't see any Note Off commands, thus sticking the note(s). A similar problem can happen with pitch bend; if you change tracks while a note is bent, it will remain at that pitch until it receives another new bend message. Make sure you know where to find the 'All Notes Off' command!

For now, I believe your best bet is to use a dedicated piece of software like RT Player Pro or V-Stack, along with a master controller that can store presets. However, keep your eye on the upcoming generation of dedicated hardware hosts, as they are likely to be more road-friendly than personal computers.

Q Why aren't the rotary knobs on my MIDI controller behaving?

I have a couple of MIDI control surfaces with endless knobs, but I'm not sure how to use them. When I've tried using them on some of my software, the software controls just jump between a couple of values, but on others they work fine. Do they use some special kind of MIDI?
SOS Forum Post

SOS contributor Len Sasso replies: Endless rotary encoders (or, in other words, knobs that you can turn all the way around) are designed to solve the problem of the controller and the thing being controlled getting out of sync. That happens in hardware, for example, when you change presets — fixed-position knobs and sliders don't change and therefore no longer reflect the settings they control. That's why most synths have at least one endless rotary encoder (often called a "Data Wheel") used to

Your hardware and software may not correctly interpret the MIDI output from endless rotary knobs, like those on the Steinberg Houston.

update settings selected in the synth's LCD. The same problem, of course, arises in software when you use a hardware controller for controls that can also be changed on screen. If you've ever used a hardware fader box for software mixing, you're undoubtedly aware of the problem. In that case, the expensive solution is motorised faders, but endless rotaries can also be used.

Where endless rotaries really come in to their own is for software synthesizer programming. Many soft synths feature a MIDI Learn function that will detect the incoming MIDI message type and automatically assign it to the targeted synth parameter. Some of those — Native Instrument's Reaktor and Ableton's Live are just two examples — will also attempt to deduce whether the incoming MIDI represents an endless rotary control. Endless rotaries use standard MIDI Control Change messages, but they must be interpreted differently at the receiving end. Instead of representing the actual value of the parameter, the MIDI data value represents the direction and speed at which the knob is being turned.

Endless rotaries can be set up in several ways, so it can be tricky to automatically detect what's going on at the receiving end. For example, a common practice is for data values 64 and above to represent clockwise motion whereas values 63 and below represent counterclockwise motion. Higher and lower values represent faster clockwise and counterclockwise motion, respectively. If your software interprets those as fixed values, the targeted on-screen control will jump between values near 64, which is probably what you're experiencing. If your software doesn't accept endless rotaries, there's not much you can do. If it does, then it typically also allows you to manually override its interpretation and select from several alternatives.

Q Where can I obtain back issues of *SOS*?

Having trawled the net looking for information on a MIDI/SMPTE Controller I have just purchased, I noticed that your May 1987 Issue features a review of the controller is question, a Nomad SMC1.0. Obviously, the magazine is well out of print now, but do you know of any way that I can get a copy of the full review? I have tried eBay for back issues, but to no avail.
Steve Fisher

Assistant Editor Tom Flint replies: From every print run of SOS we have retained some spare copies of the magazine which have subsequently been made available as back issues for sale to readers. Naturally, some issues have been sold more than others (the December 1995 and January 1996 issues containing the two-part Korg Trinity review spring to mind), so over the course of time these have sold out and are no longer available from us. Otherwise, we have extremely limited stocks of other issues. Early issues from the '80s and early '90s are very rare indeed, so much so that we only retain one complete set of every Sound On Sound here at the office, and that is definitely not for sale!

In 1998 we began making SOS articles available on our web site. Our web designers began working backwards from that date, individually formatting previous features, reviews and articles ready for inclusion on the site. Eventually they reached as far back as 1993 but we decided to draw the line at that point, largely because our archiving format pre-1993 made converting the old articles a slow and expensive process. Therefore, there are only two ways I can immediately think of to get hold of articles preceding that date. The first is to call SOS and ask for a photocopy of a specific article. However, this is a very time-consuming thing for our staff to do and so we have to charge a reasonable amount per copy just to cover our labour costs. We also reserve the right to refuse unreasonably large requests for copying!

The second option — one that we heartily recommend — is to post a wanted advert on the SOS web site (www.sospubs.co.uk/adverts). There are many readers out there who still have back issues stored in their

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Q&A

▶ gran's loft dating back to the early years, and many of them may be prepared to get out the step ladder and find them for you. Whether they'll be willing to part with them is another matter!

Q In which order should I use reverb and stereo imaging?

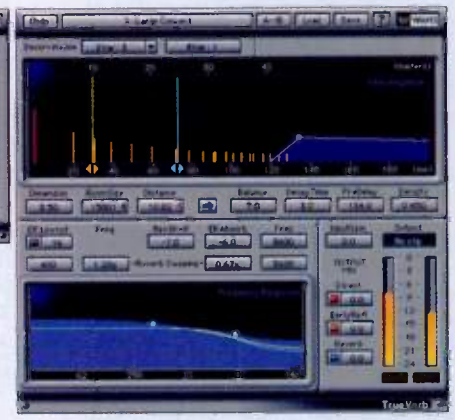
I was wondering how best to use the combination of the stereo reverb and stereo imager (stereo width control) plug-ins in my sequencer. Should I adjust the stereo width of a track before treating it with reverb or vice versa?

SOS Forum Post

Technical Editor Hugh Robjohns replies:

The vast majority of reverb processors (both the hardware and plug-in varieties) generate a very wide stereo soundstage, often from a mono input source. Adjusting the width of the stereo source going into the reverb will therefore not usually affect the width of the reverb signal coming out of it. Instead, adjusting the stereo width of the source effectively controls the size and width of the musicians placed within the artificial room created by the reverb.

On the other hand, if you apply the stereo imager after the reverb, then you will be able to control the overall width of the complete source/reverb mix. Since the reverb tends to fill out the edges of a mix, reducing the stereo width at this point will have a most pronounced effect on the amount of reverb perceived overall and give the effect a much less natural sound. Both arrangements are perfectly viable, though I would go for the former myself.



Think about the order in which you combine reverb and stereo imager plug-ins, like Waves' *Trueverb* and *S1*.

Q Can you have too much acoustic treatment?

I recently moved to a new house, where one room was already set up for home recording.

The room is square (I know you're already shaking your head!), measuring 3.6 metres on each side. There's only one door and no windows at all. Two or three layers of soundproofing materials have been installed, the walls and ceiling are totally covered with sound-absorbing foam panels, and the floor is carpeted. The only variation is provided by several metre-high wooden panels.

When I initially put my gear inside, the room was almost empty and the sound from my speakers was coming out as if they were underwater! Now that I've put some more furniture and equipment in the room, the overall sound has improved but it still isn't satisfactory. I also need to push my amplifier more than before. Can you tell me what I need to do to improve the sound? I'm still wondering why the room was built this way, and by a professional company too!
Amir Zuccala

Technical Editor Hugh Robjohns replies:
I can see why you are concerned; foam panels like the ones you describe do very little to provide sound isolation as such. What they actually do is provide some absorbtion and therefore help to control unwanted reflections within a room. The thicker and more dense the foam, the lower the frequencies affected, but in general most panels of this type only have an appreciable effect down to the midrange at best, and the upper midrange, more usually.

So, by lining a room completely with foam panels like this all the high- and mid-frequency reflections are absorbed, leaving only the lower-mid and bass frequencies to rattle around, usually resulting in a very dead but boxy-sounding room — and if this is taken to the extreme, then you can experience the kind of underwater effect you describe.

Wooden wall panels will certainly bring back some mid- and high-frequency reflections, as will all the furniture and equipment that you have installed in the room, which is why the sound now seems better than previously.

The aim is really to create a good balance between LF, MF and HF reverberation times — not to remove reflections altogether. It's usually a good idea to curb any reflections from the side walls and ceiling between monitors and your listening position, so I'd leave the foam panels in those areas alone. Likewise, leave the panels behind the monitors themselves. Elsewhere, you could try temporarily covering some of the panels randomly with sheets of plywood about one metre square to reintroduce some reflections and diffusion back into the room. Or you could experiment moving your bookcases around to achieve the desired effect. It will be a process of trial and error I'm afraid, but you should be able to achieve a good sound without too much effort.

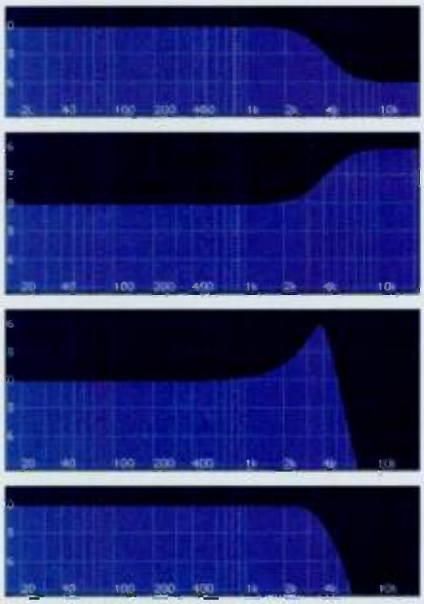
Q What's the difference between 'pass' and 'shelf' filters?

What is the difference between low-pass and low shelf, or high-pass and high shelf filters?
Philip Vernon

SOS contributor Len Sasso replies:
Firstly, it's important to note that the more apt comparison is between low-pass and high ▶

Q&A

shelf or high-pass and low shelf filtering. Shelving filters apply a fixed amount of cut or boost with a gradual slope (often adjustable) to the required level. The shelf frequency is taken as the frequency at which the cut or boost reaches 3dB. Low- and high-pass filters apply an increasing high- or low-frequency attenuation respectively. Their cutoff frequency is also defined as the frequency at which the signal is reduced by 3dB, but the drop-off continues rather than levelling off. Historically, high shelf filters were more commonly used in equalization contexts, whereas low-pass filters were used in synthesis, but now both filter types are common in both applications.



These diagrams show (from top to bottom): a high shelf cut at 4kHz; a high shelf boost at 4kHz; a low-pass filter set to 4kHz, with resonance; and a low-pass filter set to 4kHz, without resonance.

The accompanying illustrations of two high shelf and two low-pass filter curves should make the difference clear. One thing to notice is that the high shelf filter can be configured to either boost or cut the signal, whereas low-pass filters always cut. In the illustration, the low-pass cutoff and high shelf shelving frequencies are all set to 4kHz, and that is the point at which the 3dB line crosses the curve.

Another difference between high shelf and low-pass filters is that low-pass filters often offer resonance, which produces a boost just before the cutoff frequency. A further difference is that low-pass filters generally have a fixed slope, whereas the slope is usually variable for high shelf filters.

Q How do I mike up a tuba with piano accompaniment?

I want to record a CD of tuba pieces with piano accompaniment. In terms of microphones, I'll be using matched pairs of Groove Tubes GT33s and GT57s and a couple of Rode NT1s. How should I set them up? I was thinking of putting one pair of mics on the piano and and another pair on the tuba. I'd be greatful for any assistance!
SOS Forum Post

Technical Editor Hugh Robjohns replies:
I would start off by questioning the assumption that you need to separate the instruments. Presumably you are planning to record a single performance — you won't be overdubbing more tuba parts or replacing sections of the piano backing later on. If this is indeed the case, all you really need to do is arrive at a mic technique that delivers the sound you want — a nicely focused tuba, probably in the centre of your stereo image, with the piano behind, and some room ambience, possibly enhanced with some digital reverb.

You have two choices. If you're recording in a room with a nice sound, I would stand the tuba player in front of the piano and put up a stereo pair of mics about three metres in the air and the same distance in front of the performers, so that you can capture everything in one go, with natural perspectives and ambience. Alternatively, you could place the tuba further away from the piano and facing it, and then rig a figure-of-eight crossed pair between them, with one side facing the piano and the other looking at the tuba. This arrangement allows the musicians to see each other better, and you can still control balance and perspective by moving the tuba player closer to or further from the mics.

These two methods will both capture a lot of room sound, which is great if the room is a good one, but a pain if it isn't. So, you may want to consider close-miking each instrument instead ('close' being a relative term here). I would try miking the grand piano with a spaced pair about two metres away and high enough so that they are more or less looking down the edge of the lid, one looking more towards the high strings and the other towards the lower strings. The tuba can be miked from above at a distance of about one and a half metres, and the more on-axis the mic is, the more upper harmonics you will pick up. I would not recommend your idea of two mics for the tuba — it's asking for trouble! Use one mic and move it around until you find the best balance of upper harmonics and body. By using a spaced pair on the piano you will tend to end up with a bit of a hole in the middle of the stereo image into which the tuba will fit nicely. Don't pan the piano too wide, and add digital reverb to taste. You'll also need to be careful to ensure that the sound of the tuba doesn't get into the piano mics, and vice versa, to prevent phasing problems or colouration. You might want to put the tuba behind the piano, so that the open piano lid provides a degree of isolation and helps to minimise the direct spill from the tuba to the piano mics. There will still be good sight lines between pianist and tuba player, and a cardioid mic on the tuba will reject most of the direct piano sound, maintaining good separation between the two instruments.

If you want to use a spaced pair placed further out to capture room ambience, make sure that it's sufficiently far away so that the sound it captures will be diffuse and incoherent enough to avoid phasing problems.

Q Who or what is General MIDI?

Although I have a General MIDI synth and use it all the time, I'm somewhat confused about the full meaning of GM. It seems to mean one thing for synthesizer sounds, another for drum sounds and yet another for MIDI files. What's the scoop?
Trevor Gardner

***SOS* contributor Len Sasso replies:**
General MIDI (GM) is an extension of the original MIDI specification for communication between electronic musical instruments (and now including computers and many types of other electronic devices). At the outset, the primary purpose of GM was to establish compatibility between the programs, or presets, of different instruments, so that, for example, when you call up program one you always get a piano sound (though of course pianos on different instruments might sound completely different). With reference to drums, GM is intended to insure that the map connecting note numbers (pitches) to drum sounds is consistent, so that, for example, MIDI note number 36 always plays a kick drum sound. It also specifies that MIDI channel 10 will always be used for drums—consequently the standard MIDI program numbers don't apply to channel 10. GM does not specify a program numbering for drum kits, because when it was devised it was

In late 1969 synthesis pioneer Dr Robert Moog created his first portable and sparked a revolution.

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Voyager by Bob Moog is available as a standard Performer model in a hand finished original walnut cabinet at £2199 including VAT and delivery.

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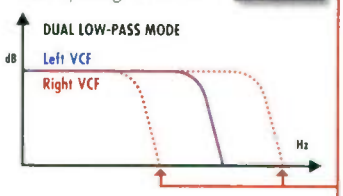
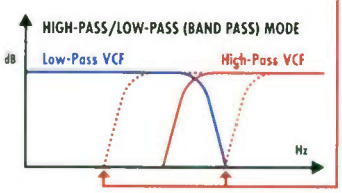
The VX351 Voyager CV Expander connects to the Voyager's accessory port, accessing all 21 Control Voltage (CV) and Gate outputs of the Voyager. It also includes two 4-way mults and two attenuators. Adding this to your Voyager adds the capabilities of a modular synthesizer. £199 inc VAT and delivery.

Also from Bob Moog, Moogerfooger FX pedals with his classic analog sound. Low Pass Filter £219.99, Ring Mod £219.99, 12 Stage Phaser £299.99 & CP 251 Control Signal Processor £299.99

Bob Moog's famous filter design gives his instruments their unique character. Wheras the original used a single low-pass filter, Voyager incorporates his dual 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





off-set 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.

Bob Moog has always favoured the warmth and rawness of voltage control to 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.

The Voyager's two Modulation Busses 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.

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 co-ordinates 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 on a free trial in your own studio.

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WRH

Q&A

unusual for a synth to have more than one drum kit.

The GM specification only covers one bank containing 128 programs. Many synths have a GM bank along with other banks of programs not fitting into the GM classification. As multiple banks of programs became common, two leading manufacturers, Yamaha and Roland, developed extensions to the GM program set called GS and XG, respectively. Those include both more banks, standardised drum kit numbers, and effects program numbering. The general strategy is to follow the GM program numbering and place additional sounds of a similar type on other banks at the same program location. For example, program one on all banks would be some form of piano sound. GS and XG are different specifications, but XG, coming later, implements most of the GS protocol.

MIDI files are another topic entirely and are not related to the GM protocol, but commercially available MIDI files typically follow the GM protocol as far as program numbers and drum maps are concerned. The Standard MIDI File (SMF), of which there are three types, sets a standard for transferring

MIDI sequences between different sequencing applications. In the process, much of the application-specific information is lost — things like graphic layout, scoring information, and so on — but the MIDI data along with its timing and channel are, at least, preserved. Tempo and time signature data is also retained. Type 0 SMFs are the simplest — everything is packed into a single track. Type 1 allows for separate tracks as well as for track names. Type 2 (almost never used) attempts to also preserve regions within tracks, for example, to correspond to loops from a pattern sequencer. Most software sequencers will both load and save SMFs in Type 0 and Type 1 formats.

Q Should I use a limiter when recording drums?

I record using a computer system with an RME Multiface soundcard. I'm thinking of buying an eight-channel mic preamp, like the Focusrite Octopre or the Presonus Digimax, to use for recording drums. I have done some drum recordings before with a Behringer MX8000 and the usual mics for drums (AKG D112, Shure SM57, AKG 414 for overheads, and so on). I feel I do not really use the full gain available and leave a lot of headroom because I'm afraid of causing digital distortion and clipping. Does it make sense to use a limiter as a kind of safety net when I record drums straight into *Cubase* via the Multiface ADAT extension?

SOS Forum Post

When recording drums, applying limiting as you record can destroy valuable transients.

Technical Editor Hugh Robjohns replies:

I would advise against using any form of dynamic control when recording your drums into any digital system — or, indeed, using any other kind of signal processing — unless absolutely essential. In my experience there is simply no need, and any processing done before recording only serves to reduce options when it comes to mixing. Whereas a certain amount of pre-conditioning was necessary in the days of analogue recorders (in order to optimise the characteristics of the tape medium) this is no longer the case with digital systems, especially if you're using decent 24-bit converters.

A lot of people are still hung up on the idea that unless the signal is almost hitting the 0dBFS meter point in a digital system 'signal quality' is being lost in some way. This is simply not the case with modern digital audio systems. In fact, it is far more likely that quality is being lost if the meters get anywhere near 0dBFS!

Of course, it is true that the lower the average recording level the less the effective system signal-to-noise ratio will be — just as is the case with analogue systems. However, even a 16-bit digital system has such a huge dynamic range in the first place that leaving a few dB's as a headroom allowance makes little practical difference to the noise floor, yet it makes the task of recording a whole lot easier, and the results a whole lot better.

For example, a reasonable amount of headroom to allocate would be around 12dB above the average level. In a 16-bit system we would then be left with a noise floor about 84dB below the average signal level — far better than virtually any analogue tape recorder, even with a decent noise reduction system — and in a 24-bit system the floor theoretically would be about 130dB down. In either case this system noise floor will be completely swamped by the acoustic noise floor of a typical home recording environment, and is therefore not a critical factor at all. The advantage of leaving this sort of headroom allowance, though, is that the system can accommodate 12dB of transient peaks without your having to worry about the possibility of overloads, and without damaging the transient attacks which are so critical to drum sounds. So you can concentrate on the performance, rather than the technology, and the recorded results will be a faithful recreation of the original, rather than a 'bent' version which can't be 'un-bent'.

Once the recording is preserved within the digital domain, then you can start

processing as you feel necessary to control the dynamics using compressors, limiters, equalisation, editing or whatever is necessary to achieve the results you are looking for. And should you change your mind about what kind of processing to apply during the mix, you can without restriction, because the original sound will have been recorded in all its transient-rich glory!

Q What equipment do I need for M&S stereo recording?

I'd like to try doing some stereo recording using the M&S technique, where (as I understand it) the signal from a cardioid or hypercardioid mic pointing towards the sound source is combined with the signal from a figure-of-eight mic at 90 degrees to the cardioid/hypercardioid to create a stereo image. However, I don't currently own either a figure-of-eight mic or an M&S decoder. Do I need to buy either or both, or can I set up an M&S configuration without them? Also, is it essential that the two mics sound the same, in the way that you'd use a matched pair of mics for recording with a spaced pair or X-Y crossed pair?

***SOS* Forum Post**

Technical Editor Hugh Robjohns replies:

To answer your last question first, ideally the microphones used should have similar tonal characteristics because the stereo image is created by the arithmetic sum of the two (more on this shortly). If their characteristics differ wildly, then the tonal quality of the image will vary noticeably as the sound source tracks across in front of the mics. If recording a static musical group you may not notice any difference in the quality of the sound across the stereo image, but if a source moves, as it would in a radio or TV drama, for example, then you would hear it very clearly.

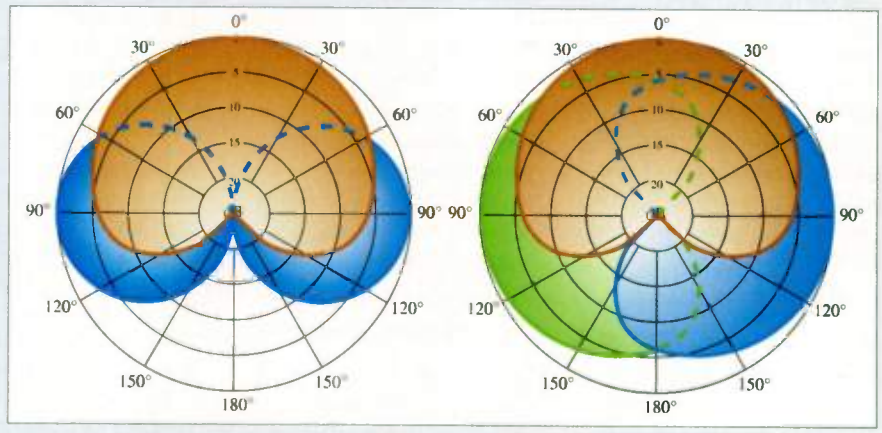
Converting the M&S signal to conventional stereo involves what's called a sum-and-difference decoder matrix. The Middle signal plus the Sides signal produces the left side and the Middle minus the Sides produces the right side of the resulting stereo signal. M&S decoders are availble in hardware and software forms, and are built into some mic preamps and mixers. However, you can achieve the same result quite easily with a conventional mixer. The nicest way to do this is to route the Middle mic to, say, channel 1 and pan it to the centre. Route the Sides mic to channel 2 and pan it fully left. Next, turn up a post-fade aux send on channel 2, then take the output from that aux send and route it to a spare channel or return somewhere out of the way — let's say channel 24. Push the fader of this channel right to the top and tape it down so that it can't be moved accidentally. Then pan this channel fully right and switch in the phase reverse (if the mixer has inverted aux outputs, and some do, you won't need to switch in the channel's phase reverse).

Basically, what we now have is the Middle mic going to both left and right outputs (channel 1), and the Sides mic going in-phase to the left output (channel 2) and going out-of-phase to the right output (channel 24). So on the left output we have M + S, giving stereo left, and on the right output we have M - S, giving stereo right. You now have to set up the aux send levels to ensure that the +S and -S components are equal and opposite, or, equal in amplitude as well as opposite in polarity, so that they cancel in mono. With someone talking on-axis to the Sides mic, set a nominal gain to get plenty of signal in the left channel (channel 2). As you increase the post-fade aux send you should get the signal coming out of the right hand channel (channel 24). Switch the monitoring to mono and find the point where the signal reaches a silent null. This is where +S and -S are equal and opposite. Fix the fader at this position, then switch the monitoring back to stereo.

You may have to juggle the channel aux send, the aux master, and the -S return channel gains to optimise the gain structure, but there's no rocket science in that. All you have to do now is set the appropriate gains in the Middle and Sides mic inputs (channels 1 and 2), then adjusting the Sides mic's fader will adjust the amount of stereo width. If you are using a cardioid Middle mic, the Sides channel's gain should be about 8dB lower than the Middle channel to equate to the same acceptance angle as a pair of 90-degree crossed cardioids.

Although this may sound like a complex way to do the decode, it only takes a few minutes to set up, and offers several practical advantages over the 'idiots way' of using two adjacent Sides channels and a splitter lead to split the signal from the figure-of-eight mic. For a start, each mic is handled by only one mic preamp. This means less noise, no phantom power issues, and only one gain control for each mic. Secondly, it's easier to adjust width using a single Sides fader, rather than a pair of linked faders — and if the gain matching between Sides channels drifts, as it can easily do with linked faders, your mono compatibility goes out of the window. Finally, if you wanted to work with more than one M&S pair (and you often do, just as you might use more than one conventional stereo pair), you only need to tie up two more channels, not three. The -S element of the second M&S pair can be sent to the same post-fade aux output bus, and collected by our -S channel (channel 24 in the plan above). This is the technique routinely used by dubbing and televsion sound mixers. It works extremely well, and is very fast to set up once you are familiar with it.

You don't necessarily need a figure-of-eight mic to record using the M&S technique either — it's equally possible to use three mics instead. In fact, a lot of the single-bodied M&S stereo mics do exactly that, mainly to ensure that the mics all have identical characteristics. They typically use three cardioid capsules, one facing front, and two facing sideways, back to back. If you combine the two sideways cardioids in opposite polarities, you're left with a figure-of-eight response. This can then be combined with the Middle signal for decoding. SOS



Above left: the polar response pattern of the conventional M&S microphone arrangement, with the cardioid (M) in red and the figure-of-eight (S) in blue. Above right: three cardioids, shown in red (M), blue and green(S), are used to create an M&S pickup pattern.

cutting edge

THE FUTURE OF MUSIC TECHNOLOGY

With big changes afoot for Windows and PCs in the medium term, we get the inside track on what they could mean for musicians.

Dave Shapton

As I mentioned last month, the PC platform is going to change almost beyond recognition over the next few years. Not just in terms of pure speed, but in the way data moves around it, and gets into and out of it. Microsoft's so-called 'Longhorn' version of Windows, the biggest upgrade to Windows since the demise of Windows 3.11 (and the introduction of Windows 95) is some way off, but it will be the first operating system to use the new features due to arrive in our PCs any day now.

PC: People Centre?

One important aspect of Microsoft's roadmap is the intention to make the PC the centre of home entertainment. How people listen to music is important to musicians, not only because the more access we have to music, the more we listen to it, but because it's good to know how people will be listening to music in the future. And if you look just under the skin of this potential home media bliss you'll find technologies that will doubtless creep into music studios as well.

Information about the new Microsoft products is seeping out, but I thought it might be interesting to ask a few direct questions that are relevant to *Sound On Sound* readers. To this end, I managed to get hold of Tom Laemmel, who is Windows' Home Product Manager for Microsoft at their Redmond, USA site. Note that some of the answers Tom gave me are pretty technical, or refer to very specific technologies. There isn't room in this column to explain everything in detail, but please persevere, because there's some very important stuff here, especially about the new PC audio architecture.

We began by talking about Media Center (sic) Edition, the version of Windows XP that lets users control media playback and recording from a remote control. It's a lot slicker than it sounds and is already on sale in the US, where it has been well received. Difficulties with the way we do digital television in Europe have slowed down its introduction here, but it's certainly coming. I've tried it and it's certainly a great way to access your music collection.

Music & Home Networking

The first thing I asked Tom was whether the Windows Media Center Edition is going to be developed to include dedicated network playback clients. (For those not familiar with this term, an example of a media network client is the Turtle Beach Audiotron — see www.turtlebeach.com/site/products/audiotron/producthome.asp. Audiotron is a device that sits on a home network, wired or wireless, and lets you browse through your media collection remotely. It's equipped with digital and analogue audio outputs and behaves exactly as if it's another component in your hi-fi system.) He responded: "Our intention is to have the Windows platform (and MCE as part of that platform) support such networked devices through content directory services.

"Content directory services will help hardware manufacturers easily build devices that can access and play PC media files over home networks. That means that any song, photo or video you've collected can be seen or heard on TVs or other consumer electronic products connected to your PC. The vision is to make it possible for consumers to distribute media from the PC to nodes throughout the house (via Universal Plug-and-Play AV devices) — media anywhere, at any time, and on any device." Asked whether such networked media would only work with Windows Media, or would be 'format agnostic', Tom replied that Microsoft's goal would be "to support all the major audio and video formats".

Bearing in mind that I was talking to Tom on behalf of hi-tech musicians, I then moved ▶

The Windows Media Center Edition will seek to support remote playback control devices such as the Turtle Beach Audiotron, via home media networking centred on the PC.

Bluetooth Audio Developments

I recently had a call from the audio compression company APT, who have announced that they've teamed up with a Korean electronics firm to produce a chipset incorporating APT-X, their compression algorithm, with Bluetooth. What they are promising is extremely high-quality stereo audio over Bluetooth, at low cost.

APT-X is different from other compression schemes because it uses the more deterministic (and less destructive) ADPCM technique. Most other audio compression schemes use psychoacoustic assumptions to reduce the data rate. To grossly oversimplify, APT-X works by recording the numerical difference between adjacent samples. This has several advantages. There is little encoding delay, because there is no need to base the calculation on a large group of samples, and approximately 98 percent of the original data is preserved. What this means is that you can compress and uncompress audio, using APT-X, with very little degradation. (I'll discuss how and why in a future instalment of Cutting Edge.) The compression rate is only 4:1, but this is ideal for Bluetooth.

This could all be very significant for the audio industry. In fact, there's no 'could be' about it. What remains to be seen is how practical it is, and to what extent manufacturers in the hi-tech/audio arena pick up on it. I'm getting a sample board set sent to me by APT and I will be reporting back as soon as I've tried it out. I'll also talk about some possible applications of the technology, such as wireless loudspeakers.

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Korg BX3

Photos: Richard Ecclestone

Dual-manual Modelled Combo Organ

Korg's CX3 digitally modelled combo organ went down a storm when we reviewed it some two years ago. Now it's time to find out if the dual-manual BX3 is twice as good.

Gordon Reid

I have known fellow *Sound On Sound* writer Nick Magnus since the phrase 'burning bush' was a biblical reference, not an ambition. And, for the past few years, we have had a little telephone ritual whereby he telephones me and asks "How is one?", to which I reply, "Not as good as two". Silly, I know, but such is the stuff of human existence. This particular observation, too, is amply confirmed by the Korg BX3, the dual-manual version of the Korg CX3 combo organ that I reviewed in *Sound On Sound*'s January 2001 issue. The sound generator in the BX3 is identical to that of the CX3. So, rather than repeat much of my detailed review of the CX3, I have limited myself to presenting an overview here. If you would like more detail, please refer back to the original review as mentioned above.

Organ Donation

Despite its elegant 'vintage' appearance, everything about the BX3 is digital, with a set of algorithms that emulates a tonewheel sound generator, and yet more algorithms to recreate the various effects that are so crucial to the classic Hammond/Leslie sound. The basic voicing emulates that of the B3, C3 and A100 models, but with many additional facilities that you can access via a simple editing system. These include 'vintage' and 'clean' tonewheel settings, leakage, key click, percussion settings, chorus/vibrato, amplifier models, EQ,

SOUND ON SOUND

Korg BX3 £2995

pros

- The best Hammond C3/B3/A100 emulation I've heard.
- Excellent editing system with a large, friendly screen.
- First-class on-board treatments and effects.
- 'EX' mode is a superb extension to the original Hammond algorithm.
- Excellent MIDI CC capabilities.
- A dream to play.
- Looks gorgeous.

cons

- Bi-timbral, so you can't play two manuals plus pedals.
- No Leslie output.
- Not cheap.

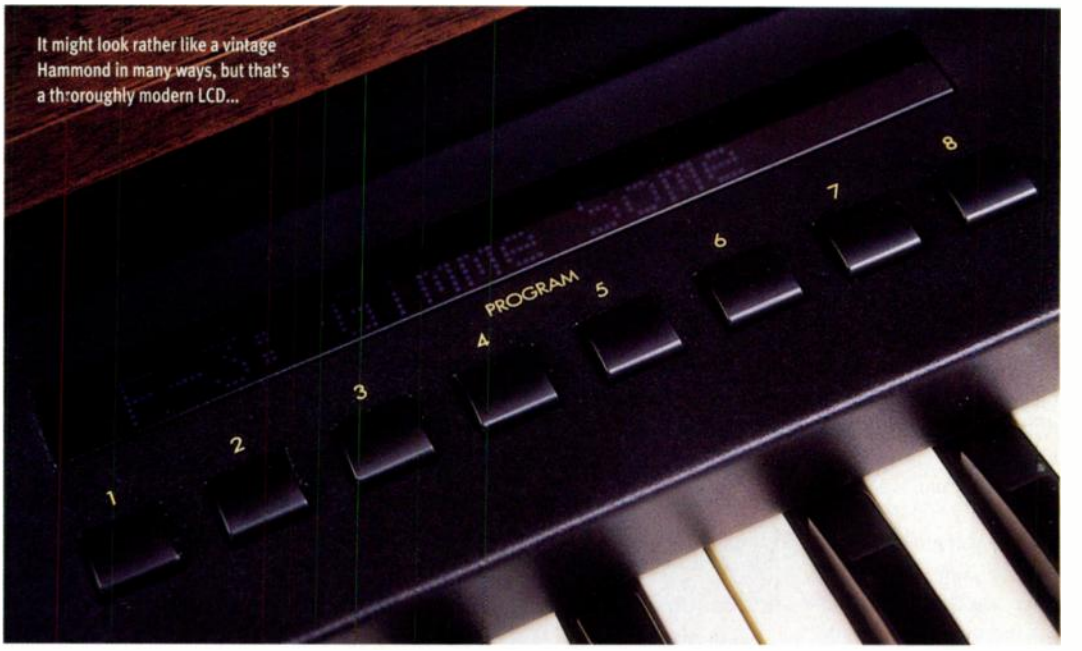
summary

The BX3 would be the best Hammond emulator on the planet were it not for its lack of a pedalboard and Leslie output. If neither of these omissions bothers you, it's still the best there is. But if you want to play with your feet, or plug a Leslie directly into your organ, you'll have to look elsewhere.

reverb, the rotary speaker effect, and a whole bunch of other parameters that allow you to craft the sound in exactly the ways you want. You are not starved of choices: for example, the Leslie emulation offers no fewer than 17 parameters that allow you to set up and 'mic' the virtual speaker in almost any way that you could set up and mic the real thing.

Like the CX3, the BX3 also offers 'EX' mode, which extends the traditional Hammond voicing by adding a further four drawbars to the sustained sound, plus five new percussion footages. I reported in 2001 that these options improve the basic Hammond 'algorithm' and I see no reason to change my view. The BX3, like its smaller brother, sounds superb in EX mode, especially when you play it as a church or gospel organ rather than as a rock & roll instrument. The only drawback here is that you lose the ability to place different registrations on each keyboard. EX mode places heavy demands on the sound generator, so one sound is all you'll get. On the plus side, the BX3 can even act as a touch-sensitive MIDI controller.

But let's move on to the nitty-gritty. How does the BX3 perform next to the real thing?



It might look rather like a vintage Hammond in many ways, but that's a thoroughly modern LCD...

Control Zone

When it comes to reviewing Hammond emulators, I'm very fortunate. I simply place the instrument in question next to my mint, 38-year-old A100 and Leslie 147, hook up a pair of speakers, and away I go!

Although in isolation the BX3 appears much like a vintage Hammond, it's surprising how modern it looks when placed alongside its forebear. There's something distinctly 21st century about the one, and equally mid-20th century about the other. The Korg is the smaller of the two, being four inches narrower and a smidgen less deep from front to back. The narrowness is, in part, a consequence of the length of the keyboards: while the Hammond boasts a pair of six-octave manuals (the lowest octave of each being the twelve presets for that manual), the Korg sports dual five-octave manuals with a small control panel to the left of each.

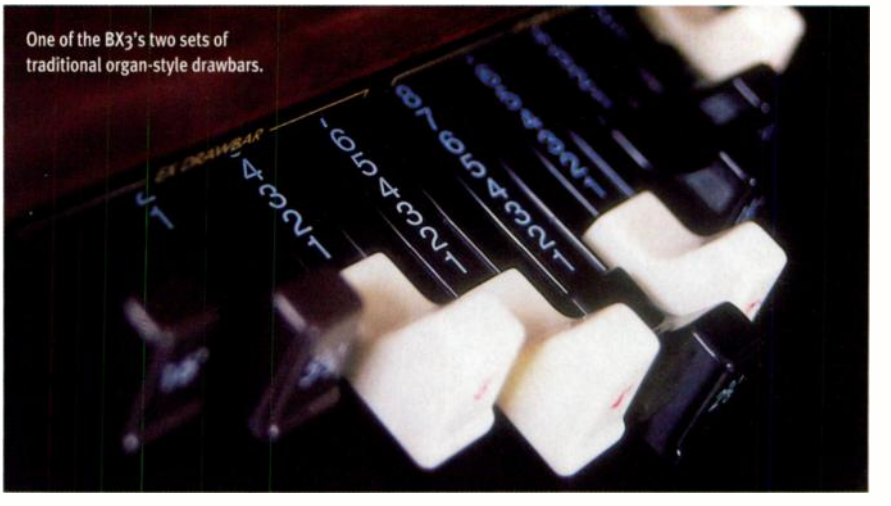
There are other differences, too. For example, the Korg has just two sets of drawbars above and behind the upper manual, whereas the Hammond has four. But, bearing in mind that these sets of drawbars were the only easily 'programmable' memories on a Hammond, and the Korg has 128 of those, I'd have to say that the loss of the duplicate sets is not a problem. The space thus liberated is taken up by the screen and programming controls.

To the far right of the main control surface, you'll find the percussion controls on both instruments, and these perform in exactly the same fashion on each. To the left, there are the chorus/vibrato controls, and these too are the same on both organs. The only difference here lies in the volume control to the extreme left. On the Hammond, this is a two-position switch with Normal and Soft settings; on the Korg it is a knob that ranges from 'Min' to 'Max'.

Where the Hammond's preset keys lie, the Korg offers three buttons for each manual. These access drawbar set 1, set 2, or the memories. This area is also where you will find the pitch-bend and modulation wheels. At the bottom of these panels are the Leslie controls — On, Stop, and Fast/Slow. Every Hammond player will be ▶

Onboard Demos

The BX3 comes with a number of demonstration tracks that exhibit its capabilities as a rock, gospel, church, jazz and blues instrument. Each of these is played in glorious three-part harmony, with upper manual, lower manual and pedal parts. But don't let them fool you. As explained in the body of this review, the BX3 has no pedal generator, so I suspect that Korg created them using a set of MIDI bass pedals to play the lower part an octave or two below the keyboard. This might be an acceptable compromise, but it will severely limit your choice of lower registration and almost certainly preclude you from using EX mode. Beware.


One of the BX3's two sets of traditional organ-style drawbars.

comfortable with this placement, because it's where almost everybody mounted the crescent-shaped Leslie controls on the original Hammonds.

Finally, the panel alongside the lower manual offers a Master Level control, Treble and Bass EQ (which you'll not find on a vintage Hammond) and a reverb level control. And that's about it... With minor differences, the two instruments look and feel remarkably similar. Yes, the keyboards themselves are somewhat different, but that's not surprising when you consider that one is a few months old, while the other is a few decades old. But if you play either in isolation it feels great, and I think that you would have to be a fanatical purist to declare that the Korg was 'wrong'. Indeed, the BX3 retains the CX3's innovative keyboard mechanism that plays a note immediately you depress a key, not when the key reaches the bottom of its travel. This is close to the response of the real Hammond, and makes the BX3 far more responsive than Hammond emulators with synthesizer keyboards. (If you wish to change the response to 'synth-type', the appropriate command is just a couple of button pushes away.)

Simple EQ controls situated on the lower keyboard add the potential for quick and easy treble and bass tone shaping.

Ups & Downs

I have only two serious criticisms of the BX3. Firstly, it has no multi-pin output for a genuine Leslie speaker. This is a shame because, good though the on-board effect is, there's nothing that sounds quite like a 147 or 122RV in full flight. You can overcome this if you can lay your hands on a Leslie that has been modified to accept a standard quarter-inch input, and which offers independent on/off and speed controls, but it's a shame that you should need to.

My second serious criticism is that the BX3 has no provision for a dedicated pedalboard and, because it has just two sound channels, you cannot add a MIDI pedalboard to play a third part. The best you can do is use MIDI pedals to play the lower registration an octave or so below the lower manual. Given that the Hammond XM series and the Oberheim OB series offer three parts, I'm not inclined to forgive Korg for this. To be fair, Keith Emerson and Jon Lord wannabes are not going to worry about it but, unlike the CX3, the BX3 is also aimed squarely at church players and club organists, for many of whom it is made singularly unsuitable by this omission.

A couple of minor criticisms, also true of the CX3, include the lack of an effects loop that would allow you to insert a valve overdrive into the correct place in the signal path. Korg's original, analogue CX3 and BX3 had this, so it's a shame that the modern versions do not. Then there's the continuing absence of a spring reverb setting, which would make the Hammond/Leslie impersonation even more realistic.

Nonetheless, the BX3 is a joy to play. I cannot fault the layout of the controls, and the editing system is in a different league to some of its competitors. Likewise, the sound it produces is 'the real thing', and I have no difficulty turning from my A100 to the Korg BX3, and back again. I can hear the difference, but only when the two are next to each other. Anyway, that's not the point. They both sound superb. In particular, the key-click and 'spit' of the BX3 is superior to any other digital organ I've played (and I've played most), and its chorus/vibrato is almost indistinguishable from the Hammond's. Meanwhile, in EX mode, the additional harmonics and percussion pitches make the BX3 more flexible than any original Hammond, let alone its digital competition.

Conclusions

Back in January 2001, I predicted that a dual-manual version of the CX3, which would compete with (and beat the pants off) the Hammond XB5, the Oberheim OB5 and the Roland VK77, would appear. Korg have now delivered, and if you're going to restrict your playing to two manuals (as I suspect most organ-loving *Sound On Sound* readers will) I suggest that you use the Korg every time. However, if you're a gospel organist, or still playing tea dances in the ballrooms of the world, the lack of pedals and Leslie outputs may well exclude the BX3 from your shopping list. SOS

Put Your Foot Down

Around at the back, the BX3 offers three pedal inputs that allow you to control various parameters. And, unlike the CX3, the BX3 comes with its own swell pedal, the OXP1 Organ Expression Pedal. This is particularly chunky and has a reassuringly full action, making it very satisfying in use. However, it has two extra attributes that may not be immediately obvious. Firstly, you can adjust the angle of the whole assembly to accommodate seated and standing playing positions. Secondly, the OXP1 has a 'standard position' to which it will it return after you press it even further for *fortissimo* passages. This allows you to emphasise parts of your music, knowing that the BX3's volume will return to your preferred level when you remove your foot. Bravo, Korg!

At the back you'll find the MIDI, Expression pedal and two additional assignable pedal sockets.

information

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Thermionic Culture Culture Vulture

Valve Distortion Processor

This unusual product aims to give you every tube distortion sound you could ever want!

Hugh Robjohns

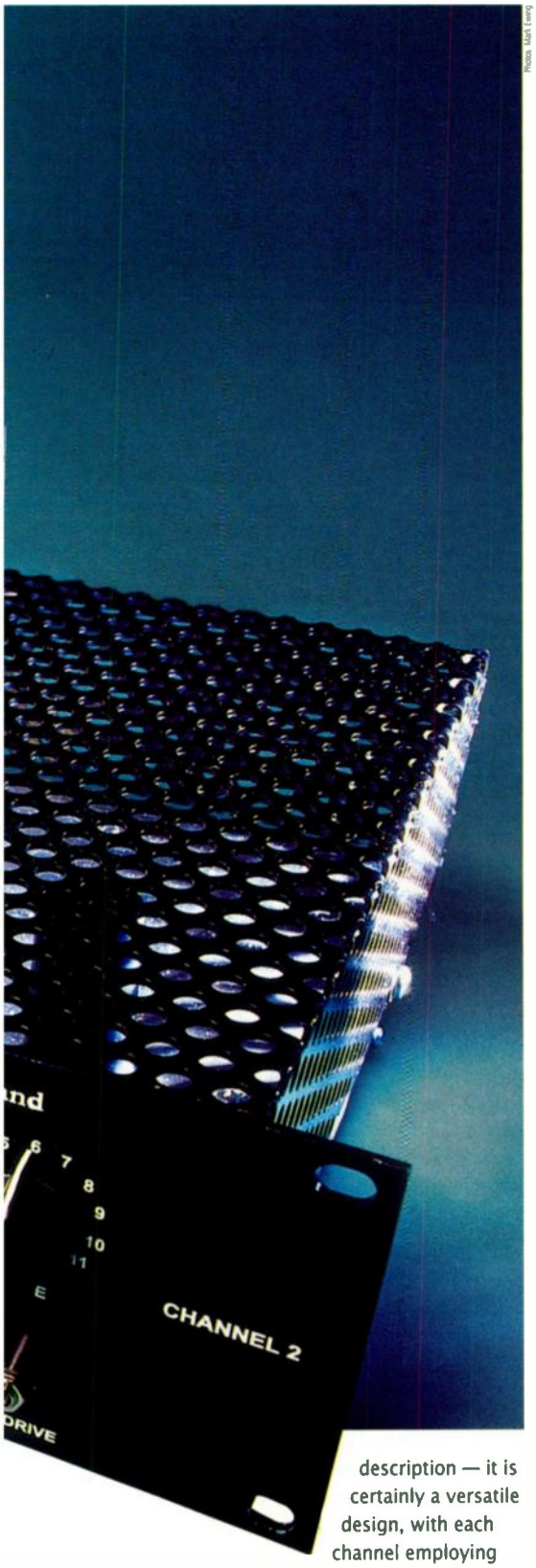
With high-resolution digital mixers, processors and recorders now standard fare, our recordings can sometimes seem too clean and sterile. As a result, there is quite a demand for devices and plug-ins which add a little distortion or warmth to a recording. Many A-D converters incorporate some sort of overload protection that emulates the saturation of analogue tape, and there are numerous plug-ins which simulate the nonlinearities of magnetic tape or valve equipment.

However, if you really want the subtle nuances of valve distortion, why not use a valve processor? This approach has its followers too, and there are plenty of preamps and other processors that incorporate valves to lend the familiar tube characteristics to the sound — although there are some where the valve is little more than a marketing ploy!

Thermionic Culture, a specialist British manufacturer of valve-based audio equipment, can trace its pedigree back to the 1950s, when the company's founder, Vic Keary, built his first studio. He went on to build several more, including Maximum Sound and Chalk Farm, and the all-valve Chiswick Reach. Other key names in the company are the chief designer Jon Bailes, who has a wealth of experience from the electronics industry, and Nick Terry, a highly regarded recording engineer.

Multi-valve Design

This 2U rackmount unit is claimed to be 'the first and only valve unit dedicated to producing the best harmonic distortion money can buy.' This seems a fair



description — it is certainly a versatile design, with each channel employing an EF86 on the input, a 6AS6 to provide the controllable distortion, and a 5963 (ECC82 or 12AU7 equivalent) to handle the output. The 'distortion' valve's configuration, bias and drive can all be adjusted to provide three different distortion modes, enabling second and/or third harmonic distortion, and with an amount variable from about 0.2 percent to 150 percent.

The Culture Vulture exudes vintage charm in its styling and controls, as well as its construction. This machine is hand built in the traditional way, with full-size components strung between tag-strips in the lower section, and the valves, big reservoir capacitors and mains transformer mounted in the top section under a perforated lid. On the review model (serial number VU0050), nothing was quite square or straight, and although the front panel was well finished, everything else looked very homemade, including the labelling of the rear connectors. For many, these imperfections will add to the charm of the unit, but for those who don't like such things, they'll have to stick it in a rack so they can't see them!

This is a dual channel line-level unit, with identical facilities on each channel, and it can easily be used for processing a stereo mix, although you obviously need to take care to match all the controls in each channel. The centre of the unit is dominated by a pair of large moving-coil meters calibrated in milliamps to show the current flowing in the main 6AS6 valve in each channel. Between these two meters are a mains power switch and a large green lamp. Below, a pair of bypass switches enable the effect of each channel's processing to be auditioned independently, connecting the input directly to the output and bypassing all of the electronics.

The two sets of channel controls are arranged in a mirror-image configuration, which I found slightly confusing. A pair of traditional chicken-head Bakelite rotary controls adjust the Drive (input level) and Bias, the latter setting the current flowing through the main 'distortion' valve. Both knobs are calibrated from one to 11, and the Drive control can reduce the input signal all the way down to complete silence.

SOUND ON SOUND

Thermionic Culture
Culture Vulture **£993**

pros
- All-valve circuitry.
- Amazingly versatile distortion characteristics.
- Dual-channel flexibility.

cons
- Somewhat unpredictable operation.
- 'Homemade' construction quality.
- Mirror image controls for the second channel.
- Unbalanced I/O.
- Noisier than modern solid-state equipment.

summary
An unusual dual-channel all-valve processor, the very *raison d'être* of which is to add distortion to your audio. A quintet of controls allows a huge range of effects, from an extremely subtle warmth to mad chain saws from hell! The perfect antidote to sterile digital recordings.

Distortion Modes

A three-position rotary switch reconfigures the operating mode of the distortion valve. The 'T' position provides a triode configuration, which generates mainly even-order harmonics. The P1 position gives a pentode configuration which creates odd-order harmonics. The third option, marked P2, provides an alternative pentode configuration which provides far more drastic distortion effects, especially when used with high bias settings. A toggle switch labelled Overdrive increases both the Drive gain and Bias range, for a more pronounced effect.

Another small three-position rotary switch selects a low-pass filter, with Off, 4kHz or 7kHz settings. The filter slope is a second-order, 12dB/octave design. A matching rotary control knob adjusts the output level of the channel, again calibrated from one to 11 with unity gain between the seven and eight positions, although this doesn't seem to reduce the output all the way to silence — just very quiet!

The rear panel carries four quarter-inch sockets, providing unbalanced inputs and outputs, plus the IEC mains inlet and a fuse holder. The front panel also has a pair of quarter-inch sockets which take priority over the rear-panel sockets, enabling easy connection with instruments. However, the handbook for the unit suggests the input impedance is just 30kΩ for both the front and rear sockets, which is rather low in the context of an instrument DI input.

The specifications suggest a maximum output level of +17dBV (about +19dBu), and a noise floor better than 75dB below the maximum output level (ie. around -56dBu). Clearly, it pays to drive this unit fairly hard to maximise the signal-to-noise ratio. The frequency response is given as ±1.5dB between 50Hz and 15kHz (at a low-distortion setting).

Using The Culture Vulture

As you might expect, it really comes down to using your ears to decide on the type of effect and the amount of distortion that is required. However, the current meter does provide some useful information about the status of the circuitry. As the Bias control is advanced, the amount of current flowing through the 6AS6 valve falls, along with the output level. A 'normal' setting would provide between 0.2mA and 0.4mA, which produces a very subtle effect in the triode configuration, not dissimilar to saturated analogue tape. It does seem odd that the meter falls as the Bias control is increased, ▶

THERMIONIC CULTURE CULTURE VULTURE

but such is the nature of the control and the parameter being displayed. If the Drive control is advanced a long way, the amount of current can be seen to be modulated by the audio signal itself, adding to the nonlinearity of the whole process.

Decreasing the Bias control to set the current to about 0.6mA provides a more obvious 'warm' kind of distortion, adding a nice but restrained 'thickness' to the source. Increasing the Bias control to give less than about 0.1mA 'starves' the valve and gives a rather lean and much quieter sound, with a more 'uneven' distortion, being most pronounced on signal peaks. This starvation effect becomes very obvious indeed when Overdrive is selected, especially if the Bias is pretty high, as only signal peaks manage to break through the circuitry at all!

All of the controls except the output control seem to interact with each other to create a wide variety of different characteristics. The Drive and Bias are by far the most critical controls, and small changes to either can have quite a pronounced affect on the sound. Obviously, selecting the different configurations also changes the character of the distortion dramatically, and engaging the Overdrive switch really unleashes the chain saws from hell! The two filter settings of 4kHz and 7kHz are very helpful in turning the mad fizzy settings into something rather more musical.

I also found that the tonal quality of the source sound changed quite a lot as I adjusted the various parameters. In addition to the harmonic generation, the overall spectral balance of the sound varied, becoming thinner with higher Bias settings, and seeming to lose some of the high end with lower Bias settings. Because of all these complex interactions, I found it difficult to predict precisely how moving one control would change the sound — it became much more a process of trial and error. However, fine-tuning the controls to optimise the type and character of distortion was always interesting, and the results were always worth the effort.

I found I generally used the triode mode for thickening and warming individual sounds or even complete mixes, while the first pentode mode seemed more appropriate for guitars, organs, electric pianos and some special vocal effects requiring a much harder, more aggressive kind of distortion. The P1 mode was also distinctly noisier than the triode mode, although in normal use I don't think the background noise and hum would present a problem. The second pentode mode seemed to combine the best of both worlds, sounding particularly rich. However, strange things happen as the Bias is adjusted, there being a kind of null point of extremely horrid, almost clipping distortion as you get to about 0.5mA — above or below that point the sound is fine, with a proportionate distortion character. Strangely, the P2 mode was also the quietest of all.

The majority of the Culture Vulture's circuitry is housed in the lower section of the rack unit, while the main reservoir capacitors, the valves, and the mains transformer all protrude, as you can see here with the external perforated cover removed.

Down & Dirty!

The Culture Vulture is a very unusual machine, which is going to be something of an acquired taste to many and a fashion accessory to some. However, there will certainly be those who absolutely swear by it and use it on everything. This is certainly a very musical tool which can be used to 'dirty things up a little', adding a little character and warmth to digital recordings, or to create much more overt distortion effects spanning the tasteful to the completely manic!

Unfortunately, the machine is not particularly logical to operate, most Drive and Bias settings being found more through serendipity than science. I also found the mirror-image control layout of the second channel really frustrating when processing a stereo mix because I was always finding myself grabbing the wrong controls, but maybe more familiarity would help to overcome this particular foible. Although some users will find the Culture Vulture too unpredictable to set up, and maybe even too quirky for their squeaky-clean digital world, there is no denying that this unit makes an impressive job of providing a very flexible range of distortion effects, covering the whole gamut from almost imperceptible warmth through to seriously vicious overdriven distortion, and everything in between. Definitely one to add to your auditioning list. SOS

information

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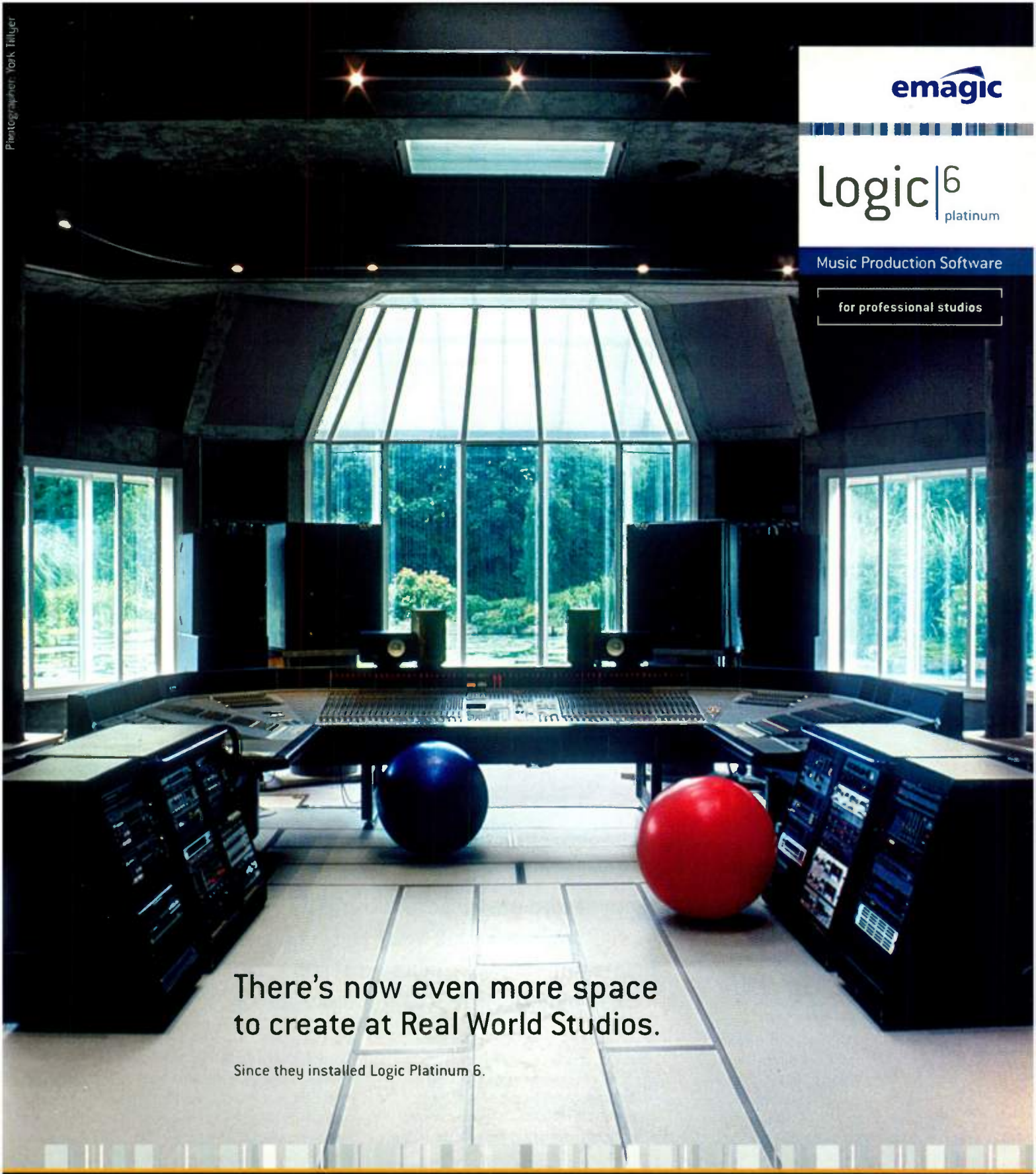

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Mickie Most

Mickie Most in his office at RAK Studios.

Richard Buskin

Many record producers are content to remain out of the public eye, but Mickie Most was a household name. In a unique interview, Britain's most successful hitmaker looked back over his extraordinary career.

He was an Aldershot-born singer/guitarist who once claimed to have been "the Elvis of South Africa"; a music publisher, record label exec and studio owner whose estimated £50 million net worth placed him on the *Sunday Times* list as one of the 200 most successful people in Britain; a renowned talent-spotter whose biting comments about the competitors on '70s TV show *New Faces* turned him into a household name. Above all, he was the man whose work with the Animals, Herman's Hermits, Donovan, Lulu, the Nashville Teens, Jeff Beck, Hot Chocolate, Smokey, Mud and Suzi Quatro garnered more worldwide number one singles than any other producer in the history of the record business.

Mickie Most, who died in London on May 30, just three weeks short of his 65th birthday, had an uncanny knack for unearthing hit material and marrying it to the right artists, whether this was based on their looks or their abilities. Accordingly, while the Animals' powerful cover of the Josh White blues song 'House Of The Rising Sun' became an instant classic upon its release in 1964, topping the charts on both sides of the Atlantic and earning Most a Grammy Award, he was more often associated with catchy but lightweight MOR numbers such as the Hermits' 'I'm Into Something Good' and Hot Chocolate's 'You Sexy Thing'. In 1965, the Animals parted ways with their producer due to the overtly commercial material that he was putting their way, and despite the fact that Most launched Jeff Beck's solo career with the single 'Hi Ho Silver Lining' the following year, his production of the Yardbirds' 1967 *Little Games* album was fairly disastrous — the record didn't even get released in the UK.

As Most himself would subsequently admit, rock music wasn't his forté, and neither was album work. Nevertheless, his talent for creating three-minute pop gems was undeniable, and when I spoke with him back in April 1998, like all who possess a natural ability, he really did make the art of the hitmaker sound ever so simple. It isn't, of course.

A World Without Rules

"The first thing you have to understand about the music business is that there are no rules," he proclaimed. "If I was to say to you a few years ago that a group from Manchester called Oasis was going to do the Beatles and sell millions, you'd say, 'Oh come on, that's all been done.' You never can tell what's coming next. It could be anything, but normally it's a

progression from America with regard to what is dictated in terms of beats per minute. American black music is the only black music. British black music is really white."

Indeed, despite his subsequent penchant for mainstream pop, it was African-American music that initially captivated Mickie Most, before rock & roll inspired him to pick up a guitar. As a kid, going by his original name of Michael Peter Hayes, he grew up listening to the R&B sounds broadcast by American Forces Network radio during the early-to-mid '50s. Yet it was also at around this time, when albums were too expensive for him to buy, that his preoccupation with singles took hold.

"Albums were for people who had money to burn," he asserted. "In fact, one of the only albums that I bought in those days was the first by Elvis Presley, and I still play that today, so I've certainly had my 30 bob's worth out of it! As most of the albums would just have one or two songs that you liked and the rest was throwaway, we were really hot for singles and we lived in this world of jukeboxes. That was our entertainment. Any cafe that had a jukebox and a pinball machine was Las Vegas for us in the '50s, and I don't think I ever grew out of that."

Learning to play the guitar, Michael Hayes performed semi-professionally in clubs around Central London's Soho district including the legendary Two I's coffee bar — before a pairing with a schoolfriend saw the disingenuously named Most Brothers recording for Decca during the mid-to-late '50s. Their single 'It Takes A Whole Lotta Loving To Keep My Baby Happy' was a moderate success, but this was only a precursor to the stardom that awaited the newly rechristened Mickie Most when he joined his future wife Christine in South Africa in 1959.

"Christine was from South Africa, and when she returned there her family said I would have to follow her if I wanted something more permanent," Most recalled. "They thought I wouldn't bother but I did, and they then made it clear that I would have to spend four years there as they didn't know me, which seemed sensible."

Sensible in the personal sense, maybe,

Studio Time

In the Autumn of 1976, with a stack of hit productions to his name, a successful record label up and running, and the profits to show for all this, Most decided to circumvent the then-crippling British tax system by investing in a recording facility, RAK Studios, in north-west London. Not perhaps the easiest way to make money, but nonetheless an appropriate move for someone in the business, and, given Most's entrepreneurial instincts, a sure-fire earner all the way. "It's made money every year for 22 years now," he commented back in 1998. "So, on top of the tax avoidance, it's been a very, very good decision. We bought the building for about £350,000 when the market was on the floor — and we're talking about 60,000 feet, in St John's Wood, a hundred metres from Regent's Park — so it was really a bargain. Then, when we sold the record company, which owned the studios [*to EMI*], I bought the studios back for a couple of million, and now I think they're worth about £7 million."

RAK Studios: "We're talking about 60,000 feet, in St John's Wood."

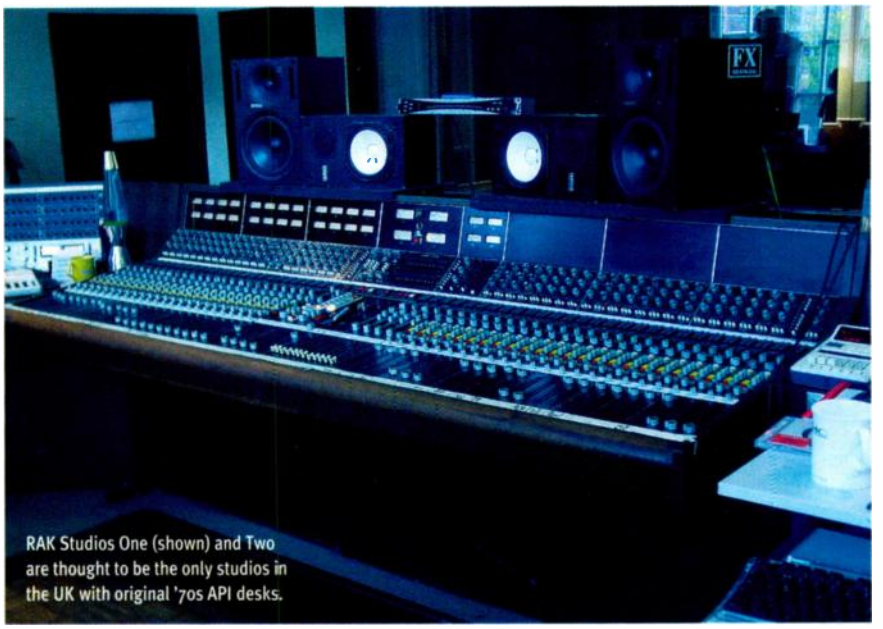
although professionally such a move had to be questioned in light of the rock boom that had been taking place in Britain. Or did it? As things turned out, Elvis's army induction, Little Richard's dedication to the Church, Chuck Berry's imprisonment for statutory rape, Jerry Lee Lewis's ostracism for marrying his 13-year-old cousin, and the deaths of Buddy Holly and Eddie Cochran coincided with rock & roll taking a back seat to sterile, parent-approved pop as performed by the likes of Fabian, Frankie Avalon and Pat Boone. In South Africa, by contrast, white teens were still hungry for the kind of material that had blazed a trail just a few years before, and Mickie Most was quick to cash in on this opportunity.

Fronting a band called the Playboys, he scored 11 consecutive number ones through 1962 with covers of American hits such as 'Rave On' and 'Johnny B Goode'. What's more, he also paved the way for his future career by producing these records, before heading straight back to England after completing his four-year probation on the African continent. Once again, his timing couldn't have been better: during a 1963 package tour, performing on the same bill as the Everly Brothers, Little Richard and Bo Diddley, Most visited Newcastle's Club-A-Go-Go and saw a band on stage called the Animals.

"I immediately knew that this was what I'd been looking for since I'd arrived back in England," he recalled. "At that point the music scene was really bland, with people like Eden Kane and John Leyton, but the Beatles and their like were also just starting to hit, and so I was fortunate to be in the right place at the right time."

Independence

Most was not just fortunate, but also astute. At a time when there was only a handful of major record companies controlling matters, Most himself opted to pay for the artists that he signed and subsequently produced. "The record companies didn't like the idea of you doing things that were outside the norm," he said, "but I just signed the groups to myself and I financed them, offering them a royalty and a deal, and then it was up to me to make this deal work. Fortunately I had already been recording with EMI, and EMI were interested in what I was doing. They had a label manager there working for Motown named Derek Everett and he liked what I was doing. The first record that came out was a hit, the second record was number one all over the world, and after that I never had a problem."



RAK Studios One (shown) and Two are thought to be the only studios in the UK with original '70s API desks.

The first Top 20 hit by The Animals was a record entitled 'Baby Let Me Take You Home', on the strength of which they secured a tour supporting Chuck Berry. 'House Of The Rising Sun' was among the numbers that they performed regularly on stage, and in mid-tour Most decided to bring the band down from Liverpool to London overnight and commit their extraordinary performance of this song to tape.

"They got on the sleeper and I picked them up early in the morning along with their drum kit, amplifiers and all their gear," he recalled. "We were booked into Kingsway Recording Studio for a three-hour session from eight until 11, and by 8:15, take two, I said, 'That's the one.'"

So what to do during the remaining two hours and 45 minutes? Well, that was easy. Why not make an entire album?

"That consisted of songs that they wanted to record, really," Most explained. "Songs that they'd rehearsed and played many times as part of their repertoire, so I said, 'OK, go for it.' We did everything live, straight to mono, and that's how it all started. After that, for me, it was a case of hit after hit. The next one was 'Tobacco Road' with the Nashville Teens, followed by 'I'm Into Something Good' with Herman's Hermits."

This last was a million miles away from the earthy R&B sensibilities of the Animals. Mickie Most, don't forget, was into R&B and rock & roll, but, as time would soon tell, he was also equally into capitalising on his gift for spotting commercially viable acts and matching them up with the right songs.

"I had this Goffin and King tune, 'I'm Into Something Good', which was really catchy, and I really thought it needed somebody youthful-looking," he remembered. "Herman's Hermits' management had called me many times and asked me to take a look at them, so I said, 'Send me a photograph,' and as soon as I saw the photo I envisaged Peter Noone as a young [*President*] Kennedy. I quickly went up to Bolton, where the band was playing, and they were doing all of the pop R&B stuff such as 'Mother In Law', 'Poison Ivy' and so on. I'd brought 'I'm Into Something Good' with me and they fitted it really well, so I told them to learn the song by Sunday and we would record it then. That's basically what happened and it was as simple as that."


The substantial live area in RAK Studio Three.

Atlantic Crossings

After these early successes, Most soon settled into a life of transatlantic commuting. "I used to spend every other week in New York or Los

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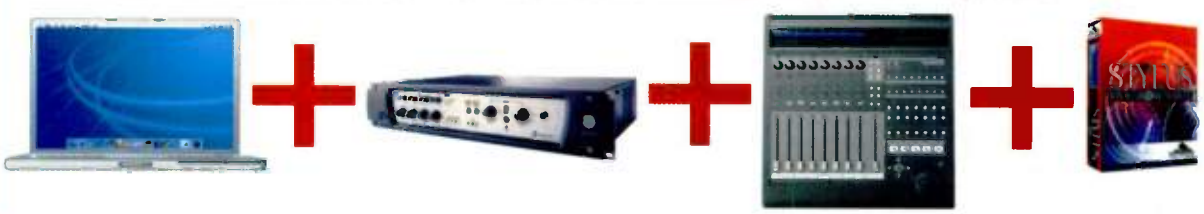

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Angeles, scouring around places such as the Brill Building for material. I had all of these appointments set up for me, so when I arrived there on a Sunday night I'd have my schedule and then from Monday morning to Friday evening I'd visit publishers and listen to tunes. On Friday night I'd return to London, record the material the following week and then go back to the States the next Sunday. That's all I did for five years."

Sounds very straightforward, doesn't it? However, while a lot of people think they can spot a hit record, most potential hits never even make it into the lower regions of the charts. So what were Most's criteria when trying to identify the kind of material that would prompt record-store cash registers to ring? Well, to quote the man himself, "There has to be that bit of magic. The song, the recording; the whole thing has to add up in my mind to a hundred, and when I hear it I go, 'That's it!'

"At other times I might hear a great song, but the arrangement isn't doing it for me, so I'll rework it and often that'll turn out to be what is needed. I just seem to have the ability to do that, I don't know why. There again, there are also times in your life when you're wrong — perhaps it was the wrong timing for the record; it came out too early or too late, we didn't pick up the airplay, whatever — but if it doesn't succeed, it doesn't succeed, and making excuses is a negative. You just have to say, 'OK, I goofed, I've got to try harder next time.'"

As the '60s moved on, the record business was rapidly evolving, rock music was being taken more seriously and priority was increasingly being given over to album sessions. Didn't this necessitate much more time being spent in the studio? "They certainly all took longer than 15 minutes," was Mickie Most's reply. "I mean, that was just one of those freak things, but still, as far as I'm concerned, once a performance is on tape it's just pointless to keep going on. With 'House Of The Rising Sun' I realised I'd got it, and I must have got it because the record's sold millions and millions for more than 30 years. I'm sure if I'd spent another two weeks doing it I would never have improved on it. In fact, it would probably have got worse.

"As we moved towards the late '60s things were changing technically. We went from mono to stereo, four-track to eight-track to 16-track, and things obviously began to take longer, but I personally like to be in and out of the studio. I just can't keep things up for that amount of time; it's too long. Also, as you get older you don't want to waste so much time doing something that you used to do in three hours. We used to do a whole single and maybe a spare 'B' side in a three-hour session — certainly we'd get the master done — and even all of those Donovan records, some of which were quite complicated, were done in three hours.

"Having said that, I think there are records that suit the lengthier sessions. A lot of dance and rap records suit it, because you've got programmed material and once you've got the vibe right on the programming it remains right. So, you can do overdubs, and so on, and maintain the energy, but I do believe that when you're performing group music the recordings sound and feel better when everything is played together. If they're good players and they're well rehearsed they should play in time, and that will produce a better feeling. After, all, most people buy records because they feel and sound right. Musically they don't understand, and why should they? They're not musicians, but instinctively they know."


The old and the new: analogue 24-track and Pro Tools hardware in RAK Studio One.

RAK Days

Even though Most had brought Epic Records a lot of success over the course of about five years, courtesy of his work with Donovan, Lulu and the Yardbirds, by the end of the 1960s CBS's main man, Clive Davis, felt that the single had already had its day. So did many of his industry colleagues, yet Most didn't agree, maintaining that it should still be regarded as the flag-waver for the album. This was the attitude that he adopted when forming his own RAK Records label in 1969 — if others were willing to abandon the singles market then he would aim to fill their shoes, and the result was that the first 27 records issued on RAK were all Top 50 hits. Thus commenced Mickie Most's cycle of success during the 1970s, during which time he discovered acts such as Suzi Quatro, Mud, Smokie and Hot Chocolate.

"I was recording an album — that never got finished — with Jeff Beck at Motown in Detroit when I first saw Suzi Quatro," he recalled. "The manager of a group called Cradle invited us to see them in our spare time, and they were pretty good, but it was the bass player who caught my attention. She was not singing at the time, she was just standing at the back, but she played very well and I thought that she had something. So I told the manager that I was not interested, but that if the group didn't make it, and it should break up, then give her my number in London, and I'd like to talk to her. Some time later she phoned and said that the group had broken up, so I sent her some money, a contract and a plane ticket, and that's how it happened."

Hot Chocolate, meanwhile, appeared at the RAK offices in the form of songwriters Errol Brown and Tony Wilson during the early '70s, and Most promptly used a couple of their compositions to good effect with Herman's Hermits and Mary Hopkin. However, when Brown and Wilson then turned up with a song entitled 'Love Is Life' he suggested that they record it themselves. Some session musicians were quickly brought together in the studio, but it took a lot longer to come up with the

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sound that the producer was looking for. "We had to create a sound, a Hot Chocolate sound, because there wasn't a group, just two writers," he said. "I kept trying things, and it was almost like being a chef really, introducing different ingredients, throwing them away and starting again. Eventually I got this kind of organ-guitar thing going, this riff, and that's what they got known for.

"Anyway, that record was a very big hit. The second and third weren't so big — they were a bit too Carribean, too calypso-ish, and I told them that although the songs were all very pleasant I didn't think they were going in the right direction. I said, 'You've got to write something really black, otherwise there's not much more I can do,' and the next song that they wrote was 'Brother Louie', which was a black record. That got them back on the path, and then we had all of the big stuff that followed, like 'Sexy Thing' and 'Everyone's A Winner'."

Meanwhile, it was a riff that Mickie Most had heard on an American blues record back in the mid-'50s that would eventually lead to him converting a drummer into a front man. Cozy Powell was the sticksman and 'Dance With The Devil' was the record that he had a smash hit with during the mid-'70s, by which time the riff had been floating around in Most's head for the best part of 20 years. "It reminded me of the *Coronation Street* theme," he said. "It had the same notes. I'd known Cozy since he'd worked on the Jeff Beck album in Detroit, and we got on really well, so I suggested turning this riff into a drum-based song. We worked on the arrangement, we recorded it, and, amazingly enough, it became successful as well."

Getting Out

Having scored UK hits in the '80s with Racey, Kim Wilde and Johnny Hates Jazz (featuring his son Calvin Hayes), Most once again followed his finely tuned instincts when they told him that his tastes and *modus operandi* weren't in sync with the contemporary scene. "When I sold the record company it was because music was turning in a way that I didn't understand," he admitted. "You know, the kind of stuff that Duran Duran and the like were doing, it was starting to move into areas that I didn't feel I could contribute to. You see, before sampling and synthesized sounds, when we were in the studio we relied heavily on the rhythm section, and then if we wanted to sweeten the tune up a bit there were only three or four things we could do; we could either use strings, brass, reeds or voices. There was nothing else, other than the percussion, and so if we wanted to make a sound that didn't exist in those days we'd have to do so through echoes and mixing sounds together. We did that a lot with Donovan and with the Yardbirds: putting amplifiers in cupboards and microphones in the toilet, and tape running all around the studio for those long delays as we didn't have Lexicons. That kind of thing was interesting.

Studio Three, unlike the others, is based around an SSL G-series mixer.

"Eventually, however, the recording process got bogged down with so many preset sounds that it became very difficult to make a decision. At the same time dance was getting in there as well with all of those 125 beats, and while the people who were taking ecstasy could probably see the light, I couldn't. After all, I was getting past my sell-by date now to be spending my evenings dropping this stuff and leaping around until five or six o'clock in the morning. I'd already spent 30 years of my life in the recording studios, and so just before I was 50 I retired from seriously making records.

"I took a long time off and I just sort of dabbled, dealing with our publishing company and overseeing the updating and installation of new equipment in our four studios. I would hang out with a load of musicians who came in every day for three months, made their album and disappeared before another lot would come in, and it was great to do that because I didn't feel like I was missing anything. Instead I was here without having to do any of the work!"

In early '98, after an eight-year hiatus, Most produced a new artist named Tee as well as an album and two singles by a group of three girl singers called Jamaica. So it was that his work had, in a sense, come full circle, as he once again essayed to develop raw talent and come up with an innovative sound. "It's interesting," he remarked, "because it's a battle. It's a big challenge, and I've always loved a challenge."

A couple of years after our interview, Most would also produce an album by Steve Harley. Yet, for the most part, he was content to indulge his interests away from the studio: cooking, collecting cars, riding his motorbikes and residing in a palatial house in Totteridge, North London, which boasted eight bedrooms, nine bathrooms, a 40-metre indoor-outdoor pool, fully fitted gym, sauna, tennis court, five-a-side football pitch and four and a half acres of parkland. Not everyone in the music business does so well, but then not everyone has Mickie Most's acumen.

"We had a deal with MGM," he said, looking back to his earliest distribution deal. "They had Herman's Hermits and the Animals. Then I had a further deal with Epic for the next five artists that I produced. You see, EMI distributed MGM's records in England, and the president of the company came over and said, 'Hey man, why haven't we got the Beatles?' So, Len Wood, who was running EMI at the time, looked down the charts and said, 'Well, have these ones; the Animals.' It's funny how these things start.

"'I'm Into Something Good', 'Tobacco Road' and 'House of the Rising Sun' were all number one hits in America, yet six months before I'd played these records to a lot of companies in New York, Philadelphia and Los Angeles, and not one of them would take any of the three, saying they didn't think they were right for their market. It wasn't difficult to hear that these records were in for a shot, so I was laughing really. It didn't depress me at all, but the only thing was that I expected these people in America to know. I couldn't believe how much they didn't know, and nothing has changed. They're clueless, and the proof of this is that if they knew what was going down they would all be multi-millionaires, wouldn't they? I mean, the guys in A&R departments would be riding around in Lear jets if they got it right all the time, but they're not." SOS

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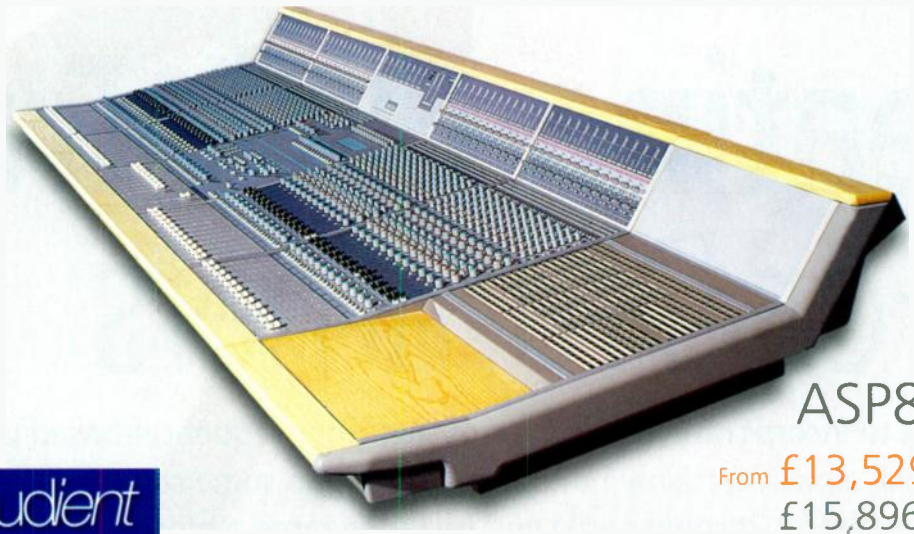

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Creating Click Tracks For Drummers

If you want to incorporate live drumming into your sequencer-based productions, your drummer will almost certainly have to play along to some sort of click track. However, if you're not careful, it could easily end up being more a hindrance than a help.

Gavin Harrison

As a session drummer, I occasionally get asked by a producer, programmer or fellow musician, 'What kind of click do you want to play to?' Sometimes they forget to ask, and I end up having to face some nightmarish click scenario. Unfortunately, I can't simply ignore the problem, as playing with a click is essential nowadays. Most areas of modern production rely to a large extent on MIDI sequencing and hard disk editing, and only a brave but foolhardy few attempt to record their tracks without the safety net of pre-programmed, metronomic tempos and on-screen bar lines. In addition, live bands often want to incorporate sequenced and pre-recorded audio into their performances, and in some shows lights, video and even pyrotechnics are programmed to run alongside the backing track. In these situations, sync between band and machines can only be achieved one way: by playing to a click.

It makes no difference whether the job is a tiny club gig, a recording session or a live TV broadcast in an Olympic-size stadium in front of 92,000 people — to do my job well (ie. not go out of time with the backing track!), I need a sensibly programmed, musically intelligent click. It has become the drummer's role to form the 'human sync' between the backing track and the band, and it can be quite a pressure to know that the whole show is resting solely on my ability to hold steady with that insistent little pulse. Over the years I have encountered many types of click programming, some helpful and some very unhelpful, and I wanted to pass on to you my experience and advice on what a drummer needs from a click track. My priority is to help you avoid the 'very unhelpful click' scenario by using a bit of musical common sense.

Basic Sounds

Let's start with the all-important sound of the main click: my personal preference is a mono sample of a medium-pitched wood block, dry with no reverb. This plays the main beats, usually four in a bar. For subdivisions, I use a very short, high-pitched cabasa sample, also mono — this sound operates in roughly the same frequency range as a hi-hat, but remains distinct when I play real hi-hat on top of it! To protect my

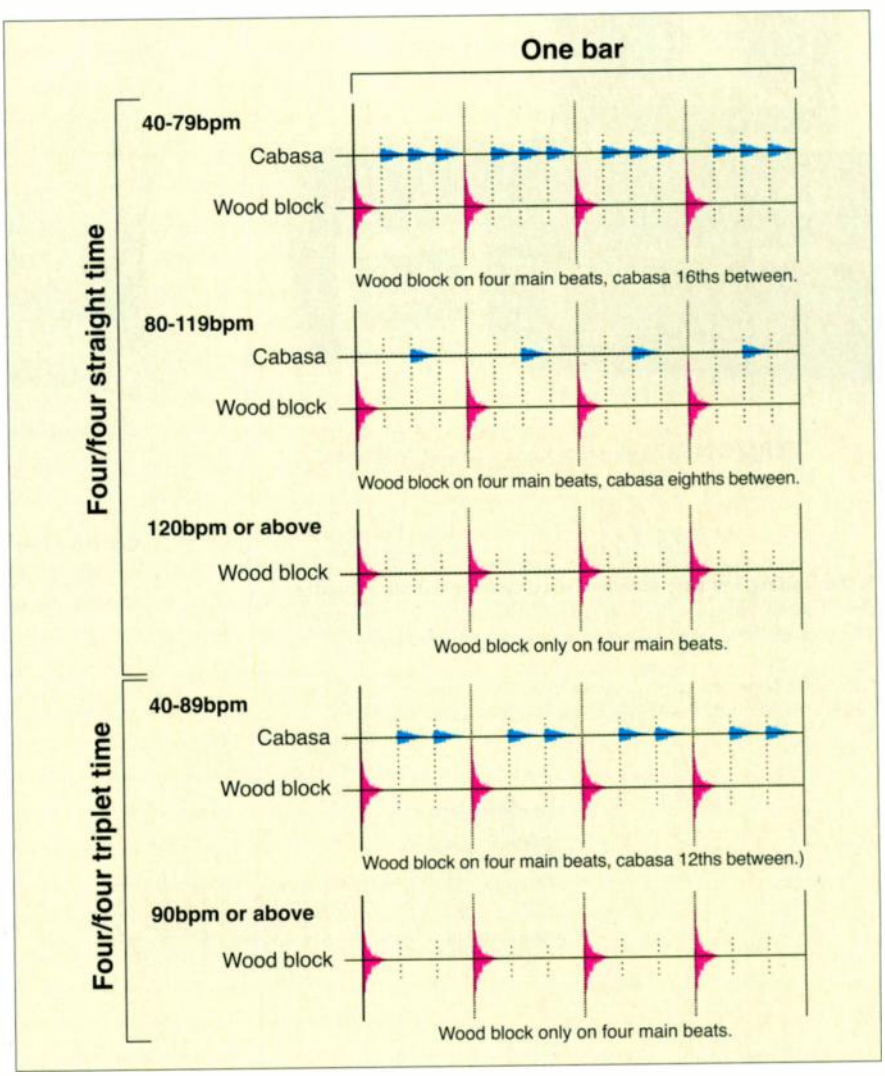

Figure 1. Suitable click tracks for four/four straight and triplet times.

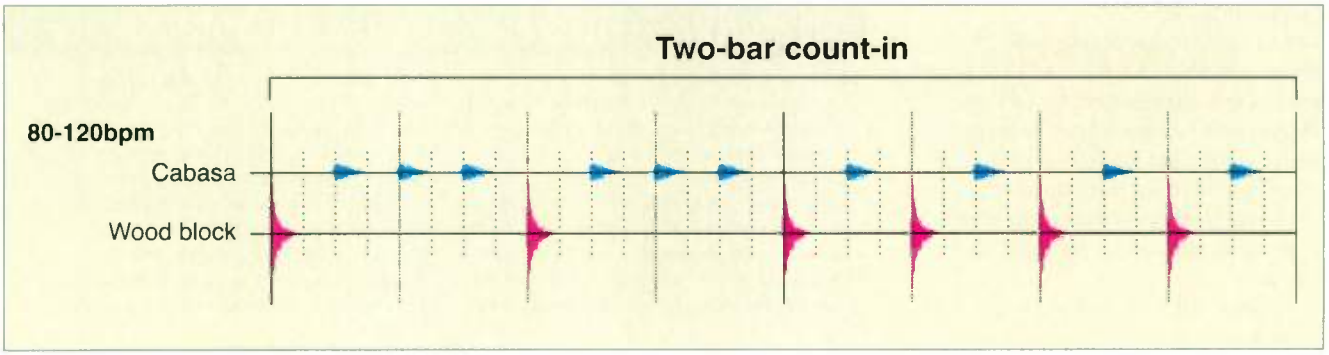

Figure 2. A good two-bar count-in, all eighth notes.

hearing, both samples are EQ'd, shelving off everything above 7kHz. This spares my eardrums a high-frequency onslaught, resulting in very little or no whistling in my ears at the end of the gig.

It's also vital to ensure that both samples are well trimmed at the front to guarantee a tight rhythmic response — you can use your sampler's graphic waveform display to zoom in and check this. Wood block samples usually have a sharp, well-defined front edge, but a cabasa has a slower attack and you may have to trim off some of its initial 'swoosh' to prevent it speaking late. Be diligent in your trimming, as even a few milliseconds can adversely affect the feel!

When it comes to the trickier question of subdividing the beat, take a look at Figure 1. This shows some simple ways of programming a click for a song in four/four time. The choice of subdivision is determined by tempo.

Playing It In

When playing the click into your sequencer, resist the temptation to carry on for 32 bars, or you will end up with an unnecessarily large editing job. Program just one bar, and adjust any discrepancies in the note velocities so that the sounds are dynamically even and consistent. It's a good idea to start off with MIDI note velocities in the 70-80 range; that will give you some dynamic headroom should you ever need to reprogram the click at a higher level. (Like in the passage where your guitarist lunges for the Overdrive switch on his 350W stage amp.)

Next, make sure the click is in time! Hard quantise those MIDI notes — you should have no qualms about doing this, as an out-of-time click cannot possibly help the feel of your track. There are a couple of ▶

caveats, though:

- Don't automatically believe your sequencing program when it tells you that something is quantised into perfect time — always check by closely listening to how it relates to the other elements in the track.
- Don't use the computer's 'screen click' — this is nearly always in front of the other music tracks. It also uses horrible click sounds!

Although this may seem blindingly obvious, make sure that the click continues through all the sections of the arrangement (even the really quiet bits!) and stops in the right place at the end of the song. Using a click shouldn't preclude the use of tempo changes or rallentandos, but I've found that these occur so rarely in sequenced music that it's best to warn the drummer about them in advance! You can, of course, simply stop the click at some point, leaving the drummer and band free to continue playing at their own tempo, or to perform some big, tumultuous free-time ending. However, musical sync will be lost from that point on, and you shouldn't attempt to reintroduce the click without first giving a new programmed count-in — of which more in a moment.

Please don't put an accented note on the front of every bar — here's why: to compete with the insane racket generated by a drum kit, drummer's headphone clicks have to be incredibly loud. If you set your headphone level to accommodate the accented note at the start of every bar, you will struggle to hear the quieter, unaccented clicks in the rest of the bar. But if you turn your headphones up louder to hear those other beats, the accented first beat will blow your ear drums out of your nose, requiring an expensive mopping-up operation and incurring first aid bills! If, after a two-bar count-in, your drummer can't remember where 'one' is without having an accented note on the downbeat of every bar, I'd say it's time to get a new drummer!

You should be careful to check that the overall level of the click is the same from song to song. It is sometimes desirable to program quieter clicks for quieter songs, but such dynamic variations really need to be tested in a rehearsal situation. Thankfully, it's easy these days for drummers to be in control of their click volume by running it through a little headphone amp positioned next to their kit.

Too Much Monkee Business — The Wrong Kind Of Subdivision

I did a session once where the producer wanted to remake 'Hey Hey We're The Monkees' for use in a film — I didn't have the nerve to ask why! He booked a very old-style analogue studio to get that authentic '60s sound, and turned up with a click track on a DAT tape. As you may remember, the basic feel of this song is triplet-based, and the drums play the classic swing hi-hat rhythm — 'ting tingka ting' — during the intro. The problem was that the producer had programmed a click which had four-in-a-bar cowbell with 16th-note subdivisions between each cowbell beat. There was no way to rerecord the click, because it had been worked out to synchronise perfectly with the film. In my youth, I learned to play Frank Zappa's mind-bogglingly polyrhythmic 'The Black Page', but trying to play 'ting tingka ting' on the Monkees theme tune against a relentless straight-16ths click was harder. I laugh when I tell this story, but it wasn't funny at the time!

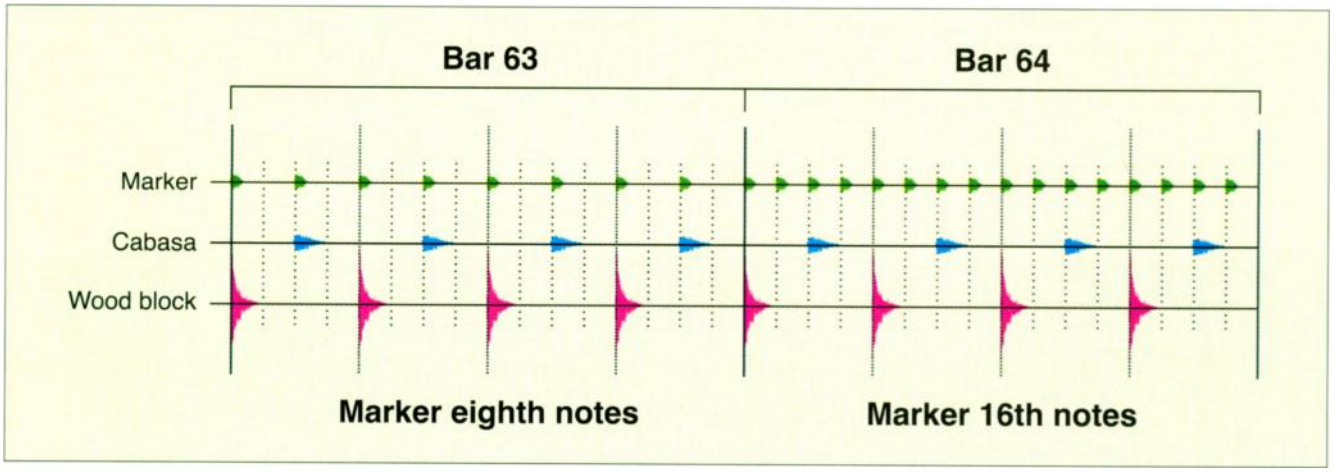

Figure 3. Using a marker sound to signal the beginning of a new musical section.

Programming Count-ins & Cues

It is absolutely vital that the drummer hears a good positive count-in — this is an area where there is no room for error. I prefer a two-bar count, (ie: one... two... one, two, three, four). Figure 2 shows how I program it for tempos of 80-120bpm. With a count like this, the drummer can be absolutely sure where the all-important 'first beat of bar one' is. This sets him up nicely for bar two, during which he can bang his drum sticks together and bellow 'one, two, three, four!' for all the other musicians (and hopefully, the entire audience if you're playing live) to hear. For a few precious seconds, the wretched tub-thumper, butt of so many cruel jokes, is running the show. This is the drummer's moment of glory — do not deny it to him by programming a five-beat count-in!

It's also often helpful to program cues or 'markers' into the click track. (This hadn't occurred to me till I sat in for a drummer with a reputation for getting drunk on his gig, and realised, after checking his headphone mix, how it was that he could count all those bars without getting lost.) A marker is an additional sound designed to grab the attention, like a tambourine, cowbell or something even more startling — my colleague Dave Stewart sometimes uses a police whistle sample. This noise comes in loudly one or two bars before a major event in the song, like the ending. Alerted in this way, the drummer can be sure that he's in the right place. This is great for a long guitar solo (is there any other kind?) of, say, 64 bars — I don't want to have to count all those bars, but inserting a marker over the last two bars means I can forget about counting during the solo, get my warning cue on bar 63, then confidently cue the rest of the band by playing a fill on bar 64. If you program the marker as shown in Figure 3, it will really stand out. If you would like to replicate how I program my click tracks, feel free to download my click samples and accompanying MIDI files from my web site www.drumset.demon.co.uk. SOS

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Gmedia Oddity

Synthesizer Plug-in for Mac & PC

Gordon Reid

We take a journey through a new software instrument that aims to put the distinctive sound of the famous ARP Odyssey analogue synth into your computer.

As some of you might know from reading my Retrozone features about vintage synths over the past few years, the ARP Odyssey was my first 'serious' synthesizer. I had owned a Korg 700 and MS20, and a Roland SH1000, before that, but these instruments were never able to give me the sounds I wanted: fat and edgy by turns, aggressive, and overflowing with *je ne sais quoi*. The 'white-faced' Odyssey Model 2800 did this, and in spades. It shrieked at the top, growled at the bottom, and cut through a mix in exactly the way that my Korgs and Roland didn't.

For many years the Odyssey and its simpler stablemate, the ProSoloist, were my 'synthesizer section'. Then came MIDI, and I was soon playing solos on a Roland Super JX10, with which I became adept at programming ARP-ish sounds. This is not that surprising, because the basis of the JX synth engine is quite similar to that of the Odyssey. The JX10 also allowed me to play solos over six octaves, and even create keyboard splits with an ARP-ish bass and lead on either side. The Roland lacked the rasp of the Odyssey and was less flexible, but with its benefits of MIDI and a superb velocity-sensitive keyboard action with aftertouch, there was no competition. Despite their justified positions in the keyboard pantheon, my ARPs were retired from live duties.

I've never lost my love for the Odyssey or the ProSoloist, often digging them out for a few hours of noodling. But nowadays I'm a creature of convenience, so they have never regained their places in my live rig, nor have they contributed to any studio recordings since the late 1980s. So when David Spiers of Gmedia contacted me to say that his company was — together with plug-in manufacturer, Ohm Force — developing a software version of the Odyssey, it would be an understatement to say that I was interested. 'Excited' would be much nearer the truth.

Installation

The *Oddity* arrives in a seriously chunky box that belies the affordability of the contents: master CD, 20-digit security code, and a manual as robust and well produced as the box.

Loading the software could not be simpler. Insert the CD, click the icon, then open the folder that matches your needs. I loaded the VST version onto my 1GHz G4 Powerbook running OSX 10.2.4, and a MAS version (to plug into *Digital Performer* 2.7) onto my 400MHz G4 tower running OS 9.2.2. The MAS version was supplied by Gmedia via email, because at the start of the review period only the VST version was available, but in both cases the software loaded and installed without a glitch.

Since I don't use my Powerbook for music, I have no sequencer on it that will support the *Oddity*, but many moons ago I downloaded a beta version of *VSTi Host*, by Dan Nigrin. Provided that you have OMS on your Mac, this allows you to use plug in VST instruments as stand-alone synths. I'm

aware that it has been superseded by a more sophisticated program that you can purchase [www.defectiverecords.com/], but the beta works for me, so I leave it alone.

Launching *VSTi Host* in the Classic environment, I clicked on the 'Select VSTi' box and directed it to the folder containing the *Oddity* software. I selected 'Oddity_VST2Mac', then clicked on 'Edit', and the *Oddity* appeared. I checked that the MIDI Input and Output devices were set to VST in the Set Up menu (no other options were available) and it was ready. Pressing a note on the on-screen keyboard produced an Odyssey-ish note from the Powerbook's speakers, so I was confident that everything was working correctly.

Launching the MAS version proved to be just as simple. A few frustrating moments were wasted working out that QuickTime instruments must be enabled in FreeMIDI for *Digital Performer* to direct the MIDI input from the MOTU MIDIExpress XT MIDI interface to the plug-in, but once I had worked that out the *Oddity* was up and running. Again, I checked the MIDI Input and Output, and these had set themselves to MAS. Perhaps because I still use an ancient Korg 1212 audio I/O card, there was unpleasant latency when I first played the *Oddity* from the Korg Trinity Pro that I use as a master keyboard, but reducing the 'studio' and buffer sizes in *DP* eliminated this. I was ready to start testing...

How Good A Copy?

As you can see from the screen heading up this review, the *Oddity* is a faithful reproduction of the original instrument on which it is based, albeit with a longer on-screen keyboard. The Odyssey's unique and quirky sound generating architecture, as well as its appearance, has also been recreated in software, although Gmedia have added velocity sensitivity for both the VCF (Voltage Controlled Filter) and VCA (Voltage Controlled Amplifier), optional beat synchronisation of the LFO (Low Frequency Oscillator) if the host application supports it, and an option to switch off the LFO reinitialisation that occurs each time you press a key on the Odyssey. Other additions include the A440 tuning switch that was so useful on the Minimoog and so sorely missed on the Odyssey, a Monophonic/Duophonic switch, and a slider to set pitch-bend range. All of these are sensible additions that do nothing to detract from the sound or functionality appropriate to the original.

Everything on screen may be controlled using the computer's mouse or touchpad, and every time a control is altered its current value appears in the display found at the bottom left.

Four ways of adjusting faders (all movements of which can be sent as MIDI continuous controllers and saved for use as automation within the host application) are offered: grab the fader head and move it vertically to the desired position; grab it and move the mouse left/right to move the fader in finer steps; click in the fader track to move the value up or down in fine steps; or click just above or below the fader and 'throw' it to one extreme or the other with a quick swipe of the mouse. If you want to see the mouse cursor while you move a control, switch off the 'Enhanced' mouse mode under the Set Up menu. I did this and found it much easier to make fine adjustments.

Patches are loaded from and saved to local RAM in groups of 64 called Preset Banks, and these are cross-compatible between the PC and Mac versions of the *Oddity*. If, like me, you prefer to create your own sounds and save individual patches to disk, forget it. You can't. Instead, you must use the 'Memorise' switch to store the patch in the RAM location of your choice, then save the whole bank that contains it. You might think (as I did) that this would be a little clunky, but in practice it proved not to be a problem.

What is a problem, however, is the inability to scroll through patches without going via the menu, and the fact that it is not possible to change sounds using MIDI Program Change messages. I found this quite frustrating. However, Gmedia point out that in the VST version, using *Cubase*, it's possible to scroll through sounds using the *Cubase* Patch Manager.

Before starting to play, I decided to make sure that the joystick and ribbon controller on my Korg Trinity were controlling sensible parameters on the *Oddity*. You do this using the Auto-Binding facility in the Set Up menu. Simply click on 'Auto-Bind', move the control on the *Oddity* that you want to bind, and then move a control on the physical instrument to send a MIDI continuous controller. The two are then linked by the software; you need do nothing else.

It's possible to save and recall MIDI configurations via the Set Up menu, but if you're happy to use the factory configuration, Gmedia have linked all 62 *Oddity* parameters to continuous controllers. These do not conform to current standards — for example, CC#7 controls VCA Modulation Source, rather than VCA Level (CC#110) or VCA Mod Level (CC#111) as you might expect — but you can change them without too much hassle.

Unfortunately, you can't map the same control to two destinations simultaneously. Oh yes... and the modulation controls are far too sensitive, exactly as they were on the ▶

Loading a patch.

System Requirements

MAC OS:
- Power Mac G4
- 64MB RAM (128MB for Mac OS 9)
- Mac OS 8.6 or higher

WINDOWS:
- Pentium III or better
- 64MB RAM
- Any current Windows version

SOUND ON SOUND

Gmedia *Oddity* £99.95

pros
- The wonderful sound of the Odyssey is accurately reproduced.
- All parameters can be linked to MIDI controllers and automated.
- Responds to velocity, aftertouch, joysticks, wheels, ribbons... and anything else.
- Simple to install and use.
- Will support multiple instances (host allowing).
- Somewhat cheaper than a room full of vintage ARPs.

cons
- Parameters are still subject to stepping when controlled using MIDI.
- MIDI Program Changes are not recognised.
- It's rather power-hungry if you use the S&H section.

summary

Soft synths have come a long way in the past few years, with oscillators and filters that sound very much like analogue circuitry. The *Oddity* is one of this new breed, and provides a remarkable imitation of a classic synthesizer. Given that you can launch multiple instances simultaneously, there's absolutely no excuse for anyone who uses instrument plug-ins to turn down a bagful of Odysseys for under £100.

Test Spec

- *Oddity* version 1.0
- 1GHz Apple G4 Powerbook, OS 10.2.4, 512MB RAM
- 400MHz Apple G4 tower, OS 9.2.2, 128MB RAM.
- Dan Nigrin's VSTi Host beta version
- MOTU *Digital Performer* version 2.7

The Odyssey used for sonic comparison in this review was a black/gold Model 2811, serial number 0184. This has the pitch-bend knob of the earlier Odysseys, and the earlier oscillators, but the hobbled 4075 filter and the CV+Gate interfaces of the later black/orange Odysseys with Model numbers 2820 to 2823.

▶ Odyssey. This is, of course, true to the spirit of the original instrument, but I think that it's one of those cases where bending the rules would have been acceptable.

In Use

To paraphrase something I wrote recently when I compared the Moog Voyager to the Minimoog, there are yobs on the net who state that the *Oddity* sounds "nothing like a real Odyssey". Again, I don't have a clue what they're talking about and, again, neither do they.

I ran the *Oddity* under *DP* 2.7 next to my near-mint Model 2811 Odyssey, and within moments it was clear that, with the exception of one inconsistency, one control limitation (both of which I shall discuss below), and a few minor differences that are no more significant than the variations between revisions of the original, the *Oddity* sounds like an Odyssey. In fact, the similarities are at times astounding, whether you're inspecting single oscillators across seven octaves in an analytical way, or creating and playing complex patches.

I patched a number of sounds on the *Oddity* and then on my Odyssey, playing a melody on one and the counterpoint on the other. I then reversed this, playing the counterpoint on one, and the melody on the other (if you see what I mean). I couldn't tell which was which. OK, it was possible to hear slight differences if I compared single notes, but these were the differences between two Odysseys, not the differences between an Odyssey and something else.

Consequently, the *Oddity* sits in a mix every bit as well (or as badly) as the original, it's every bit as unpredictable, it's every bit as annoying, and it's every bit as exciting. I could go into details and tell you that the oscillators exhibit the same aggressive qualities as the original; I could tell you that the edgy filter responds in the same way; I could tell you that all the complex and wacky modulation routings respond correctly, and that the envelopes retrigger in the right way, but given that I've stated that the *Oddity* sounds like an Odyssey, what's the point? Indeed, the accuracy of the emulation even extends to quirks such as the fact that the original Model 2800 retriggered every time you pressed a note, but from the Model 2810 onwards it only did so for the first four notes, after which multi-triggering ceased. A side-effect of the cut-price keyboard architecture used on later models, this is yet another characteristic that has been reproduced faithfully for the *Oddity*.

Now for the differences.

The inconsistency I mentioned above is a subtle one. On all the Odysseys I have played (and that's quite a few, because I've owned four of them, and played others), 'Sync On' has locked the oscillators together to precisely the same pitch. On the *Oddity*, there's a slight chorusing effect. It's not unpleasant, but it's not hard sync.

The control limitation is more serious: the controls 'step' when you grab them on screen and move the mouse up/down, or when using a 7-bit MIDI controller. Given that *Oddity* sounds slew smoothly when you use the Morph facility (see 'Morphing' box), I suspect that this may be a consequence of the rate at which the computer polls the mouse position. Whatever the cause, there are going to be players who find it annoying.

The zipper effects are almost eliminated when you use the fine modes of control mentioned earlier, but you are then precluded from quick movements between extremes. Depending upon how you use your synthesizers, this will either be a problem or of no consequence whatsoever.

The only significant sonic difference I noticed between my Odyssey and the *Oddity* was that — with the filter wide open — the *Oddity* was distinctly the brighter of the two. Given that my 2811 has a hobbled ARP4075 filter (see 'Odyssey Filters' box) I had a good idea why this might be. I contacted Gmedia to discuss it and, sure enough, they had modelled the sound of the *Oddity* on a later model with a corrected 4075 that did not suffer from the bandwidth restriction. Knowing this, I can now say with some confidence that my Odyssey's filter has a maximum cut-off frequency of just 10kHz because, at this value, the *Oddity* sounds like my Odyssey with its filter wide open.

As for playing the *Oddity*... what can I say? It's unlikely that performing with a plug-in will ever be as satisfying as having the original work of art at your fingertips but, on the other hand, the faders are not going to snap off when you get carried away and tweak them just a little too hard. (Yes, it happened.) Anyway, mapping the controls to CCs overcomes many of the restrictions, and with the joystick, ribbon controller and ▶

Morphing

One area in which the *Oddity* radically exceeds the capabilities of the Odyssey is Morphing. This facility allows you to move smoothly between two presets, with the transition time — from zero to 99 seconds — determined by the Morph Time knob. Morphing begins as soon as you select a new preset, but I was unable to get it to work from *DP*'s automation, so I had to initiate each Morph by hand, selecting the new preset from the patch list.

Strangely, Morphing works differently with the VST version to how it works with the MAS version. In the case of the former, any changes to the positions of switches occur in the middle of the morph, whereas with the latter they occur at the start. Either way, such changes introduce an inevitable glitch as, say, modulation routings change. Consequently, Morph works best with sounds having identical switch settings but different fader settings. This is not a deficiency of the *Oddity*, it's just how the world works.

The ARP Odyssey on which the *Oddity* was modelled.

Oddity Endorsees

Clearly, I'm not the only one to feel that the *Oddity* is a faithful recreation of the Odyssey, and Gmedia are happy to supply references from a number of respected players who have given permission for their views to be used as endorsements. Herbie Hancock says, "the *Oddity* is so authentic!" and Klaus Schulze not only said, "beautiful, great sound!" but offered to write sound banks for it. Other endorsees include Billy Currie (who was a famous Odyssey user in his Ultravox days) and Ted Pearlman (production credits including Diana Ross and Whitney Houston), who said "this soft synth sounds like you went back in time and snatched the original and dragged it back to now." Most telling of all is possibly the endorsement from Mike Overacker, the owner and co-writer of the definitive Odyssey web site, www.arpodyssey.com. Now there's a man who should know!

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Odyssey Filters

There has always been some dissent regarding the exact configuration of each Odyssey model. In no small part, this is ARP's fault, because the company was not averse to building new models using components and sub-assemblies from previous ones. While this used up ageing stock, it makes it very difficult to determine which oscillators, filters and so on were used in each model.

The following information seems to be the most accurate, although you will find statements that contradict it in books such as Mark Vail's *Vintage Synthesizers*. If so, please don't write in to tell me.

Model	2800
Year	1972-1974
Fascia	White with black legends
Oscillator board	B1
Filter	4023
Interface	None
Pitch bend	Rotary knob

Model	2800
Year	1974-1975
Fascia	Black with gold legends
Oscillator board	B1
Filter	4023
Interface	None
Pitch bend	Rotary knob

Filter Characteristic:
The 4023 was a 12dB/octave, SEM-style filter; it was slightly noisy but offered good bass response, especially at high resonance.

Model	2810
Year	1975-1976
Fascia	Black with gold legends
Oscillator board	B1 or B2
Filter	4035
Interface	None, or CV+gate+trig
Pitch bend	Rotary knob

Filter Characteristic:
The 4035 was a 24dB/octave, Moog-style filter. This was the subject of a patent infringement claim, and was replaced by the 4075.

Model	2810-2813
Year	1976-1978
Fascia	Black with gold legends
Oscillator board	B2
Filter	4075
Interface	CV+gate+trig
Pitch bend	Rotary knob or PPC*

Model	2820-2823
Year	1978-1981
Fascia	Black and orange with white legends
Oscillator board	B2
Filter	4075
Interface	CV+gate+trig
Pitch bend	PPC

Filter Characteristic:
This was ARP's own 24dB/octave filter, and appeared in many of their later instruments. It offered low noise and distortion, but a design fault (easily rectified) limited its maximum cutoff frequency to just 12kHz or thereabouts.
PPC: Proportional Pitch Controller

The model and serial number of the Gmedia Odyssey.

▶ buttons of my Trinity linked to important parameters such as pitch modulation depth, filter cutoff frequency and so on, it was easy to forget that this was 'just' a bit of software.

Wondering whether the *Oddity* restricts you to a single emulation of the Odyssey, I allocated eight tracks within *Digital Performer* — four MIDI tracks to control four instances of the *Oddity* in four audio tracks — and composed a short Symphony For Four Odysseys. I patched each *Oddity* differently, with a bass sound, a percussive accompaniment, a lead synth, and a duophonic 'carpet', recorded parts of each, and then pressed 'play'. Everything went swimmingly until *Digital Performer* stopped (not crashed), telling me that I had exceeded the system's capacity. I was using tiny buffers, so I extended these. That helped, but the system was still unable to play all four parts. Reading the manual, I discovered that the most power-hungry part of the *Oddity* is its S&H (Sample & Hold) section and, sure enough, three of my four patches made use of this. So I flipped all the relevant switches, and bingo! The Symphony For Four Odysseys was reproduced perfectly. Consequently, £79.95 isn't buying you a single Odyssey: it's buying as many as your computer can handle. This is excellent news. Given that my G4/400 is now getting long in the tooth, I am sure it's possible to achieve even better results on a modern Mac or one of the latest PCs.

Conclusions

As the chaps at Gmedia have themselves admitted, it would have been easy to design an Odyssey front-end and bolt this to a standard set of digital oscillators, filters, and amplifiers. But people like me would have noticed this immediately, and would torn the company to shreds for it. Fortunately, shredding is not necessary, because the *Oddity* is indeed a remarkable emulation of the Odyssey.

But it's not only that. Consider that I'm controlling four *Oddity*s from a split, six-octave, velocity-sensitive keyboard with aftertouch, and you'll see that I've come back full-circle to the territory once occupied by my venerable Super JX10, with all the benefits that that offered, plus the true sound and flexibility of the Odyssey. So if you have any love for the sounds of the '70s and are happy to use plug-ins, I recommend that you try the *Oddity*.

Hmm... let me change that. Given that Odysseys are rare, expensive, unreliable, often have damaged faders, always have scratchy faders, often drift out of tune, and are always a nightmare *to* tune, I don't merely recommend that you try the *Oddity*. I very *strongly* recommend you try it. SOS

information

£ £99.95 including VAT (includes Mac and PC VST, MAS and Audio Unit (Mac) versions).
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The Odyssey Sound

The Odyssey had a character that set it apart from any other synth of the era. ARP's famously aggressive oscillators offered pulse-width modulation, sync and ring modulation, putting the competition to shame. In addition, the 2800 had sample & hold, multi-triggering, a superb 12dB/octave low-pass filter, a high-pass filter, and dual envelope generators. It also incorporated an innovative keyboard-scanning system that assigned the oscillators to the highest and lowest keys played, thus making it the world's first duophonic synthesizer.

ARP revised the Odyssey on numerous occasions and its final incarnation appeared in 1978. Recognisable by its black and orange control panel and steel chassis, this offered further changes, of which the most visible was the chassis itself: this left the last inch or so of each white key exposed, resulting in a number of breakages. Less obvious was the permanent adoption of the Proportional Pitch Controller that replaced the unconventional pitch-bend knob with three unconventional pressure pads.

Other changes included a redesigned VCO, improved power supply regulation, better Sample & Hold, better CV (Control Voltage) generation, a standard quarter-inch audio input, and a balanced XLR output.

Despite their chequered history, Odysseys never failed to sound bright and zappy. It might have been more difficult to coax warm, mellow voices from them, but they excelled at basses, wild effects and aggressive lead sounds, and many of their patches remain to this day the standards by which other analogue and virtual analogue synths are judged.

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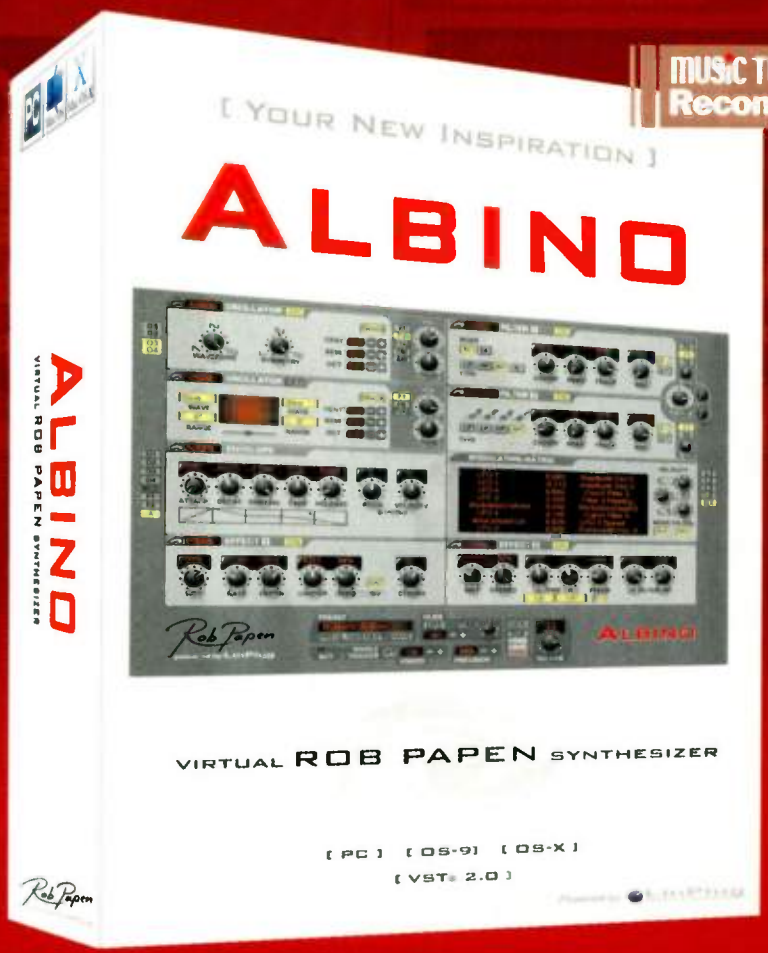

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Studio SOS

In order to widen the stereo image of the kit, the single Rode NT1 which Ian Anderson had been using as an overhead mic was replace with a matched stereo pair of Groove Tubes GT55s. Here you can see Ian positioning one of these mics to get the best balance of cymbals.

SOS helps reader Ian Anderson to achieve his favourite drum sound.

Mike Senior

In my experience, one of the bands most commonly praised for their rock drum sound are AC/DC, especially on their albums *Highway To Hell* and *Back In Black*. And so it was with *SOS* reader Ian Anderson, who contacted us following our in-depth drum miking workshop in *SOS* February 2003 to ask for advice regarding his recorded drums. Based in Newcastle, Ian plays guitar with the rock band Velatones, and he had been recording band demos in their rehearsal space — a four-room industrial unit shared with a couple of other local bands. The recording setup was based around a Mackie 1604VLZ mixer and a PC running Syntrilliums's *Cool Edit Pro* and Emagic's *Logic Audio Silver*. However, Ian had only so far configured his eight-input M Audio Delta 1010 interface to work with the former, so all recording had to be done using *Cool Edit* before exporting the files to *Logic* for mixing. Some outboard processing was also available in the shape of three Behringer Composer compressors and a Behringer graphic equaliser.

For mics, Ian had been using an AKG D112 on the kick drum and a Shure Beta 58 on the snare, with SM57s and SM58s on the toms and a Rode NT1 for an overhead mic. While Ian was happy with the kick drum sound, he felt that his snare sounded woolly, almost as if the snare wires had been removed, or as if the drummer were hitting a tom-tom. He had followed our article's suggestions, and had even tried miking the underside of the snare, but to no avail.

I asked him to send over a few recordings on CD and loaded them into Emagic's *Logic* to have a listen. The snare drum did indeed lack definition, and had a pronounced low-end ring. In addition, I felt that the overall sound lacked high-end clarity and a suitable sense of size and power compared to 'Back In Black', the AC/DC track which Ian considered to be the ideal reference. With this in mind, I arranged to visit Ian's rehearsal room to see what could be done to remedy the situation, taking along a few extra mics to help out.

Setting Up Overheads & Ambience

An early start saw me arrive up in Newcastle just before 10am and, after the obligatory cup of coffee, we went to work. Ian had arranged for Wayne Stronach, the Velatones' drummer, to be there, so the first thing was to have a listen to what was happening in the room. It was a bit of a surprise to find that the drum sound in the room was nicely balanced and powerful, and well-suited to the style of music they were recording. Although the room was not huge (about 6 x 6m), all but one of the walls were bare stone, and these reflective surfaces were reinforcing the sound in a very beneficial way. I could immediately see why the recordings Ian had been getting were such a source of disappointment to him!

Although Ian's main concern was the snare sound, I felt that we should first set up the overheads — so much of the sound was right in the room that it seemed best to work from that. For a start, I felt that it was essential, given the target sound, to mike the cymbals in stereo, giving the drums more width and space in the stereo image. Because Ian had no matched pairs of

condenser mics available to him, I'd brought a pair of Groove Tubes GT55s — large-diaphragm cardioid condensers. These were connected to two channels on the Mackie console, which also fed the mics the necessary phantom power. The two mixer channels were bussed via its main outputs to two inputs of the Delta 1010. Once basic levels had been set, we fine-tuned the positioning of the overheads by ear for a good balance of the cymbals.

We could make an educated guess at positionings by moving mics while listening to the results on closed-backed headphones, but there was so much noise in the room that the only reliable method of monitoring was to work incrementally, making test recordings for each new mic position. This method of working is extremely time-consuming, but is often the only workable solution for the one-room studio on a budget. In addition, there were no real studio (or even hi-fi) speakers around, so we had to rely on headphones to make our recording decisions — albeit referencing 'Back In Black' periodically. For this reason, I switched in the 75Hz high-pass filters on all the desk channels other than that of the kick mic, in order to avoid potential low-end phase-cancellation problems. We could have delayed this decision until after recording, but I didn't think it would really reduce the mixing options and, given the rather harsh sound of the channel processing in *Logic Silver*, I figured it would be best to commit to EQ in the analogue domain. Unless you've got access to very high-quality digital processing, I find that this approach often gives the best results.

In order to help increase the perceived 'size' of the room sound, we also wired up a couple more condenser mics for ambience — I'd brought a pair of small-diaphragm Shure KSM141s for the purpose — and routed their mixer channels to the same two console outputs. (We had to limit ourselves to six soundcard inputs for the drums, because we wanted to leave two soundcard inputs free for recording guitar and bass parts alongside.) The mics were set up out in the corridor, which also had bare stone walls and quite a high ceiling, and were pointed away from the recording room, with an angle of about 90 degrees between them. With the door to the studio left open, this created a great ambience sound, especially once the mic polar patterns had been switched to cardioid, eliminating more of the direct sound. I panned the ambience mics hard left and right, while the overheads were panned for a slightly narrower image — I find that this makes for a more convincing overall sound when your overhead mics are effectively acting as cymbal close-mics, as in this case. Finally, a little high-end sparkle was added to both sets of mixer channels using the Mackie's 12kHz shelving filters.

Salvaging The Snare

Once the overheads and ambience were up and running, it was time to tackle that troublesome snare sound. I'd packed one more condenser for this to try to get as bright a sound at source as possible — another Shure, this time a KSM137. The drummer was taking no prisoners in terms of volume, so I engaged the mic's 25dB pad, as well as switching in the built-in low-cut filter. The snare channel was routed through one of the Mackie's subgroups to a separate soundcard input. Despite using a different mic, setting it up in a 'textbook' position just over the rim of the drum gave a very dull and boomy sound, just as Ian had found. A little low mid-range cut on the overhead and ambience channels helped create a slightly less muddy sound, but the close-mic obviously needed some serious attention.

My first thought was to try to damp down some of the drum's low ringing, which was adversely affecting the sound. Firstly, I tried sticking a wad of tissue paper to the drum's top edge, but just from tapping the drum skin with my finger I could tell that this was making very little difference. A position at the bottom left of the skin worked rather better, usefully reducing the extent of the ringing.

Next we set about finding a better position for the mic. Initially, we moved it to aim more at the point where the stick was hitting the drum, to try to pick up a bit more 'snap' in the sound. However, this was a dead loss, accentuating the ringing we'd just tried to reduce. Some more extended experiments with mic positions while Wayne was playing indicated that the least boomy sound was to be obtained by pointing the mic towards the wad of damping material. However, the resulting signal was still rather dull and lifeless, so we decided to see what processing could offer.

I would normally also check at this point whether inverting the phase would improve the overall sound, but there were no readily available phase-inversion facilities while we were recording, so we left this until we imported the tracks into *Logic* at the end of the session. As it turned out, none of the tracks benefited appreciably from phase inversion, and I imagine that the high-pass filters on the Mackie had a lot to do with this.

The first snare processing we tried was taking off some of the low end using the Mackie's EQ, allowing the overheads and ambience to provide more of the body of the sound. Listening to the snare in the context of the whole kit, we rolled off a few decibels of low end using the snare channel's 80Hz shelf, and also cut a few decibels using the mid-band set to 200Hz. A little 12kHz boost also helped the snare cut through more.

At this point we were beginning to get closer to the sound we were after, but Ian still felt that the snare could do with a bit ▶

Two Shure KSM141 small-diaphragm condenser mics in a corridor adjacent to the recording room were used to record ambience. With the studio door left open and the polar patterns set to cardioid to reduce direct sound, these mics really helped to knit the overall sound together.

Mike adjusts the snare mic to try to emphasise attack without capturing excessive ringing.

more bite. He had tried to mike underneath the snare before, but had not had any success, and a few minutes spent experimenting with an SM58 confirmed that this was not going to be useful to us — I actually thought that the extra 'buzz' from the snare wires added something to the sound, but Ian definitely didn't like it, so that was that!

Returning to the basic snare sound, we resolved to finish the job using EQ and compression. After some further listening, we switched the mid-band to a fairly savage 9dB boost at around 6kHz. A Behringer Composer Pro was then patched into the snare channel, set up to emphasise the drum's attack: the settings we used were 2:1 ratio, 30ms attack time, 0.5s release time, and up to about 6dB of gain reduction showing on each main hit. The good news was that this processing provided a much more punchy close-miked snare signal which combined well with the overheads. The bad news was that hi-hat spill coming down the heavily EQ'd snare mic was now adversely affecting the overall hi-hat tonality...

Fortunately, it made sense to close-mic the hat anyway, because we were after quite an upfront sound, so we rigged up Ian's Rode NT3 on the outside edge of the hat, as far as possible from the snare, and angled it to minimise spill from the cymbals. Once a couple of decibels had been added at 6kHz using the Mackie's mid-band EQ, the spill coming through the snare mic ceased to be a problem, so we decided to quickly rig up the kick mic to get a better idea of the overall picture. Ian had already been getting a good kick sound, but it now needed a little extra attack to compete with the snare. This was achieved by boosting the kick channel's mid-band EQ at around 3kHz, and applying a similar compression setting as was used on the snare, except with a slower attack time of around 50ms to avoid robbing it of too much low end.

The hi-hat close mic was placed on the outer edge to reduce snare drum spill, and was pointed downwards to reduce cymbal spill.

Putting The Drum Sound In Context

By this time, we were most of the way there, so we adjourned for a late lunch to give our ears a bit of a rest. On returning, we made a few small balance adjustments to the sound, including increasing the mix level of the ambience mics to knit all the other mic signals together — real ambience of this kind is so effective, but almost impossible to achieve on all but the most expensive reverb processors, so it's great to be able to be able to use it while recording.

With the drum sound now fitting together quite nicely in isolation, Ian suggested that we try recording one of his guitar parts alongside, so he plugged into a wonderful '60s Vox AC30 on the other side of the room and let rip! Again, it sounded great in the room, but this time, fortunately, an SM57 in front of one of the speakers immediately produced a nice solid sound. We grabbed a few spare drapes and cushions the band had lying around the rehearsal room, and used them to tame the worst of the guitar spill, but there was only so much we could do in this respect, so we just went ahead and hit record to see what we'd end up with.

It was at this point that everything really came together. There was enough separation on the guitar mic to give a useful level of control, but the guitar spill on all the

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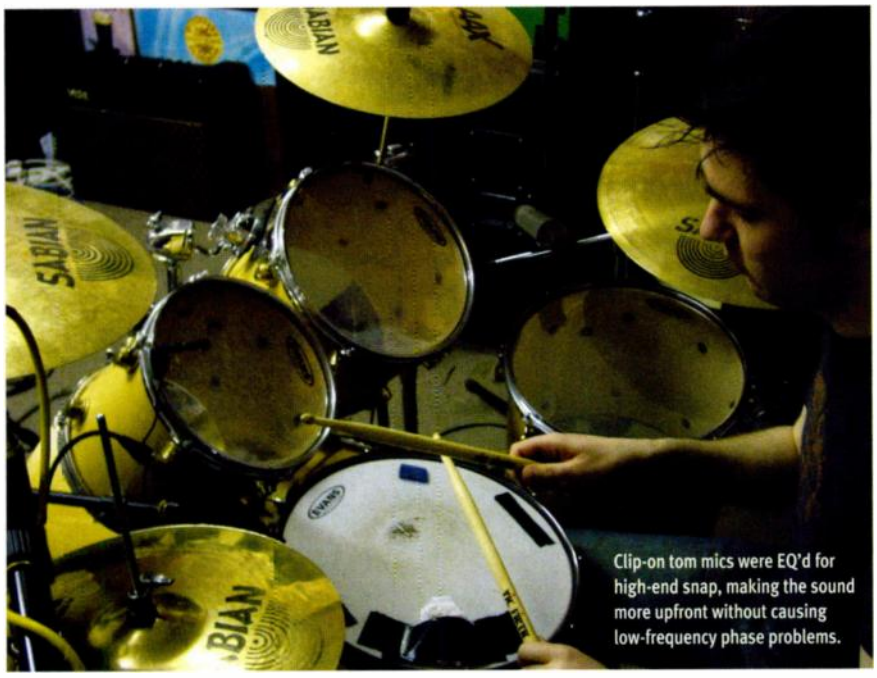

Clip-on tom mics were EQ'd for high-end snap, making the sound more upfront without causing low-frequency phase problems.

drum mics really bound everything together wonderfully. A little more of the ambience mics was the only further tweak — it's amazing how much drum ambience simply disappears into a track once the other instruments get in there.

As a final test, we fired up the band's PA system and compared our recordings to 'Back In Black' over the speakers — although not an ideal monitoring solution, it did at least reassure us that there wasn't anything disastrous going on at the low end. Continuous A/B'ing between the two drum sounds confirmed that we had got pretty close to our target, although it was agreed that we'd probably removed a little too much low end out of the snare, so the 80Hz shelving cut was reduced on the snare drum's mixer channel.

While I was packing up to head for home, Ian replaced the condenser mics I'd brought with me with some of the dynamics in his collection. While the snare sound didn't suffer much from the change of mic, the overhead sound was noticeably less airy, so my main suggestion was that he get hold of at least one stereo pair of condenser mics for using as overheads. Studio condenser mics are so affordable these days that there's no excuse for having lifeless cymbals any more — and you could probably get away with dynamics for your ambience mics if the overheads were condensers.

As we hadn't had time to concentrate on miking the toms, Ian also quickly rigged up some clip-on electret tom mics, and this confirmed that the toms could easily be brought more into the foreground by mixing these with the existing overall sound — the lack of phase inversion facilities seemed not to be causing much difficulty when the close mics were mainly being relied on to provide high-frequency definition to the sound.

Conclusions

So much emphasis has been placed on multi-miking as the 'proper' method of recording drums that it's easy to lose sight of the fact that many rock drum sounds rely more on the overhead and ambience mics than they do on the close mics. If you've got a great sound in your room, as Ian did, don't be afraid to major on it. This means you can use (and abuse!) the close mics to complement the overall sound, rather than having to get the main body of the sound from the close mics. It proved difficult to create even a half-decent snare sound from the close mic in Ian's case, but this didn't matter too much in the end given that the main body of the snare sound was coming in via the overhead mics.

It's also worth reiterating how effectively the drum ambience bound together the whole sound, and how great the guitar sounded when it was playing with the drums. A lot of effort is often put into reducing spill in the recording studio, because its effects can be unpredictable, but eliminating spill completely can be like throwing the baby out with the bath water. The way in which the spill in Ian's studio formed the guitar and drums into a cohesive whole was one of those bits of studio magic, so think twice before immediately hiving off your guitar and bass cabs into another room when recording drums. If your band can play together alright, do multiple takes and edit between them if necessary — you may be surprised how much better the end result sounds. SOS

Ian's Thoughts On The Session

Since Mike's visit we've bought a matched pair of Groove Tubes GT55 condenser mics, and that has made a huge improvement to the overall drum sound. When Mike first plugged in his GT55s on the drum overheads I couldn't believe how good they sounded, so when I saw a pair on clear-out for £230, I couldn't pass that offer up!

I've now got SM58s on the toms to bring them into focus, as we have a lot of songs where the drummer plays a riff on the toms, so we need those close mics to get enough attack. There is a fair degree of spill between the various drum mics, but we've found that they all mix together to create the overall 'sound' of the drums as we hear it — when listened to in isolation, the snare lacks some snap, but the overheads and an NT1 above the drummer's head provide that. Using the mics out in the corridor has worked well for us too, and with the band playing along we get a nice 'ambience' track to mix in and gel everything together, plus I've just got a amazing '67 plexi Marshall to add to the sonic palette.

I'm still playing with the snare to get more snap/cut. It's getting there, and the addition of an AKG C418 clip-on mic has helped in that respect. Patching in the Behringer graphic EQ and boosting around 6dB at 6KHz seems to bring out that snare 'crack', although I'm sure all snares are different and you need to play with that frequency a little. Panning the snare a little bit off centre seems to make it cut through the mix better as well, and we're trying that out at the minute. When Mike was here we patched in the Behringer compressors and dialled in a little compression on the peaks, but I've since decided that it dulls the sound too much for my tastes, so I'll leave it off till mixdown. I suspect better compressors are needed here and I'd really like some of those Empirical Labs Distressors for the kick and snare for that 'brick wall' Bonham drum sound, but the budget is nonexistent at the minute unless some kind record company would like to upgrade our studio in a 'development deal'...

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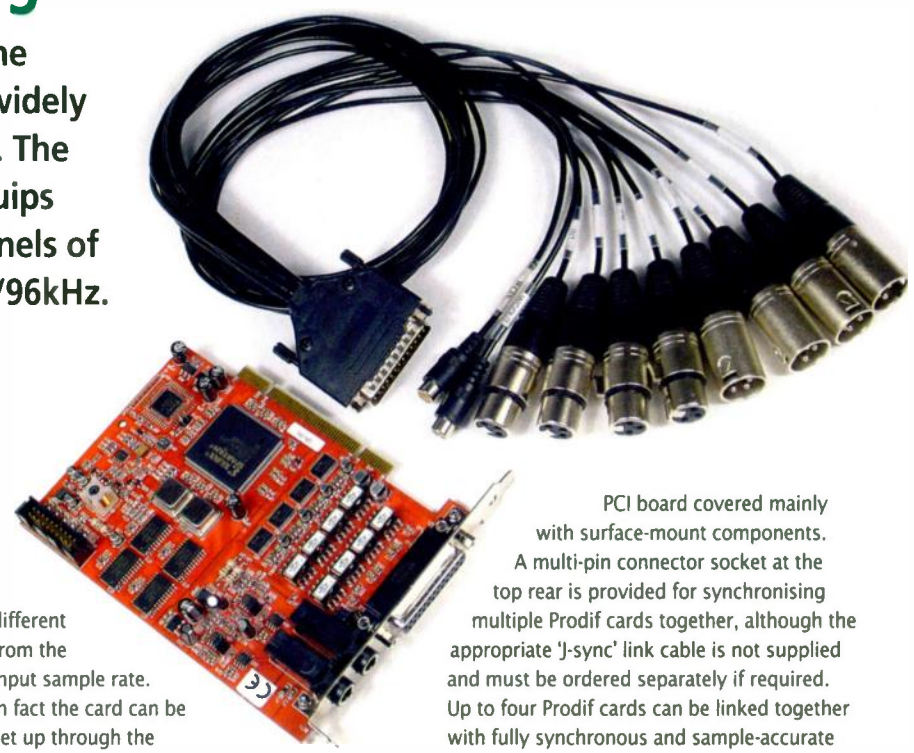
SEK'D Prodif 88

24/96 AES-EBU Digital Audio Card

Among audio professionals, the electronic AES-EBU format is widely used for digital audio transfer. The SEK'D Prodif 88 soundcard equips Windows PCs with eight channels of AES in and out at up to 24-bit/96kHz.



Hugh Robjohns

Amidst the plethora of PCI audio interface cards for computers there are few with truly professional aspirations, but the SEK'D Prodif 88 is one such offering. This unit boasts eight bi-directional I/O channels of pure AES-EBU digital interfacing, with full 24/96 resolution. Each digital port is transformer-balanced, and there are a further two analogue outputs for stereo monitoring. Being primarily a digital I/O interface, the technical specifications really depend on your audio processing software, and the quality of the A-D and D-A converters you choose to use for recording and monitoring.

Interfacing

The digital I/O is made available via a 25-pin D-sub connector, and a one-metre breakout cable is supplied. This provides a tangle of 10 separate cables, four terminated in male XLRs for the AES outputs, four more in female XLRs for the AES inputs, and two with phono sockets for word clock in and out. It would have made life a lot easier if cable-mounted female BNC connectors had been used rather than the phono sockets, given that word clock interfaces are connected exclusively with BNCs. However, suitable BNC-phono adaptors are available from all the usual suppliers at a cost of around £3. The D-sub pin-out wiring is a bespoke arrangement (mainly to accommodate the clock terminals) and is not directly compatible with the ubiquitous Tascam standard, but the handbook does provide the pin-out plan should you want to make up your own interface cables.

On the subject of clocking, the card is pretty flexible in this regard. The word clock output is derived from the analogue monitor outputs' D-A sample rate, and this may be different from the input sample rate. In fact the card can be set up through the configuration menu for independent clocking options on the record and playback sides, although certain combinations are not allowed. The user can select separate record and play clocks from either the external word clock input, any of the four AES-EBU inputs, or the internal clock at whatever rate has been preselected. However, when monitoring both record and playback simultaneously (as you would when overdubbing, for example) both sections must obviously use the same clock source. A second restriction is that if playback is locked to one of the AES inputs then the record side must clock from the same input. Finally, if you're recording with the internal clock or an external word clock as a reference, playback can not be referenced to an AES input.

The analogue stereo monitoring outputs are provided on quarter-inch TRS sockets at the top of the panel strip, and support balanced or unbalanced connections with selectable nominal output levels of +4dBu or -10dBV. The D-A converter is 24/96 capable and the specifications claim that the noise floor of the analogue monitor output is better than -108dBFS (A-weighted at 44.1kHz and +4dBu nominal level).

The card itself is a high-quality short-form PCI board covered mainly with surface-mount components. A multi-pin connector socket at the top rear is provided for synchronising multiple Prodif cards together, although the appropriate 'J-sync' link cable is not supplied and must be ordered separately if required. Up to four Prodif cards can be linked together with fully synchronous and sample-accurate clocks to provide 32 channels of AES I/O.

Four of the quintet of handbag jumpers on the board are provided for user configuration of a few aspects of the hardware. Two select the output level for the analogue monitoring ports (+4dBu is the default condition, with -10dBV being available by moving two ▶

SOUND ON SOUND

SEK'D Prodif 88 £682

pros
- Well-engineered digital interface.
- Analogue monitoring outputs.
- External clock facilities.
- Flexible configuration modes.

cons
- Word clock I/O on phono connectors.
- Non-standard D-sub wiring configuration.

summary
A compact PCI card providing eight channels of AES-EBU digital audio into and out of a PC, complete with separate word clock input and output and a 24/96-compatible stereo line-level analogue monitoring output, the Prodif 88 is supplied with MME and ASIO drivers for all current Windows OS versions, and works splendidly.

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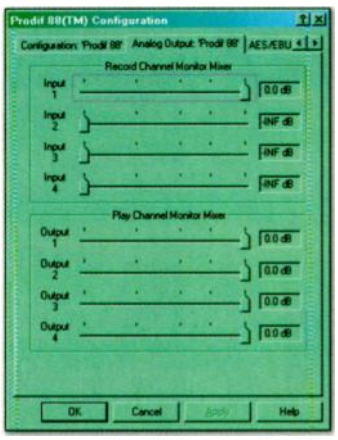
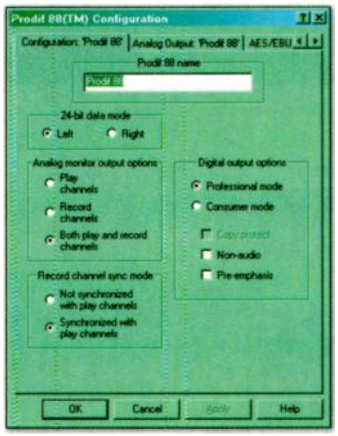
jumpers), and a second pair enable or disable the external word clock input and output facilities individually.

SEK'D have issued quite a few software and firmware updates for the Prodif 88 card since its launch early last year, most providing bug-fixes and some including operational improvements. The complete update history is documented on the company's web site. At the time of writing, the current versions are Revision B PCI card hardware with Version 4 firmware and v4.05.1011 drivers.



In a multi-card setup, the ability to rename the card may be useful.



The Prodif 88 features a stereo analogue output for monitoring purposes.

The published minimum system requirements for the Prodif 88 are a Windows-based computer (sorry Mac users) using a 300 MHz PII processor with 64MB RAM and a "free PCI slot" — no, really! However, a more realistic minimum would be a 450MHz Pentium III with 128MB RAM. The driver software supplies Multimedia MME (wave) and ASIO drivers for pretty much all the common Windows operating systems including Windows 95/98/ME, Windows NT (from SP3), Windows 2000 and Windows XP. The drivers have not yet been tested by Microsoft, so a message pops up during installation to warn of 'unsigned' drivers.

Installation

Installing the card and software is a doddle. After fitting the card into a spare PCI slot I rebooted the machine and pointed the Found New Hardware wizard at the supplied CD-ROM to load the core drivers. Having loaded the basic MME drivers I then had to do a little manual file manipulation to load the ASIO drivers and the control panel to display and change the configuration menus. These two software items are apparently not loaded by default to avoid cluttering up the system with "unnecessary files" — although if you are a *Cubase* user, ASIO drivers are pretty important, and we all like to tweak control panels, don't we?

As usual, it was only after installing everything that I discovered updated drivers on the SEK'D web site (the CD-ROM supplied with the board was the previous v4.05.1008). After downloading a PK-Zipped file containing all of the drivers for every OS plus the control panel software, I was able to install the current v4.05.1011 drivers.

Control Panel

As you can see from the various screen grabs, each menu page has its own tab at the top of the window, starting with the basic card configuration page, and everything apart from the initial configuration menu is largely self-explanatory.

Some of the first menu options are less than obvious, so I'll give a quick run-through. At the top of the window the name of the interface can be changed if required, which might be useful in a multi-card system. The radio buttons on the right-hand side set the output status bits to indicate professional or consumer mode, audio or data, pre-emphasis, and copy-protect (only applicable when consumer mode is selected). The provision of a data mode is handy if you happen to working with Dolby Digital or DTS surround-encoded audio files.

The 24-bit data mode sets the way in which the driver handles 24-bit audio data packed within a 32-bit value, and the options below determine what will be output through the analogue monitor sends. The record channel sync mode enables the record and replay channels to operate independently or be synchronised — although this function depends to a degree on the flexibility of your audio software. This facility is intended to appeal particularly to broadcasters using computer-based radio automation systems, allowing each channel to be started and stopped independently, for example.

The Analogue Output menu provides a mixer panel to combine the record and replay channels. If the monitor option on the configuration menu is left in its default mode of monitoring the replay channels only, then the input channels are disabled in the mixer. The AES menu page enables the AES outputs to be used as monitoring channels (with zero latency), to pass through the corresponding input signals (and only works if the monitoring selection is set to both record and replay).

The Input Lock page simply provides illuminated legends to show when valid clocking signals are being received and decoded correctly from the four AES inputs and the external word clock. The Version page shows the hardware card revision and firmware version, but not the driver versions, strangely — this has to be located in the Windows Control Panel under the Sound Devices sub-section.

The Clocks and Sync page looks empty here, but each card installed is listed here and by clicking on the appropriate card a second window pops up to enable the record and replay clock selections to be made, as previously described. The final menu page is to configure the buffer setting of the Prodif 88 ASIO driver, if installed. The default buffer size is 80ms.

In Use

The SEK'D unit was trivial to install and configure, and worked remarkably well. There are many inherent advantages in keeping A-D and D-A conversion well away from computers, not least being a lower noise floor and usually far better conversion quality. With the proliferation of affordable digital mixing consoles and 'producer preamps' with onboard A-D conversion, it certainly makes sense to just pass digital audio to and from the computer via a card like this.

I hooked the Prodif 88 up to a variety of professional equipment including a an Apogee PSX100, Panasonic DAT machine, HHB CD recorder, a Genex 8500 multi-channel recorder, and a Yamaha 02R96, passing audio in and out of the computer to *Cubase VST* 5 and *Cool Edit Pro* v2.1 without any difficulty at all. The clocking all worked properly and reliably, and after making sure dither was turned off in *CEP* I was able to prove that the card was bit-transparent — what came in, went out, and came back in again was identical to the source! If you are looking for an eight-channel interface and are happy to work with AES signals this is a fine tool for the job — I can certainly recommended it. SOS

Test Spec

- SEK'D Prodif 88 Revision B with version 4 firmware.
- Soundcard driver version 4.05.1011.
- 2.4GHz Pentium 4 PC with ASUS motherboard and 1GB RAM, running Windows XP Home Edition.
- Tested with Syntrillium *Cool Edit Pro* 2.1 and Steinberg *Cubase VST* 5.

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Photos: Mark Ewing

Novation Remote 25

Portable USB Controller Keyboard

The concept of the portable laptop-based studio is enticing, but you still need a musical input device — hence the current popularity of compact MIDI keyboards. And although it's not the cheapest, Novation's Remote 25 has much to offer...

Derek Johnson & Debbie Poyser

Originally projected as a dedicated controller for Propellerhead's immensely popular *Reason* electronic studio software, Novation's Remote was announced two-and-a-half years ago as a Propellerhead/Novation joint venture. *Reason* users were understandably excited. Forums buzzed and photographs of prototypes appeared on the Internet, but a long time passed and no Novation *Reason* controller appeared.

Until now. But Remote 25, despite sporting the *Reason* 'Re' prefix, is no longer what it was first intended to be, and instead has metamorphosed into a general-purpose device that comes with profiles and control overlays for 24 different software packages and hardware synths — including *Reason*. What changed Novation's mind about producing a dedicated *Reason* controller? Find out in the 'Remote History' box on the next page.

Novation's 'reasons' aside, the change of direction means that, instead of standing out from the crowd as a *Reason*-centred device, Remote 25 now has to run with the pack of 'keyboard-plus-knobs' controllers from several other manufacturers.

Test Spec

- Novation Remote 25 OS version reviewed: v1.05.
- 450MHz Apple Mac G4 with 896MB of RAM, running OS 9 and OS X.
- Propellerhead *Reason* v2.5.
- Steinberg *Cubase SX* for Mac v1.04.

Feature Overview

'Cute', if not 'revolutionary', is a word that comes to mind when looking at Remote 25. Clearly the Remote is aiming at the same affordable controller market as Evolution's MK-series or Edirol's PCR-series, or M Audio's Oxygen 8 and Ozone keyboards. Like the last two instruments in this list, the Remote 25 sports a 25-note full-sized keyboard. The Remote 25 offers velocity and aftertouch sensitivity, and the two available keyboard octaves are transposable over an eight-octave range.

Where the Remote 25 really scores is in the sheer number of assignable knobs, buttons, sliders and other controllers its compact front-panel hosts. Its eight knobs, eight continuous rotary encoders (stepped, with no end stop), eight rather short-throw sliders and 24 programmable buttons make the eight knobs offered by M Audio's Oxygen 8, for example, look a tad skimpy. There's also a sequencer transport section (play, stop, record, fast forward and rewind buttons), a combination pitch-bend/mod joystick, and a programmable X-Y touchpad to which up to four parameters can be

SOUND ON SOUND

Novation Remote 25 £269

pros

- More controls available simultaneously than on competing devices.
- Full-sized keys.
- Fun X-Y touchpad controller.
- Easy to edit and create Templates.
- Lots of support for popular software and hardware right out of the box.

cons

- No Mac OS USB drivers on initial release.
- USB power-draw problems with some laptops.
- External PSU is currently an optional extra.

summary

There's currently nothing to beat Remote 25 as a solution to the price/controller equation if you're in the market for a fully featured portable keyboard/knob centre. Especially cost-effective when you consider that the sheer number of physical controllers means that you would not have to invest in a separate MIDI fader/knob box.

assigned. The last is a very welcome performance-oriented tool, not seen on any similar product. Indeed, the Remote is generally a thoughtfully designed device — users may even choose whether they want the mod part of the joystick sprung or unsprung, via a little switch! Expression and sustain pedal sockets complete the potential controller line-up, and a collection of edit and cursor buttons, along with a data knob and 2-line x 16-character backlit LCD, fill out the front-panel layout.

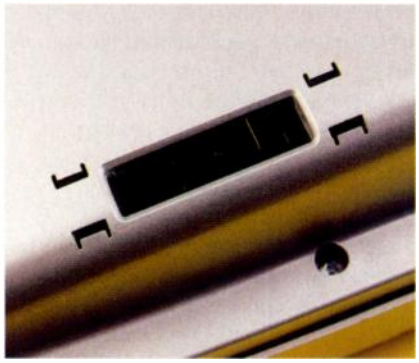
All connectivity is located at the rear, including the USB port, MIDI In and Thru ports, and two MIDI Outs. The five-pin MIDI sockets can be treated as an independent one-in/two-out MIDI interface when the keyboard is connected to a computer via USB, increasing the Remote's value-for-money quotient.

Lastly there's a 9V DC power supply socket (and power switch). No PSU is provided — it's an optional extra, which is slightly odd. The Remote 25 is supposed to be able to draw power solely from the USB connection, which in some degree would excuse the lack of PSU. But not all USB connections are equal, especially on laptops, and some may not provide enough current to drive the keyboard. The Remote's manual even mentions this possibility in connection with some laptops, but we found that the USB current generated by our *desktop* Apple G4 wasn't sufficient to power the Remote 25. Even with a laptop that can provide enough juice, you'd probably rather not use USB power alone when running from the laptop's batteries.

Happily, there's a third (albeit potentially expensive) alternative, since the keyboard can also run off six 'C'-type batteries, making it powerable independently of USB or mains (Novation claim a maximum life of 64 hours if you use Duracells). Usefully, if you install rechargeable batteries, it's possible to trickle-charge them from the USB and PSU connections.

Designed to be a portable controller, perhaps ideally suited for use with laptop music setups, the Remote 25 allows you to play notes into your software and to alter a wide range of on-screen parameters in software, or hidden parameters in the case of some hardware instruments. It comes pre-loaded with 59 control Templates, though there can be several per instrument or software package — there are 10 for *Reason* alone. However, Remote 25 is fully programmable, so you should be able to create templates (such as the one we made for our Korg Trinity workstation) for instruments not covered, and save them to any of the 64 template locations. One or all templates can be dumped to computer via MIDI, if desired.

To help you more easily associate the many physical controllers with what they'll be doing in your software, a set of card overlays that fit into recesses over the three main button areas on the front panel is



The Remote 25 can be run from an (optional) external PSU or from six 'C' cells inserted in this slot underneath.

provided. There are pre-printed ones for the factory presets and blanks for your own use. Nice as this sounds in theory, in practice they're a bit fiddly, and it's a drag to have to slip three cards in and out every time you change template — which is quite regularly when working with the *Reason* devices, for example. We also wondered how durable these thin cards will be in the long term. Fortunately, Novation can sell you new ones.

Build quality is fine — you think the Remote 25 is going to be a bit plasticky when you first unpack it, but it's actually sturdy. The sliders are not the most pleasing to move, but the knob and encoder pots are of good quality, with plenty of space between them for even stubby fingers. The pitch-bend part of the joystick on the review model was incorrectly calibrated, however, and wouldn't quite transmit a full range, leading to flatness and sharpness at the extreme of upper or lower bends. It was less noticeable when the target's pitch-bend range was set to a couple of semitones, but still present (especially for downward bends). Resetting the Calibration menu, which Novation suggested might have been scrambled in a software upgrade, had no effect, but they claim that the fault hasn't been reported with other units, so we had to conclude that the review unit had a ▶

Remote History

As attractive as a dedicated hardware controller for *Reason* would have been, one has to recognise that such a product would have a limited potential market — obviously a generic device has the potential to sell to a greater number of people. This fact became clear to Novation during Remote 25's development, with the result that the final product differed markedly from the original concept. Novation's Nick Bookman offered some feedback on how the product changed during the development period. The first big step towards making the keyboard generic was the decision that the prototype's excellent grid system, dedicated to editing *Reason* devices, used up too much panel space. In the end, this became filled with knobs instead. Prototype Remotes made do with a three-digit LED display, and this is definitely improved upon by the 2-line x 16-character LCD on the production keyboard. Customer feedback also had an impact on some design decisions — for example, the substitution of a joystick for separate mod and pitch-bend wheels. This feedback is also responsible for the sprung/unsprung option for the joystick's mod-wheel element, and it influenced Novation's decision to implement knobs, encoders *and* sliders rather than simply offering all knobs. Users were split 50/50 as to whether encoders or knobs should be specified, so both were included on the final product; stepped encoders are particularly useful for parameters with a fixed, rather than continuous, value range. For example, when changing the semitone tuning of a synth oscillator, an encoder could be clicked five steps and you'd know a five-semitone shift had been made. In the interests of compactness, a two-octave keyboard was substituted for the prototype's three octaves — probably the correct decision.

Lastly, the prototype used a similar colour scheme, parts, and mechanics to the Supernova II and Nova II keyboards. Manufacturing cost considerations demanded simplification — mainly in a switch from metal to plastic. Also, since the prototype's debut, recent Novation products have moved to a silver livery, and the finished Remote 25 now fits in nicely with the current range.

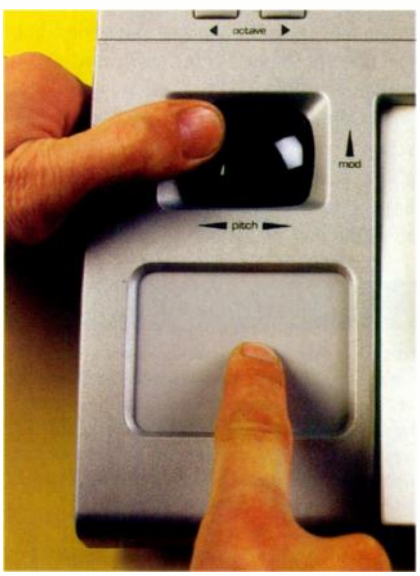
hardware fault. Otherwise, the keyboard feels fine, and it's excellent that the keys are full-size. Our only comment would be that the way the keys physically pivot at extreme aftertouch values is a little alarming.

In Use

Getting the Remote 25 going is simply a matter of installing the right USB drivers for your system (they're supplied on CD-ROM with the keyboard) and connecting the unit to your music computer. The keyboard now becomes a MIDI input device for MIDI sequencers and software instruments. As we write, there are no Mac USB drivers (OS X drivers are expected later in the summer), so we connected the Remote 25 to a spare port of our MIDI interface via the five-pin MIDI sockets. Mac users who remain devoted to Mac OS 9 for music will find that the five-pin MIDI connection is their only option, since OS 9 USB drivers are unlikely to appear. We tested the keyboard with Propellerhead's *Reason* (for Mac OS 9 and Mac OS X), and Steinberg's *Cubase SX* MIDI + Audio sequencer in Mac OS, plus some virtual instruments inside both *SX* and *Cubase VST*.

Not all *Reason* devices are covered in the Remote's current collection of preset Templates, but all v2.0 instruments are here — *Subtractor* and *Malström* synths, the *Dr Rex*, *NN19* and *NNxt* sample-based devices, the *Redrum* drum machine, and *Remix* mixer.

All supported *Reason* devices except for the 'samplers' require two Remote Templates; *Redrum* requires three. These devices simply have too many controls for one Template. In practice, this means switching Templates via two dedicated buttons. For the synths, the Template arrangement is straightforward: each of the two focuses largely on one oscillator, dividing the remaining parameters in a fairly logical manner. A handful of relatively insignificant parameters aren't assigned to controllers in each case (odd, since there are free slots in the Templates), but if they're important to you, it's simple to add them to a Template and re-save it (see box on the next page). Another niggly problem — easily fixed — is the way in which some preset button mapping doesn't cycle through the full range of device options: *Subtractor*'s LFO1 destination, for example, has a column of six options, yet the Template assignment just toggles between the first and last. A simple tweak (setting the Button Type to 'Step' from 'Toggle' in the Remote's Edit menu and resaving the Template) fixes this.



The apparently unremarkable pitch/mod controller conceals another novel feature — a small switch allows you to change the operation of the joystick hardware so that modulation can be set via a sprung or unsprung action, whichever you prefer.

As it happens, a lot of controller assignments for certain parameters in *Reason* — such as filter cutoff and resonance — are the same for all devices, so you'll find that one *Reason* Template will mostly function for several devices, sometimes saving you the trouble of changing Templates to tweak different devices.

There is a strange situation with the preset *Redrum* and *Remix* Templates. Even though it takes three Templates to cover *Redrum*'s functions, not all its drum voices can be tweaked — just eight of the 10 available. The same problem affects the two *Remix* Templates: only eight channels of a 14-channel mixer can be controlled from the Remote, so you can't do any proper real-time hands-on mixes unless you make your own, more suitable, templates. Even then a mix would have to be undertaken in multiple passes, but this is the case with many MIDI controller units. For the *Remix* channels that can be controlled with the supplied Templates, nearly everything has been assigned, including mute and solo functions, as well as level and pan. In the case of *Redrum*, most voice-editing controls for the eight controllable drum voices are mapped for you.

These issues notwithstanding, we thought the Remote 25/*Reason* combination was excellent, making the recording of real-time tweaks and editing much more of an organic procedure than when working solely with a mouse. *Reason* is better served than some software for mouse-based onscreen control, but real controls are still better! Remote 25 really does become an extension of the computer screen, making Propellerhead's simulation of the analogue studio even more convincing.

With *Cubase SX*

In order to establish communication between Steinberg's *Cubase SX* and the Remote 25.

Factory Templates

NOVATION
- A-Station.
- K-Station.
- V-Station.
- BassStation Rack.
- Super BassStation.
- Supernova.

PROPELLERHEAD
- *Reason* (*Subtractor*, *Mälstrom*, *Sampler*, *Redrum*, *Mixer*).
- *Rebirth RB338*.

NATIVE INSTRUMENTS
- *Reaktor*.
- *Absynth*.
- *FM7*.
- *B4*.
- *Pro 53*.

ROLAND
- JP8000.
- JP8080.
- SH32.

CLAVIA
- Nord Lead 3.

KORG
- MS2000.

ACCESS
- Virus A.
- Virus B.
- Virus C.

STEINBERG
- *Model E*.
- *Cubase SX*.

WALDORF
- *PPG Wave 2.V*.

GMEDIA
- *Oddity*.

EMAGIC
- *Logic Platinum* v5.

More templates are said by Novation to be under development; when they materialise they should be downloadable from the company's web site.

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SPL Model 2380

Surround Monitor Controller

Photos: Mark Ewing

This affordable new unit from SPL brings surround monitor control within reach of the home studio owner.

Hugh Robjohns

There appears to be a lot of pressure being put on studio owners to cater for surround sound recording and mixing. The more cynical reader may see the push towards surround sound as little more than marketing hyperbole, and only time will tell whether the great record-buying public really do want surround sound with their music. However, surround sound for film has definitely received the thumbs up, and music produced with surround sound can certainly be very effective, depending on the style of music and the way the extra channels are used. So, assuming that surround sound does become a standard for music presentation, it would make a lot of sense to start experimenting with the format and gaining some experience before it becomes a mandatory requirement.

Unfortunately for the home studio user, the technology is a little slow in catching up. For example, it has only been in the last few years that digital mixers and computer DAWS have been equipped with surround panning and bussing facilities. Virtually none of the budget mixers have decent surround monitoring facilities, and trying to master your carefully crafted surround material to a disc format compatible with domestic surround sound replay systems is a serious challenge, requiring surprisingly expensive software at the very least. The good news is that the situation is changing for the better, and all three of these problem areas are being addressed by the manufacturers as the demand for surround capabilities grows.

The Model 2380

The subject of this review is a surround monitoring controller providing facilities which, until now, have only been dealt with effectively at a professional level — and at professional prices — with devices like Tascam's DSM7.1 digital surround controller, or Audient's ASP510/520 analogue surround controller and bass management system. German manufacturers SPL (Sound Performance Lab) are no strangers to surround sound, as users of their high-end mastering console and Atmos 5.1 system will attest, and they have now applied their engineering expertise to producing an analogue surround monitoring controller at a UK price which brings it well within reach of the more budget-conscious professional edit suite or mix room, as well as the well-heeled home studio.

The Model 2380 is a compact all-analogue surround controller, with a basic portfolio of facilities — certainly enough to manage a surround system effectively, even though there is no provision for clever bass management or for precisely calibrated monitoring levels. What is provided is source selection between two stereo and two 5.1 sources; stereo and surround mode switching; speaker mono, dim and mute; and a rotary multi-channel level control.

The rear panel defines the possible connectivity. To the left is the ubiquitous IEC mains inlet and a mains power switch. The power supply is a conventional linear design with a toroidal transformer, and it appears that mains voltage selection is done during construction by connecting the primaries in series or parallel as necessary. There is certainly no external switching, nor anything

obvious internally. The rear-panel labelling suggests the unit can accept either 230V or 110V supplies, and appropriate fuse ratings are displayed for the two internal fuses, but there are no external markings that I can see to state what the unit is currently configured for. I fear this is a potential safety hazard, as many users may assume that the unit has a universal switched mode supply, and may inadvertently connect the unit to the wrong mains voltage, possibly with dramatic and devastating results! Apparently, one of the boxes to the left of the voltage ratings label is meant to be ticked at the factory, but this had not been done on the review unit.

Both balanced and unbalanced inputs are catered for, the former through a D-Sub connector, and the latter through phono sockets. The first of a pair of 25-way D-Sub connectors accepts eight balanced input channels, wired according to the now almost universal Tascam standard. The second D-Sub connector is a direct loop-through, intended to enable the mixer surround output busses to pass directly to a stem recorder, with the monitoring controller effectively 'eavesdropping' across these busses. Since this connector carries eight channels, SPL have labelled it Input A + C — Input A being a 5.1 source and Input C being a stereo source. I'll return to the channel assignment in a moment.

SOUND ON SOUND

SPL Model 2380 E469

pros

- The most affordable controller yet.
- Simple, compact design.
- SPL sound quality.
- Balanced and unbalanced inputs.
- Balanced outputs.

cons

- Non-standard channel allocations on eight-way interfaces.
- Allows simultaneous stereo and 5.1 output.
- No indicators on speaker mute or mode buttons.

summary

An elegant and very affordable analogue surround monitor controller accommodating dual 5.1 and stereo inputs, separate 5.1 and stereo speaker outputs, and all the necessary source selection, mode switching and speaker muting, plus an accurate and transparent passive volume control.

The unbalanced inputs are accommodated by eight phono connectors, Input B being the 5.1 array, and Input D being the stereo inputs. Although it initially makes the back panel legends appear cluttered, SPL have labelled all the connectors twice, so that they can be read either from behind or from above (and therefore upside down). This thoughtful provision will be appreciated by many users when struggling to rewire the system without dismantling everything. Below all the input connectors is a row of quarter-inch TRS balanced output connectors intended to feed the monitor amps or active speakers. Eight sockets provide 5.1 channels for the surround rig plus a separate pair for conventional stereo monitoring.

Input & Output Assignment

The 5.1 layout of the unbalanced input and balanced output sockets is a little odd, following the order: left, right, left surround, right surround, centre, LFE. The channel assignment of the D-sub connectors copies that layout, and this is one drawback of the Model 2380 — I would certainly recommend that the company reconsiders this aspect of an otherwise well-designed unit. The ▶

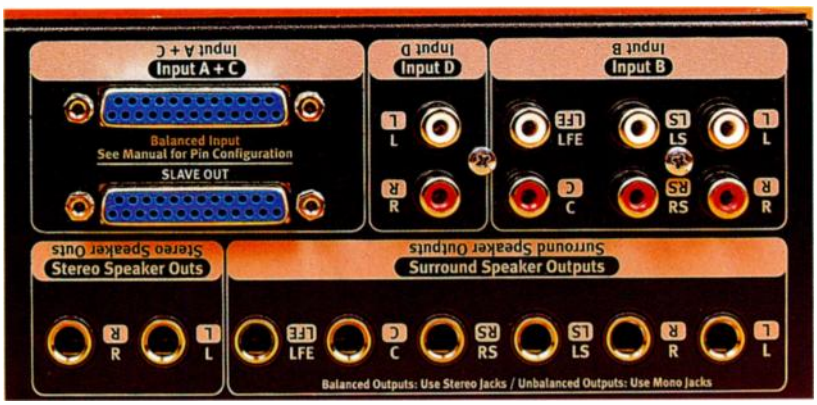
SPL MODEL 2380

eight-channel D-sub interface is currently wired as follows through channels one to eight: left front, right front, left surround, right surround, centre, LFE, stereo left, stereo right. This sequence ignores the internationally agreed standard for 5.1 channel order assignments within an eight-channel system.

For the record, the AES and ITU both recommend the following allocation for channels one to eight respectively: left front, right front, centre, LFE, left surround, right surround, and channels seven and eight are available for 'free use', but are typically allocated to a stereo source: left on channel seven and right on channel eight. It's not as if Germany has vetoed this allocation standard either, since the German Surround Sound Forum have even proposed a colour coding sequence for it — yellow, red, orange, grey, blue, green, violet, brown.

Of course, the channel order can be anything the user chooses — the source selection, volume control, Dim and Mute All functions are unaffected. However, the individual speaker mute buttons on the front panel would have to be relabelled accordingly, and the Mono Surround Channels button ignored completely. A better solution, and one I would recommend that SPL either adopt or offer as an alternative, is to rewire the ribbon cable interface between the main circuit board and the rear-panel connectors. Although rather fiddly, this would not be particularly difficult to do.

The internal construction of the unit is to SPL's typically high standard, with a high-quality main PCB at the base, and two further boards supported from the angled front panel to support the switches and volume control. The unbalanced inputs and the majority of the buffering circuitry are constructed using standard-sized op-amps and components, while the output drivers employ surfacemount components on small daughterboards alongside each output socket.



Surround Controls

Moving around to the front of this compact control unit, there are two rows of seven buttons and a large rotary control on the angled face plate. The top row of buttons are coloured white, providing source selection and configuring the monitoring mode. The lower row mute the individual 5.1 speaker outputs, and the separate stereo pair — the buttons have to be pressed in to hear the corresponding speakers. It is interesting to note that the 5.1 mute buttons are arranged in a different order again: left, centre, right, left surround, right surround, LFE.

In low lighting conditions it can be surprisingly difficult to see whether these buttons are pressed in or not and, given that this is a mains-powered unit, I'm surprised that some form of indicator has not been associated with each button to make the operating status more obvious — panel space is certainly not an issue. In fact, the only indicator is a blue LED below the volume control to show when the power is on.

The input selection and routing is not entirely obvious, and the handbook is rather poor at explaining exactly what is going on here — a simple block diagram of the unit would have made all the difference. By testing the various signal paths manually, I managed to ascertain that the selected inputs are routed to all of the appropriate outputs. In other words, the left and right channels of a selected 5.1 source also appear on the independent stereo monitor outputs, and the left and right channels of a selected stereo source appear on the left and right channels of the 5.1 monitor outputs. This makes for very flexible monitoring configuration, but can be confusing and does allow accidental monitoring on both the 5.1 and stereo monitor systems simultaneously. Indicators to show which speakers are currently switched on would help here, but a better option would surely be to mute the stereo outputs if a surround source is selected and vice versa, since I can't think of any situation when a user would want to have the same sources playing over both sets of speakers simultaneously.

The Monitor Mode buttons all work as expected, the Mono L/R button applying to both the 5.1 and stereo outputs. Both the Mono L/R and Mono LS/RS buttons introduce 6dB of attenuation to each channel to try to maintain consistent signal levels between stereo and mono. These mono buttons are really only provided to enable easy checking of adjacent channel phase — there is no provision of any kind of stereo or mono down-mix facility here. The two remaining buttons enable a 20dB dim to all channels and to mute all outputs, the idea being that once a monitoring level has been established it can be left alone, the dim or mute buttons being used if you need to answer the phone or check the balance at a lower level, for example.

Multi-ganged Volume Control

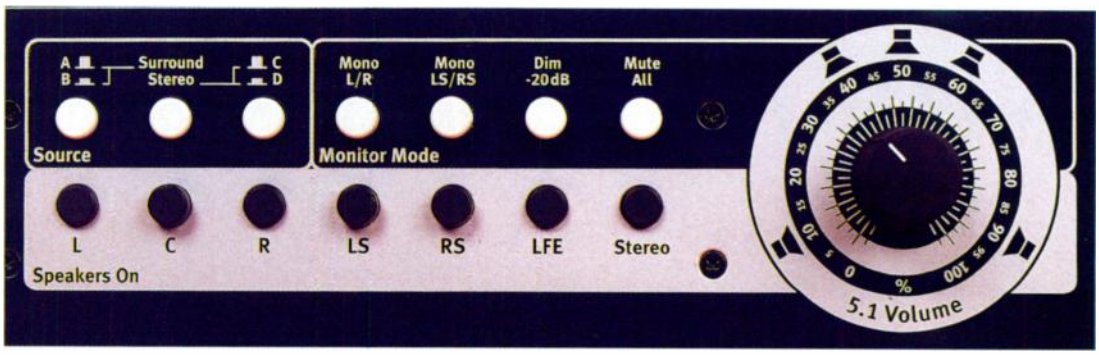
The volume control itself is a high-quality multi-ganged potentiometer, and is probably the most expensive component in the box, by quite a large margin! SPL chose to engineer the unit with a passive volume control, rather than using some sort of VCA technology, in order to maintain the highest sound quality with a wide operating bandwidth (10Hz to 100kHz at the -3dB points) and negligible distortion (better than 0.01 percent). The wide bandwidth is obviously vital if working with SACD or high-resolution DVD-A material.

The volume control is scaled from zero to 100 percent with sufficiently fine divisions to enable accurate and repeatable monitoring levels to be established. Inter-channel tracking seemed to be extremely consistent across all channels throughout the typical operation range — say between 40 and 80 percent — and was remarkably good even at more extreme control positions. As well as auditioning the controller with my own PMC surround speaker setup, I also checked the channel linearity using the goniometer or Lissajous display of my DK Audio MSD600 meter. Although this particular display mode can only show the relationship between two channels at a time, by using the left input as a reference and swapping the other four channels around, I was quickly able to check the matching of the whole system. Perfectly matched channels appear as a thin vertical line and any channel imbalance caused as the volume control is adjusted makes this line 'lean over' in one direction or the other — inaccuracies of a fraction of a decibel become very obvious. Although it was possible to notice a slight imbalance between some channels over the full range of the control, over the typical working area I was impressed with just how precise and consistent it was.

Impressions

The SPL Model 2380 is an attractive and very practical unit which would work well

alongside any analogue or budget digital console which has surround panning but no surround monitoring facilities. I have some reservations about the interface channel assignments currently employed by this unit, and the possibility for simultaneous accidental monitoring of the left and right channels on both the stereo and 5.1 monitoring system is also a cause for concern. However, the first point may not worry users new to working in surround or those whose material is not destined to leave their own premises, and is, in any case, relatively simple to resolve by rewiring the connectors.



However, these issues excepted, this unit does all that is necessary in a surround environment, and with typical SPL quality and precision. There is no significant loss of quality in monitoring signals routed through this controller, and the tracking of the volume control is essentially perfect over the critical operating range, with practically insignificant variations at very low settings.

The provision of two surround and two stereo inputs is very useful, since this allows multiple 5.1 and stereo sources to be selected, as well as the possibility of wiring the unit to both the mixer outputs and the corresponding recorder returns. Being able to mute individual speakers is very important when trying to track down an errant sound source, and the mono front and rear facilities are useful for confirming phase problems.

This is the most affordable surround monitor controller yet, and while it has necessarily dropped some of the sophisticated bass management functionality available in higher-end professional controllers in order to meet its tough price target, all the essential facilities are present and correct. This unit is well worth considering if you are keen to work in surround sound. SOS

information

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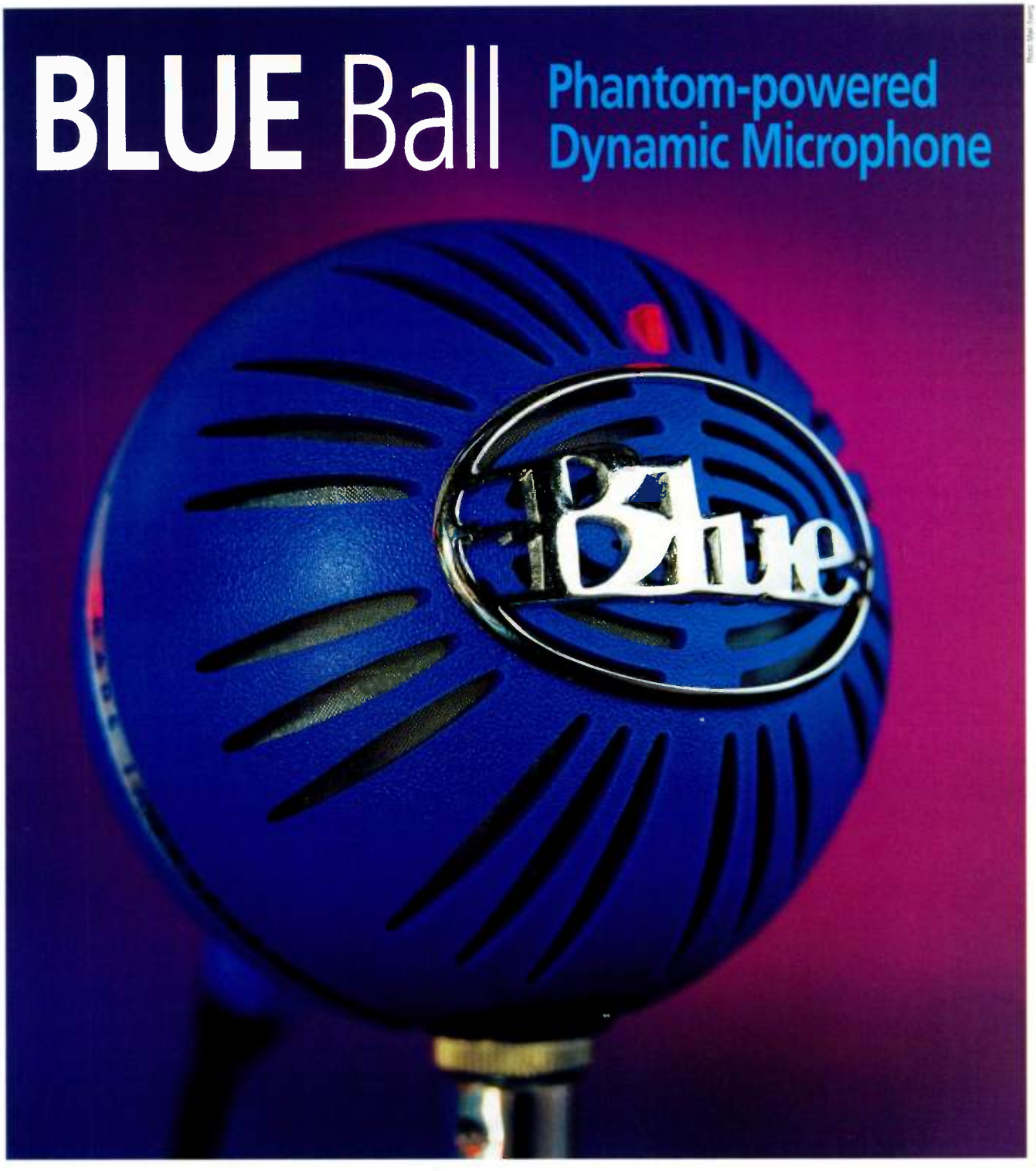
BLUE Ball

Phantom-powered Dynamic Microphone



Hugh Robjohns

BLUE's most affordable mic yet continues their tradition of off-the-wall design and styling.

A phantom-powered dynamic microphone?! What's all that about then? You'd be forgiven for thinking that you're reading an old April *SOS* by mistake, but the description of the new BLUE Ball is, in fact, accurate. The performance of dynamic microphones, whether ribbon or moving coil, is dependent to some degree on the load they have to drive — the impedance presented by the combination of connecting cable and preamp input. Inherently, the value of this load varies with frequency which, in turn, affects the amount of current the microphone can deliver at different frequencies and so also affects the frequency response. This is one reason for the growing interest in preamplifiers with adjustable input impedance, since changing the input impedance can have a pronounced affect on the tonality of a dynamic microphone.

It is for this reason that the BLUE Ball uses phantom power, because it incorporates a solid-state discrete Class-A buffer amplifier designed to present the

microphone capsule with a constant-impedance load, while driving the cable from a constant 50Ω source. The result is a dynamic microphone able to provide a far more consistent tonal character regardless of the length of mic cable or preamplifier input impedance.

The Hardware

Of course, being a BLUE design, the styling of the Ball microphone is far from conventional. It is — not surprisingly, given its name — spherical in shape, and fashioned from a blue anti-resonant ABS plastic shell measuring roughly 95mm in diameter. The BLUE logo and a red phantom power LED signify the front of the capsule, and a series of radial slots enable sound to enter through a fine wire-mesh grille. A standard three-pin male XLR at the rear of the shell provides the output termination, and a 5/8-inch standmounting socket is built into the base of the sphere (a European 3/8-inch adaptor was not supplied with the review model). This coupling is mounted in a single-axis ball socket so that, when fixed on a mic stand, the microphone position and angle can be adjusted over about ±45 degrees.

I did consider disassembling the microphone in the interests of scientific research, but an identification label is glued around the centre of the sphere where the front and back halves join, and I didn't want to damage the review model in taking this off. The handbook for the mic is written with tongue very firmly in cheek, and includes endorsements from such audio luminaries as Socrates, Beethoven, and Da Vinci! Although an amusing read, there is relatively little useful technical information about the mics other than the bare specifications, from which we learn that the Ball has a cardioid polar pattern and a frequency response which extends between 35Hz and 16kHz (no limits are given). Its sensitivity is relatively high at 3.5mV/Pa and the maximum SPL is either an ear-splitting 162dB or 146dB depending on whether you believe the handbook or the company's web site, respectively (both figures are for one percent distortion). Likewise, the equivalent output noise is either 17dBA or 18dBA, depending on which source of information you use. The mic draws 2.5mA of current from a standard 48V phantom supply, and its optimum inflation pressure is specified as 28psi — no, not really!

These specs suggest that the internal preamp/buffer provides some gain, since the output level is four or five decibels higher than most high-output dynamic microphones, but the preamp circuitry doesn't seem to have affected the noise floor. Although 17dBA sounds high by capacitor mic standards, a figure of 20dBA is quite common in dynamic microphones, so the Ball is no noisier than many and the higher output level will help to offset the self noise by allowing a reduced preamp gain. The frequency bandwidth is also very typical of a dynamic capsule — the relatively high mass of the voice coil glued to the back of the diaphragm inherently curtails the HF response somewhat. So, a good all-round technical performance then.

The mic's XLR output socket is at the rear, and there's also a built-in standmounting socket which allows the mic angle to be adjusted once fixed to the stand.

The Globe Sessions

The Ball is claimed to be suitable for use in any roll — I mean role! — where dynamic mics would normally be chosen, and in both the studio or in live sound applications. The microphone's relatively large size enhances its front-to-back separation, particularly at high frequencies, and its distinctive and slightly retro styling is enough to turn the heads of most vocalists.

The handbook lists just about every common musical instrument as a suitable target for the Ball, starting with vocals and including electric and acoustic guitars, strings, upright and electric basses, organs, harmonicas (although the Ball is probably a little too large to hold comfortably in the hand while playing), drums (including kick drum), saxes, flutes, and other reed instruments. Strangely, the brass section has been left out of the recommendations list — while the mic's high-end roll-off will tend to dull the attack and bite of brass instruments, at least the high SPL is not a concern. I find the mention of drums interesting, since the microphone's size would make placement over snares and toms a little more difficult than usual.

I tried the Ball out with various vocals, acoustic guitar, clarinet, and the Leslie cabinet of my Hammond, all with a surprisingly good performance. I found the rear rejection to be exceptionally good, and the mic exhibited a very narrow frontal pickup area with reasonably smooth off-axis attenuation. However, the Ball does seem particularly susceptible to handling noise and vibrations through the mic stand, and ▶

SOUND ON SOUND

BLUE Ball £260

pros

- BLUE's most affordable offering.
- Distinctive shape.
- Versatility.
- Relatively high output level.
- Excellent front/back rejection.

cons

- A dynamic mic that needs phantom power.
- Susceptible to mechanical vibrations through the standmount.
- Large size.

summary

A competent, general-purpose and very robust dynamic mic with built-in phantom-powered buffer amplifier.

BLUE Mic Cables

BLUE obviously care a great deal about microphones, so it's hardly a surprise that they eye run-of-the-mill mic cables with suspicion. Its all well and good having a high-resolution microphone, but hook it up to the console or mic preamp with a poor-quality mic cable and all that sonic detail can be quickly lost. So, in an effort to help owners of high-quality mics — and not just those made by BLUE — the company also markets a small range of high-spec XLR mic cables.

Needless to say, these cables are within BLUE's tradition of striking styling, with glittering braided shielding visible through coloured translucent cable sheathing. One aspect that BLUE seem keen to promote is that the these microphone cables are constructed from a propriety blend of virgin materials. Three balanced mic cables are available, each constructed to BLUE's exacting standards: the twisted-pair Cranberry and Blueberry cables, the star-quad Kiwi cable, and a specialised Champagne multicore cable for use with valve mics.

The Blueberry is rated as a 22awg cable (this referring to the diameter of one of the inner cores) with each signal core constructed from 60 strands of 40awg wire. The two cores are twisted together to help reject electromagnetic interference in the usual way, while also exhibiting low capacitance to help deliver an extended frequency response. The tinned-copper braided shield, visible through the translucent outer sheath, provides 95 percent screening coverage, and the complete cable has been designed to provide good handling characteristics, even in low temperatures. Gold-plated XLRs terminate the cable.

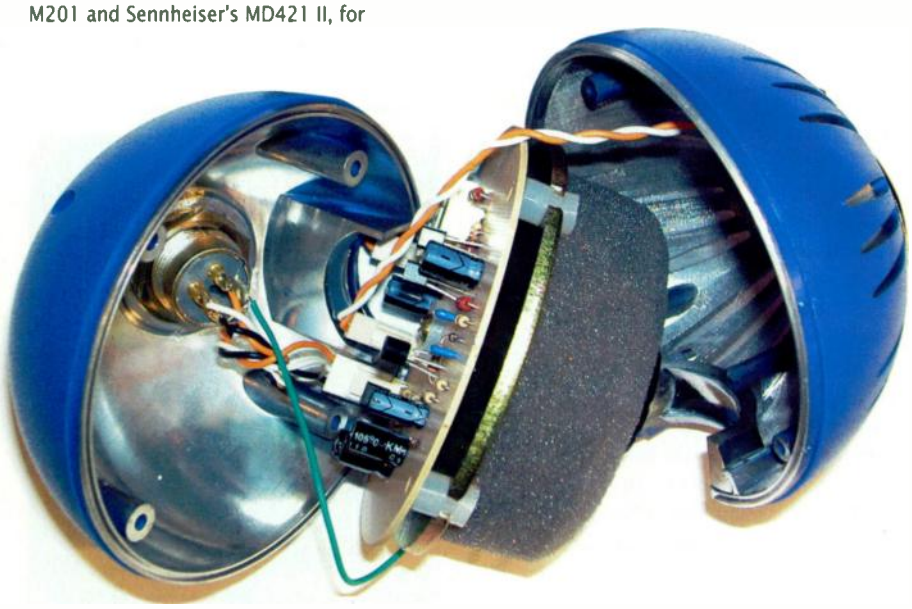
The Cranberry is slightly chunkier, and rated as a 20awg cable. The two inner cores are each constructed from 40 strands of 32awg wire, and twisted in the same way as the Blueberry cable, with a similar 95 percent braided shield. BLUE suggests that the more substantial construction of this cable makes it better suited to radio, TV, and sound reinforcement applications, but it remains a very flexible cable, fitted with gold-plated XLRs.

The Kiwi cable is a star-quad design, using a quartet of 22awg inner cores, connected in opposite pairs to effect a much better level of electromagnetic interference rejection — especially from nearby sources. The overall screen is the familiar 95 percent coverage tinned-copper braid, and gold plated XLRs are once again used to terminate the cable.

Although not appropriate for the BLUE Ball mic, or any of BLUE's solid-state condenser mics, the Champagne cable is a multicore design intended to provide a high-quality link between a valve microphone and its power supply. The audio signal is carried by a twisted pair of 22awg cores (comprising 60 strands of 40awg wire) with a tinned-copper braided screen. The various anode, heater and other control voltages are carried by five more 24awg conductors.

I ended up placing the stand legs on dense foam blocks to try to reduce the transmission of mechanical noise from the floor through to the mic.

The overall impression of the BLUE Ball is much as you would expect from any competent general-purpose dynamic microphone. It has a slightly closed-in, but full sound when compared with a similarly priced condenser mic, but holds its own very well when compared with popular dynamic mics such as the Beyerdynamic M201 and Sennheiser's MD421 II, for example. The Ball has a useful mid-range punch which helps sounds to cut through in a mix, but it also compresses transient dynamics — as all dynamic mics tend to. This can be used to great effect when miking drums and percussion, and even acoustic guitars to some extent, but can also make the sound a little dull and lacking in detail. The frequency response sounds relatively smooth, without obvious narrow-band peaks or dips, although there does seem to be a broad presence boost which helps a little with clarity and diction on voices.



The internal construction of the BLUE Ball — the sensitive side of the moving-coil capsule can be seen just protruding past the layer of foam.

Music Of The Sphere

The Ball is an intriguing microphone. It's highly unusual shape makes it instantly distinctive and recognisable, and that alone will give it great appeal. However, this mic is also a competent performer, with a well-controlled polar pattern and a huge dynamic range. It also appears to be very rugged and well built, although I remain a little concerned about its susceptibility to mechanical vibration through the mic stand.

The ridiculously low cost of Chinese condenser mics in the UK means that the BLUE Ball will have to fight hard for its share of the studio market, but the badge on the front will help considerably, as BLUE have been acquiring quite a reputation for their unusual and impressive condenser mics. Think of the Ball as the Latvian equivalent to the Sennheiser MD421 — a good all-round performer! SOS

information

£ BLUE Ball, £259.99; Blueberry mic cable, £24.99; Cranberry mic cable, £26.99; Kiwi mic cable, £31.99. Prices include VAT.
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Donald Fagen and Walter Becker on the recent Steely Dan tour.

Mark Hutson/Redferns

Walter Becker, Donald Fagen, Elliot Scheiner and TJ Doherty: Recording *Everything Must Go*

When Steely Dan ended a 20-year hiatus with 2000's *Two Against Nature*, they took full advantage of today's digital recording tools. For their new album *Everything Must Go*, however, they've returned to analogue tape and live band recording.

Paul Tingen

So Walter, about your studio in Hawaii, Hyperbolic Sound...

"Your house looks very nice!" interrupts Walter Becker, apparently looking at pictures of the author's family and residence on the Web. "But who mows the lawn?"

Eh? "Kasper, our son."

"He doesn't look old enough! There are very strict child labour laws in the UK, aren't there?"

Perhaps Donald Fagen will be more forthcoming. "We're planning to use some new techniques on our summer tour," he asserts.

"Like what?"

"Well, the Ktistec machine, for instance."

"A what machine?"

"A Ktistec machine," confirms Becker. "Spelled k-t-i-s-t-e-c."

"What's that?"

"A device for changing distances."

Come again? Clearly, the two musicians who make up Steely Dan are doing their best to uphold their reputation for being awkward interviewees. In preparation for this Steely Dan interview, conducted via conference call with Fagen and Becker at their respective homes in New York City and Hawaii, yours truly had noted that all published Steely Dan interviews run along similar lines. Instead of answering questions straight, Becker and Fagen prefer to go off on endless absurd tangents with their trademark sarcastic sense of humour. "Has anyone ever suggested you might be difficult to interview?" asked an exasperated *Mojo* interviewer in 1995, while in a recent interview feature in the *Guardian* the writer sighed, "each question is teased and twisted into absurdity."

Things went along comparable lines when *SOS* spoke to the Dan duo; but while they served up their banquet of the bizarre, Becker and Fagen did occasionally throw your reporter a few tasty bones. To put more flesh on them, additional details were sourced from two engineers who were pivotal to the latest Steely Dan album *Everything Must Go*: Elliot Scheiner and TJ Doherty. According to the former, the Dan guys have "mellowed" and are now "more easy-going". So would yours truly come out of this Dan interview in one piece? "We've never lost anyone yet," laughs Fagen, not entirely convincingly.

"I can do a pretty nice defibrillation with the Ktistec machine," adds Becker, helpfully...

Sonic Obsession

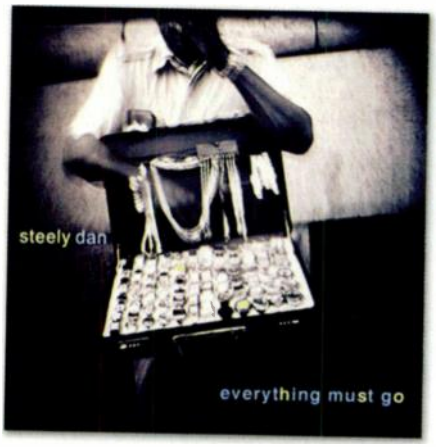
The Ktistec machine is a recurring theme, and some of the other tangents Fagen and Becker go off on see them seemingly trying to unpromote their new album, or at least the DVD/5.1 version of it. For instance, Becker

remarks: "Our interest in surround and high sample rates and DVD technologies and stuff like that represents a solemn prayer for world peace." Fagen explains: "I finally realised what these things are good for: we're going to add helicopter and gunshot sounds to our old tapes and put them in the back speakers. We figure: make war DVDs, not war."

What does emerge from the interviews and the massive amount of press Steely Dan's ninth studio album has received is that *Everything Must Go* is both as retro and as 21st century as they come. The former is defined by the band's return to live-in-the-studio and analogue recording, the latter by the many formats *EMG* is released on: vinyl, standard CD, special edition CD/DVD, and DVD-Audio. Despite being a relic from the time of analogue, the Dan fit strikingly well in the digital era. The simple reason is that since they emerged in the early 1970s, Steely Dan have been famous/notorious as visionary/rabid (depending on your point of view) musical perfectionists and sonic pioneers.

Elliot Scheiner has worked with Steely Dan since their fifth album, 1976's *The Royal Scam*, and is arguably the most highly regarded engineer in the US, with credits ranging from Van Morrison and Toto to Fleetwood Mac and Barbra Streisand. As five-time Grammy winner, and a man renowned for sonic excellence, even Scheiner marvels at the extent to which the Dan duo have an "obsession with sonic detail".

The stories of Fagen and Becker's "obsession" are legion. For instance, when working on their second album, *Countdown To Ecstasy* (1973), they ran an eight-bar loop of two-inch tape to an idler wheel outside the control room in an attempt to achieve drum machine-like precision in the rhythm section. Steely's web site, www.steelydan.com, proclaims with some pride that because of a faulty tape machine used on the recording of *Katy Lied* (1975), the band refused to listen to the final album. When working on *Gaucho* (1980), they pioneered the use of engineer Roger Nichols' freshly developed Wendel sampling drum machine and audio sampler (12.5kHz/12-bit) for drums and percussion. An indication of the amount of overdubbing, splicing, and re-recording that went into their quest for perfection was that Nichols and Scheiner used up 360 rolls of tape recording *Gaucho*.



For Fagen and Becker only the very best session musicians (meaning, in the '70s, the likes of Jeff Porcaro, David Sanborn, Randy Becker, Larry Carlton and Joe Sample) and engineers (Scheiner, Nichols, Bill Schnee) would do, and even these top guys were pressed hard to perform beyond their best. At every stage the Dan duo were among the first to embrace the latest studio technology, and the musicianship and sonic quality of their albums has always been at the very limit of what is possible.

Postmodern Irony

So what drives Steely Dan in their attention to sonic excellence?

"Either a cab or a hired sedan," replies Donald Fagen.

"Donald and I are great sensualists," agrees Becker. "We love beautiful women, fine wine, suede moccasins. I have a fleece-lined jacked and sometimes I wake up in the middle of the night and put it on just..."

"...we love exotic and rare incense..."

"...beautiful smells...we like..."

"...all our senses constantly stimulated..."

"...good food, delicious... What nationality are you?"

Oh dear. There were a few signs things would turn out like this when two spotty youngsters with a zany sense of humour walked into the famous Brill Building in Manhattan in 1969, trying to sell their songs and get jobs as resident songwriters for a publisher. Fagen (born 1948) and Becker (born 1950) had met in 1967, and started writing songs together based on their mutual liking of jazz and acerbic wit, two things that shaped their aesthetic outlook and set them apart from the hippy generation of the day. Their music and attitude were in many ways ahead of their time and now form the essence of their modernity. Put differently, they were cool then, and are still cool today (just forget about the incense and fleece-lined jacket).

To be able to influence those who came after them, Fagen and Becker first had to influence those around them. A chance meeting with ABC Records producer Gary Katz provided their springboard. Katz hired Fagen and Becker as ABC staff songwriters and the duo moved from NY to LA in 1971, only to find that their songs were unsuitable for ABC's artists. So they set up a band, called it Steely Dan (after a dildo in William Burrough's novel *Naked Lunch*) and with Katz as producer, recorded *Can't Buy A Thrill*. Released in 1972, the album was well received and spawned two hit singles, 'Do It Again' and 'Reelin' In The Years'. *Countdown To Ecstasy* and *Pretzel Logic* (1974) followed, after which Fagen and Becker stopped touring and dissolved their group. Their plan was to continue as a studio-based ▶

Eyeball To Eyeball

Given that Fagen and Becker live in New York and Hawaii respectively, one might expect them to have taken advantage of digital and Web-based technologies in their songwriting collaboration. Have they? If so, they don't seem keen to talk about it...

"We don't usually write music over the phone, like sending files and stuff," says Becker. "When we work over the phone we do it to write lyrics, and that works very well. Writing on the phone is a little like being in analysis, because you're not reacting to the facial expressions of the other person."

"But we can surmount that with the Ktistec machine," insists Fagen.

"We choose not to use the Ktistec machine sometimes. Having a great piece of technology doesn't necessarily mean you use it all the time. Some things are better done..."

"...in secret."

So how, then, do Steely Dan write music?

Fagen: "Most of the stuff was written in the room I'm in now in Manhattan, where I have an upright piano and an old Mac with a very old version of *Vision* software."

"We're still using the computers we bought after the 1993 tour," adds Becker. "The computer is AD820."

"Actually, a Quadra with the last version of the *Vision* program that came out. But it's pretty burned up now. It won't actually boot up anymore. It died when we were writing the last track for the album."

"Sometimes we have a second guitarist or keyboardist in the room, but most of the time it's just Donald at the piano and I'm at the computer. We use the computer as a sketchpad and a sequencer. I can easily alter things in *Vision* or edit them or establish new key relationships, arrange stuff, test out a melody or invent a melody on a keyboard, whatever."

"When I play piano, Walter makes comments. And then we get something that sounds like a song. Walter programs it into the *Vision* program, just so that we can see what it sounds like, and arrange it."

"We like to write music in the same room. It's hard enough to get anything done when you're eyeball to eyeball, let alone when you're at a distance. But that may change now that we have the Ktistec machine. Make sure you get the spelling correctly."

duo, hiring top musicians on an *ad hoc* basis to realise their musical vision. *Katy Lied*, *The Royal Scam*, *Aja* and *Gaucho* were the commercially and artistically successful results.

Despite their achievements, by the time of *Gaucho* the Dan duo were at a low ebb, struggling with artistic burn-out, drug problems, and contractual conflicts. Bad luck also seemed to attach itself to them: the first completed track for *Gaucho* ('The Second Arrangement') was accidentally wiped, Becker's girlfriend overdosed in his New York flat, and he was hit by a taxi a few months later, breaking his leg in several places. Tired, hurt, and disillusioned, Becker and Fagen decided to pack Dan in. While Becker retreated to Hawaii to lick his wounds, Fagen had one more stab at commercial and artistic greatness with his solo album *The Nightfly* (1982), but soon afterwards he also was forced into a period of introspection, rest and healing. For several years nothing more was heard from either of them.

The Second Coming: Part 1

As Steely Dan's absence from the music business drew on, an aura of mystery began to form around them, and by the mid-1980s they had achieved an almost mythological status. Some folk began to deify them to the degree that they probably thought that a reunion would be nothing short of the Second Coming.

For those folk, Becker's low-key comeback in the mid-1980s as producer of China Crisis and Rickie Lee Jones was probably rather disappointing. Similarly frustrating must have been the news that by the late 1980s Fagen had developed an interest in soul music and had founded the New York Rock & Soul Review, an outfit with which he performed soul classics and the odd Steely Dan song. Much more enticing was the news in the early '90s that he had begun work on his second solo album, which was to become *Kamakiriad* (1993), and had invited Becker to produce it. Within the same time period Fagen returned the favour by co-producing Becker's first solo disc, *11 Tracks Of Whack* (1994). These events considerably shortened the odds on a Steely Dan comeback.

Apparently the Dan fire was relit at a low-key and impromptu joint live performance at the end of 1991, and was further tended by Becker's participation in a tour of the New York Rock & Soul Review. Given Fagen and Becker's declared hatred of touring there was widespread surprise in 1993 when, with their two solo albums about to be released, the duo went on tour with the All New Steely Dan Orchestra, playing many old Dan favourites never before performed live.

"No-one would have predicted that," Becker admits. "We wanted to promote Donald's record, and we'd seen the enthusiasm that was out there for Steely Dan songs. So we put two and two together. Plus our manager convinced us that touring was not going to be the incredible series of screw-ups it had been in the '70s. He was right and out we went."

In 1994 Fagen and Becker went out again, this time with The Citizen Steely Dan Orchestra, and in 1995 some of the best performances from these tours were documented on *Alive In America*, which was released under the Steely Dan moniker. Another tour followed in 1996, and during much of 1997-1999 Fagen and Becker went back to their perfectionist ways with elaborate work on what was to become Steely Dan's first studio album in 20 years, *Two Against Nature* (2000). The comeback was complete, and the album's four Grammys (including Album of the Year) put paid to any credibility problems and nagging doubts that this was just an exercise in nostalgia. Clearly, these middle-aged guys were still up to it.

Surround Sound: Exploitation Or Art?

The DVD-A version of *Everything Must Go* contains a plethora of data formats: 'advanced resolution' multi-channel surround sound (96kHz/24-bit), advanced resolution stereo (192kHz/24-bit), Dolby Digital 5.1 and DTS 5.1 surround sound, and Dolby Digital 2.0 stereo. There is also a 13-minute short movie called *Steely Dan Confessions*, plus song lyrics, a photo gallery, song credits and production credits. Some of this stuff plays back on DVD-A players, some only on DVD-V players. It appears that 21st century music consumers will need a doctorate's degree in electronics to be able to work out what they can play back on what. They are also going to need very deep pockets.

"We're aware of two kinds of technical innovations," says Walter Becker. "Category number one are things that help us do something sonically or musically that we couldn't do before, but probably already wanted to do for 20 years. Category number two are things that can increase our income. So every time somebody comes up with a new format in which our material can be repackaged, we put aside whatever forebodings we may have about the durability or advisability of the new format. Instead we throw our weight 110 percent behind it to get the product our there on the shelves and see if anyone will buy it.

"People are now downloading music for free from the Internet, so what this is about is creating a new set of technologies that the record companies are better able to defend from public dissemination and duplication via the Internet. And they're going to sweep up all these new bucks and get people in Third World countries to go out and buy DVD players and discs with 5.1 and God knows what other formats, and then the Americans won't have to send in their armies. You see?"

One suspects that there's more than a hint of irony in these statements, and it seems that Becker and Fagen do have a more positive motivation to be at the forefront: "On a more serious note, the actual appeal when we listen to surround sound is that it has a tremendous potential as a hi-fi medium in terms of separation and clarity and so on. It's great for people who want to hear into tracks and hear all the individual elements stand out more clearly."

The Second Coming: Part 2

Indeed, on the CD liner notes of *Alive In America*, Steely Dan claimed that their prime motivation for rekindling Steely Dan and touring was to "forestall middle-aged decrepitude". When asked whether this has proved an effective strategy they laugh, and Fagen comments "It didn't work, but we'll try again this year with a new tour." Even so, Fagen and Becker appear to be riding a new wave of creative energy, having written a new set of songs so soon after *Two Against Nature*, and having recorded their new album *Everything Must Go* in a little over a year. Perhaps they finally grew tired of endlessly mulling over every single detail: the new album saw a different and much quicker approach to creation than *Two Against Nature*. The latter was recorded over several years, on digital, and entirely through overdubs, starting with drums and bass and then moving upwards to the chord and melody instruments. With Fagen and Becker's penchant for perfectionism given endless scope for tinkering by turn-of-the-century digital technology, the results, both sonically and in terms of playing, were slightly on the stilted and sterile side.

By contrast, the analogue recording and live-in-the-studio playing at the heart of *Everything Must Go* has resulted in a much more vibrant and alive feel to the playing, while the sonic quality is lush, sumptuous, and spacious, without ever being smooth or glossy. It makes *EMC* one of the best-sounding albums that has ever seen the light of day. The often very bluesy songs are of respectable quality too, despite the fact that knock-out melodic hooks are far and few between. Overall, the second album of Steely Dan's comeback sees them greatly reinvigorated.

According to Scheiner, the first seeds were sown in a recording session in early 2001, aimed at fairly quickly recording a Joni Mitchell song for a Joni Mitchell tribute album. Becker and Fagen had by now assembled the core of musicians that would also appear on *EMC*, and wanted to see what would happen if they cut the track live in the studio. They hadn't reckoned with Scheiner's next suggestion.

"When we got to the studio," Scheiner remembers, "I said to them 'Look, this is not for your record, let's do it on analogue. Let me give you a taste of that again.' They said, 'fine', not expecting much. But when they heard the first playback, they went wild. They had completely forgotten how good analogue sounded. The whole Joni Mitchell track was recorded and mixed [*though it was never released*], and they were so impressed by the sound. It did sound amazing. When they realised that it was great to work with live playing and analogue again they decided to record the whole of *Everything Must Go* this way."

Today's Lo-fi Music

Donald Fagen's explanation for Steely Dan's return to analogue recording was, typically,

more surreal: "Digital sound loosens the fillings in your teeth. I had a lot of work done on my teeth since I started working with digital."

As a result digital sound can, apparently, indirectly lead to mercury poisoning. It's an option which, says Becker, was "considered by us 20 years ago, but dismissed". After some further prompting, he produces a more to-the-point response: "We were working in a studio other than our usual studio [*Fagen's now defunct River Sound*]. It was a small place called Sear Sound in New York, which we discovered had once been the Hit Factory, where Donald and I had worked on some album tracks in 1969 or 1970. It's an old-style studio with small control room and lots of vintage microphones and equipment. We loved the way it sounded."

Yet Becker is at pains to point out that the medium alone can't deliver great sound. "It was not necessarily a question of how good analogue sounded. It's a question of how good analogue sounds if you happen to have Elliot Scheiner and a great bunch of musicians in the room. Analogue has all sorts of problems associated with it, along with the potential to sound very good. And not only is Elliot a real pro in dealing with these problems, he also gets the most out of the creative possibilities that analogue offers. Just walking into a studio with analogue tape machines isn't going to buy you anything."

Still, given the recent improvements in digital sound, and the scores of people claiming that digital has finally come of age with high sampling rates and 24-bit resolution, it's surprising the hear the praises of analogue sung like this. In Scheiner's judgement even vastly improved digital is still no match for analogue, which, notes Fagen, has itself been improved. "Elliot told me that there had been a lot of improvement in analogue tape since the digital age began. He was right."

"The quality of analogue tape has become better, but I don't think it makes that much of a difference," the engineer retorts. 'We had quality tape back then as well. In the early days I used Scotch 3M 250, switched to 3M 26 at some point, and on the last record we used BASF 900. I grew up and learned analogue and I'm an analogue geek. It's not that I'm kicking digital, but analogue has a much better sound. When you are able to A/B analogue and digital, which we could do in this case, there's simply no comparison. The top end is so sweet and beautiful. I've never heard anyone say about digital, even at 24-bit/96kHz or 192kHz: 'Isn't the top end as sweet and beautiful as you've ever heard?' You don't because digital just doesn't sound that way."

Scheiner stresses that he isn't claiming that analogue gives a more truthful representation of reality. "Analogue changes something in the sound," he elaborates, "but I think it does something good. By contrast, digital is pristine and sterile. On the other hand, it has great things about it. There's nothing better than be able to fly stuff around or tune it in a digital workstation. That's really outstanding. And I don't think every project should be recorded on analogue. You have to look at it on a case-by-case basis. When you consider that the majority of today's music is rather lo-fi, then it's really not that important what you record it on. But there are some projects that command that importance."

Photo: Mr Bonzo

Elliot Scheiner recently used LA's new Cups 'N' Strings Studios for preparation of the original Steely Dan *Gaucho* (1979-80) multitrack analogue masters for release this year in 5.1 surround. Owner and chief engineer Bruce Maddocks first baked the priceless masters in his laboratory-grade mechanical convection oven, and they were then played back on a Studer 827 24-track deck. Pictured are (L-R) Bruce Maddocks and Elliot Scheiner.

Better Luck

Everything Must Go was, naturally, a project of such importance, and Becker enthuses about how having "a great bunch of musicians in a room" supports analogue recording and their decision to play live. "One of the things that people discovered is that when you're mixing, you're not necessarily trying to make things distinct, you're trying to blend them together. With digital recording this can be difficult. But analogue, because it changes the sound a little bit more than digital does, tends to blend and process things so that it sounds more coherent and unified. You want to make the guys in the band sound like they're playing together.

"It's actually always been our first plan on any project to get a live band together. It's true that we've often worked with various sorts of track manipulations, but always as a last resort."

"Most of the time we've used technology at the tracking stage because we were unable to the track with a live band," adds Fagen. "It was a desperation tool."

"This time we had better luck," Becker continues, "because of the musicians that we found in the last two years, particularly drummer Keith Carlock. He also played on one track on *Two Against Nature* and is able to play in any number of styles and still remain himself. He's a great groove drummer and a good jazz drummer as well. So he has the technique and the happening backbeat. He just nailed every song that we gave to him and by the end of the day, or sooner, we'd have a track down on tape. We had a six-guy band with two guitar players [*Jon Herington and Hugh McCracken*], two keyboard players [*Fagen and Ted Baker*], and bass and drums.

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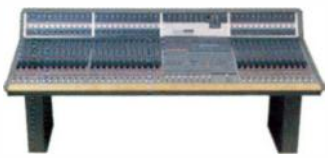

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Everybody felt the same way and was able to get on the same wavelength and really define the rhythm and come up with cool parts."

A lot of the feel for *Everything Must Go* comes from the seamless interplay between Becker on bass and Carlock on drums, surely the reason why Becker preferred to play bass and not guitar in the six-piece. According to Scheiner, Fagen and Becker's working method was to rehearse one or two tracks in a rehearsal studio, record these tracks live with the band in Sear Sound Studio A, and overdub and mix soon after, mostly in Skyline Studios (NYC) and Presence Studios (Connecticut) respectively. A few weeks later the process would be repeated for the next batch of songs.

The first recordings and overdubs took place in August 2001, with 'Things I Miss The Most' and 'Lunch With Gina', and the final mix for the album was completed in November 2002. Elliot Scheiner explains some of the technical details of the tracking sessions at Sear. "The desk was an old 36-input Neve 8036, and we used Studer A827 24-tracks with Dolby SR. We used two, so I could do edits, for instance replacing a bad chorus with a better chorus from somewhere else. Any fixes that needed to be made were done right there on analogue. To have six musicians play live in one room at the same time is amazing today. We were able to put all of them in the small room at Sear, and keep the leakage situation fairly contained. The smallness of the room actually added a nice liveness to the drums. You won't believe this, but I used [*Electrovoice*] RE20s as room mics, and I put them in the surround speakers in the 5.1 mix.

"One of the great advantages of Sear Sound is that they have one of the most unbelievable microphone collections, with lots of vintage mics. On acoustic piano I'd use a [*AKG*] C12A, which was amazing-sounding and made a huge difference. On electric guitar cabinets I used nothing special, Shure SM56s, but run via Universal mic pres, while a Neumann U47 was great-sounding on acoustic guitar. For drums Neumann U67 microphones were great for overheads, there was a [*AKG*] D112 on the kick drum, Audio-Technica ATM25 on toms, and SM57 on snare. Oh, and Walter's bass went via an Avalon DI box straight into the desk. I always record as much as possible without effects. The only effects I used were Fairchilds for Walter's bass and the electric guitars. There were no other effects printed on tape."

Digital Dubbing

Once Scheiner had recorded the band at Sear, the project continued with overdub recording, which was, perhaps surprisingly, done on digital multitrack. "One of the problems with analogue tape," explains Becker, "is that as you continue to work on a piece of tape the sound deteriorates. So after recording the basic tracks on analogue we transferred them to a 16-bit Sony 3348, used this for overdubs, and when it was time to mix we used the original analogue 24-track and locked it up with the overdubs on 3348. While we did overdubs we also did some editing on computer. There are a few manipulations that

Mixing *Everything Must Go* In 5.1

Elliot Scheiner is one of the world's most prominent proponents of surround sound, and has set benchmark standards for 5.1 with his surround mixes of the Eagles, Queen, Van Morrison, REM, Allman Brothers, Derek & The Dominos, and many others, including, of course, Steely Dan. He mixed *Two Against Nature* in 5.1, and his 1997, 16-bit 5.1 DTS mix of *Gaucho* became a classic in the field. For this reason some were surprised when he recently did it again in 24-bit/96kHz. Scheiner thought the *Gaucho* remix was entirely justified, because "the difference between the original and new surround mix was absolutely staggering. I'd transferred the analogue tapes to Steinberg's *Nuendo* and mixed from that. It was like a veil had lifted off the original mix."

Given that he's one of the world's prime experts, it's interesting to find out more about how exactly Scheiner approaches a surround mix, and how he mixed *Everything Must Go*. "I try hard to not come in with preconceived notions of how I'm going to approach a surround mix, but inevitably I almost always have the bass and drums in the front stage. I've only strayed from this once, when I mixed Van Morrison's *Moondance*, which I had recorded and originally mixed in stereo. On one song, 'Crazy Love', I put the drums in the rear speakers, because when I listened to the multitrack it conjured up a memory of me standing in the recording area talking with Van, while the band were still rehearsing around us. I wanted to convey this memory in the mix, with the drums behind me, bass left, centre and right, vibes on one front side, Van's guitar on the other front side, the girl singers in the rear, and Van's voice everywhere. It was an eight-track tape with six tracks of material. With eight tracks you can come up with interesting stuff, but I think doing four tracks in surround would be very difficult.

"When I mix in 5.1 I always like to have mono information. I like to have each instrument and effect coming from one spot, and I like to place the instruments around me. As I said, generally I put the bass and drums up front, and I'll have certain elements of the drums, for instance the overheads, splashing from the rear. If there have been reverbs used on the drums I'll put them in the rear as well. Guitars and keyboards and percussion are mono, and the reverb returns go to the same spot. If a conga comes from the right rear, the conga reverb will most likely also come from there. But if the vocal is a featured instrument, I tend to put it pretty much everywhere, though not as much in the surround speakers as the front.

"I can't imagine having lots of effects on everything in 5.1. For me that would make everything ill-defined. Part of the greatness of 5.1 is all these little things coming from different places. They are what test your ear. I call them 'air candy'. That's what makes 5.1 for me, many details coming from different but well-defined spots. Many people prefer to put the instruments in the front and have reverbs splashing from the back. I won't do that, I find it boring. I want to be treated to something different. I want a new experience. I think when we're creating a new listening arena and a new format, if we want people to accept it, we have to make things a lot more interesting for them than just giving them stereo with rear reverb. Anybody I've played surround music for has been completely knocked out by hearing things coming from around them. That's probably the most important element, to create a fantasy situation, to really put the listener in the centre of the band."

Asked whether he thinks 5.1 is a new artistic medium, Scheiner replies "Oh, absolutely. No question. It requires a whole new way of thinking." He agreed that the introduction of such a new medium raised issues of artistic responsibility and integrity. "You have to stay faithful to the original material. You can't just stick a delay on a guitar and pan that over to the other side. That changes the music. You have to match what was on the record and what the original mix was about. You can't add effects that weren't on the original tape. I think the original artist would say no to that. And all the surround mixes I've done have been approved by the artist. The older acts I've worked with specifically asked me to do the surround mix or were involved. When I surround mixed Queen's *A Night At The Opera* both Brian May and Roy Thomas Baker were heavily involved."

So what about *Everything Must Go*? "It was fairly conservative, I guess," reckons Scheiner. "Once again, the drums were basically up front, while I fed the toms and kick also to the sub, and I had the room mics and a little bit of the overheads in the rear. On some occasions I put the two guitars in front left and front right, and the two keyboards in rear left and rear right, and sometimes I reversed this and put the keyboards in the front and the guitars in the back. Horns are for 90 percent of the time coming from the rear, while the backing singers are 50 percent coming from the rear, and 50 percent from the front, depending on whether the parts they sing are integral to the lead vocal or not. I use the centre front speaker for focus. If I need a little accent on the lead vocal or snare or bass, that's what I use that speaker for. Percussion will usually come from the rear. I had four 140 plate reverbs from the Yamaha SREV1 in the mix, one for each of the corner channels, and nothing for the centre speaker or the sub."

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▶ are much easier to do on a workstation."

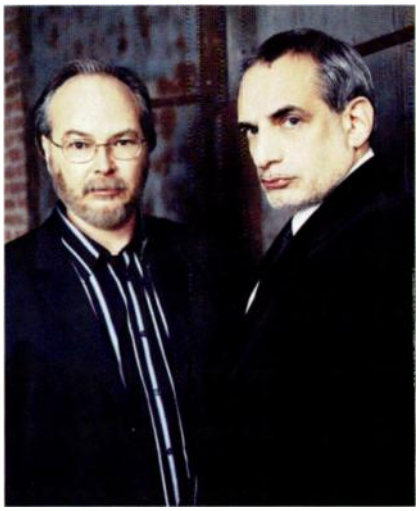
"Walter and Donald had some trying experiences in the 1970s with analogue," Scheiner points out. "One of the most annoying things was the shedding of tape. After a while you found most of the oxide lying in front of the headstack. Nobody wanted to deal with that, so once we finished with analogue we put the analogue tapes away until the mix. For me the sound of the basic tracks after they had been dumped into digital was no comparison to how they had sounded in analogue. But overdubbing is a lot easier in digital."

Scheiner took no part in the overdubbing stage. Instead engineer Roger Nichols, who has been involved with Steely Dan as an engineer right from their first album in 1972, engineered the overdubs for the first couple of tracks that were recorded, 'Things I Miss The Most' and 'Lunch With Gina'. These were done at Skyline Studios, where a young engineer called TJ Doherty assisted Nichols. Fagen and Becker liked Doherty so much that they hired him as main overdub engineer for the remainder of the tracks. (He must have made a seriously good impression, because in November 2002 Walter Sear hired him as engineer at Sear Sound.)

Becker and Fagen were in Hawaii in January and February of 2002, having a holiday and overdubbing guitar and keyboard at Hyperbolic Sound to the songs 'Green Book' and 'The Last Mall', aided by Hyperbolic engineer Dave Russell. They continued work in New York in March. "I have a Soundtracs IL48 desk, two Sony 3324 digital machines and a Pro Tools rig for the occasional edit at Hyperbolic," Becker divulges after repeated invitations to talk a bit about his studio. "Is that enough for you to know?"

Key Tracks

Fagen is marginally more forthcoming about the tools of his trade. "During tracking I usually played acoustic piano or electric piano," he



explains. "I don't use synthesizers very much, and if I do it's only during the overdubbing stage. For one thing they're so out of tune that you have to adjust them carefully. I find that it's a problem with all synthesizers. They have very unnatural harmonics and they're not stretch-tuned properly and so the upper notes are a little flat and the lower notes a little sharp. The only ones I own and used are a Korg Triton and Kurzweil K2500, and occasionally I rented some stuff in like a vintage keyboard machine." Some of the vintage keyboards Fagen used are mentioned on the liner notes to *Everything Must Go*, and include Fender Rhodes, Wurlitzer and Clavinet. According to Doherty, Fagen also played a Hammond B3 organ during final overdubs at Sear Sound.

Doherty's first job as main engineer on *Everything Must Go* was recording vocals with Fagen, which took place in Bearsville Studios in New York. After a few days in Bearsville the company relocated again to Skyline, where Fagen overdubbed more of his vocals and keyboards, Becker his guitar solos, and horns and backing vocals were also added. The last few songs were recorded and overdubbed at Sear Sound.

"We'd usually start with a keyboard or vocal overdub," explains Doherty," and then there would be a guitar solo overdub, and finally the horns and backing vocals.
I recorded Donald's voice with a Sony C800 with an LA2A or 1176 compressor at Skyline, and with an M49 microphone at Sear. On Walter's guitar cabinets I used an SM57, because I know what that mic does. I'll always spend time in the recording area listening to where things sound best, and then place the mic there and angle it slightly, and so on. Walter also had a really nice Groove Tubes mic, I forget which one, and liked to use the Avalon 737 compressor. I used the Groove Tubes for his cabinets a few times and also on the trombones. I used a 67 and a 47 on the B3. All overdubs were pretty close-miked. I only put up room mics when recording the horns.

"Overdubbing was really easy, because the musicians were so damn good. For me this was the biggest thing about this album, the amazing playing by the musicians. They would come in and usually nail everything on the first or second take. We would do a few takes, and then we'd comp the best bits. It was a very straightforward procedure. Still, the 3348 came in very handy. I don't know why anyone would do overdubs on a machine other than the 3348. It's such an easy machine to work with because it has this rehearse function for punching in and comping. I've also used the Studer digital multitrack and Pro Tools, but the 3348 is really easy. It also has pretty good converters."

Nevertheless, Doherty did occasionally hire in some help in his work with the 3348. "Larry Alexander came in to move some stuff about in Pro Tools," explained Doherty. "It can be a pain in the ass to shift things around in the 3348, and with Pro Tools you have one look and you know exactly where it belongs. When I worked with Roger Nichols, he had a Pro Tools system with him, as well as a 24-bit ADAT Bridge rig, which has UFC. That enabled him to go back and forth between Pro Tools

The Future Of Surround Sound

Elliot Scheiner's enthusiasm for surround sound is infectious, and even got this skeptical writer curious. But still, isn't 5.1 destined to go the same way as the ill-fated quadraphonic sound, and aren't all these new formats way too confusing for the average consumer, and what about 6.1 and 7.1 formats, and won't surround contribute to killing off new music, because record companies will focus on reselling their back catalogue instead of developing new artists? Scheiner does his best to address this avalanche of questions.

"Quadraphonic sound came too soon. The car dictated eight-track and compact cassette and CD, and I believe that cars will also drive surround. The first 5.1 system in an automobile will be installed this fall, made by Panasonic for a Honda Accura. Most people spend a lot of time in their cars, and it's a great environment for surround sound. With regards to different formats, I think there's more future in DVD-A than SACD, because you can put a DVD-A in your DVD video player. It's backwards compatible, and millions of people already have DVD players, whereas with SACD you need to buy new hardware.

"Six point one and 7.1 are not going to happen. When you have more than three front speakers everything gets just too close together and there's enormous phase shift. You can't determine or pinpoint where the information is coming from. Moreover, we've been making 5.1 records, and we can't ask the consumer to go out and change their amplifier and buy new speakers again. There's the argument between film people and music mixers, where the film people have the speakers to the side, and we mix with speakers behind us. The reasoning is that many people won't have space for speakers behind them. If true, with 5.1 people can simply put the rear speakers to the side. But they physically won't be able to accommodate a sixth or seventh surround speaker. It's doesn't make sense. Will people accept the new format, or feel they've been resold the same thing again? I think the key is that when people buy surround, they are buying something completely new. A piece of music that they may have been familiar with for 30 years, all of a sudden they'll be hearing it differently, and hopefully they'll be enjoying it even more."

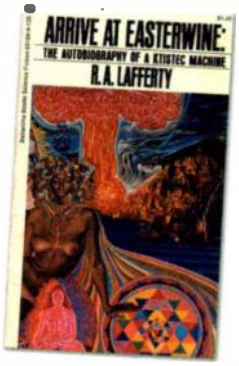
And so, as Fagen and Becker put it in 'The Last Mall', "Roll your cart back up the aisle..."

and the 3348 really easily. A company called the Toy Specialists came in purely because of my paranoia about losing material. A few years ago when working on a digital Studer I had a track that went dead in one spot, I think because the tape got worn. Now whenever the interpolate/hold/mute lights start to come up on the 3348 I get a little nervous. So I had the Toy Specialists make backups for me to another 3348, just in case."

Pipe-smoking Transcendence

With backups stored elsewhere, Doherty was happy to hand Scheiner the multitrack tape for the mix with only the final, comped parts on it. Scheiner mixed everything in Presence Studios on a Neve VR60, plus the original 24-track analogue and 48-track digital tapes. "I did all the stereo mixes first," states Scheiner. "Until the stereo mixes are finished, I only focus on stereo, also during recording. I simply don't think of 5.1 and don't record things with 5.1 in the back of my mind. The stereo mix was fairly straightforward, mostly a matter of EQ'ing and balancing. Walter and Donald would let me work for six to eight hours on a track, and then they'd come in and we'd finish it off together."

It was entirely in keeping with the spirit of *Everything Must Go* that the main effect Scheiner used during mixing was once again a combination of retro and 21st-century technology. "Walter [*Becker*] brought a couple of Roland delay boxes," recalled Scheiner, "and I may have used the odd compressor. But the only reverb used on the entire record was the 140 EMT plate sample from the Yamaha SREV1. It sounds exactly like the real thing. I've always felt that part of the charm of old records is that you could hear the reverbs return to the same place as the instrument. Like if I have an electric guitar on the left, the reverb returns to the left as well, so all the sound comes from one place. When I mixed records in the '70s, mostly at A&R Studios in NY and the Village Recorder in LA, I would use three 140 plates: one I'd dedicate to the left, one to the right, and one to the centre. That's pretty much what was in those mixes, apart from the occasional tape slap. We decided to go for a 140 plate sound on *Everything Must Go*, and I did pretty much the same thing."



Horn overdubs to 'Things I Miss The Most' were added towards the end of the project, prompting Scheiner to remix the track. In fact, he says, he "ended up recalling and remixing all tracks, except for maybe one song. Basically the mixes had been done, but we just wanted to make a couple of changes." After completing the stereo mixes Scheiner went on to mix all tracks in 5.1, details of which can be found in the surround sound box.

The story of *Everything Must Go* leaves us with one loose end: the Ktistec machine. Is it retro or the future? Not surprisingly, a bit of both. It turns out to come from a book by American science fiction writer RA Lafferty (1914-2002), where it is featured as the world's first transcendental (and pipe-smoking) computer, which can change the past retrospectively — and guess what: one of its characteristics is a dislike of answering questions straight. Sounds familiar. But what Kasper wants to know is this: does the Ktistec machine also mow the lawn? A straight answer please... SOS

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Audiotrak Prodigy 192

Multi-channel 24-bit/192kHz Soundcard For Windows PCs

Launched under their Audiotrak badge, ESI's Prodigy 192 audio card provides support for 24-bit and 192kHz audio plus optional digital and MIDI I/O. But the really good news for software-based musicians is that it also provides a low-cost route to the company's EWDM drivers and Direct Wire technology.

John Walden

Audio interface products from ESI Pro (formerly known as Ego Systems Inc) have been the subject of a couple of recent *Sound On Sound* reviews, where Martin Walker looked at the Wami Rack 192X in October 2002 (read the review on-line at www.sospubs.co.uk/sos/oct02/articles/esipro.asp) and Waveterminal 192M in March 2003 (www.sospubs.co.uk/sos/mar03/articles/esipro.asp). Both of these products are aimed squarely at the recording musician and, at their respective price points, each offers a interesting balance between features, audio quality (excellent in the top-end Wami Rack) and affordability.

For the software-based studio, however, perhaps the most significant feature of these two ESI Pro units is the combination of multi-client EWDM drivers and Direct Wire software patchbay, which together provide unrivalled flexibility when running multiple audio applications through a single soundcard. For those whose input/output needs are not as sophisticated (or whose pockets are less deep), under their Audiotrak brand, ESI have now put the same EWDM/Direct Wire technology into what they are advertising as a 'multimedia' card: the Audiotrak Prodigy 192.

Overview

With two analogue ins and six outs on stereo mini-jacks, the hardware is clearly not as sophisticated as that of either the Wami Rack or Waveterminal. At under £100, the 'multimedia' nature of the analogue hardware is an obvious cost constraint, but given due care and attention, it is perfectly possible to make respectable audio recordings via mini-jack connectors. Moreover, both optical and co-axial digital outputs are included and 24-bit/192kHz audio is still supported (although only 192kHz is only supported on playback, with 96kHz being the highest sampling rate available for audio recording). A big plus is the inclusion of the EWDM/Direct Wire drivers that Martin was so obviously impressed with when reviewing both of the ESI Pro units mentioned above.

A summary of the Prodigy 192's features is provided in the Brief Specification box. Both mic and line-level analogue inputs are provided, although it is an either/or arrangement and they can not be used simultaneously. The six-channel analogue output is obviously aimed at 5.1 playback and Cyberlink's *PowerDVD Player* is bundled with the Prodigy for those with a suitable DVD drive installed in their PC. The digital output can also send out AC3-encoded Dolby Digital audio.

If the user wants to overcome any limitations they might feel from the unbalanced mini-jack analogue inputs, one solution might be the optional MI/ODI/O add-on card (read MIDI I/O and Digital I/O). For a further £50 this adds a single 16-channel MIDI In and Out and digital I/O in both co-axial and optical formats, although it does require an additional backplate slot in the host PC. With the add-on card in place, the Prodigy 192 is able to operate as a four-in/eight-out device if both analogue and digital connections are utilised.

Installation

Having followed the usual procedures for installing the PCI card and add-on MI/ODI/O

SOUND ON SOUND

Audiotrak Prodigy £100

pros

- Low-cost access to ESI Pro's excellent EWDM/Direct Wire driver technology.
- Very respectable audio quality for the price.

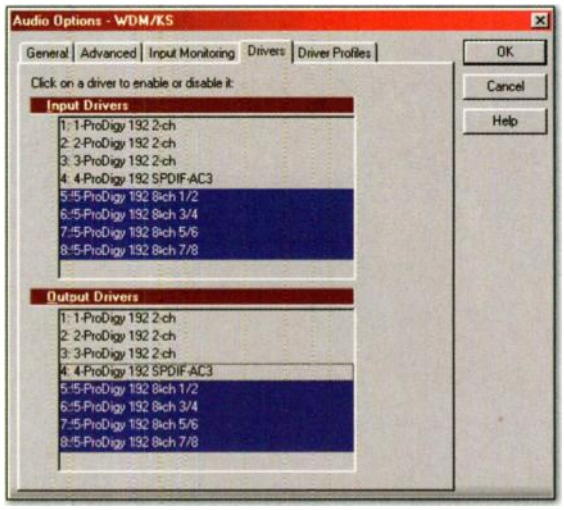
cons

- 192kHz only supported on playback.
- Audio applications have to be shut down before adjusting latency.

summary

The audio performance is respectable for a budget multi-channel PCI card, but the Audiotrak Prodigy 192's biggest selling point for the PC software studio is affordable access to the excellent EWDM/Direct Wire technology.

board, driver installation proved painless under both Windows 98SE and XP Pro. The Prodigy was supplied with version 3.8 of the EWDM (Enhanced Windows Driver Model) drivers, but I found the newer v4.0 on the Audiotrak web site. This driver package installs the EWDM Controller, EWDM Wave-1 to Wave-5 and the EWDM MIDI drivers. This is all very similar to the Waveterminal and Wami Rack — one driver fits all OS types, including 98SE, ME, 2000 and XP — and supports MME, ASIO, GSIF and Direct X. Within suitable audio applications, these audio drivers appear both as a series of stereo pairs and in a multi-channel form which could be used, for example, with surround sound-based projects.

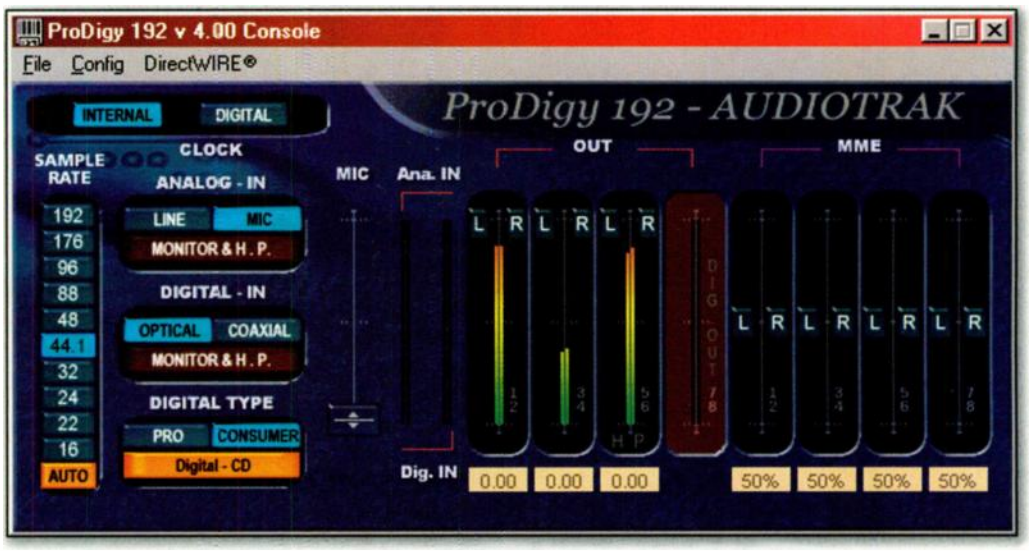


The Prodigy's EWDM drivers appear as stereo pairs and multi-channel formats in audio applications such as *Sonar*.

Consolation Prize

One of the key features of the Prodigy's drivers is that they are multi-client, so that a single card can be accessed by multiple applications: a sequencer, soft synths, samplers and sound editors should all happily run side-by-side. The Console utility and the Direct Wire v2 patchbay operate in very similar fashion to those of the Waveterminal and Wami Rack, within the somewhat slimmed-down hardware specification of the Prodigy.

The Console provides monitoring level adjustment and selection of input sources, and allows the sample rate to be set. The Config menu also allows the latency to be set, in terms of the number of samples — this cannot be done from within your sequencer, as it can only be adjusted when the drivers are not in use. The Direct Wire patchbay allows signals to be routed from one application to other within the host PC. This is an excellent feature; for example, you might want to send the output from your stand-alone soft synth into your MIDI + Audio sequencer so you can add your favourite VST or Direct X effects to the sound — Direct Wire makes the life of the PC software studio owner considerably more straightforward. Both of these utilities have been described fully in the earlier reviews of the Waveterminal and Wami Rack, so it is probably sufficient to say that they work in essentially the same fashion here.



The Console utility.

In Use

Testing latency via the ASIO drivers in applications such as *Reason* and *Cubase SX* gave very good results. When working at 44.1kHz, I was able to select the lowest setting (48 samples) within the Console utility and achieve consistent, glitch-free playback of moderately busy mixes. This probably equates to a real-world latency of about 3ms, which is excellent for real-time use of any fast-attack soft synth/sampler patches. *Sonar*'s Wave Profiler suggested a buffer size producing a 2ms latency, but even for a fairly simple arrangement of a few audio tracks, this loaded CPU usage to around 30 percent. Adjusting the buffer size to give a latency of 12ms (which is still perfectly usable) halved the CPU load for the same arrangement.

I tested the audio performance of the analogue line in and line out using Rightmark's *Audio Analyser* 5.0. At 16-bit/44.1kHz, *RMAA* returned a very respectable background noise figure of -93.8dBA. This fell to an excellent -96.1dBA at 24-bit/44kHz and then rose to -93.1dBA at 24-bit/96kHz. At this price point, there is nothing to be critical of here. In his review of the Waveterminal 192M, Martin Walker reported high stereo crosstalk measurements, but this was not such a problem here, with results between -84.1 and -87.2 dB — respectable, if not outstanding. Checking Rightmark's web site revealed a recent set of results posted for the Prodigy that were similar to my own figures, but with somewhat better background noise levels at 24-bit/96kHz.

Subjectively, recordings made with the Prodigy at 16-bit/44.1kHz were good and there was a noticeable (if subtle) improvement when moving up to 24-bit/44.1kHz, with a little more top-end clarity being the most obvious difference. Frankly, moving to 96kHz didn't produce any marked further improvements, but those serious enough about their audio to want 24-bit/96kHz recording and multi-channel playback are probably going to be spending more money than this in any case. Playback also seemed clear and clean, ▶

Test Spec

- EWDM driver version 4.0.
- Pentium 4 1.6GHz with 1GB RAM, running Windows 98SE and XP Pro, with Echo Mia 24, Yamaha DSP Factory and Yamaha SW1000XG soundcards.
- Tested with Propellerhead *Reason* 2.5, Sonic Foundry *Acid* 4, Cakewalk *Sonar* 2.2, Steinberg *Cubase SX* 1.05B and *Wavelab* 4.

both in two-channel stereo and 5.1 surround. Indeed, multi-channel output worked very well in 5.1 projects created in applications such as *Cubase SX* or *Acid Pro*.

For those with suitable external A-D converters, the MI/ODI/O add-on card means the mini-jacks can be bypassed when recording, and the co-axial I/O produced good results for routine recording and playback tasks via my own Yamaha 01V mixer. The MIDI port also did exactly what it said on the tin.

While my own Echo Mia produces similar background noise levels to the Prodigy 192, in other respects (frequency response, dynamic range, total harmonic distortion, stereo crosstalk), its *RMAA* figures are better than those of the Prodigy and I felt this was borne out in some basic listening tests. The Mia produced more detailed results, most obviously with solo acoustic instruments such as guitar or a guitar/vocal combination. With busier mixes, the differences were perhaps less noticeable.

Of course, the Mia is more expensive and has balanced analogue I/O, but it doesn't have multi-channel outputs or Direct Wire and, as with any soundcard, the Prodigy's particular balance of features will suit some but not others. Perhaps a more direct comparison might be made with something like Creative's Audigy 2, which is about the same price and also supports 24-bit, 192kHz multi-channel playback. While the Audigy 2 includes MIDI as standard and a wavetable synthesizer, the Prodigy has its EWDM and Direct Wire technology. If the Audigy's synth was surplus to requirements for the software studio owner on a budget, the EWDM/Direct Wire combination might just tip the balance.

Prodigy 192 Brief Specifications

Main card

- Stereo line in on 3.5mm mini-jack, -10dBv unbalanced, 10kΩ impedance.
- Mono mic in on 3.5mm mini-jack with preamp.
- Six-channel analogue line ouput (three x 3.5mm mini-jacks), -10dBV unbalanced, 100Ω impedance. Output 5/6 doubles as headphone output.
- Supported analogue sample rates: 16, 22, 24, 32, 4.1, 48, 88, 96, 176 and 192 kHz (176 and 192 kHz on playback only).
- Optical and co-axial digital outputs at 32 to 192 kHz and up to 24-bit.

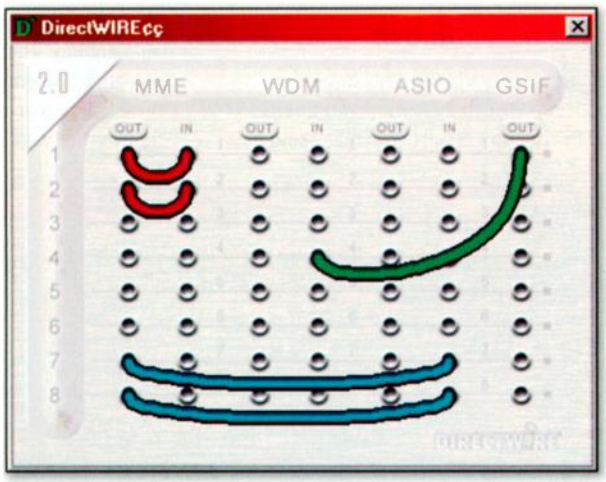
Optional MI/ODI/O board

- 16-channel MIDI I/O.
- Optical and co-axial digital inputs and outputs at 32 to 192 kHz and up to 24-bit.
- Digital input and output can be used simultaneously with analogue I/O, giving four inputs and eight outputs.

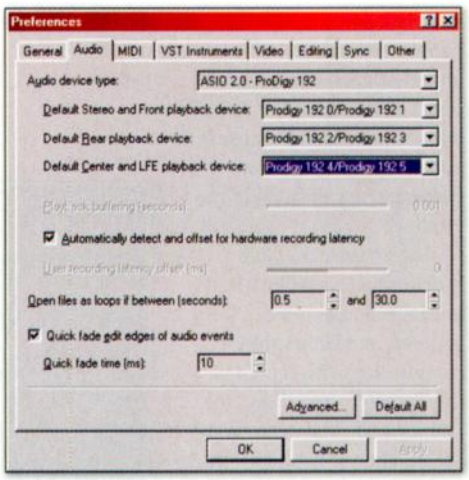
Conclusions

While I'd be more than happy for someone to convince me otherwise, on a soundcard costing under £100 and using unbalanced mini-jacks for analogue I/O, I think the idea of 24-bit/192kHz audio is more to do with marketing (and the ability to meet the required spec for playing back DVDs) than real differences in the listening experience of the potential user. At this price point, 44.1kHz recording at 16- or 24-bit is likely to be more than adequate and, for these tasks, the Prodigy 192 does a very respectable job — no better and no worse than other similarly priced, multi-channel PCI soundcards on the market.

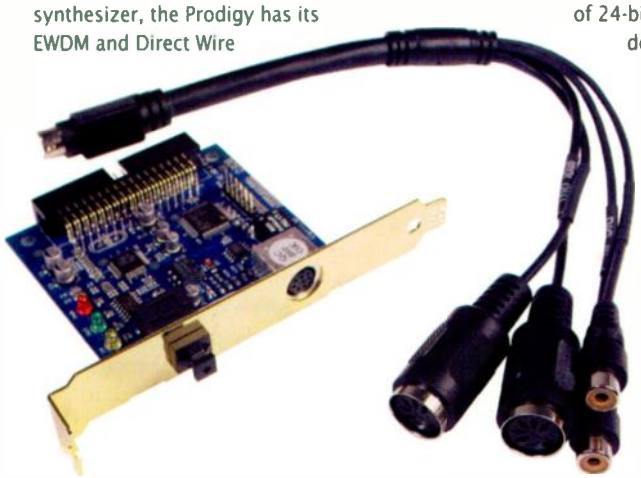
However, where it is likely to benefit the recording musician most is in providing access to the EWDM/Direct Wire technology at a relatively low cost. Until other soundcard manufacturers catch up on this front, this gives ESI/Audiotrak products something of a distinctive feature set. For the home musician whose entire studio (bar a mic, guitar preamp and keyboard) is contained within their PC, these drivers make combining sequencers and software instrument applications within the same computer so much easier. If this is you and your budget is tight, or you are just not yet ready to take the plunge with something offering more comprehensive in terms of balanced analogue I/O or professional phantom powering, then the Prodigy 192 is well worth a closer look. SOS



ESI's Direct Wire technology provides a flexible virtual patchbay for connecting inputs and outputs from your various applications.



The multi-channel output of the Prodigy makes it suitable for 5.1 audio projects in applications such as *Acid* (as shown here) or *Cubase SX*.



The MI/ODI/O daughterboard adds MIDI and digital audio capabilities to the basic Prodigy functions.

information

- £ Prodigy 192 £99.99; MI/ODI/O add-on card £50.00. Prices include VAT.
- T Audiotrak UK +44 (0)870 765 9880.
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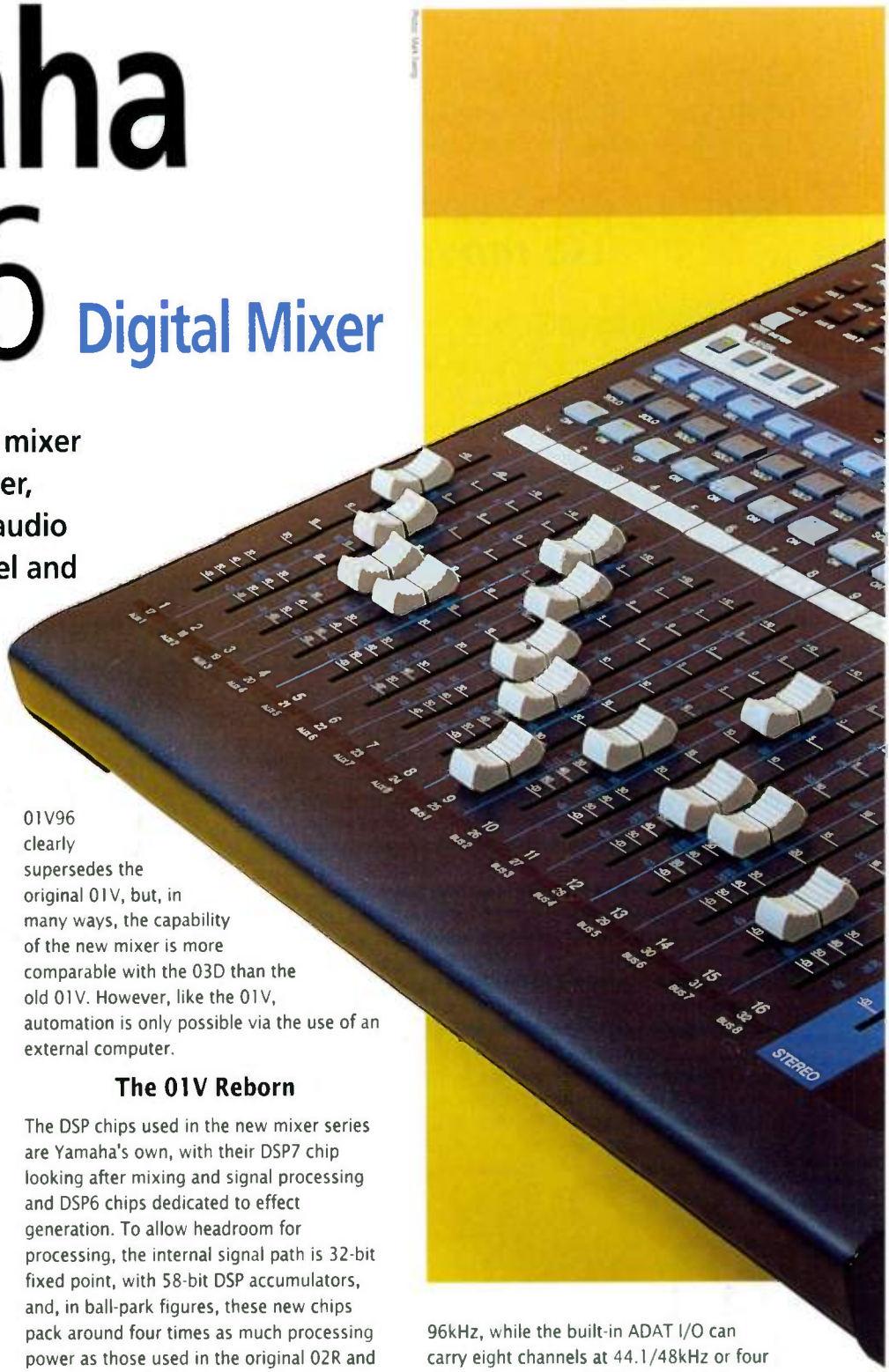
Yamaha 01V96 Digital Mixer

Yamaha's entry-level digital mixer gets an 02R96-style makeover, providing increased digital audio resolution, improved channel and effects processing, and surround functionality.



Paul White

Around six months ago, Hugh Robjohns reviewed the new Yamaha 02R96, which was so advanced compared to the original 02R that it had little in common with its antecedent other than physical size. This highly evolved desk was part of a major 0-series upgrade that brought 24-bit/96kHz capability, more mix channels, a new and more analogue-sounding EQ, better effects, more transparent-sounding preamps and numerous other improvements, while still retaining the operational paradigm of the earlier models. The 19-inch-wide Yamaha 01V96 clearly supersedes the original 01V, but, in many ways, the capability of the new mixer is more comparable with the 03D than the old 01V. However, like the 01V, automation is only possible via the use of an external computer.

SOUND ON SOUND

Yamaha 01V96 £1729

pros

- Huge amount of functionality for the price.
- Good audio quality.
- Comprehensive routing capability.
- Can mix up to 40 inputs.
- Dedicated layer for MIDI DAW control.

cons

- Lack of automation makes it less attractive to those working in a computerless environment.

summary

The sound quality, I/O capability, routing ability and onboard processing make the 01V96 very attractive to anyone who doesn't need integral automation. Ideal for use as a monitoring and control centre in a computer-based studio.

The 01V Reborn

The DSP chips used in the new mixer series are Yamaha's own, with their DSP7 chip looking after mixing and signal processing and DSP6 chips dedicated to effect generation. To allow headroom for processing, the internal signal path is 32-bit fixed point, with 58-bit DSP accumulators, and, in ball-park figures, these new chips pack around four times as much processing power as those used in the original 02R and its siblings. Full functionality and channel count is retained at 96kHz (other than in the effects section, where the effect count is halved), though there are some caveats regarding I/O when working at higher sample rates. A double-channel mode allows digital interface formats such as ADAT and TDIF to be utilised to carry one channel of 96kHz data over two 48kHz channels. The 01V96 slot can handle up to 16 I/O channels at 44.1/48kHz or eight channels at up to 96kHz, while the built-in ADAT I/O can carry eight channels at 44.1/48kHz or four channels at up to 96kHz. There's also a double-speed mode for sending data to and from external devices that support higher sample rates, but the appropriate expander card (MY8AE96 or MY8AE96S) must be installed to support this.

Unlike the original 01V and 03D, the Yamaha 01V96 has full-size motorised faders, 16 to control the channel and group levels, buss out levels and aux sends via 'mixing layers' and one further fader that acts as

"The 01V96 may be Yamaha's entry-level digital mixer, but its sound quality and facilities are anything but entry level."

a stereo master fader.

Three fader layers control the inputs, busses and aux sends for the mixer's own signal path, while a fourth is reserved for controlling computer DAWs via MIDI. The user can determine what controller information is sent by the controls in the DAW layer, though the 01V96 comes with templates for Steinberg's *Nuendo* and Digidesign's *Pro Tools* software built in, as well as a generic DAW template. Templates for other popular sequencers and audio packages are said to be 'work in progress', though Emagic *Logic Platinum* v6 provides extensive remote support for the 01V96 and other Yamaha consoles using the Generic DAW template in the 01V96. DAW control goes way beyond fader and pan levels, with access available for virtually all key functions.

Cosmetically, the mixer follows the styling of the new range, making use of blue panels to segregate the various control sections. The only incongruity is that the 320 x 240-dot display is slightly smaller than the one used in the 03D and is green rather than blue, which is somewhat at odds with the overall colour scheme. The familiar Selected Channel section allows direct access to the four-band parametric EQ and channel pan for whichever channel is currently selected, and there are eight user-definable buttons to the right of the master fader that can be set up to directly access internal functions that are used regularly.

Mixer Architecture

Out of the box, the 01V96 has 12 mic/line inputs (with switchable phantom power and pre-converter analogue insert points), four ▶

line-only inputs, separate stereo and control-room monitor outputs, and four Omni outputs as used in the original 01V, to which any desired output signal can be assigned. Each of the inputs has a dedicated mixer channel, and four further stereo input channels are provided, with slightly streamlined features, for use as aux returns. Once you factor in the onboard coaxial S/PDIF and optical ADAT inputs as well, this adds up to 24 inputs in total, expandable to 40 with the addition of an optional mini-YGDAI interface card. The mixer architecture is therefore sensibly based around 40 mixer channels, eight busses and eight aux sends, where four of these would normally be used to feed the internal effects units. Comprehensive grouping and linking functions are supported for the creation of fader groups, mute groups, EQ linking and compressor parameter linking. Linking can be applied to channels, busses or aux sends.

The architecture also includes digital-domain insert points within the channels, auxes and busses, which can be routed to external devices via the Omni outs or whatever optional I/O card is fitted. There are also analogue two-track ins and outs on phono connectors, plus digital two-track inputs and outputs on S/PDIF. The 01V96 already has one set of ADAT In and Out ports as standard, so adding a dual-ADAT expander card means a 24-track recorder can be accommodated entirely in the digital domain, with the proviso that sample rates of 44.1kHz or 48kHz are used. The digital two-track input can be routed to any stereo channel or pair of channels and so shouldn't be considered just a two-track return.

I notice that the auto clock navigation system that was used in my 03D isn't available here, so you have to set the clock source manually when locking to an external digital source. A warning message comes up on screen if there's an obvious clocking problem, such as leaving the console set to internal sync while feeding in an external digital signal.

Having an included ADAT port is hugely useful for anyone using a DAW where the sound card or interface has an ADAT port, or indeed for anyone using a hardware recorder with ADAT compatibility. Should more I/O be needed, there is a single card slot available which can deal with up to eight extra channels of analogue I/O or up to 16 channels of digital I/O. There's also an mLAN card and the Waves Y56K effects expansion card. Since the card slot accepts only the new mini-YGDAI interface cards, it is not compatible with most of the cards used in the original mixer series (the exception being the original 01V, which also uses a mini-YGDAI slot). When the optional dual-ADAT card is fitted, this may be used to run 16 further channels at standard sample rates or can work in 'doubled up' mode to run eight channels at the higher sample rates. It is also possible to cascade a pair of 01V96s in the digital domain.

Routing & Control

To make using the basic I/O and optional interface cards as flexible as possible, the console includes a comprehensive routing system that allows any physical input to be routed to any signal path, including internal insert sends and returns. Similarly, any channel direct output, insert send or buss output can be routed to any physical output. Routing setups may be stored in a routing library, and the current library setup may be stored as part of a Scene. Importantly, though, the internal automation system does not include either dynamic or snapshot-based automation — this can only be accomplished by automating the fader movements or Scene changes from a sequencer or other software package suited to the task. Scenes may be mapped to MIDI

Versatile Connectivity

The top panel of the mixer houses the XLR and balanced jack mic/line inputs, where inserting a jack overrides the XLR. Phantom power is switchable in blocks of four channels and the 12 mic/line channels have an insert point on a TRS jack as well as a 20dB pad switch and a rotary Gain control. The last four channels have only input jacks and Gain controls, though inputs 15 and 16 also have an associated source select switch that toggles between the input jacks and the two-track input. This enables the two-track input phonos to be routed into the stereo mix without repatching, should that become necessary. That leaves the headphone jack and level control — this output tracks the main monitor signal at all times, which can either be the mix, any soloed channels or the two-track return. When monitoring the mix, Solo always overrides the monitor source in the usual way. Having connections on top of the mixer is a somewhat mixed blessing, because, although it makes casual connection easier, it can look untidy.

The back of the mixer looks fairly sparsely populated, with the main stereo outs on balanced XLRs and the four assignable Omni outs on balanced jacks. Further balanced jacks are used for the stereo monitor output and above these are three slide switches for the phantom power. Conventional Toslink optical connectors are used for the ADAT I/O ports, while the two-track digital I/O is on coaxial S/PDIF only. A full set of In, Out and Thru MIDI ports are provided alongside a USB To Host connector. Word clock I/O is on BNC connectors and the mains is connected via a standard IEC socket with a recessed power switch alongside. A plain metal cover hides the single mini-YGDAI slot. There are no fans inside 01V96, so mechanical noise is not an issue other than the chatter of busy motorised faders whenever you switch Scenes or fader layers.

MIDI Facilities

MIDI plays a large part in the operation of the 01V96 — Scene changes can be automated via MIDI Program Change messages, dynamic automation can be implemented simply by recording the MIDI output of the 01V96 to a sequencer track, and of course there's the dedicated DAW control mixing layer. Furthermore, there's a comprehensive MMC section with on-screen transport controls (these could be mapped to the User Defined keys) and the ability to arm up to 24 tracks on a remote recording system. Eight auto-locate points are included in this section, and MMC sync can recognise frame rates of 24, 25, 30 and 30 drop-frame. There's the facility to turn the transmission and reception of different types of MIDI on or off, but in addition to the features just described, MIDI Note On/Off may also be used to trigger the Freeze sampler effect and, of course, the mixer setup and control value contents can be saved as a SysEx dump. When a valid dump is received by the mixer, the existing settings are overwritten.

MIDI data may also be transferred via the USB port if the included drivers are installed, and this port is capable of supporting eight MIDI ports for a total of 128 MIDI channels. This means that, if an mLAN card is installed and one of the connected devices is an mLAN MIDI interface, up to seven ports will be available for the connection of external devices — the mixer takes up one port. A MIDI setup page allows the transmit and receive ports and MMC mode to be set to MIDI, USB or Slot, with choices of MIDI or USB port available for *Studio Manager* and the DAW layer.

When controlling Scene changes via MIDI, Scenes may be assigned to specific MIDI Program Change messages rather like the patch map in an effects unit. Real-time parameter control may also be set up to work via SysEx messages or MIDI Continuous Controller messages.

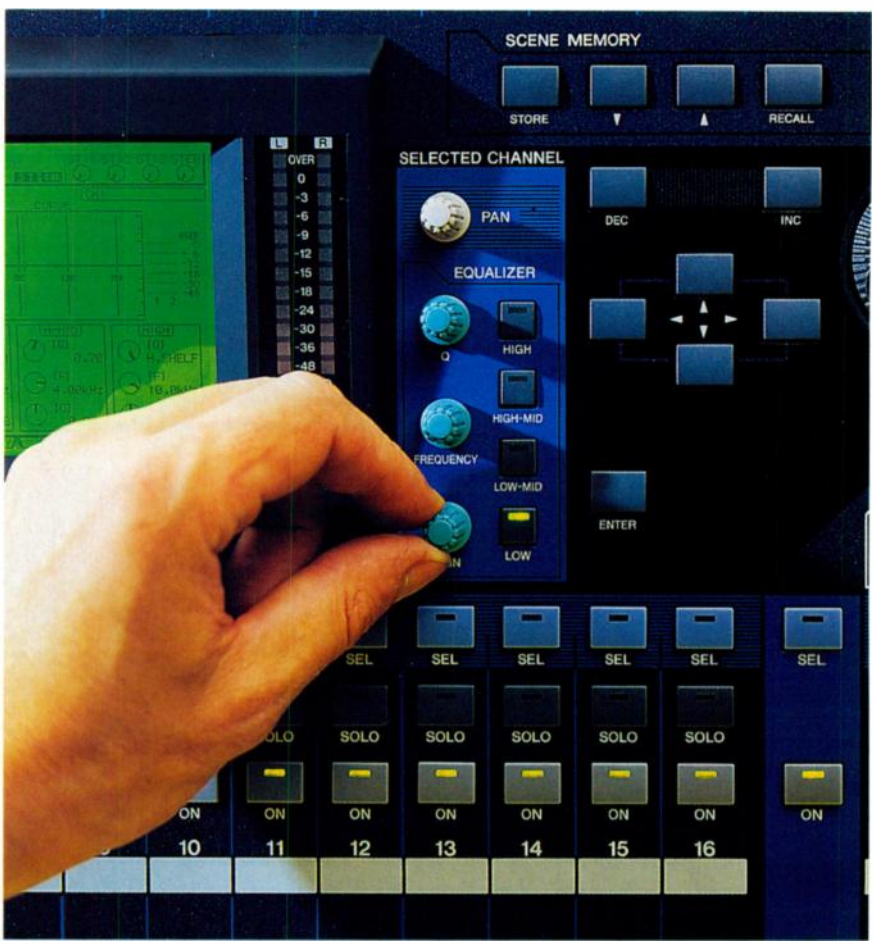
Program Change messages so Scene switching via a sequencer is extremely easy and doesn't require the mixer to be locked to timecode. As far as I can see, this lack of integral dynamic automation is the only area where the 01V96 obviously falls behind the 03D (it is an 01V replacement after all), but, for those working mainly with computers, this needn't be a drawback. It is more of a limitation for those users teaming the 01V96 with a hardware recorder in a computerless environment, though Scenes can still be stepped through manually.

Unlike the 02R96, the fader caps are not touch sensitive, but then automatic channel selection via touching fader caps is often more trouble than it is worth, and many users of such systems find themselves switching that particular function off. Nevertheless, there is a user preference that, when active, automatically selects channels when a fader is moved. The faders used are made by Alps, and seem smoother and more responsive than the short-throw faders in my old 03D.

Scene mix data is stored internally and must be dumped to an external MIDI device for storage if the internal memory capacity of 99 Scenes is exceeded, though the included *Studio Manager* software can be used to organise mix data as well as other libraries. *Studio Manager* is actually a very serious piece of software that communicates bi-directionally with the mixer and provides an expanded graphical interface of the mixer's controls, libraries and settings both at global and channel level. Changing either a *Studio Manager* control or a physical mixer control updates the other party (see box for details).

Naturally, adjacent odd/even channels can be paired for stereo use, in which case the aux sends, EQ, dynamics and fader group are also linked, but, to simplify the control system in cases where a lot of stereo signals are being mixed, it's also possible to choose vertical pairing. This feature is best described by example. Let's say you have the left channel of a signal coming in on input one, you can choose the right input to be fader one on the next layer (input 17) so that only a single fader need be moved in layer one to control a stereo signal. This is potentially confusing, as your stereo pair now comprises inputs one and 17, but, thanks to the 01V96's flexible input routing, you could easily create a routing library setup and Scene especially for stereo mixing, where input one feeds channel one, input two feeds channel 17 and so on.

The internal effects are based around four independent multi-effects engines that can be used via any of the mixer's eight aux sends or be connected to a digital insert point via the routing system. However, this is one area where there's a penalty for working at high sample rates, as the effects count drops to two. The outputs from the effect processors are most conveniently routed back into the mix via the console's four sets of stereo inputs, though the flexibility of the routing system means you don't have to be bound by this. All four effects may be used as mono-in or stereo-in, and all have stereo outputs, though there is dedicated stereo-in reverb and stereo multi-band dynamics processing. As before, effects are fully editable, with the facility to ▶



The Selected Channel control section beside the LCD screen allows quick access to EQ and panning parameters for the track you're working on.

store the edits in an effects library and a large number of presets provided including reverbs, delays, modulation effects, dynamics and guitar amp/speaker emulators. There are also several dual effects, such as chorus/reverb, delay/early reflections and so on, as well as a multi-filter, the simple Freeze sampler and a stereo dynamics processor. There are no dedicated surround effects, as there are in the 02R96, though there's sufficient routing flexibility to use pairs of effects processors to set up your own surround reverbs or delays.

Additionally, each of the 32 main fully-featured input channels includes its own delay that goes up to 984.1ms. This type of delay is often used to compensate for mic position time delays in large-scale orchestral recordings and suchlike, but this time Yamaha have added a feedback control so that it may also be used to set up straightforward DDL echo effects. For use as a time delay compensator, the delay time can also be set in feet, where the delay time is worked out automatically, taking the speed of sound at 25 degrees Centigrade (around 340m/s). The effects capability of the mixer may be further augmented by fitting a Waves Y56K mini-YGDAI card into the expansion slot, though this precludes adding any more I/O over and above the eight channels of ADAT I/O that are built into the Y56K card.

Test Spec

- Yamaha 01V96 OS v1.01
- *Studio Manager* software v1.2.0.22

Updated EQ Algorithms

I mentioned earlier that the EQ has been updated, but you still have the option to use the original Type I EQ where that might be more appropriate. As you may recall, the original mixer series had a very transparent, uncoloured sounding EQ that behaved rather differently to most analogue equalisers and seemed to require large amounts of cut or boost before it made much subjective difference to the sound. Type II is rather more analogue sounding and in general needs less cut or boost applied to get the job done. As with earlier Yamaha models, EQ libraries with factory presets for particular jobs are available, but, in my view, every EQ task is different and so should be set up from scratch for the best results. The only exception is where you have created an EQ setting that works for a specific client in a specific situation (such as recording voice-overs) and where you may need to repeat the result at some time in the future.

During testing, I noticed that the Type II EQ quirk discovered by Hugh Robjohns in his 02R96 review is still present, though it is of little consequence in normal usage. What happens is that, if two EQ notches are set to the same frequency and bandwidth, and are made as deep as possible (maximum cut), then the curve develops two negative peaks either side of where you'd expect the centre frequency to be. It's also the case that setting up two bands to be identical, except with one applying cut and the other the equal amount of boost, the curves don't actually cancel out, though this could be due to the use of a proportional-Q EQ curve.

The channel dynamics section is similar to that found in the 01V/03D insomuch as there are compressors and gates, but in the older mixers only one dynamics processor could be used in a channel at any one time. In the case of the 01V96, each channel can have one gate-type processor and one compressor-type processor (which includes expanders and duckers) running at the same time, which is a big improvement.

Improved User Interface

The front panel of the mixer is about as clear

Yamaha's *Studio Manager* Control Software

Currently, the *Studio Manager* software is available for Windows PC or Mac, but not yet for Mac OS X. Because the software can offer a much more detailed graphic overview of the mixer and its functions, it can be used off-line to create routing setups or other desk configurations. This is very valuable because, although nothing about setting up the 01V96 is actually complicated, there are lots of user preferences to choose from and routing options to set up, which can be time-consuming at the outset. OMS and USB MIDI drivers are provided for Mac OS 9 users, while the necessary Windows counterparts also come on the installation CD. Any computer less than three or four years old should run *Studio Manager* comfortably, provided that it has a graphical resolution of 1024 x 768 pixels. I tested *Studio Manager* on a Mac G4 via USB and found that it worked with no problems once I'd discovered the 01V96 page that let me define USB as the communication preference for *Studio Manager*.

An overview window shows all 16 bank channels at a time, so the screen is quite busy, but the sumptuous graphics rather make up for this. Communication with the *Studio Manager* software can either be via the USB port or a conventional MIDI cable and interface, and one clear advantage with using software like this is that there is effectively no limit to the amount of patching or library information that can be stored.

***Studio Manager* is based on a series of windows or pages relating to different console views and libraries, including a detailed channel view and a timecode read-out. It doesn't offer any direct means of dynamically automating the 01V96, but as a tool for making adjustments, creating setups or managing libraries, it is excellent.**

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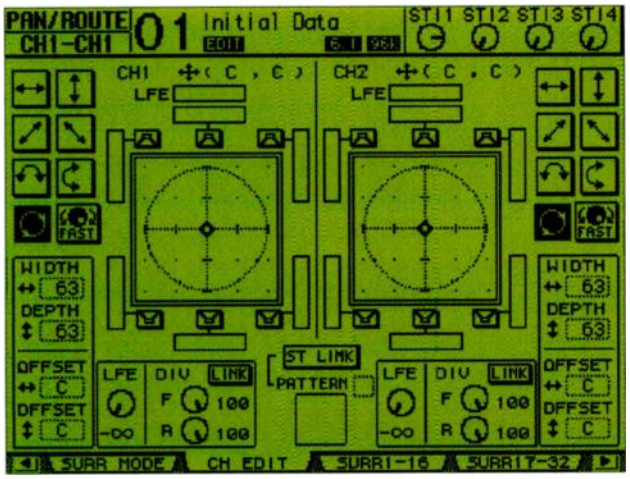

The densely packed surround panning page, as seen on the 01V96's built-in LCD screen, offers all the controls you need to experiment with surround mixing on a budget.

▶ and intuitive as possible, given the huge number of features is accesses. Perhaps more important, though, is that the operation of the interface is largely consistent, regardless of what task you're doing. A Home button brings up the main metering page and sets the faders to control levels (hardware meters are only provided for the main stereo output, and there's no obvious provision for a meterbridge option). Above it are eight Aux buttons that assign the correspondingly numbered aux send to the faders. Above these are 12 Display Access buttons that get you directly into EQ, dynamics or effect pages, as well as accessing the MIDI, routing, digital I/O and global settings pages. Below the Home button are four further dedicated buttons for selecting the four mixing layers, designated as Ch 1-16, Ch 17-32, Master (busses and aux sends) and Remote, the latter being the MIDI controller layer. Note that aux send controls are not available on the Master layer, only on the two layers of input channels.

Below the display, which has a physical contrast control, are six buttons, two of which function as arrow keys and the other four of which correspond to tabs shown in the display window, enabling the user to go directly to one of up to four display pages. Where there are more than four pages, the arrow keys are used to shift to the next or previous set of pages. Pressing the Display Access button repeatedly also steps through all available pages. Data entry is by the now standard means of a data wheel, four arrow keys and an Enter button, though there are now also increment and decrement buttons that do much the same as the wheel, but in small steps. Holding down one of these keys while pressing the other causes the value to change at a constant rate until the buttons are released.

The Scene Memory buttons will also be a familiar sight to all Yamaha digital desk users and comprise Up/Down buttons plus Store and Recall buttons. Up to 99 Scenes can be stored and any externally controlled dynamic automation sequence must also start from a Scene, as that defines all the starting parameters of the mix. Placing a MIDI Program Change message at the start of the track to recall the appropriate Scene helps avoid confusion and also resets the start values when you play the track from the beginning. Scenes store all the fader, aux and buss levels, phase switch and attenuator settings, channel delay and dynamics settings, EQ and pan settings, channel routings, fader groups and channel linking. These settings are also stored along with the Scene title and fade time, the effects settings and the I/O routing library Patch number. As with earlier systems, Scene settings can be made to crossfade from one to another (not routing of course — now that *would* be weird!). Note that any routing changes made when setting up a Scene must be saved to the Patch library, otherwise they will not be recalled correctly when that Scene is revisited.

Below the data wheel is the Stereo In section, with a button that selects between controlling Stereo In channels 1/2 or 3/4. Below this are two sets of Select, Solo and On buttons, as well as rotary encoder-type level control for the two selected inputs. The Stereo In sources are configurable, but might best be used as effects returns, as their level is controlled by knobs rather than faders. They have the same output routing as all the other channels, except that they can't be set up as direct outputs and can't be assigned compressors. Below this section are the eight user-definable keys.

For adjusting EQ settings, there are four buttons corresponding to the four EQ bands, plus three rotary controls addressing Q, Frequency and Gain. These reside in the Selected Channel section to the right of the display, along with a Pan control, and relate to whichever channel is currently selected. Each channel has its own illuminated Select, Solo and On buttons. A master Solo warning LED shows when one or more channels are soloed, while an adjacent Clear button switches off all Solo buttons in a single action.

Surround Facilities

Yamaha were one of the first console manufacturers to include surround support as standard and, although the 01V96 has no dedicated facilities for monitoring surround, ▶

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- 01V96 digital mixer, £1729

ANALOGUE MINI-YGDAI INTERFACES
- MY8AD96 eight-channel 24-bit/96kHz analogue input card, £359
- MY8DA96 eight-channel 24-bit/96kHz analogue output card, £329
- MY8AD24 eight-channel 24-bit analogue input card, £289
- MY4DA four-channel 20-bit analogue output card, £209
- MY4AD four-channel 20-bit analogue input card, £209

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- MY16AE sixteen-channel AES-EBU I/O card, £449
- MY16TD sixteen-channel TDIF I/O card, £299
- MY8AE96 eight-channel AES-EBU 24-bit/96kHz I/O card, £369
- MY8AE96S eight-channel AES-EBU 24-bit/96kHz I/O card with sample-rate conversion, £479
- MY8AT eight-channel ADAT I/O card, £219
- MY8AE eight-channel AES-EBU I/O card, £209
- MY8TD eight-channel TDIF I/O card, £209
- MY8mLAN mLAN interface card, £379

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ST IN 1/3
ST IN 2/4
USER DEFINED KEYS
STEREO

▶ there's a surround page that enables you to configure the buss outs to carry the surround mix components. These may be routed to any of the available outputs for monitoring or recording, with a dedicated option to route the front left and right feeds to the console's stereo outputs. If you wish to record the surround mix to an ADAT-compatible device, you can have record outs and surround monitoring outs available at the same time by using the analogue outputs as monitor feeds. Using fader grouping to group the buss faders used for the surround mix would enable all the monitor levels to be adjusted using a single fader, which is useful when you're using active monitors.

Various surround modes are included, supporting what Yamaha call 3-1 (I'd call it 4.0 as it comprises three front speakers, one rear and no subwoofer), 5.1 and 6.1 (like 5.1, but with a rear centre speaker as well). Surround panners are available on screen, but, as there's no surround joystick for panning, you either need to set up a static position using the virtual joystick on screen or pick from a list of preset surround pan trajectories. These are controlled from the data wheel, where you can adjust the rate of panning, width, depth and offset in both left/right and front/back directions. An on-screen control allows the LFE (subwoofer) level to be set, and there's also a divergence control that determines how centre-panned sounds are balanced between the centre speaker and the left/right speakers. Because dynamic panning is accomplished using the data wheel, it is necessary to record pan movements into a sequencer to achieve dynamic panning of more than one channel (or linked channels).

Overall Impressions

During this review I had to keep reminding myself that the 01V96 is a replacement for the entry-level 01V and not an updated 03D less the automation. Having used Yamaha mixers before, I found navigation relatively straightforward, though there are a lot of preferences and routing options that you may need to set up before use if the straightforward default routing isn't suitable for your needs. Having said this, the manual is very clearly written and *Studio Manager* makes setting up and library management considerably easier. Nevertheless, I'm surprised that Yamaha didn't go the extra mile and include dynamic mix automation capability in *Studio Manager*, as that would have been rather more friendly and easier to edit than automating via a sequencer.

The quality of sound available from the new preamps is definitely better (and quieter) than from the old mixer range, which is hardly surprising, as all the preamps in the new range are now versions (simplified in various ways) of the preamps used in Yamaha's new high-end consoles. You may still get better performance from a really good external preamp, but there's nothing about these preamps to worry about in typical studio applications. The effects quality has also moved up a gear, and having four processors available at 'real world' sample rates should be more than enough for anyone.

So why would you choose the 01V96 over a straight analogue console, given that there's no on-board automation? Part of the answer has to be the UK price, and when you factor in the value of the four excellent effects processors, the mixer almost comes for free. The ability to recall static mix snapshots and routing setups is also something you can't do with an analogue desk and, of course, an analogue desk won't let you connect up to 24 channels of ADAT using lightpipe — and going optical means no ground loop problems. The 16 faders should allow you to control a typical 24-track mix in real time without constantly flipping between layers, given that you'll probably want to group the drums and that some tracks won't need their levels adjusting.

In the computer-based studio, the 01V96 can function as a central monitoring controller, a signal router and a DAW hardware controller as well as giving you a means to integrate two-track and multitrack hardware recorders into the system. It has enough input capability to mix multiple channels of computer audio with MIDI hardware instruments, and it provides a cost-effective means of routing and monitoring surround mixes. The high-quality effects help take the load off your plug-ins, and in the case of reverb, the quality is likely to be considerably better than a typical native reverb plug-in. Similar benefits derive from having comprehensive dynamics on every channel. The high-quality mic amps provide a clean way into your system and, if you fit an mLAN card, the mixer can become the audio interface in any studio based around a computer with a Firewire port. Furthermore, sequencer users can use a track to record mix data, giving them the benefit of full dynamic automation, where the mix moves get stored with the song.

To sum up, the 01V96 may be Yamaha's entry-level digital mixer, but its sound quality and facilities are anything but entry level. The only advanced feature it lacks is onboard automation, but in all other areas, including I/O count, it exceeds expectations while remaining very affordable. SOS

Effects Processing

As far as I can tell, the effects chip here is the same one used in Yamaha's latest generation of hardware effects units, and the quality of effects is a definite step up when compared to the 03D and 01V. The reverbs are particularly strong and have 14 editable parameters, which is a sensible compromise between flexibility and ease of operation. The reverb algorithms are mainly mono-in/stereo-out and include the ability to balance early reflection and reverb tail levels, something I find particularly valuable. There's also a dedicated early reflections algorithm for creating ambience effects.

The remaining algorithms cover all the usual delay and modulated delay areas, including Yamaha's famous Symphonic chorus, plus there's auto-panning, tremolo, pitch-shifting and rotary speaker emulation. If you like your 24-bit, 96kHz audio to sound nasty, you have ring modulation, resonant filtering and distortion at your disposal, as well as amp emulation, plus a host of dual effects, several of which combine either reverb or delay with other effects. The delays include a facility for setting delay time by tempo, while the Freeze sampler can be triggered manually or via input signal level. The sample may also be looped and the number of loop playbacks specified. Additionally, there's a true stereo reverb and a stereo three-band dynamics processor that offers simultaneous compression, limiting and expansion.

Here you can see the range of editable parameters available for one of the 01V96's internal reverb algorithms, as presented in *Studio Manager*.

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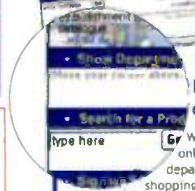

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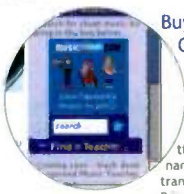

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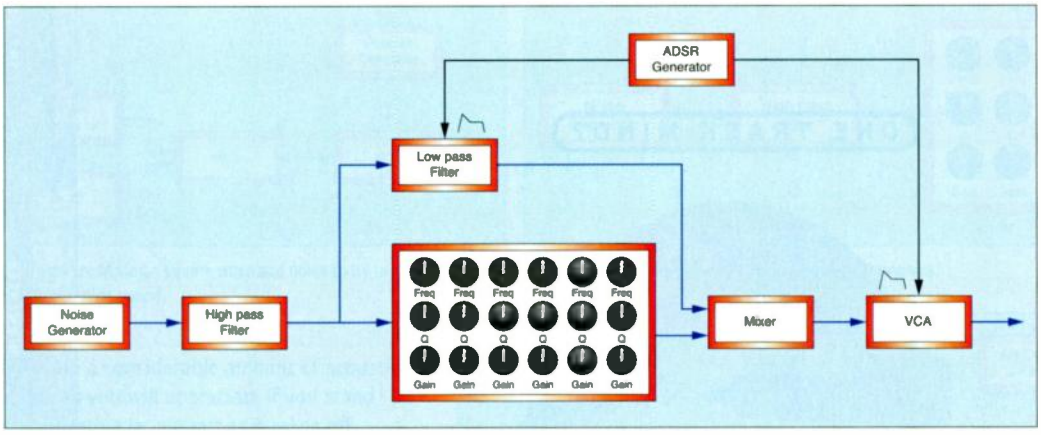

Figure 14: Creating the chiff and breathy elements within the sound.

▶ Attack-Decay-Sustain-Release) envelopes, inserting a tiny delay before the onset of the Attack phase. Unfortunately, few synths have these envelopes, but we can get away with a simple ADSR if the Attack value is carefully chosen. Figure 15, below, shows how the two contours combine the wave and the noise into the composite sound.

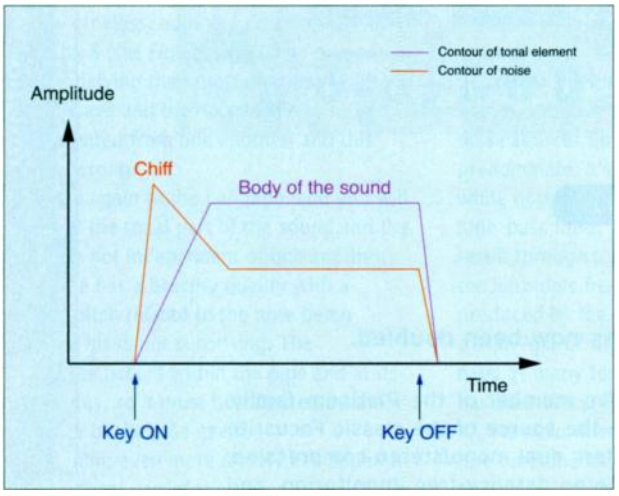

Figure 15: The contours for the noise signal and the pitched signal.

Refining the pitched sound still further, a bit of modulation wouldn't go amiss, so we'll add an LFO to create vibrato, and then a wheel to control its depth. In fact, let's go the whole hog, and patch some vibrato, tremolo and a little bit of filter modulation simultaneously. But, contrary to everything we have learned about natural sounds, we'll invert the amplitude modulation so that, as the filter opens, the gain is reduced, and vice-versa. This seems odd, and I wouldn't have tried it had fellow *SOS* contributor Nick Magnus not bullied me into it. Nevertheless, it seems to work well, keeping the total amplitude steady as the filter opens and closes. I have shown all of this — the filtered square wave, the envelope, and the modulation — in Figure 16, at the bottom of the page.

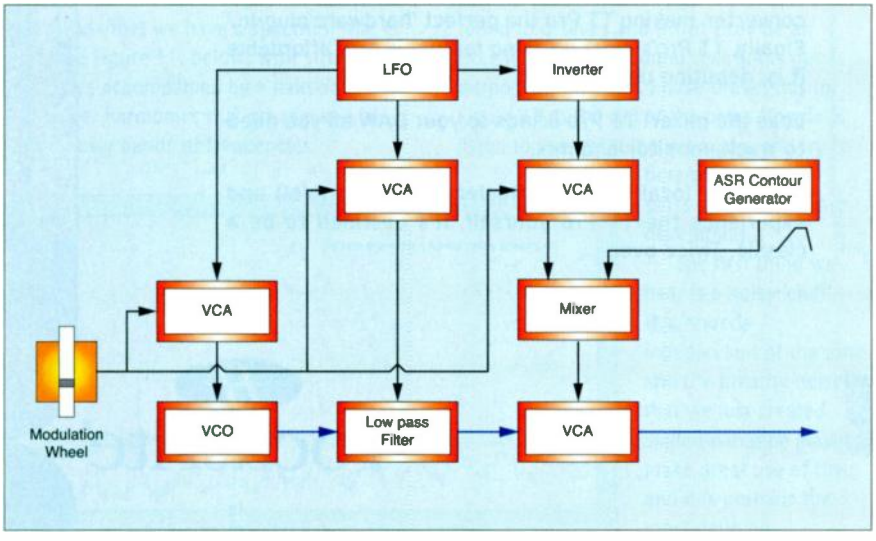

Figure 16: Shaping and modulating the tonal elements of the sound.

Figures 14 and 16 contain almost everything we need to produce the single note produced by one pan pipe. However, a single note is not of much use unless you're into minimalist Andean avant-garde music. So we need to add some control signals that will make the patch work over a range of notes. We'll provide these from a conventional CV+Gate keyboard, but keep the following points in mind as we patch it in.

Firstly, it's vital that the oscillator in Figure 16 and the formant filters in Figure 14 track the pitch CV together. If they do not, the two elements of the sound will disassociate, and ruin the illusion.

Secondly, it's important that the keyboard offers multi-triggering. This ensures that the chiff occurs at the start of every note, even when you play legato.

Thirdly, I'm going to add an attenuated pitch CV to open the filter in the lower signal path, allowing us to make the signal brighter as the pitch rises, but not necessarily in a 1:1 relationship. This is, of course, variable keyboard tracking.

Next comes something we've not tried before in Synth Secrets, and I'm again indebted to Nick Magnus for suggesting it. If you refer back to Figures 9 and 10, you'll remember that the oscillator signal and the noise signal failed to form a composite sound. We overcame this in Figure 14 by tuning the noise to the harmonics of the square wave, but we can do even better.

Applying noise to the CV input of the low-pass filter shaping the square wave signal adds a rough edge to the sound. It's noise, but with a very different character to that obtained by adding audio-signal noise using a mixer. What's more, you can manipulate the tone and amount of this noise using a graphic EQ or 'fixed filter bank', so that it sculpts the sound in desirable ways. If you make sure that the noise in this part of the patch is at predominantly high frequencies, and apply just a little to the filter CV input, it works a treat.

Right... now we're ready for Figure 17, over the page.

Despite these refinements, the sound is still somewhat artificial in nature. With a MIDI keyboard that accepts a breath controller, plus a suitable MIDI/CV converter, you could animate the patch in ways that are not possible with envelope ▶

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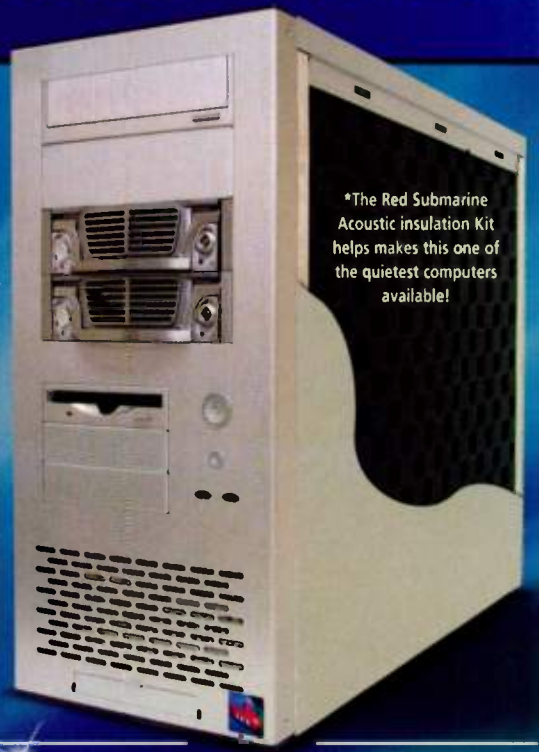

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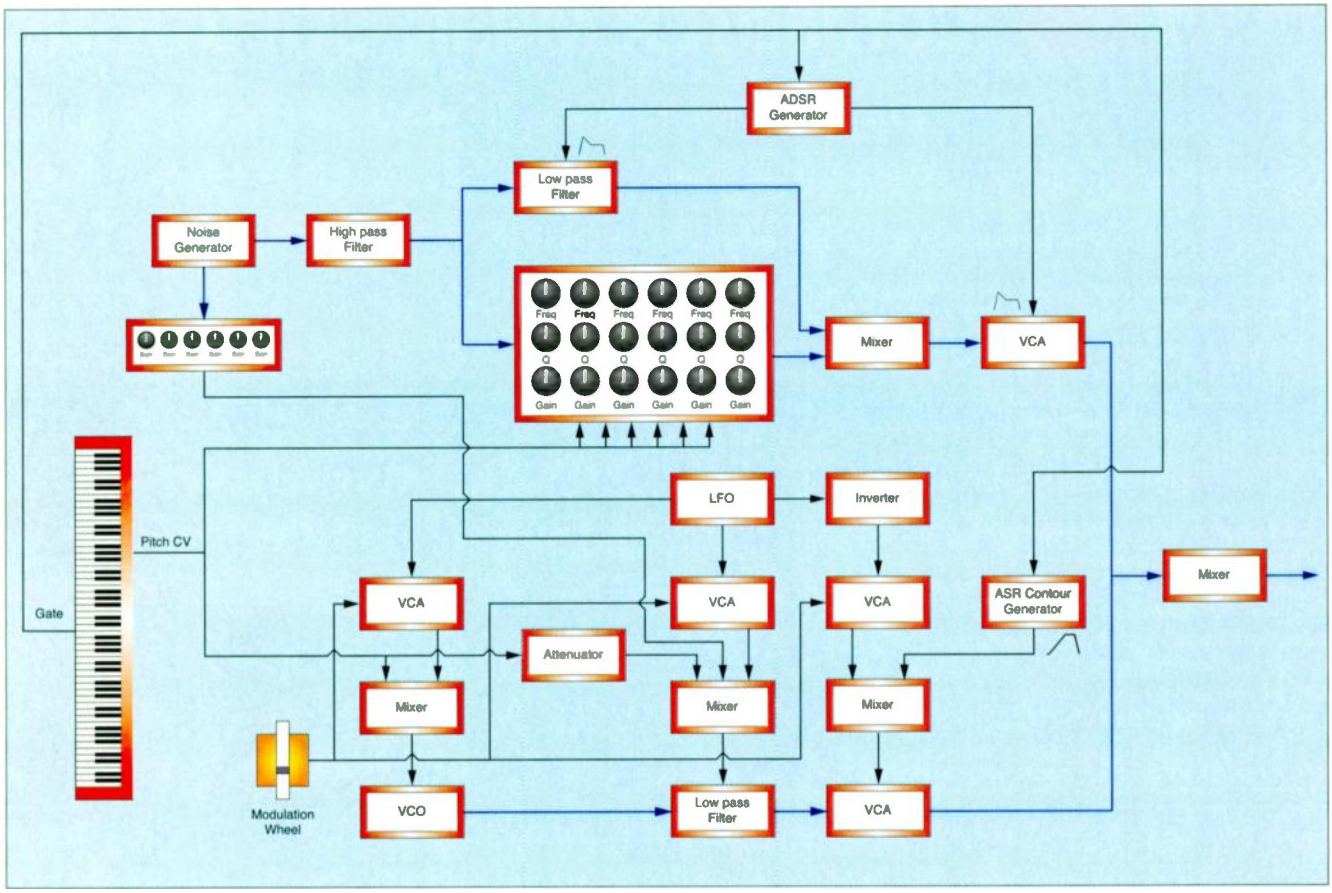


Figure 17: The pan pipe patch.

▶ generators and LFOs. You could improve matters even further by replacing the keyboard, modulation wheel and breath controller with the Ondes Martenot discussed last month. What do you mean, you don't have an Ondes Martenot? Oh well, there's another good solution...

In the hands of a skilled player, a real pan pipe exhibits a great deal of pitch bend, as well as vibrato and tremolo. So — instead of using an Ondes Martenot or breath controller — our final development involves replacing the modulation wheel with an X/Y joystick, and patching it so that the Y axis provides control over modulation depth and the X axis provides pitch bend. For clarity, I have shown the relevant part of the patch in Figure 18, below, and incorporated it into the final diagram, opposite, as Figure 19.

If you've set the controls of each module appropriately, this patch now sounds very much like a pan pipe. In fact, it sounds more like a pan pipe than I would have thought possible before I developed it. It's true... Figure 19 is not just theory; I created it using one of my analogue modular synth systems, and it sounds superb.

But you can go still further. For example, if you're programming on a modern computer-based software-synth package such as NI's *Reaktor*, or a hardware/software system like Clavia's Nord Micro Modular, you can make the attack velocity sensitive, which proves to be another huge improvement. You could also patch the joystick's pitch bend to amplitude, and there are other flourishes that would add performance and realism to the sound. But, however you choose to complete the patch, just add a judicious sprinkling of reverb and... *hola*, *amigos*!

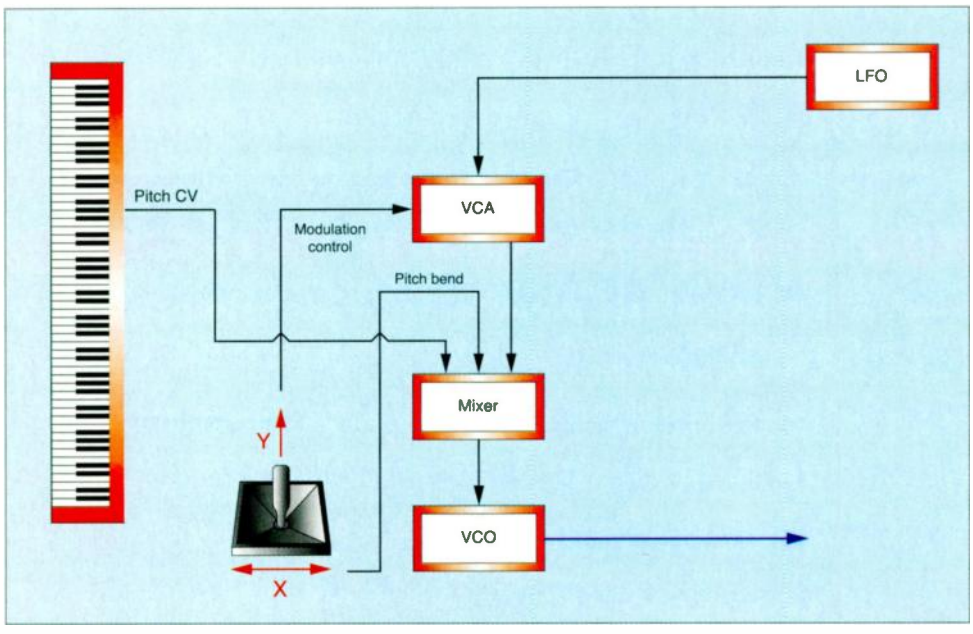


Figure 18: Using a joystick for added realism.

Epilogue

I have looked through the patch

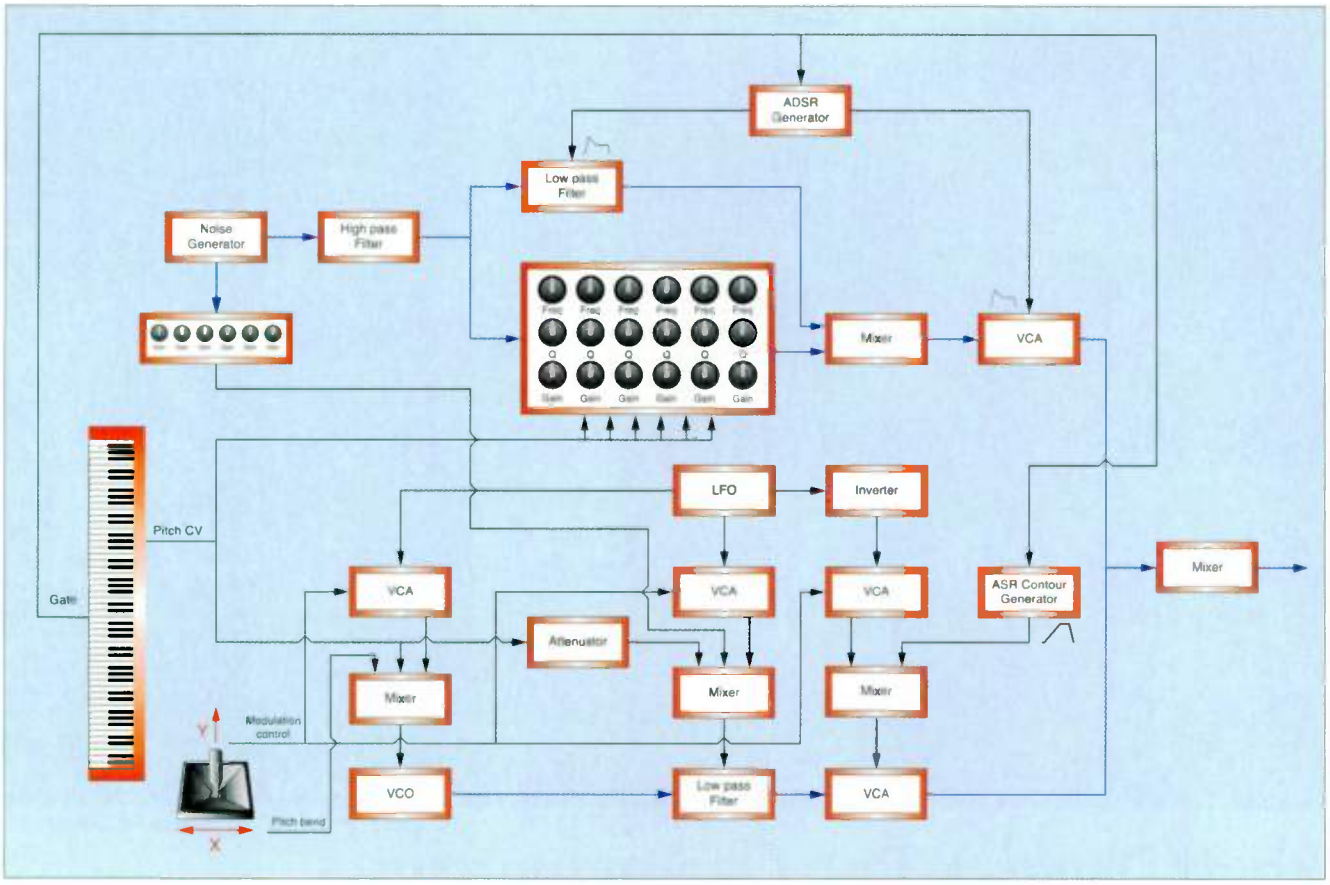


Figure 19: One more time, with feeling.

books supplied by ARP, Moog, Roland, Korg and others, and despite a wealth of flute patches, I could find no pan pipes. Yet here we have a remarkable patch that requires just four voltage controlled filters, a formant filter, a fixed filter bank, an oscillator, a noise source, seven VCAs, four contour generators, a bunch of mixers and multiples (which I haven't even shown), a joystick, and... Ah yes, I see the point. Pan pipes may be straightforward to synthesize in software or on something the size of a small wardrobe, but their instantly recognisable 'breathy' sound is not going to emerge unscathed from a Minimoog, Odyssey or SH101. Nonetheless, orchestral flutes pour forth from basic synths. Despite the increased mechanical complexity of the flute, its sound must be simpler than its predecessor, the pan pipe. So, next month, we'll create some patches that you'll be able to try on almost any synth. Until then... SOS

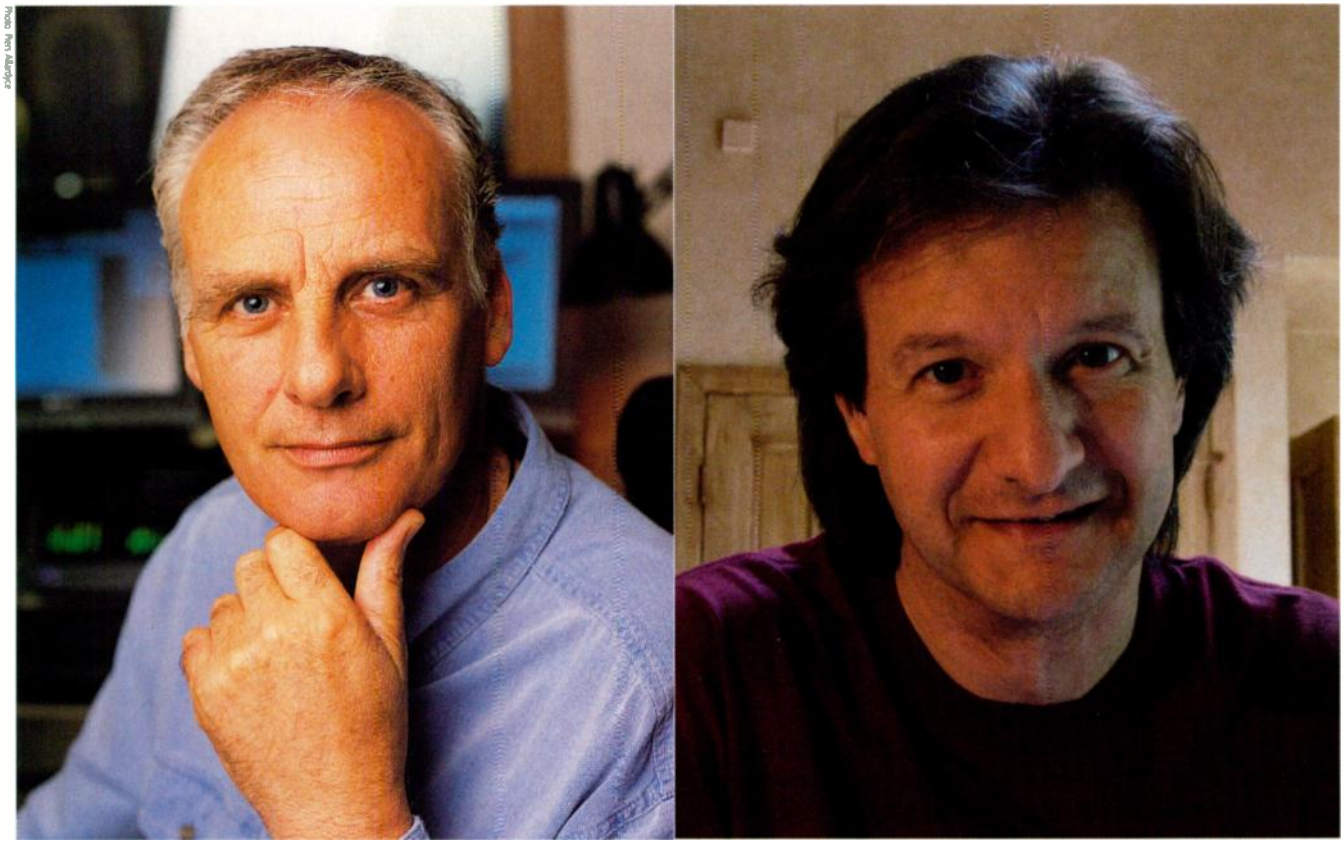


Photo: Mary Murphy

Rhett Davies & Bob Clearmountain.

Rhett Davies & Bob Clearmountain: Producing & Remixing Roxy Music's *Avalon*

Avalon

"When we originally mixed *Avalon* in stereo, I was thinking that it should be in surround," says Bob Clearmountain. Twenty-one years on, he and producer Rhett Davies describe how they first made Roxy Music's classic album and how they finally got the chance to mix it in 5.1.

Sam Inglis

"This record probably means more to me than anything I've ever done," says Bob Clearmountain of Roxy Music's last, and most successful, studio album. "I've had more comments and compliments on this album by far than anything else I've ever done."

When you think just how many hit records Clearmountain has mixed, that's quite a distinction for Bryan Ferry and his band. It's now 21 years since *Avalon* was released, and Virgin have marked its coming of age with the seemingly obligatory surround remix. In keeping with their policy of hiring the original producer and mix engineer where possible, they asked Clearmountain and producer/engineer Rhett Davies to handle the 5.1 remix. Working from digital copies of the original 24-track tapes, they remixed it for Super Audio CD at Clearmountain's LA studio.

Back In The Day

Both Davies and Clearmountain began their association with the band during 1979's *Manifesto* album. "They were in the middle of making *Manifesto*, and the engineer working on it was Phil Brown, one of the house engineers at Island, who I'd learnt my trade through," recalls Rhett. "He had to go into hospital, and they asked me to stand in for a couple of weeks until Phil was well again, and that was it. I kind of got stuck there. We went to America to do some overdubs and mix at Atlantic Studios, and then Bob Clearmountain did a remix of 'Dance Away', and that was the first time that Bob had got involved."

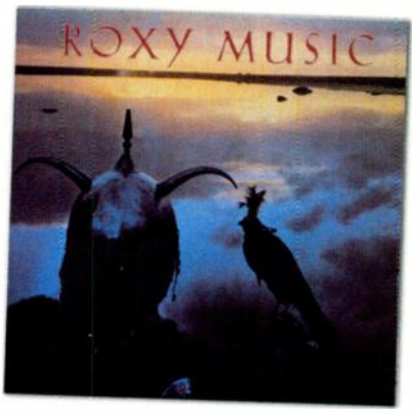
"I had worked with Chic, and that was on Atlantic Records, so I got a reputation over at Atlantic for doing R&B stuff and dance mixes and stuff like that," explains Bob. "The Stones and Roxy Music were interested in more of an R&B sound, and I guess my name must have come up somewhere along the line."

Clearmountain made an impact straight away with his remix of 'Dance Away': "They said they wanted an R&B type of thing, but I remember at the time the drums weren't doing the right thing. The bass drum wasn't consistent enough, so I actually brought in a New York drummer to just play bass drum, and we added some percussion. Then the

song wasn't structured right. It was verse, chorus, verse, middle eight. [*Legendary Atlantic boss*] Ahmet Ertegun came over and he said 'Where's the second chorus? You've got to have another chorus in there.' I didn't know Roxy Music, I'd never met any of them, and I was thinking 'How can you mess with their song?' But we put the second chorus in and they loved it."

Synthetic Grooves

Davies, meanwhile, brought with him the experience of working with Brian Eno on groundbreaking albums like *Taking Tiger Mountain* and *Another Green World*. As a result, he was able to introduce Ferry and the band to a completely new way of writing and recording their material. "Eno had opened me up to the way of working where you walk in with a blank sheet, stick some white noise down, count one to 100 and then fill in the spaces, and it was great working that way. Sometimes at the end of the day Eno would just turn round and say 'Stick all 24 tracks into Record and get rid of it, I hate it!' — which was tough to do — but most days we'd come out with something. When I started working with Roxy Music and with Bryan Ferry, Bryan had only known the 'let's cut the track with the band in the studio' approach, and I think he was searching for certain feels in his music which he wasn't getting from the studio floor with live musicians. I said 'Well, there is another way of working. We can put down our groove exactly as you want it synthetically, using a rhythm box, and the musicians can then play to that groove.' So, at all times, Bryan had the atmosphere or the feel of the track that he wanted, and we found that a good way of working. The musicians came in and, rather than trying to create something, they responded to the atmosphere that was already on tape."



Manifesto and the subsequent *Flesh & Blood* album were both recorded in this fashion, and *Avalon* proceeded likewise. "We started off down at Phil Manzanera's Gallery Studios in Chertsey. We started with a blank sheet; there weren't any songs. Phil might have had some chord sequences or musical ideas, and Andy would have some tunes that he'd written, which he'd present to Bryan, and Bryan would play around with them to see if there was any work he could do. I would then spent time with Bryan alone, writing. It didn't take that long — we'd go in in the morning and I'd get a groove going to get something happening that Bryan could walk into, and hopefully he'd be inspired by it."

With work well under way on the basic tracks, Davies and the band decamped to Compass Point Studios in Nassau for a month. Here they continued to build up musical backing tracks based around rhythms from a Linn Drum. "The Linn Drum hadn't been around for *Flesh & Blood* — we were using Roland CR78s and stuff like that — but it was the main rhythm machine on *Avalon*. Sometimes I'd be programming to a chord sequence and we'd say 'We just need a click track,' and then on other days I'd be driving into work and hear a Talking Heads track or something, and I'd think 'What a great groove that is,' and I would go in and do my version. Then Bryan, Phil or Andy would come in and go 'That's pretty good, let's try...' and it would evolve from there."

Finishing Touches

By the time band and producer headed to the Power Station in New York to finish the album with Bob Clearmountain, it was still a long way from being complete, lacking as it did lyrics, vocals, and live drums. "It was all done either with a drum machine or with drums that they wanted to redo," says Clearmountain. "A couple of the songs had the final drums on them, but the rest of them we overdubbed Andy Newmark a couple of days before we mixed, and then we did percussion as well, with Jimmy Maelen. And Bryan was doing vocals right at the last minute, as well. He'd only just written the lyrics. Most people didn't work like that. The drums were usually the first thing, at least back then!"

"On a couple of tracks, on songs like ▶

Stairwell To Heaven

"When we remixed the *Avalon* album at Bob's studio in Los Angeles, the biggest task that we had was to recreate the Power Station reverbs," says Rhett Davies. "The first time we stuck it on and we were listening to it over there we both went 'Jesus Christ, there's so much reverb on this!' It was scary, but it fits the mood of the album. The main thing at the Power Station was the stairwell. They had an enormous stairwell which was miked up, and had an unbelievable sound. You'd put anything through it and you'd just go 'Yeah, we've got to have that.'"

"It was a magnificent-sounding long reverb," agrees Bob Clearmountain. "It was a 75-foot stairwell with a beautiful sound, and trying to recreate that was difficult. It was about four seconds, depending on how humid it was that day. I think we had a big roll of fibreglass if we wanted it smaller, but for that record we just kept it wide open. It would change a lot depending on the weather. If it was a really humid day you'd get an additional second or so on the reverb time. The more moisture in the air, the better the sound can travel and the further it goes — moisture's a really good conductor of sound. We had a couple of AKG 451s in an X-Y pattern in the middle of that space on a tall mic stand, it was very stereo, and the speakers were two flights down pointing downwards, so there was no direct sound at all. It was an interesting sound, because the top end would gradually roll off before the middle. I've studied it quite a bit, because I used it so much in the '80s, so that made it easier to duplicate, because I knew that if I put a mid-rangey reverb at four seconds and then a brighter reverb at two seconds I could make it work."

Recreating the Power Station's stairwell might sound like the ideal job for a sampling reverb such as Yamaha's SREV1, but there's a snag: it doesn't exist any more. Instead, it took a lot of hard work from Bob Clearmountain. "I had four different digital reverbs, plus I have two live chambers in the studio — they're pretty small but they're quite nice-sounding — so I just got different combinations and worked for hours to make it sound really similar to the Power Station reverb. What was interesting was that on the first track that we mixed, I was able to do that, and then on the next track, I figured 'Oh great, now I have that down, I'll just use it again' — but it would be totally different. There'd be some other instrument, I'd put it in there and it wouldn't sound anything like the original. Then I'd have to go through the whole thing again, I've no idea why.

"Instead of thinking literally about the size and shape of the original, which I knew quite well because I helped to build it, it was more a question of imagining the space in the particular piece of music. I thought of it as an imaginary environment, and it was a lot easier to duplicate that way. I have a couple of Yamaha boxes and some Lexicon boxes and knowing what they do and how they react to particular sounds, I just moulded it. Like a painter would know that certain colours give you a certain type of effect."

Even when working in surround, however, Clearmountain tends to stick to mono or stereo reverb patches. "I don't really use a four- or five-channel reverb. I've tried them, and they just sound bland to me. It's like a synthesized four-channel effect that sounds like it's everywhere instead of being somewhere. I'll use two PCM70s that are stereo front and rear left, and front and rear right, and then I can cross those, send one thing from the left over to the right side, or localise things. You can do a lot more with creative use of mono or stereo effects in surround. It gets a lot more interesting."

'India', the Linn Drum parts are still the main thing," adds Davies. "To say we replaced them on the other tracks isn't exactly true. On some we did; Andy Newmark was drumming to a full-sounding track with a full drum program on there, so it freed him up to a large extent. In some cases it was a straight replacement — he'd replace that groove and add a feel to it. In other cases we would keep the more percussive components of the Linn pattern in the final mix, and just take out the kick and snare and hi-hat, which would be replaced by the real drumming. You could never say what combination was going to work. Sometimes Andy would go out and just do tom and cymbal overdubs against what we had.

"By and large, if we recorded a kit, we used it. We'd generally get a full kit pass, and then we'd do additional tom fills and overdubs. We got a great drum sound at the Power Station — it was a totally wooden room to mic up in, and that's part of the sound of that record. We did use a room sound, it wasn't all close-miked. We weren't really worried about the separation; if it felt right and sounded right, that was good enough."

Beginning with musical ideas and grooves rather than complete songs had freed Roxy Music from some creative restraints, but it also had its down side. Unsurprisingly, a fair amount of material went to the wall. "We would cut a lot of stuff that never got used, a lot of trials that Bryan just couldn't work into songs," says Rhett. "If you're just starting with an instrumental, there's going to be times when you just think 'I can't write a song for this.' When he eventually did write a song, we'd then have to slow the tape down drastically, or speed the tape up drastically to get it to a key that he could sing it in. Most of the time we'd get by with it like that — when we went to mix the album at the Power Station we were talking about varispeeds of a whole tone, which they'd never heard of before. They had to realign the machines.

"With the 'Avalon' song we had to recut the entire song right at the end of the album. We were actually mixing the album, and the version of the song that we'd done just wasn't working out, so as we were mixing we recut the entire song with a completely different groove. We finished it off the last weekend we were mixing. We put some percussion on and some drums on, and then on the Sunday, in the quiet studio time they used to let local bands come in to do demos. Bryan and I popped out for a coffee, and we heard a girl singing in the studio next door. It was a Haitian band that had come in to do some demos, and Bryan and I just looked at each other and went 'What a fantastic voice!' That turned out to be Yanick Etienne, who sang all the high stuff on 'Avalon'. She didn't speak a word of English. Her boyfriend, who was the band's manager, came in and translated. And then the next day we mixed it."

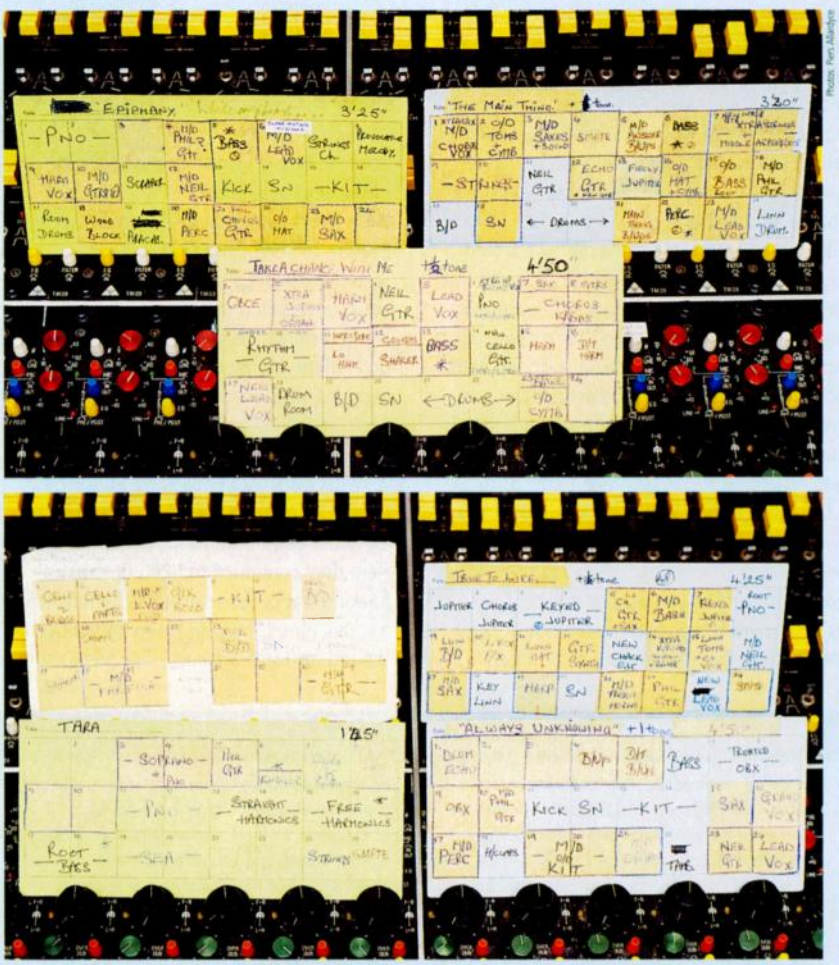
"The record was so well produced and well put together that it wasn't difficult to mix at all," says Clearmountain. "In fact, for the most part we did two songs a day — and that's an eight-hour day, because the Power Station at that time wouldn't let you lock out the studio. They always insisted that each room had a day session and a night session, so you had to start from scratch the next day."

Surround At Last

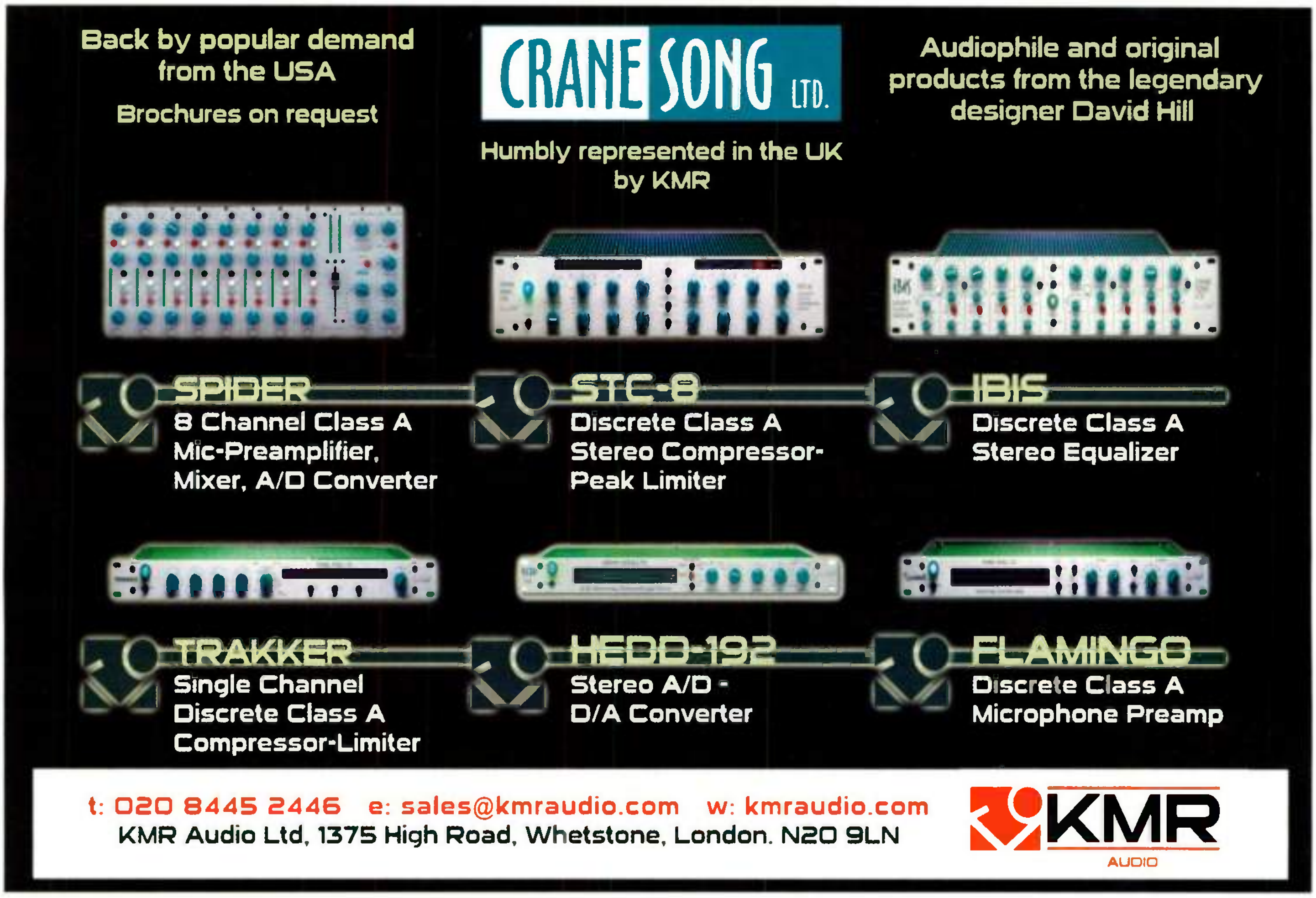
On its release in 1982, *Avalon* soon took up residence at the top of the UK charts, and also became the band's most successful album in the US. The CD version has already had the remastering treatment at the hands of Bob Ludwig, who'd mastered it the first time around; and, as one of the most important albums in Virgin's back catalogue, it was an obvious candidate for remixing into surround. "The interesting part to me was that when we originally mixed it in stereo, I was thinking that it should be in surround," says Bob Clearmountain. "I was wishing that I had more channels to pan things to, and I imagined it being like that. It's that type of a record, it

Keeping It Tidy

"These are my original track-sheet cards for *Avalon*," says Rhett Davies, producing an evelope full of battered pieces of card, many of them thick with layers of gaffer tape. "I used to cut gaffer tape as I would comp things and bounce things and move things around so I'd got them just how I wanted them, then that track would get moved, and some of the gaffer tape is a quarter of an inch thick! To me, losing a generation of quality of something on tape wasn't of prime importance. Getting it to sound right was. If it meant that I had to lose quality to get the sound that I wanted then I wasn't frightened to do that. I'm a very tidy person, and I like to have everything organised and cleaned up. If there's stuff we don't want, erase it, get rid of it. Don't have it sitting around creating confusion later on. Once we got into 48 tracks, as we did on a couple of the songs, then you've got some decisions and choices. When we were remixing it, Bob and I had to go back and check the record a few times, and think 'Oh, we cut that out in the second verse, that isn't there.' That's when it started to move towards keeping everything, which makes it a lot more complicated and time-consuming."



Some of Rhett Davies' original track sheet cards for the *Avalon* album.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The SSL G Plus desk in Bob Clearmountain's studio has had several modifications to make it more suitable for surround mixing.

▶ really lends itself. When surround first started one of the first things I thought was 'I'd love to mix *Avalon*,' because I knew there were so many interesting production elements on the album."

Rhett Davies was more apprehensive about the project: "When I was first approached by Sony with the idea of remixing *Avalon* into surround I had my apprehensions about it, I must admit. I thought 'You don't f*ck with things like that.' I was a little worried, but when it was confirmed that the original stereo mix would be on the SACD as the first layer, then I thought of it more as a challenge. I thought 'If people buy it, they'll get the original stereo mix in the best possible quality, and we've got a chance to see what we can do with it in surround, which will be fun.'"

The ideal would probably have been to have worked from the original analogue multitracks, but these had been recorded on the wrong type of Ampex tape, and were in no state to be used 20 years later. Fortunately, however, they had been baked and their contents transferred to Sony digital open-reel tapes before the deterioration became terminal. From the Sony machines, the tracks were mixed into surround in the analogue domain using Bob Clearmountain's SSL mixer, with the surround mixes being recorded onto Sony's dedicated multi-channel DSD recorder.

"I don't think the sound quality in DAWs is as good as an analogue desk," insists Clearmountain. "It might not be true of the more high-end digital systems like the new SSL or Euphonix desks, but Pro Tools is still not very high quality. The converters in the new HD systems are a little bit better, but the mix buss is still fixed-point. As soon as you do any processing in Pro Tools you're degrading the signal and I hear that. When you do level changes, pretty much anything, it tends to degrade and you lose depth, you can't really get that type of depth perception that you get from a really good analogue desk like an SSL G Plus or a J-series. You notice it right away, as soon as you push the faders."

Mixing For The Future

Analogue mixing may preserve better sound quality, but working on a desk that's not designed for surround can be very restrictive. However, Bob Clearmountain had already worked out how to make his SSL G-series suitable for the task. Forty years ago Bill Putnam had the foresight to record in stereo at a time when most record labels were only interested in mono; now Clearmountain is taking the same approach to 5.1 surround. "Everthing I've mixed for the last two years I've done also in surround, even though it's usually just stereo mixes that people want," he explains. "It was actually my wife's suggestion. A few years ago she said 'You should be mixing everything in surround.' I was like 'My God, how am I going to do that?' But I sat down and thought about it for a minute and I realised that there were some factory modifications that I'd had done when I ordered my SSL desk which facilitated being able to do both at the same time quite easily.

"It has what they call the Bluestone mod. I don't know where they got the name from, but it's actually more for facilitating the use of eight-channel headphone mixers for musicians, so that each musician can do his own eight-channel mix. It's a 32-mix buss console and they've taken the last eight and sent them from a send on the channel. So instead of a front-back panner, they've converted that into a send to these eight additional busses. Normally, there's a bunch of effects I would send from the multi-channel busses like delays and additional reverbs and stuff like that — I use them as aux sends off the small fader — but for the surround mixes I'm using the multi-channel busses for the surround matrix, for getting to the surround channels, so I no longer have that to use for additional effects. So this mod gives me eight additional aux sends really, that's what it amounts to.

"The desk has eight stereo patchable

Printed Matter

One feature of Rhett Davies' production style that surprised Bob Clearmountain when they first worked together was his willingness to print effects to tape with instrument recordings. "Generally speaking, and this applies to *Avalon*, if we were working on a particular sound and that sound had a delay or a reverb, I would print that with the signal. I love delays. We used the Roland Chorus Echos a lot, and I still do today, I love them. Quarter-note triplet delays are my favourites. Anything that creates cross-rhythms is what I was always looking for, so if we were working with a rhythm box, I'd always be experimenting with delays, just to create something more than the plain thing that was there. Obviously it depends on the instrument, but if you're talking about basic backing-track instruments then you're trying to create something.

"My concept was always that anybody could put the track up and push the faders up and it would sound as it's supposed to sound. When we mixed *Flesh & Blood*, Bob couldn't believe it, because nobody printed delays with the signal. If it was something like the lead vocal, I'd print that to a separate track, but we were still working on 24 tracks, and if it was a guitar and that was part of the sound it got printed. Roxy enjoyed working that way, because there's nothing worse than thinking 'It doesn't sound as good as it did last week, what's different? I'm sure that's the same setting.' This way, it's always there, and it makes a faster way of working. I could put a track up in a minute and it was ready to do an overdub, so if we had musicians coming in that we wanted to try on two or three songs, it was really fast just to change the tape, and the song was ready to go. I also always used to try to keep an instrumental rough mix on tape as a working mix, so you could just whack up two faders and it was there."

VCAs, which I usually don't use very much, but through a very simple mod I was able to link the stereo compressor to those eight patchable VCAs, and then I use those for my six-channel mix compression. So as long as I have a stereo mix running, the six-channel mix will compress the same. It's like a side-chain off the stereo compressor. It's a really simple mod, you just need a little buffer amplifier in there. I had been trying to find a really good six-channel compressor, and I couldn't find an analogue one anywhere. There were only digital ones, and I didn't really want to go through another digital process. I compress my surround mixes the same way I compress the stereo mixes, just because I like that particular sound, it makes the mix sound more exciting to me and more fun to listen to — but not to the point that some mixers do it, and probably less than if I was going for a strictly commercial single. On *Avalon* I didn't compress it very much, not like if I was doing the next Kylie Minogue single or something like that."

One potential limitation remains: with only faders and pots to control pan positions, smooth motion panning around the surround field can be difficult. "I don't do a lot of that because I sometimes find it distracting," says Clearmountain. "Occasionally I will do it, and there's a few ways of doing it. One is paralleling to a bunch of different faders and just assigning them to different channels — turning one down and turning the next one up. The other way is actually to send something into Pro Tools and use Pro Tools as a panner. I'd rather not do that, but at a pinch that will work — I take a four- or five-channel output out of Pro Tools and then use the panner in there, then I can program it any way I want. I tend to do more things with cascading delays. On *Avalon* there's a few places where you'll hear something in the left rear and it'll delay to the left front and then to the right front and the right rear, things like that. It gives you more of a feeling of spaciousness, instead of just having things moving around.

"At first I was really reluctant to use the centre channel, because whenever I put something just in the centre, it seemed to mess the vibe up. There's something about the phantom centre in stereo, there's an illusion of some sort there that is somewhat seamless, whereas if you put the vocal right in the centre speaker, all of a sudden it sounds like it's coming out of a speaker, rather than sounding natural. What I usually do is I'll put vocals and drums and things like that in all three front speakers, but less in the centre. But then occasionally I'll put it more in the centre. Putting it at the same level, you tend to get phase problems depending on how the speakers are set up. And then occasionally I'll have the vocal in all three speakers, and put the lead guitar or acoustic guitar just in the centre, so they're both in the centre, but somehow in different places, there's a different perception of depth."

No Control

"The manufacturers of consumer gear should put a really obvious button on their systems saying Music," says Bob Clearmountain. "Most of the home systems are designed for movies, and have extra DSP built in to create some sort of theatre ambient effect, and they have automatic level controls. Those are the last things you'd ever want for listening to music. A lot of systems default to having them switched on, which means that if you play music, you get one big bass drum or tom-tom, and it kicks the level right back. It's usually buried 10 menus deep. But how are people supposed to know that? It was tough for me to find on my Sony. You get the general public out there and they're lucky if they get the speakers in phase. How are they going to know to do that?

"You really don't have much control over how things are played back. There's this whole bass management issue, which I still don't quite understand. I just know that on my Sony receiver at home, I noticed that if I didn't put anything in the LFE channel, the system made up its own LFE, and it sounded terrible. It would just take some kind of sum of the other channels and create a subwoofer channel. But when I did use the LFE channel it was just what I put in, and it sounded much better. A lot of people told me 'For music, don't put anything in the LFE channel, that's only for movies.' But then I started doing it and when I played it on my system it just sounded right, when I had control over it. But depending on how you have your system set up, that could be wrong. I just put stuff in the LFE channel and let the mastering guy worry about it!"

True To Life

"The way that Bob works, which is nice, is to build up the stereo mix first," explains Rhett Davies. "We A/B'ed it against the original album and tried to get it as close and as true to the original stereo mix as possible before we even thought about the surround. Once we'd got it to that stage, we would then open up the surround and experiment with instrumentation and panning. Bob and I said 'We're not just going to put a little reverb in the back speakers, we're going to make this something special. We're really going to play with the medium.' And we were both blown away by how well the *Avalon* album worked, technically, in surround. It seemed to use that it was made to be mixed in surround. We made it playful, but I think in keeping with the original record. We had reverbs in the back speakers as well as delays, but also we actually put instruments directly into the rear speakers as well."

"My surround mixes are basically very similar to the stereo mixes, except there's things panned in different places," says Bob. "I try to make them a bit more interesting, but it's actually the same balance, all the same rides and the same EQs. It's just that the effects are expanded and their placement in surround is discrete. And there's a subwoofer channel.

"It was as fun as it was difficult for me, and interesting, because I really had to think back 20 years. We had no notes, we were lucky to even have the multitracks. All I had was my memory and what I could hear from listening to the stereo mix. We had the original stereo mixes lined up with the multitrack, and it was a matter of thinking 'OK, what did I do there, how did I get that particular effect?' And then I'd have to think back to what I might have been doing 20 years ago. We did try to duplicate it as much as possible.

"At one point I thought 'Maybe we should just go in a different direction,' but when I did that, it didn't sound like the right album — even though if I had mixed that album today, I probably would have done it differently. There probably wouldn't be quite so many effects, not as much reverb or delay. But when I tried to do that it didn't sound right. I know the album well because I've listened to it a lot, and I'm sure the fans, people who know the record would find it uncomfortable because it would be different."

Bob Clearmountain's preference for mixing in the analogue domain is reversed when it comes to choice of recording medium. "We mixed originally to analogue, and I think digital nowadays is a better format to mix to. I know people like analogue, but I think it actually hurt it a little bit. I think it sounds better not going through that analogue tape stage and losing that extra generation. It makes it sound a bit more distant, it's like a very thin curtain in front of everything. For some things I think that helps, but for a record like *Avalon* I don't think it does."

More Than This?

Following the release of *Avalon*, nothing was heard from Roxy Music for almost 20 years, but the band recently reformed for a live tour, which was overseen by Rhett Davies as musical director. A live album from the tour has already seen the light of day, and Roxy's management haven't ruled out the possibility that a new studio album might emerge in the future. In the meantime, fans with Super Audio CD players can enjoy the fruits of Davies and Clearmountain's labours. "I feel that this is actually an extension of the original experience of the album," concludes the latter. "I sure hope people like it..." SOS

M&K CR2401 & CR480

Passive Monitors & Powered Subwoofer

Photos: Mike Cameron

A new nearfield satellite and subwoofer system for stereo or surround applications, using infinite-baffle designs for a smooth frequency response and increased phase linearity.

Hugh Robjohns

Miller & Kreisel have been making domestic and professional loudspeaker systems in America for over 25 years, with a particular interest in satellite/subwoofer combinations. The company also produce a range of specialist audiophile recordings, and Ken Kreisel — the President of the company — is both chief speaker designer and a very experienced recording engineer, so obviously has first-hand knowledge of how musical instruments are supposed to sound.

The first time I encountered M&K speakers was during my *SOS* July 2001 review of the renowned active MPS2510s and matching MPS5310 subwoofer, and I was extremely impressed with the sound quality and imaging accuracy. I was also taken with the fact that M&K recommend their various speaker systems on the basis of the size of room that they are to be used in, which makes a huge amount of sense, and I'm surprised other manufacturers haven't followed suit.

Although the M&K range of loudspeakers is already pretty extensive, both in the specialist consumer home entertainment market and in the professional range, the designers continue to develop new products. One of the latest additions is the new Creator series, which includes the two units under review here: the CR2401 passive satellite speakers and the partnering CR480 powered subwoofer. This is a physically compact system, but one more than capable of filling a modest-sized room with high-quality sound — and at a very

affordable UK price.

It might be worth pointing out that, although the review models were full production units, M&K decided to change the name of the range shortly after supplying them to us. It is for this reason that you can see different model numbers — MP2401 and MP280 respectively — in the photographs.

The CR480 Powered Subwoofer

The subwoofer cabinet is surprisingly compact, measuring just 25.5 x 35 x 28cm (hwd) and weighing 9.5kg. This is an infinite-baffle (sealed-box) design, containing a single eight-inch long-throw driver which is the same as that used in the MPS2810 powered subwoofer — although that model uses two drivers configured as a push-pull pair, instead of a single unit as employed here. The built-in amplifier is an in-house M&K design rated at a very conservative 75W (continuous power), but it is claimed to have a peak capability well in excess of 150W, thanks to a unique circuit design.

A second powered subwoofer model is also available, called the CR481. This is identical to the CR480 except that its driver is mounted inverted — the idea being that a CR480 and CR481 can be used together, side-by-side, to create a push-pull subwoofer package, very similar to the MPS2810 configuration mentioned above. The advantage of this arrangement is that the CR480/CR481 combination can be installed in small spaces where a larger subwoofer cabinet may not fit.

The front baffle is covered by a curved wire mesh grille to protect the driver, although this can be removed if required — the centre dust cap of the driver carries the M&K logo and the words 'Discover Deep Bass' — nice! The rear panel contains both unbalanced line and speaker input terminals, plus a balanced XLR input, providing a useful degree of flexibility in terms of interconnection. There is also a relatively small vertical heat sink for the amplifier (which obviously needs free air circulation to help cooling), a captive mains lead, and a power switch. The CR480 is intended to be left powered continually.

If used as part of a surround system, the subwoofer would be fed from a dedicated subwoofer output, benefiting from the bass management facilities of the surround controller. This connection could be made either via the balanced line-level XLR input, or via the left channel unbalanced phono socket input — all inputs on the subwoofer are active at all times, and there is no need to select a particular input.

In conventional stereo configurations (as reviewed here), the subwoofer can either ▶

SOUND ON SOUND

M&K CR2401 & CR480

pros

- Very compact size.
- Good standard of monitoring.
- Choice of direct or tripole surround speakers.
- Flexible subwoofer connections.

cons

- No active satellite version.

summary

A high-quality and very compact nearfield monitoring system with a performance that belies it's diminutive stature. The system is well integrated, but does require care in optimising the subwoofer position and settings.

accept mono or stereo line inputs via the phono connections (perhaps fed from spare preamp outputs or dedicated subwoofer outputs), or paralleled feeds from the amplifier's speaker terminals — whichever arrangement is easiest to hook up. However, if you're using the loudspeaker connections it is worth remembering that, while the internal electronics incorporate the necessary low-pass filtering for the subwoofer itself, there is no provision for complementary high-pass filtered outputs for the satellite speakers (unlike some subwoofer systems). A lot of systems provide a high-pass filtered feed-through for the satellites to enable them to deliver slightly higher SPLs, once freed from the need to produce low bass, but, if using the loudspeaker connections, the satellites always receive the full-range signal.

The rear panel of the CR480 powered subwoofer — although the model number shown here is MP280, this has now been changed for all new units to CR480. A choice of inputs and setup facilities allows the subwoofer to be used directly in 2.1 systems, or with a bass management controller in more complex surround configurations.

Like most subwoofers, the CR480 is equipped with controls to adjust both the turnover point of the low-pass filter and the volume, so that the subwoofer can be matched precisely to the satellite's LF performance, adding the precise degree of low-frequency extension. The filter control can be bypassed (for use with a proper bass-management system) or adjusted between 50Hz and 125Hz. The adjustable filter has a slope of 12dB/octave, and a second filter set to 125Hz (36dB/octave) removes mid-range signals. When used with the CR2401 satellites, the optimum setting is apparently 85Hz — matching the THX specifications — although there is no rear-panel calibration mark for this setting (you have to estimate a point between the 75Hz and 100Hz marks).

The continuously variable volume control is calibrated between -6dB and +9dB in 3dB increments, but actually extends a long way either side of these settings. A toggle switch is provided to invert the polarity of the output, which can often be helpful when optimising the position and turnover-frequency settings of the subwoofer.

In terms of positioning, the handbook recommends placing the CR480 in a corner at the front of the listening room, avoiding corners near doorways or openings. It also suggests a technique which I have found to be very reliable, which is to temporarily place the sub at the listening position, and then listen close to the corners of the room and along the walls (at the height of the subwoofer) to identify the point(s) where the bass is most accurate, extended and tight. The sub can then be placed in this optimum position and you can return to your listening position to fine-tune the level and crossover settings.

CR2401 Satellites

These compact monitors, measuring 330 x 125 x 145mm (hwd), are designed to deliver a similar quality and neutral sound presentation to the company's high-end MPS2510 active system, but in a more affordable package better suited to smaller monitoring environments such as editing suites, home studios and so on.

Like the subwoofer, these satellites employ infinite-baffle enclosures — so no port resonances to worry about, and an inherently smoother and more extended LF roll-off. At the time of writing, the full specifications of the CR2401 had not been released, so the amount of technical information I can provide is limited. The speakers have a nominal 8Ω impedance, and power handling is suggested to be of the order of 100W — but I had no problems driving them to more than adequate monitoring levels using my reference Bryston 4B 250W/channel amplifier.

The speaker is fitted with two M&K three-inch bass/mid-range drivers, plus a one-inch Vifa soft-dome tweeter, all mounted in a vertical line to minimise the width of the front baffle. These drive units have all been used in other M&K products, so their characteristics are well known to the company. The front baffle edges are all gently rounded to minimise edge diffractions, and with such a narrow baffle, stereo imaging should be very good. Like the subwoofer, a removable curved metal grille is provided to protect the drivers.

The rear panel carries a pair of 4mm binding posts, recessed on a plate at the top of the speaker, and the surprisingly complex crossover is mounted directly behind this on multiple circuit boards. The rear panel is also fitted with a couple of threaded inserts to accept a bracket for wall mounting.

The CR481 subwoofer has an inverted driver, which allows you to use it with the CR480 as a push-pull pair, especially where space is limited.

Setting Up

I started listening to the CR2401 satellite speakers on their own, before hooking up the subwoofer. Naturally, the bass response was limited, with a gentle roll-off starting maybe as high as around 100Hz. However, the mid-range clarity was very evident and the high end was detailed without being harsh — if anything, these speakers initially sounded very slightly subdued at the extreme HF, at least compared to my reference PMC IB1s. Stereo imaging presented reasonable width and depth perspectives — as you'd expect with such narrow baffles — but it did not seem to be as precise or stable as some of M&K's more expensive models, or indeed some other popular nearfield monitors. I think this aspect of the system could be classed as adequate, but not exceptional.

Having developed a feel for the capabilities of the satellites by themselves, I hooked up the subwoofer, initially using the speaker connections, simply extending the speaker cables from the rear of each CR2401 down to the subwoofer inputs. The next half hour or so was spent humping the subwoofer around the room, and lying on the floor with my head near the wall, trying to find the best location for the sub. I ended up with a location about 15 inches from the side wall and 20 inches from the back wall, facing into the corner — this being the point where I obtained the smoothest and most controlled bass response at the listening position.

Next I used my Terrasonde Audio Toolbox test set to help establish an initial system calibration with the crossover set to the recommended 85Hz (or as close to that as the lack of calibrations would allow). I started by setting a reference output level on the satellites alone of 79dBSPL (slow response, C-weighting) with a pink noise signal. I then disconnected the satellites and adjusted the subwoofer level control to provide 76dBSPL on the meter — the 3dB lower value in recognition of the reduced bandwidth of the subwoofer output. From this point, I fine-tuned the subwoofer level by ear using familiar music, eventually ending up with the level control set to -6dB (which was a few decibels lower than my initial pink-noise calibration). Clearly, the subwoofer volume is dependent on several factors, not least being the acoustic gain provided by the relative position of the subwoofer to the walls/corner.

Listening

With the system now pretty well balanced, I started listening in earnest, and I have to say I was very impressed with the overall sound quality, especially given the UK price of the system — the CR2401s are around a third the cost of the MPS2510s, for example. The integration between sub and satellites was very smooth indeed, thanks in part to the exclusive use of infinite baffle enclosures with inherently gentle roll-off and linear phase characteristics. Having auditioned the system using the simple loudspeaker connections to the subwoofer, I then rewired and recalibrated the system to use a dedicated subwoofer feed from my surround controller, setting the bass management to operate with a crossover at 85Hz again. This seemed to give a slightly faster bass response, but the difference was pretty marginal. The bulk of my listening was done with the system in this configuration.

"Like the bigger M&K speakers, these units are able to extract a lot of detail from the recording, and present it in a very natural and proportionate way... overall the subjective quality is far greater than first impressions (or cost) would suggest."

Like the bigger M&K speakers, these units are able to extract a lot of detail from the recording, and present it in a very natural and proportionate way — the acoustic of the recording environment and the mechanical noises of acoustic instruments were clearly audible, and enabled accurate EQ and mix decisions to be made. The absolute ability of these diminutive speakers is obviously constrained to a degree by the selection and size of drivers, but overall the subjective quality is far greater than first impressions (or cost) would suggest.

There is little to fault on these speakers given their price, although the stereo imaging was perhaps not all it could have been and, as I mentioned earlier, I felt the extreme HF was a little subdued. I tended to want to add a touch more 'air EQ' than perhaps I normally would when mixing acoustic recordings, but I think this is something to which one would quickly acclimatise. The upside was that these speakers were very comfortable to work with over extended periods, with no hint of listening fatigue at all.

Overall, the treble region is crisp and precise without being hard or tiring, the mid-range neutral and detailed, and the low bass is powerful when appropriate, as well as being fairly fast and dynamic on suitable material — although this will depend a great deal on how well the subwoofer has been positioned in the room and aligned with the rest of the system. Indeed, dynamics are conveyed well with no hint of power compression at sensible listening levels, and the system is capable of delivering more than enough SPL for nearfield applications.

In essence, the CR2401 and CR480 together form a three-way monitor (albeit with a common bass section in the configuration employed here), and the system certainly exhibits many of the qualities of a three-way monitor. In particular, the mid-range seems more detailed and less coloured than many two-way designs and, with the relatively low crossover point of 85Hz, the shared bass driver is an acceptable compromise. You could always add a second CR480 to provide a stereo subwoofer system if required! The performance of this M&K system is certainly comparable with two-way systems costing a similar amount, but also offers additional advantages such as a greater bass extension, impressive mid-range clarity, and all the practical conveniences associated with the compact size of the components. The system would make an ideal compact surround monitor setup, and is excellent as a nearfield stereo monitoring system for workstations, edit suites, location recording and the like. It provides good-quality and reliable monitoring, with an impressive price/performance ratio, and has a clear upgrade path to extend and expand the system's capabilities. SOS

Tripole Surround Speaker

For surround sound applications, there are two schools of thought regarding the rear-channel speakers. Some prefer to stick with the ITU arrangement of five identical speakers, three in front and two behind, all at the recommended angles and firing sound directly at the listening position. Others prefer more diffuse sound — especially for film use, and typically use dipole or tripole speakers along the sides and rear. To meet these needs M&K have designed a tripole speaker specifically to complement the CR2401 main speakers.

The CR1403 Tripole matches the tonality of the CR2401, and combines a direct-radiator speaker (tweeter and mid-range) with a dipole speaker (sideways firing mid-range units), in the same cabinet. The drivers are all integrated with M&K's unique Phase-focused Crossover. One of the benefits of the tripole concept is a much more consistent spread of sound throughout the room, so that even people sat at the rear of the room can hear reasonable imaging and spatial information.

information

£ CR2401 passive satellite monitors, £517 per pair; CR480 powered subwoofer, £504.08 each; CR481 powered subwoofer, £tbc; CR1403 passive tripole surround speakers, £420.65 per pair. Prices including VAT.
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Paul White

Aphex have ported their expertise in spectral processing to a range of guitar pedals that also double as DI boxes. Currently there are models for acoustic guitar, electric guitar and bass, all housed in similarly-styled but differently coloured cast metal cases. Power can come from batteries or an external power adaptor (optional) and the output is available on both unbalanced jack at instrument level and balanced XLR connector with a ground-lift switch.

The XLR output is designed to feed a balanced mic preamp, such as a mixer. This DI output has a switch that allows it to be configured with or without the effected signal added. Apparently the external power system has been designed so that it can accept any polarity (or even AC) and it works over the voltage range 5-12V AC or 7-17V DC. When running from a 9V battery, the current draw is only around 5mA, so the battery life should be reasonable. The instrument input is switchable between a high-impedance jack optimised for use with passive pickups or a medium-impedance one for use with active pickups. The Acoustic pedal has a particularly high impedance (10MΩ) for use with passive piezo pickup systems alongside a lower impedance for use with active electronics.

Big Bottom & Aural Exciter

All three pedals use variations on the same Aphex circuitry to provide high-frequency enhancement based on harmonic generation, plus the dynamic 'optical' Big Bottom circuitry. This is tuned differently for the different models, so that for acoustic guitar it emphasises the body tones, for electric guitars it provides an alternative tone colour for the lower notes, and for the bass guitar it makes the notes sound deeper and more powerful. The Big Bottom process is a form of dynamic equaliser based around an optical limiter circuit, and phase shift also figures in the equation. The Lo Tune control sets the upper frequency limit for bass enhancement, while Lo Blend determines how much of the effect is added. Because the effected signal is added to the original, the effect is that of lifting low-level signals rather than squashing the peaks and, because of the limiting element of the circuitry, the peak level doesn't increase significantly, even when the perceived level of bass has increased quite dramatically. The Lo Tune range is 40-210Hz for the Acoustic model, 30–210Hz for the Bass model, and 40-210Hz for the

SOUND ON SOUND

Aphex Xciter Range £116

pros

- Genuine Aphex Big Bottom and Aural Exciter processes.
- Very easy to operate
- Runs on almost any power adaptor that will fit the socket!

cons

- If you play all three types of guitars, you have to buy three pedals, which can work out expensive in the UK.

summary

All the benefits of the Aphex sound in a pedal format with proper balanced DI capabilities.

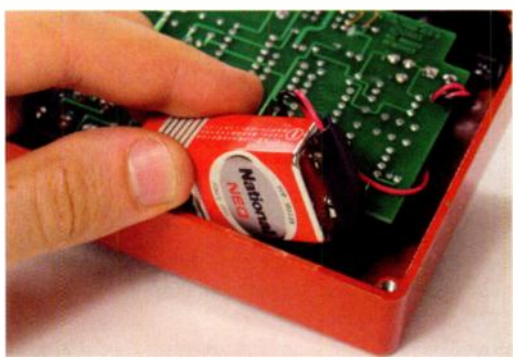
Guitar model.

The Aural Exciter part of the circuit has a Hi Tune filter control, which sets the point above which enhancement takes place, and there's a Hi Blend control to regulate the amount of harmonics added back in. The Hi Tune range is 300Hz–3kHz for the Acoustic model and 500Hz-5kHz for the Bass and Guitar models. All have a quoted signal-to-noise ratio of 70dB, and when the bypass button is operated, the input is routed directly to the instrument output.

As expected, all three devices behaved similarly except in the range of frequencies covered and, on the whole, they did exactly as claimed. The degree of bass enhancement can be dramatic, and is surprisingly effective for bringing out the body tone in the acoustic guitar — and of course it adds considerable depth to bass guitar sounds. The Aural Exciter part sounded much as I expected, as I've used many Aphex devices over the years, and, provided that you don't set the Hi Tune control too low, you can add a nice sense of air and detail without roughening up the mid-range. At lower settings it can become harsh, but then too much range is always better than not enough. When used to DI clean electric guitar, the process adds a nice zing to the sound as well as filling out the low end, but again the Hi Tune control setting shouldn't be set too low. My only slight reservation was that the Acoustic pedal, used with my active acoustic guitar, sounded quite different when bypassed to when active, even with the processing depth turned right down. This had the effect of hardening up the sound somewhat, but I suspect the effect differs depending on what preamp you're using and what amplifier you're feeding it into. The acoustic sound can be made brighter and weightier in a reasonably flattering way, but you have to be careful to add only as much processing as required. Too much can sound hard and harsh again.

Verdict

These little pedals do exactly as claimed and, though the user has to exercise restraint in how much effect is applied, having two knobs for the bass end and two for the high end makes things simple to use. In addition to providing tonal adjustment beyond what can be achieved using EQ, the DI facility is a great bonus both for live work and for recording. I also feel the Bass pedal may be useful for those people who want to process synth bass sounds to make them appear bigger and deeper, but without taking up any more headroom. If you want the genuine Aphex sound in an instrument-friendly package, this is the answer. SOS



Any of the Xciter-series pedals can be run from a 9V battery fitted into the casing if there isn't a suitable power supply to hand.

information

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Do The Fandango

I am writing in response to your review of the Kurzweil KSP8 in the May issue (www.sospubs.co.uk/sos/may03/articles/kurzweilsp8.asp). Although it was a great review, I disagree with Hugh Robjohns' comment about the unit having a noisy fan. On the desktop, I find the unit extremely quiet, with the fan virtually impossible to detect unless you get right up close to it. When the unit is rackmounted, I find that there is absolutely no audible fan noise. I have one rackmounted in my control room, and it's among the quietest and best-sounding processors in there.
Steve Donato

Technical Editor Hugh Robjohns replies: I didn't say the fan was noisy, rather that it was 'audible'. The former implies unacceptable while the latter (to me anyway) suggests potentially annoying! I loathe cooling fans in the control room and will always pick a convection-cooled unit over a fan-cooled one if all else is equal. Whereas individual high-quality cooling fans may be largely inaudible, by the time you have half a dozen fan-cooled devices in the room the ambient noise floor becomes far too high for professional audio work — in my opinion, at least.

With the Kurzweil unit on the bench, the fan noise was definitely audible in my room (which has a particularly low level of background noise, I have to say). I guess whether the amount of noise produced is distracting or annoying is a subjective thing. In this particular case the noise didn't intrude but I was certainly aware of it, and hence felt the need to draw this aspect of the machine to the attention of the readers. In your case, you have decided that the fan noise isn't a concern, and I dare say most will agree with you. I certainly share your view that this is a great-sounding processor, and something of a bargain to boot!

Left Out Of The Loop?

It seems to me that there is a serious omission from the new Yamaha 01X — it doesn't have a dedicated loop for external effect units. This feature is important to people who are moving over to a computer-based recording platform and are looking to the Yamaha 01X and similar devices for protection against the cruelties of

the world of mouse and keyboard. What should we do with our existing external units? I personally wouldn't want to retire my Lexicon PCM90. Is there a way to plug legacy effect units into the mLAN buss and make them available from within both the 01X and the software application running on a computer?
Dima Bodrov

Editor In Chief Paul White replies: Nobody ever seems to cater directly for external effects in a computer-based system but it's normally possible to utilise any of your audio interface's spare inputs and outputs for this purpose by doing the appropriate routing in your software. For example, you could use an S/PDIF output or a couple of analogue outs to feed your PCM90 (routed from an aux send in your software mixer) and then return the PCM90 outs to a stereo channel of your software mixer via any spare stereo input on your audio interface. The 01X should work the same as any other audio interface in this respect, so the only real question is whether it has enough I/O to meet all your needs.

I can't see any obvious way of using mLAN to make your PCM90 appear as a virtual effect as this would require dedicated control and routing software that appeared as a plug-in, but in theory, any mLAN I/O expansion device could be used to connect it into the system if the existing I/O is already spoken for.

Nick Howes at Yamaha-Kemble in the UK adds: This type of scenario is the main reason why Yamaha developed the OPT standard; to integrate products like your Lexicon into computer-based environments with more ease, and present a unified user interface for both hardware and software products. If Lexicon were to embrace the mLAN protocol, it would give users the ability to add their effects over Firewire on multi-channel digital sends and returns, as is already possible with the Kurzweil KSP8 signal processor. Of course, the beauty with mLAN is that the inputs and outputs can freely and easily be expanded upon by adding any third-party, mLAN-compatible I/O unit, so, as Paul says, if you run out of channels, you can add lower-cost expansion systems rather than having to buy a whole new setup.

Splitting Hairs

I'm a producer in Portland, Oregon, and enjoyed your article on Glen Ballard in *SOS* March 2003. I was wondering if you could tell me which company manufactures the guitar splitter mentioned in the article. I'm very interested in guitar recording via signal splitters, and am curious to know more about this unit. Thank you for your help.
Via Email

Reviews Editor Mike Senior replies: The guitar splitter Glen Ballard was using is the GSP1, manufactured by Inward Connections (+1 818 883 9012), whose products are available from www.boutiqueaudio.com. The GSP1 is a well-specified one-in, four-out splitter with a remote footswitch and phase-reverse, mute, and ground-lift switches on each output. You might also want to check out the Redeye from Little Labs (www.littlelabs.com). You can daisy-chain as many of these as you need splitter outputs. Little Labs also manufacture a product called the PCP Instrument Distro, a one-in, three-out guitar splitter which also features balanced inputs and a balanced DI output, plus phase-reverse and ground-lift switches. Palmer (www.palmerdirect.com) do a one-in, two-out guitar splitter called the Y-Box, which might be a more economical option. Alternatively, a Google search should be able to find some schematics, so if you're handy with a soldering iron, you could put together a basic splitter for yourself. SOS

Producer and songwriter Glen Ballard uses a splitter to route his guitar signal to multiple destinations.

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Stereo Editing & Mastering

Last month we showed you how to go about recording a complete band to stereo on location. Now let's examine the ways in which you can compile and process the different takes to make up a coherent whole.

Hugh Robjohns

Last month, I explained how I recorded a relatively large school band called Jig, opting to record them 'as live' straight to stereo, rather than using conventional multitrack techniques. Although more challenging for the recording engineer, the advantages of this technique happened to suit this particular project — not least because it was the most practical way of capturing eleven songs in just five hours of recording time! This was a tough challenge, but since this recording was of a school band and we were heading into summer term exam madness, it was important that the project had a minimal impact on the musicians' time. It was also important to minimise 'out time', to keep the production costs low. Had we adopted a multitrack approach there would have been a greater temptation to replace and overdub less-than-perfect parts, and to spend a lot of time remixing and polishing.

By recording straight to stereo, we knew that what we recorded on the day was all there was — there was no chance to 'fix it in the mix.' So the onus was on recording either a completely perfect rendition of each song, or sufficient good sections to edit 'perfect' songs together. Any fixes would be done in the editing and mastering stages, with no further involvement from the performers, who could be left alone to concentrate exclusively on their forthcoming 'A'- and 'AS'-level exams.

Setting Up For Editing

The next stage of the project was the editing, which I carried out using my SADiE Radia system — a professional stand-alone DAW using SCSI drives connected to a bespoke DSP card in a PC. SADiE is commonly used in top-flight mastering rooms and broadcast production studios. The original 24-bit, 44.1kHz recordings were transferred from the Genex GX8500 recorder to SADiE, and allocated to separate EDLs (edit decision lists) for each song. This housekeeping made it quicker to sort through the source recordings to find the appropriate takes, and it was much easier to keep track of the different edit versions as the work progressed.

The amount of editing required for each song varied enormously. Some were created from a single master take with just one insert to repair a short section, while others involved rather more editing between two or occasionally three main takes, plus inserts from retakes varying from an eight bar section down to single notes! To help the editing process along, I had marked the log sheets during the initial recordings to indicate which take we considered to be the best to use as the master, as well as noting down any mistakes and which retakes to use to cover them.

I started the editing by placing each complete take and retake on adjacent stereo-paired tracks, in roughly the correct time alignment with each other and with the

designated 'master take' on the first track pair. I then played through this master take, placing edits to mark the approximate locations where repairs were necessary. Returning to the first edit point, I then played through the alternative takes and retakes to identify the most suitable replacement section.

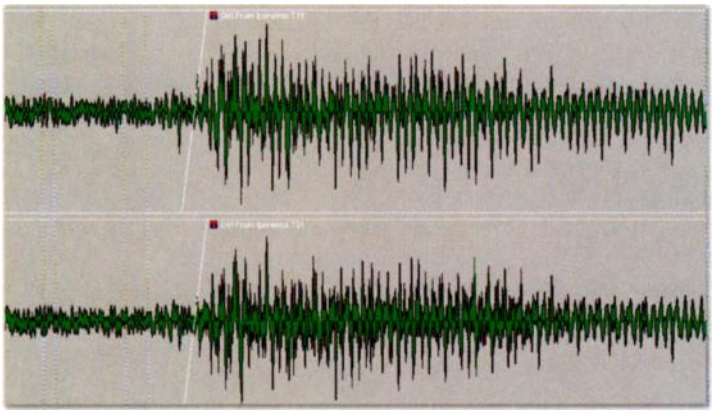
SADiE offers several different ways to perform edits and I use different techniques for different kinds of edit, but most of this 'insert' editing was performed in the Trim Editor. This is a separate editing window which shows the 'outgoing' audio waveform on one pair of tracks (ie. the master take, in this case) and the 'incoming' audio (ie. the start of the inserted replacement section) on another pair of tracks — the two audio sections time-aligned appropriately one above the other. Using the mouse and the various software tools provided, it is then possible to move the edit point forwards or backwards in time, move the incoming (or outgoing) track relative to the edit point, change the duration and shape of the cross-fade, or change the levels of the incoming or outgoing audio.

The machine also provides several audition modes, allowing you to hear just the outgoing section (to check that it ends cleanly) or incoming section (to see that it starts cleanly), as well as the crossfade itself, and even the removed material. Auditions can be performed as a single pass (of variable durations — some edits need to be heard in the context of a larger portion of material than others), or as a repeating loop section.

Editing For The Perfect Take

This may sound obvious, but audio editing is about sound — it requires good listening skills. I learned to edit using quarter-inch tape and a razor blade, where the edit point had to be found by scrubbing the tape back and forth across the replay head — a skill that takes time and practice to develop. However, the ubiquitous DAW waveform display now allows the eyes to do some of the work in selecting and fine-tuning edits and, although this has some useful advantages, it is very easy to become fooled into thinking an edit is fine because it looks right, when in fact it sounds wrong. Consequently, I think it is important to audition each completed edit with a good run up to it — at least ten seconds, to get a good feel for the rhythm of the music or speech — and to look away from the waveform display (or close your eyes) so that your ears are the only arbiters of the success of the edit.

When editing tape you have to get the cut right first time, but when editing with a system like SADiE it is faster and easier to start with only roughly placed cuts, and then fine-tune their position afterwards. I usually start with roughly placed cuts in the master track before and after the section that needs to be replaced, and roughly similar edits at the start and end of the replacement material. The replacement section can then be dropped into the gap in the master track, and the first edit loaded into the Trim Editor (in the case of SADiE), so we have the 'outgoing' audio from the master track, and the 'incoming' audio of the replacement section meeting at the edit point.



A typical edit point can be seen here — the loud drum hit immediately following the edit does a good job of disguising it.

The next step is to optimise the edit point in the outgoing audio. This is a case of playing the audio and moving the edit point to the position where it is most likely to be inaudible. The human ear is a complex thing, with many foibles, some of which make editing a lot easier than it otherwise might have been! As well as its frequency masking characteristics (for example, you can't hear the hum from a bass guitar amp while the bass is playing, because the louder instrument sounds mask the quieter hum in a similar part of the spectrum) the ear also suffers from 'temporal masking'. A quiet sound, which is perfectly audible in isolation, tends to become inaudible if followed by a louder sound within a short time period. So one of the golden rules of editing is to edit immediately prior to a loud sound — just before a drum beat, for example — so that any imperfection in the edit will be masked by the louder sound immediately following the edit.

So, with the optimum outgoing edit point located, it is a simple matter to find the corresponding point of the incoming replacement track, and then the complete edit can be auditioned. If it doesn't work perfectly, it can be helpful to check the outgoing and incoming sections separately to see if some unwanted sound has been caught. Again, don't rely entirely on the waveform display; use your ears. When editing was performed on tape with a razor blade the choice of crossfade was limited to the 89, 60, or 45 degree cut angles provided on the edit block — the fade duration being the product of cut angle and tape speed. Fortunately, modern DAWs allow a lot more creativity than that, with the ability to change both the shape and duration of the outgoing and incoming fades independently, which will often enable an 'impossible edit' to be performed seamlessly. With most material most of the time, a simple linear crossfade over the edit, of between 10ms and 20ms, will be fine, but sometimes an edit can be made to work better if the duration is changed. Beware using very short crossfades though, as they are more prone to 'bump' or click. There are no rules here; the best solution is found through experience, familiarity with the capability of the editing machine, and a fair bit of trial and error.

Having optimised the edit into the replacement section, the next task is to sort out the edit back into the master take. It is quite likely that the replacement insert will be a slightly different duration to the original — although hopefully by only a few milliseconds — so it will be necessary to adjust the position of the remainder of the master track (the 'incoming' side of this edit) to match edit points between retake and master. It is also possible that the retake might also be at a slightly different level, although, as I explained in the first part of this article,

Manual Compression?

After the main editing process is complete, but before beginning the mastering, I often include another editing stage, this time with the aim of manually compressing the larger transient peaks. I find this to be a far more transparent technique than using a limiter, even though it is a little time consuming. By looking at the waveform display of each complete song it is easy to see any particularly dominant transients, and I simply reduce each of these by 3-4dB by editing immediately before and after the transient and winding the level down as necessary. If done carefully, the modifications are completely inaudible, but the peak-to-average ratio can be improved dramatically, making it possible to raise the overall level of the track by another 4dB or so. Again, it is a case of using the ears to judge how much manual compression is needed and acceptable, but the waveform display is a helpful guide.

hopefully the rhythm section level and balance is consistent across all the takes and retakes. Even so, a small level change — often just 0.25dB or so — can sometimes help to make the join seamless!

So, that's the basic editing process — and it's simply a case of working through all the edits until the best possible compilation has been achieved. Having reached the end of the track, I play through the entire song to check that all the edits work properly, and that I haven't inadvertently missed anything or made any mistakes. With the basic editing of all the tracks completed, the next stage is to copy each one from its own EDL to a new compilation EDL, forming a provisional CD playlist. I then copy this to CD-R and send it to the Musical Director to approve the edits.

Adding Sound Effects

While I waited for approval of the edits, I started work on adding sound effects. Yes, you read that right — one of the tracks was the Starsky and Hutch instrumental theme, as performed by the James Taylor Quartet, and this required American police siren effects at the start and in a middle section. I sourced a royalty-free sound effects CD of New York city 'atmospheres' and loaded a couple of tracks into SADiE of various emergency vehicles driving through the streets with sirens blaring. I then edited and mixed the various elements together to produce two composite effects tracks to fit in the appropriate places in the song. However, because the recordings were of general street atmospheres there was a lot of background noise — including a lot of squealing brakes. While these squeals were acceptable in the context of the original effects recordings, they sounded out of place and rather discordant when mixed in with the music, and so they had to be removed.

My first approach was to use the narrow-band parametric equaliser plug-ins within SADiE to try to remove the worst of the offending noises, but after an hour trying to optimise the settings I came to the conclusion that this 'cure' was far worse than the disease. The problem was that the squeals inherently changed in pitch as the vehicles slowed down, so the filters had to be quite broad and thus removed a lot of the wanted sound in addition to the squeals.

Fortunately, the noise-removal specialists CEDAR produce a stunning plug-in for SADiE called *Retouch*. After grovelling to my friends at SADiE I was able to arrange a short demo license to install *Retouch* in my SADiE system — a unique password is required to activate the software for use on a specific hardware card and for a specific number of days.

Retouch is very easy to use, and not dissimilar to photo retouch software (hence the name). The process starts by marking the portion of the track containing the unwanted noise (up to 10 seconds in duration). This is then loaded into the *Retouch* window where the display shows time on the horizontal axis, frequency on the vertical axis, and signal amplitude with colour. The unwanted squeals were immediately obvious as long, high-frequency streaks across the screen, and the wanted sirens as almost sinusoidal curves below them.

To remove the squeals I just had to highlight each one by dragging a marquee box around it, and instruct the system to replace the marked signal with background noise synthesized from the surrounding area of relative silence. If done carefully the results are completely undetectable — natural background effects without squeals! There were actually quite a lot of separate squeals to deal with, but, although a little fiddly because I had to process several short sections at a time, the whole procedure took only about a quarter of an hour from start to finish! Although *Retouch* is quite expensive, it is clearly well worth it if you find yourself having to remove unwanted noises that would be impossible to deal with using conventional techniques.

Overdubbing

While checking the edited masters, the Musical Director noticed that there was no piano accompaniment at the end of one of the songs. On checking the original recordings we found that this was the same on all of the takes and retakes of that song — the piano disappeared after a key change. On this particular song the piano was played live by the vocalist, and it turned out that he had difficulty playing the piano part after the key change, so concentrated on just singing instead! From a performance point of view it was a sensible decision, but it had to be fixed for the recording.

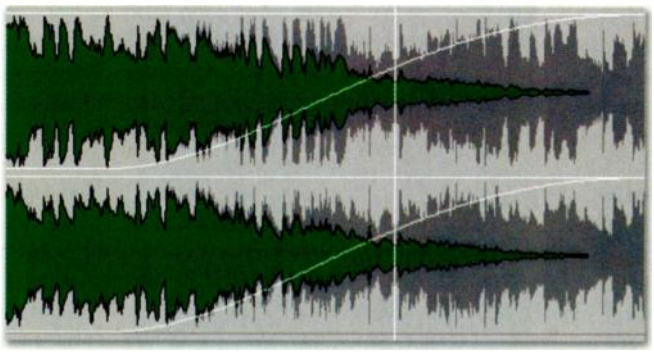
The solution was pretty straight forward. I copied the edited song from the SADiE onto two tracks of the Genex recorder and, equipped with two Sennheiser MKH40s, a couple of mic stands, some cables, a two-channel preamp and some headphones I set off for Cheltenham College again. The piano had been moved from the theatre to the college chapel, but the change in acoustic was irrelevant as I was close-miking the piano. I had the equipment set up and ready to go in time for the morning break, at which time the Musical Director and the performer arrived to overdub the piano part. It was simply a case of playing the edited track from the Genex over headphones to cue the performer, while recording the replacement piano part back into the Genex on a second pair of tracks. After a couple of rehearsals we recorded just the key change and end section, and the task was completed within half an hour.

Back at base I copied the new piano part back into SADiE, slipped it into the right time alignment with the edited master track, set the appropriate mix level and bounced the compilation down to a final composite. Job done.

Mastering

With all the edits approved, piano part fixed, sound effects in place, and a final CD running order decided, the next stage of the project was to master the album. The first step was to rearrange the edited songs into the required running order, but with notional four-second gaps to space each track at this stage. The original recordings were made with a fairly generous headroom, so the next task was to bring the peak levels up towards 0dBFS. SADiE doesn't have an automatic normalising facility, but it is very easy to adjust levels manually.

I use the Drawmer DC2476 Mastering Processor to provide a little polish to my recordings — this is a multi-function digital mastering tool equipped with a full-band compressor, dynamic equaliser and parametric equaliser, as well as a multi-band compressor, limiter, expander, stereo width controller, and valve emulator. It is an extremely powerful tool which has to be used with care, but it sounds surprisingly 'analogue' and is capable of very fine results. I connected the DC2476 to process a stereo AES output from the SADiE, recording back into a stereo input pair, with 24 bit signals and using the Drawmer's internal word clock as the system reference. The processed tracks were recorded alongside the originals,



'S'-shaped curves are usually the best option for long fade-outs, where linear fades sound unnatural and should be avoided.

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10 JULY — VESTAX

Vestax require no introduction to those involved in the DJ scene. Robust and reliable, their innovative equipment will be demonstrated live on stage by the [illegible]. With narrative from Andy Williams, Vestax UK's main man, we're all going to discover what Creative's superb PA system can do. Vestax will be showcasing their PDX 2300 turntables, and Faderboard sampling and effects unit. There will also be a [illegible] on the night.

17 JULY — STEINBERG

We all know Steinberg software, but do we really know Steinberg software? The guys hosting this event do. An evening of tips & tricks, masterclasses and tutorials, all courtesy of Steinberg. With special pricing across the range, and loads more promotional events, now's the time to get to grips with this company's superb products. The special pricing will be for one evening only, don't miss out.

24 JULY — M - AUDIO

With a huge range of new kit hitting the market this year, Midiman's rebirth as M-Audio is one of the industry's great success stories. Get the lowdown on their full product range, and enjoy being tempted by our special M-Audio pricing for one evening only! This event has been chosen by M-Audio for the first UK showing of Ozone, their amazing mobile solution. New software will also be on show, including Reason 2.5 and Ableton Live 3.

31 JULY — PEARL

Beat out that rhythm on a drum. Pearl's massively impressive range of quality percussion will be put through its paces by Darrin Mooney, of Primal Scream fame. This is going to be an evening to remember, so pre-book now! Big as our superstore is, Darrin's going to fill it with that superb Pearl sound. There's also a superb mystery prize draw, courtesy of Pearl. Be there.

07 AUG — GIBSON

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14 AUG — TAKAMINE

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21 AUG — MARSHALL

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and were routed to another stereo pair of SADiE outputs for monitoring.

The Drawmer processor was set to hold the maximum peak output level to -0.5dBFS, with standard dither at the 24-bit level (see PQ coding below) — and these were the only settings which remained constant for each song. Again, different people work in different ways, but I start the mastering process by just listening to a track to decide what, if anything, is required. Most of the songs needed some gentle compression to restrict the dynamics a little and to help make everything gel together, so I used the multi-band compressor section. I started with the smallest possible ratio of 1.1:1 on all three bands, with the threshold set somewhere between -30 and -40dBFS. On most tracks, the gain reduction display showed nothing for the high band, the occasional flash of the 2dB gain-reduction light on the mid band, and between 2dB and 4dB of gain reduction on the low band.

Where a stronger degree of dynamic control was required for the bass instruments (kick drum and bass guitar) I sometimes changed the ratio of the low section to 1.2:1, or set a lower threshold. The attack and release times remained fairly consistent for all the songs, with progressively shorter times from low to high bands. The compressor section uses a 'bootstrap' design which means that quiet signals are pulled up automatically without needing to use make-up gain — although this facility is also provided if required. Since I had already tamed the worst transient peaks through editing (see 'Manual Compression?' box), I didn't need to use the limiter at all, and the expander was also bypassed throughout.

Dynamic Equalisation & Stereo Width Control

On a couple of tracks I made use of the dynamic equaliser to help lift the kick drum slightly, and I used the parametric equaliser to help lift the piano in one song and tame the organ in another. The valve emulation in the DC2476 is an amazingly useful alternative to the equaliser, and I used the bass section to add some weight and density to the bottom end of the mix on some songs. This has the advantage that, unlike the equaliser, it doesn't increase the peak level of the signal — the harmonic distortion just thickens the sound up without making it boomy or muddy. Likewise, the high section can be used to add some sparkle and air, in a similar way to an aural exciter. I tend not to use the mid-band section, though, as this usually adds clutter to the mix and can make the sound fatiguing.

On some tracks I also narrowed the stereo width at the bass end to help clean the bottom up slightly, and tended to juggle the balance of the three compressor bands to match the tonality between each song. The mastering process is iterative — it's a case of listening to the original track to decide what needs polishing; then applying the processing; then working on the next track; then comparing the two together and fine-tuning as necessary to ensure they match each other properly. To make this iteration easier, I store the processor settings for each track into separate user memories so that I can easily recall the configuration for each track and readjust as necessary as the mastering progresses.

At this stage I'm still working with notional gaps between tracks, and without any fades, but when all the tracks have been mastered its time to listen to the whole album in sequence to check that everything works properly together and forms a cohesive whole. After auditioning the whole album in context I might decide that one track is too loud or quiet in the context of the tracks that come before and after, or that the overall EQ of a song isn't quite right, but it's easy to recall the Drawmer settings for the song, make the necessary adjustments and then rerecord the track back into SADiE.

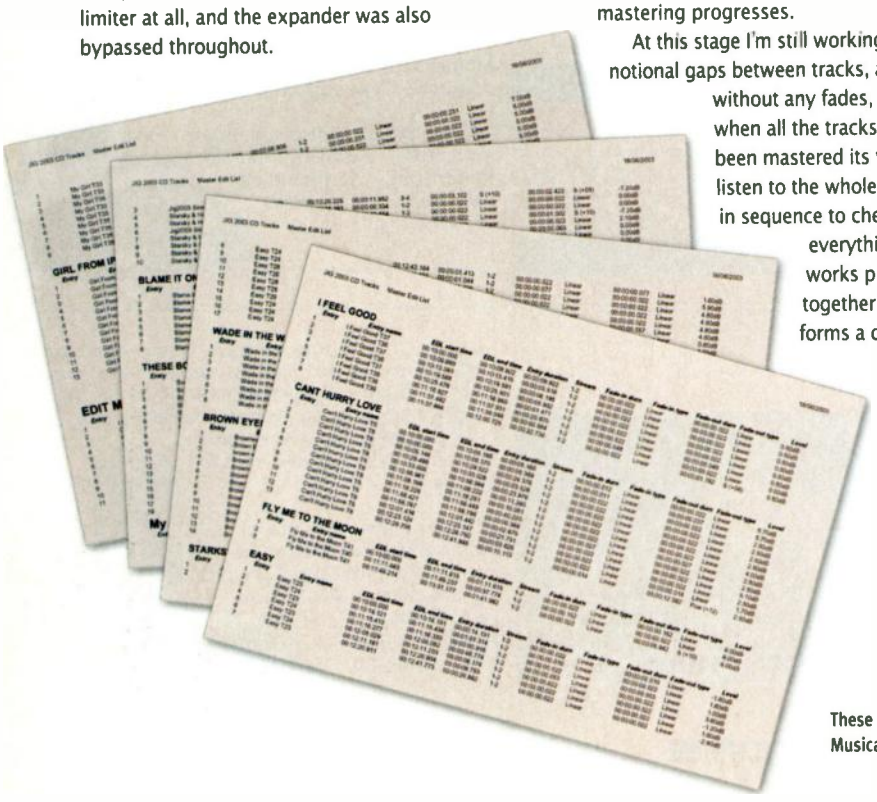
When I'm happy with everything, I edit the fades onto the tracks that require them and adjust the inter-track gaps so that everything flows nicely from one song to the next. I generally use 'S'-shaped fade curves for tracks that need a long fade out, or sometimes a gentle exponential curve, but linear fades never sound right and should be avoided if possible.

PQ Coding

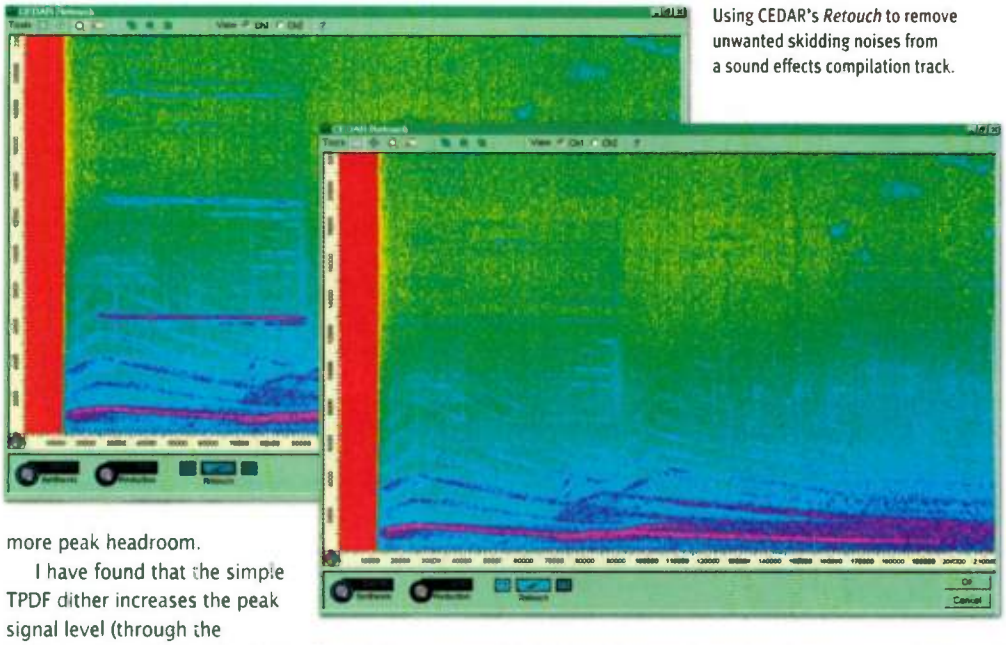
The next step in the process was to sort out the PQ coding for the track IDs on the CD. SADiE has sophisticated facilities for this, adding the default index flags automatically, based on the edited starts and ends of each song. Provided each song has been 'topped and tailed' accurately this works extremely well, and the software can be configured with any desired offset between the actual track start and the relative position of the ID (I generally use a 12 frame offset, for example), as well as minimum track lengths and gap lengths. It also has facilities for the ISRC codes if required, and the index 0 and index 1 flags can be manipulated independently making it easy to add hidden tracks, for example.

The audio material was still at 24-bit resolution at this point, and needed to be reduced to 16 bits for the CD master. This dithering has to be the very last process, after all the mastering, fades and level adjustments, so I generally use the basic TPDF dither facility built into SADiE once everything else has been done. The dither processor is presented as a 'set and forget' plug-in for the mixer section.

There are a lot of dither algorithms around, each with impressive claims for their sonic qualities. POWR is a popular one, as is the Apogee UV22HR, and with really good-quality recordings it is possible to detect some subtle quality differences between the various algorithms. However, I have found that the basic TPDF (triangular probability dither function) works just fine 99 percent of the time, and has the advantage that it requires a very small headroom margin. A lot of the more sophisticated dither algorithms place considerable amounts of energy at the high end of the spectrum where it is less audible, but this then requires a lot



These EDL printouts are generated by the SADiE workstation, and allow the Musical Director to approve the edits for each song using a preliminary CD-R.



Using CEDAR's *Retouch* to remove unwanted skidding noises from a sound effects compilation track.

more peak headroom.

I have found that the simple TPDF dither increases the peak signal level (through the addition of the dither noise) by about 0.3dB, which is why I set the maximum output from the mastering processor to -0.5dBFS — to leave enough headroom for the subsequent dithering. The combination provides peak levels in the 16-bit master which never exceed -0.1dBFS. I never allow signals to reach 0dBFS (which is why I don't like automatic normalising functions) for two reasons. First, the oversampling reconstruction filters in a lot of CD players can be overloaded by 0dBFS transients and, secondly, some replication plants will reject masters with 0dBFS peaks as having overloads!

With the songs fully mastered, sequenced and dithered, the album was burned to a SCSI CD-R attached to the SADiE and dispatched to Cheltenham College for final approval. Incidentally, with the various audition CD-Rs kicking around with different versions of material on — Session Masters, Edit Approvals, Production Masters — it is vital to label everything clearly. To that end I have a set of templates in the computer with company logo, contact details and the 'type' of disc, which I print directly on ink-jet compatible CD-Rs using an Epson Photo 950 printer. I just have to type in the project, date, and version number to produce a professional-looking audition disc. Not only does this create a good impression, but it also prevents confusion between multiple versions of work in progress, and costs only pennies to do. SOS

AKG K271

Studio Headphones

A new pair of closed-back headphones from AKG which are well suited to recording and overdubbing.

Paul White

Headphones play an important role in the studio, most often for performer monitoring, but they're also useful as a second reference when checking mixes, as noise or distortion usually shows up more distinctly on headphones than over loudspeakers. The AKG K271s are closed phones that sit over the ear of the user, making them well suited to performer monitoring, as they offer a reasonable degree of sound isolation as well as minimising leakage from the phones to nearby microphones. They are fairly conventional dynamic headphones with a wide frequency range that goes from 16Hz to 20kHz, and they are also electrically quite efficient, generating an SPL of 91dB for 1mW of input power. The maximum input power handling is 200mW, so things can get pretty loud in there — a factor worth remembering when you consider that prolonged exposure to high SPLs can cause hearing damage.

These phones have an impedance of 55Ω, so should be happy running from most mixer phones outlets or dedicated headphone distribution amplifiers. At just 240g, they are not exactly featherweight, but that's pretty good for enclosed phones of this power. A nice touch is that the cable is detachable via a miniature locking XLR connector on the left phone, and three metres of cable are supplied as standard, terminating in a gold-plated, stereo 3.5mm mini-jack with a screw-on quarter-inch jack adaptor.

The headband uses a sprung wire outer frame with a padded vinyl band below it, the latter operating on freely running slides, which makes the phones virtually self-adjusting. I found them to be quite comfortable to wear, and they were also reasonably stable, though a colleague found them less so, which probably means that you still need to match your choice of phones to your head shape to some extent. The padded circular cushions fit snugly over the ear and I found the sound quality to be neutral and revealing enough for qualitative monitoring as well as for performer monitoring. Even the bass end seemed plausibly well-balanced, which is not always the case with studio headphones, no matter what the paper spec tells you. If anything, they have a very slightly pronounced high end when compared to some of my other studio phones, but certainly nothing that could be considered excessive. Acoustic leakage from the phones is minimal, while sound from the outside world is significantly attenuated without being excluded entirely.

Overall Impression

While headphone designers can often go on at great length about the technology they employ, as far as the user is concerned headphones are there to do a job and they either do it or they don't. These work more than adequately well both for making quality judgements and for wearing while overdubbing, and they do so without being uncomfortable or allowing an unacceptable level of sound leakage. They are cheaper than many popular studio headphones yet they are engineered to stand up to sensibly heavy-duty use. The replaceable cable is an advantage, as is the now familiar jack adaptor, but, as with any audio transducer, the final product is a compromise between what is possible and what the end user is prepared to pay. In this respect, I think AKG have come up with a good balance at a price most UK project studio owners will find attractive. SOS

SOUND ON SOUND

AKG K271 £140

pros
- Good balance of performance to cost.
- Comfortable.
- Neutral sound.

cons
- May not suit all head shapes.

summary
The K271's are well-designed, mid-price headphones suitable for both foldback monitoring while recording and evaluating mixes.

information

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Tot Taylor Music For Adverts

If you watch TV, you've heard Tot Taylor's music. What does it take to become the country's busiest composer of music for adverts?

Sam Inglis

"The way that ads work, you're either king of the heap or you're nothing," says Tot Taylor. "There isn't any inbetween." And Tot is about as close to the top of the heap as you can get. He's by far the most prolific composer for TV advertising in the UK, having produced the music for a staggering 169 commercials in the year 2002 alone — and that's only one strand in a professional life that also takes in film and computer game soundtracks, musical theatre, record production and music for art installations. On one recent occasion he found himself sitting down to watch TV, only to realise that he'd produced the music for all six ads in the commercial break and the two programmes on either side of it.

Tot Taylor's success is even more remarkable when you consider that has no agent or manager, can't read music, and doesn't use sequencers or digital audio workstations. So how on earth did he get to be the first-call composer for almost every ad agency in London?

Winning Ticket

Tot's musical career began in the '70s as an artist, when he was signed and dropped in turn by Island, EMI and CBS. He then spent the best part of two decades doing a variety of odd and odder jobs in the music industry, writing Mari Wilson's hit single 'Just What I Always Wanted', starting his own labels, co-writing the soundtrack for the film *Absolute Beginners*, and working as a 'song fixer' for David Geffen. Five years as a professional gambler and a couple of bankruptcies also played their part in an eventful history, and he was once again in dire financial straits when his first advertising job came up. "I've always been writing lots of music of all different sorts for myself, even when there was no reason. And when I wrote music I would always naively send stuff to people, and say 'Hey, this might be a good bit of music for the programme you're working on.' I sent a piece of music to the creative director of Saatchi & Saatchi. He 'phoned me and said 'You sent me this piece of music and I really loved it, and I'm putting it on a commercial for the launch of the National Lottery. You haven't got to do anything, it's finished, and we're going to pay you loads of money.'"

Easy money? "Yes... but the thing was that I'd send it to him seven years earlier! That was how I got into the system, I sent somebody a piece of music and seven years later they rang me up and used it in an ad."

As is so often the case, Tot's first high-profile job opened many doors, and he was soon in hot demand. "The first films they did for the National Lottery were actually really good, and because of that, somebody else at Saatchi's phoned me up and said 'Really liked the job you did, we've got something else for you. Do you think you could remake The Beatles' 'Rain'?' So I did this remake of the Beatles track, which of course they couldn't get the rights to use — they must've known they couldn't clear it — but the idea was to get it remade, present it to the publisher and say 'Look, we've gone to all this trouble.' So we remade it note for note, and the publisher said 'But that's the original Beatles track!' I got such a good name through doing that job, which never got used, that I did about 50 remakes that year. It go so that nearly every remake you heard on TV that year was me."

Turn It On Again

Five years on, Tot still gets a lot of work remaking hit songs where the ad agency has been unable to clear the rights to use the original performance. "I remade the Hendrix track 'Voodoo Chile' for Toyota, and that was very difficult. First of all, I had to find somebody who could play like Hendrix, and I know an unusual guitarist called Paul Cuddeford. The important thing is that he's left-handed, because Jimi Hendrix's runs were quite 'left-handed', there was an

The main music room in Tot Taylor's offices, with the 24-track reel-to-reel machine that is his usual multitrack recorder.

element of backwardness about them, and I knew that Paul would be familiar with that. So I got him, we listened really closely to the record, and we figured out that the bass drum microphone, for example, was about eight feet away from the head, all those sorts of things. I bought a lot of books with photos of Hendrix recording sessions, and we could see the way the mics were positioned. Sometimes the mics were hanging from above, sometimes they were ribbon mics, which would give a different sound. We looked at all the amps, we got the vintage amps, we got the guitar, we went to Abbey Road Studio Two, we didn't use the mixing desk, we just used straight valve mic channels, we did everything that we could to be in 1969, and it worked. The agency sent it to the Hendrix estate, and again, they said 'It's Jimi, you've just sampled it!'

"For the Renault Scenic ad with the dogs singing in the car I did three songs, I did Bowie's 'Space Oddity', The Baha Men's 'Who Let The Dogs Out?' and The Mavericks' 'Dance The Night Away'. I had to remake those three records in four days, from beginning to end, and Bowie said that he would only give permission for the song to be used if the remake was 99 percent close."

Likewise, the ability to come up with convincing pastiches is another vital asset in the advertising world. "They'll say 'Can you write something that sounds like the New York Dolls?' There's things like that that come up all the time. One is 'Can you write a Burt Bacharach song?' Burt Bacharach can't write a Burt Bacharach song any more, but they expect me to be able to. Somebody at ▶

Paying To Listen To Records

"I bought 426 albums last week," says Tot Taylor. "I've been buying records for years and years, and I still buy at least 100 albums a week. This week I've already bought about 400. I've got a bloke running round London buying vinyl for me. There are good places: Portobello Road market, the Classical Record & Tape Exchange — you can get some very odd records in there. I'm in Soho nearly every day doing a job, and on my way back I always go into HMV. I'm in there every day, it's very dangerous, because I have to visit the folk department, the classical department, the pop department, the dance department, the soul department... it can take a long time. I've got a couple of people who listen to records for me, and I listen to a lot of records myself. It's not a good way to listen to music, but the only way to discover something is to hear it."

All this record buying is more than just a philanthropical attempt to shore up the ailing music industry. As well as composing for picture, Tot specialises in finding music for adverts, TV programmes and films. "That's 50 percent of my work. Downstairs in my little room, I've got my own record library, which encompasses every genre I think I will need to do jobs, and the key things within that genre, the things that people will always ask me for. If we're talking about a thriller, I've got to have *Psycho*, I've got to have *On Her Majesty's Secret Service*, which seems to be the best John Barry Bond score. I've got to have *Jaws*, I've got to have *Star Wars*, I've got to have the basics. But I'm not interested in them, I'm not going to offer them for anything, because they carry baggage and they're faded and jaded. So I'm looking for that soundtrack that Ennio Morricone did for a porn film in 1969 that no-one's ever heard of except me. If they ask me for the MC5, I'm not going to offer them the MC5, although I've got it, but I've got 20 records of similar period which might have been on a small garage punk label from Wisconsin in 1967 that only released two records. It's about finding the records that nobody's heard that have the same impact as the MC5, or the same feeling as Bernard Herrmann, or the same vibe as Ennio Morricone.

"Film directors and creative directors and so on will sometimes book a couple of hours in this room. They pay to come in here for a couple of hours and then they get what they want, make a CD and take it away. I keep changing the selection all the time — everything changes about every two months. I try to get unusual things used. It could be anything, it could be a Gregorian chant or it could be Gershwin or it could be Stockhausen, or it could be some mad band. You find something that is 'cool', that fits, that helps the film, moves the film, makes the film powerful. I've earned quite a lot of people a hundred thousand pounds, which is not bad!"

MUSIC FOR ADVERTS

"Apart from the Steinway downstairs, that is the best piano I've ever come across," says Tot Taylor of the Technics SPS (left). "It's a wonderful piano. I've bought three of them."

EMI asked me to do one last week and they said 'We thought we'd ask you to do this, because if we asked Burt Bacharach it wouldn't sound as much like a Burt Bacharach song as Tot's Burt Bacharach song.' I don't know if that's a good thing or not, but they were probably right. Paul McCartney's not going to write a song in the same vein as 'And I Love Her' any more."

An Arid Vibe

Another essential skill for working in advertising is the ability to make sense of what creatives and directors are asking you to do — and to be confident enough to tell them when you think they've got it wrong. "They'll say things like 'We need to feel like when he throws the ball down there, that really he's thinking about his sister in Venezuela.' My job is to figure out what they're on about and then make it work for them. Somebody recently described what they wanted as 'arid'. What's an arid chord? I don't know!"

When he's commissioned to write music for an advert, Tot's composition process invariably begins in his head. "When I see a piece of film, I hear a piece of music. They always want to play it to me with the temp track music on, but I don't want that. I've got a little cassette machine, and I'll watch it four or five times without the music, then I'll walk out of the room and stand in the corridor and sing into the cassette machine what I think it should be. The good thing about that is that before they've given me their briefing stuff, I've got something down on tape that I think is instinctively right, which will work against it. Then I'll watch the film about nine or 10 times and sing it to myself, and it will evolve. Then I'll play that piece of music on the keyboard against the film, and then I'll go off and have something to eat, or do a different job. Then I'll come back and watch it and go 'That works, we're in business,' or 'Ah. That doesn't work at all.' And at that point, I'll try to figure out what instruments to use.

"It's identifying the atmosphere, the mood — what I prefer to call the vibe — of what I'm seeing. There's no point in going to the Royal Academy of Music to learn how to do that. That's something you either can do, or you can't. The first thing everybody asks me is 'How can I learn to do this?', and you can't. When you're six years old, you're either going to be able to do that, or not. It's that simple.

"The directors always say things like 'Can you make it a bit like Daft Punk, but we also want it to be like Interpol' — or whatever's

A Different Perspective

Although the BBC doesn't carry commercial advertising, it does screen plenty of adverts for itself, and their recent TV campaign for Radio Two gave Tot Taylor a couple of very unusual jobs. "The BBC rang up and said 'We're recording a series of ads where people basically take a song that's well known and remake it. Would you be interested in helping us out musically with Michael Stipe? We want you to go to New York and do some recording with him, and we want you to record one of his songs in a completely different way.' I said 'Sounds interesting, but what am I doing?' They said 'Well, REM are not going to be there. It's just you and Michael Stipe.' I said 'I don't know Michael Stipe.' They said 'You like a challenge.' So I said 'OK, give me a chance to listen to the albums and so on.' 'There's no chance, you've got a flight at 10 o'clock tomorrow morning.'

"So we met Michael Stipe, and he couldn't have been lovelier. They had booked a studio at four o'clock that afternoon to do the recording, and the only things I'd taken with me were my old Roland CR78 drum machine and a WEM Copycat delay unit. I turned the feedback up on the Copycat, and it made a kind of howling sound, and Michael said 'That's great!' We spent a day messing around with old effects units, and then the next day we went down to this theatre in Harlem and recorded Michael singing 'The Great Beyond' through all these '70s analogue effects.

"A few weeks later the BBC rang up again, and asked if I was interested in doing another one of these promo films, and I said 'Who's it with?' They said 'Paul McCartney'. It took me about a tenth of a second to say 'Yes'. We met in an antiquarian bookshop near the British Museum and again, we had the brief from the BBC to do a familiar song in an entirely different way. I think he started off so many brilliant musical ideas then abandoned them, so I talked about the song on *McCartney*, his first solo album, where he plays the wine glasses tuned with water, and we talked about John Cage's prepared piano sonatas and also tape loops and coins and cotton wool on piano strings and tambouras and using all untuned instruments. He immediately had lots of ideas on how to make it work, and so we booked a little room in Maida Vale two days later to record it, and that was filmed for a BBC documentary and the ad. It was interesting to see him weave his spell and get something really good out of nothing and to observe how inventive and meticulous about everything he is. Anyway, we recorded it to four-track, which he operated himself, bouncing the single tracks down as he went, like the Beatles did for their mid-'60s recordings, then he played the harmonium chords and sang a kind of Irish lament version of 'Band On The Run' on top of this sound collage. It was fascinating, because everything he does is for real — playing and singing live. No drop-ins, no retuning, that's how you capture spirit and emotion, and he managed to do that with about 100 people watching from the next room!"

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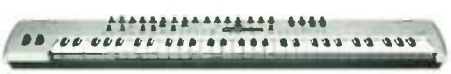

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Tot's small MIDI suite is used for jobs that have to be done almost instantly.

hip this week — 'and we want it to be a bit like the *Planets Suite* as well', and they'll play you a piece of music they like against it when you watch it. They'll say 'It's great, isn't it?', and I'll say 'It's bollocks, it doesn't fit your film. It's got nothing to do with the sense or the rhythm of the movement in your film.' I was watching one last week, and in the film a bloke walks across the film, talking. The first thing I would do is measure out the walk on a metronome and put a rhythm down. Then I'd be in business already. What I'm looking for is either something physical, moving, or the edits in the film giving you a rhythm. Sometimes, unfortunately, the cuts happen on the beat, which is completely naff. If the film's been well edited, they don't happen on the beat, they happen slightly off the beat — and that's another problem, because as a musical person, I rarely work with an editor who is musical. You'll be saying 'That shot's three frames short, the next one needs to be extended at the front by five frames,' and then they get offended.

"They will also have hit points through the 30 seconds, and the difficulty of dealing with 30-second films is that they will have hit points that are individual frames. They will go 'On the 17th frame of second 13, we need to feel a lull.' They might have 30 of those in a 30-second film, and if you're going to do your job properly, you have to hit each one.

"You have to be completely flexible and adaptable, right to the end, which is very difficult if you're dealing with an orchestra. I have had situations where we have got an orchestral piece running along and they've changed one or two of the edits. They go 'We're not hitting that point any more, can you move it?' and you think 'There's 70 people sitting out there and they've all got a bit of paper!' And they go 'Yes, but can you move it?' And you have to say 'Yeah, all right, give me 10 minutes.' And you have to literally walk around the orchestra and go 'Bar 79 — what are you playing?' and get them to play a B flat instead."

Wine Into Water

The most important thing to bear in mind when writing music for picture, however, is that the music will always take a distant second place to the visuals. It shouldn't be this way, and it doesn't have to be — but according to Tot, it usually is, and British film directors are the worst offenders. "Music should be self-contained, it should be pure, it should exist by itself. When you're writing music for picture, though, it's part of another composite form, and it isn't pure. You'll find that with film-makers, directors and writers, picture is 90 percent, music's 10 percent. They'll tell you that's shit, but it's true. You'll also find that if you add real fabric into your music to accompany a picture, it'll get thrown out because it's overpowering the film. Over a period of time you will stop yourself adding purity, real quality, and you will start adding water. And eventually you'll realise that the way to survive in the business of putting music to picture is to provide water for the film director, because that's basically all he wants — I'm talking about British film directors here, because they're more interested in film music in America.

"If you ask film directors, they'd say 'What a load of crap! Music is crucially important to me!' and I'd say 'Oh, is it? Then how come on every film, the music happens in the last three weeks? How come, on every film, you don't meet any composers before you start shooting? And how come the way you do your A&R research is to phone up music agencies and production companies in London and get them to send you showreels?' That tells me that music is not important to your film, and that's why music to film is a load of shit. You'll never get any

The Independent Path

Many would-be composers of music for picture imagine that once they've persuaded a management company or agency to take them on, their difficulties in finding work will be over. Tot Taylor, however, is not a fan of these agencies: "London is full of companies that manage composers. They have as many composers as they can get, and if you've got a job they will sign you and take your job, rather than finding you one. Also, they don't really care which one of their composers gets employed so long as one of them does and they can take their percentage. They have a roster, and they're in and out of the ad agencies and film production companies every day, knocking on doors, going 'Got any projects? Anything you need music for? We've got 20 composers and they're all fantastic.' And then they say 'We'll do the demos free.' That f*cks everybody up. It f*cks me up, because how can I afford to do a demo for free? They have these studios in Soho where they can knock something together in about two hours. They come back from the BBC, they speak to the composers who are there, and they give them the brief, and the composers knock something off. It's one way that you can get work, but you are entering a lottery."

Some of the outboard in Tot's MIDI suite: from top, Marantz CD recorder, dual DAT deck, Zoom RFX2000 and Lexicon MPX100 effects, Oram HD-DEF 35 EQ.

good music to film unless you get the composer involved as part of the package. People in films don't want really good tunes. They don't want melody, they want what I call 'comfort' and 'stuff'. But I don't do comfort and stuff, I do music. The thing that film composers always say in interviews is 'If you didn't notice the music, then I did a good job.' Why do they say that? Are they twats? Did you notice the music in *Psycho*? Did you notice the music in *Jaws*? Yes! All the great films have great music, and you notice it."

From Tot's point of view, advertising actually offers more creative possibilities for the composer than most films or TV programmes. That's partly because adverts have to make a much more immediate impact on their audience, and partly because he finds that directors who specialise in ads tend to be more open to radical musical ideas. "TV ads are where it's at, if you're interested in doing a quality job, if you want to work in a big studio with a big budget, loads of people, time, and all the facilities you would like to have. It's nice to be at Abbey Road for a week working on 30 seconds of music. People are making TV ads with five-million-pound budgets, and the films are visually beautiful. I would never ever be offered a feature film that looks that good — they're shooting 60 seconds' worth of film and they've got the budget of a feature, so you get all this beauty and attention to detail concentrated in a 60 second shot."

Even in advertising, though, it pays to hedge your bets. "What I usually do, to be fair to the directors, is do every job twice at the same time. I do the piece of 'pure' music that, to me, is it. That's the one I know will make an impact on TV and is going to work. And then I do the piece of 'water' that the director or the client — and that can be a problem with ads, because the director is not the final word — will probably like. And on most of the jobs I do they'll like one or the other. I play them the 'pure' one and talk it up, I'll say 'This is what I've come up with and I think it's bloody great.' Sometimes they go 'Yes, amazing, thank you so much,' and sometimes they go 'That is not at all what we're looking for,' in which case I go 'And I've got this one...'"

The only sampler in Tot's studio is his ancient Emu Emax rackmount, which is no longer used. Other MIDI sound sources include Emu Proteus 2000, XL1 and Virtuoso 2000 modules, Kurzweil K2000R, Roland D110, Kawai K1R, Korg O3R/W and M3R modules, and a Korg X5D used as a controller keyboard.

The Pure Stuff

At the time of writing, Tot Taylor's music can be heard in TV ads for Orange mobile 'phones, Sony Wega televisions, Renault cars, Tetleys beer and Nike running shoes, among others. Music for picture doesn't always mean great art, but it certainly pays the bills. It also allows Tot to spend time painting, buying and selling art, and most of all, to work on other projects which might not be so financially lucrative, but come closer to his ideal of 'pure' music. In the art sphere he DJ'ed for photographer Nan Goldin's exhibition at the Whitechapel Gallery, while recent highlights on his own Poppy Records, Tweed Records and Compact Organisation labels include music for the West End play *Picasso's Women*, new songs for a touring production of Shakespeare's *The Tempest*, and an album of his jazz compositions, *Popfolkjazz*. And that's just a taster: in 1999 he decided to re-release his entire back catalogue in one day. It came to 80 albums. "Working fast is good," avows Tot. "People will say 'Do you want to talk about budgets, or rights, or whatever?' No, not really. What concerns me is getting a good bit of music done. And that's it." SOS

What, No Sequencer?

"I have had jobs where they wanted the music one hour later," says Tot Taylor. "They'll phone up at four and say 'Tot, can you be in Soho at five o'clock with some music that sounds like this?'"

It's for the half-hour jobs that Tot's small MIDI setup comes into its own. "Somebody 'phones me at four, I come downstairs, I turn it on, I play something, it's there, there's no mucking about, I DAT it and about 20 minutes later I'm in a cab. I just record MIDI into Hybrid Arts *SMPTE-Track* on the Atari. It just records 60 tracks of MIDI and doesn't do anything else. I bought it in 1986. Everybody else was getting *Pro 24*, which I couldn't afford, but this was 60 quid, so I bought it, and I still use it."

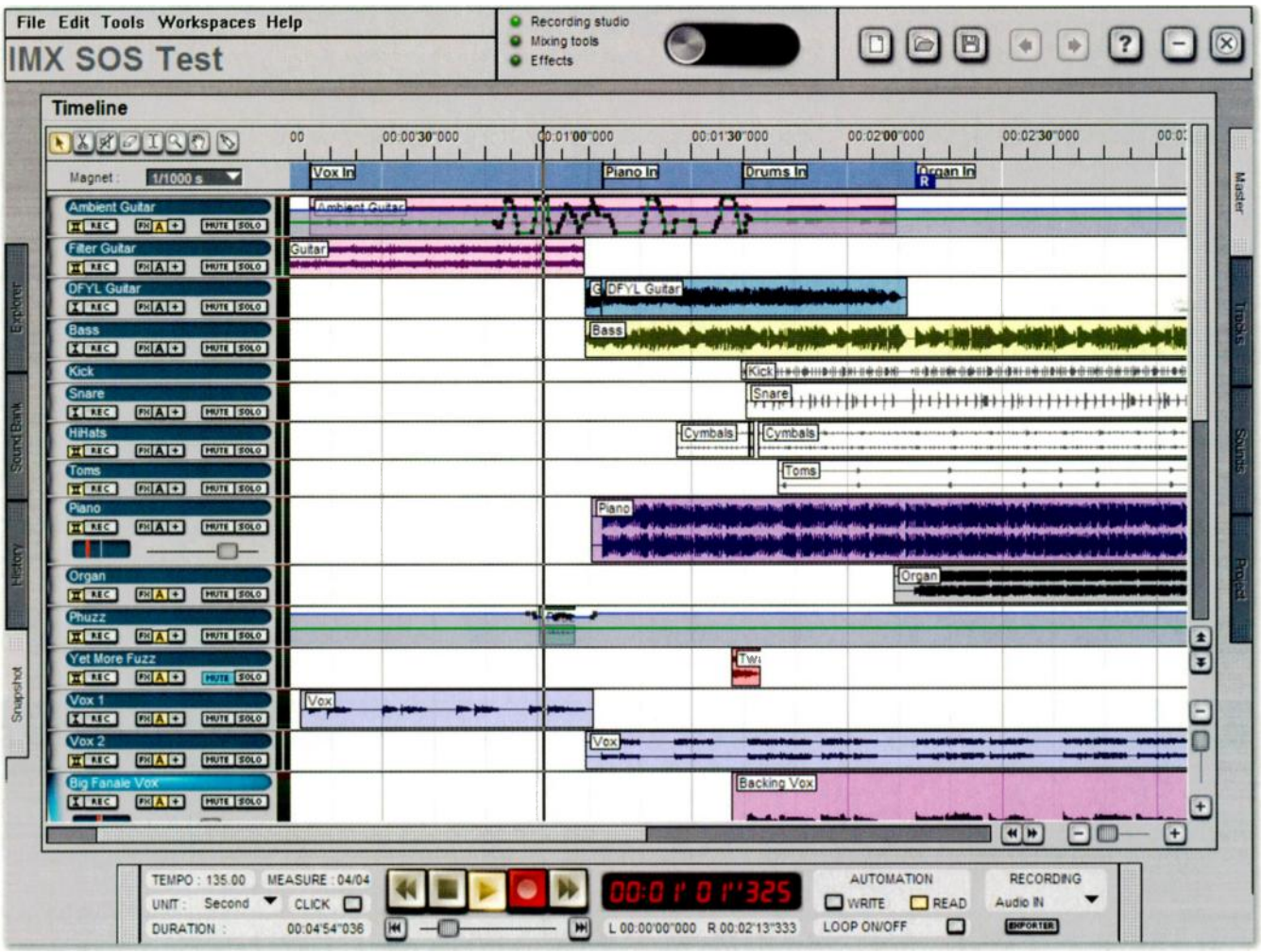
When deadlines aren't quite so pressing, Tot will always record real players rather than use a sequencer, whether it's the Royal Philharmonic in Abbey Road or a jazz drummer in his kitchen. Even when he's called upon to make a dance track, he'll play everything in by hand. "I got quite good at playing things very tight. When I did sessions for Tony Mansfield, playing piano or guitar or whatever, he was very hot on timing, and I got used to doing it again and again and again, until my timing got good. So now I can pretty much do a dance sequence or a drum sequencer or a bass loop, or whatever, by myself. I don't really need a sequencer, I'll probably play the drum parts in live, and they'll sound a bit better like that, because they'll have a bit of movement. That's why my setup is so minimal."

Apart from his tiny MIDI suite, several other areas in Tot's Camden headquarters come into play as recording areas. There's a large live room downstairs containing Tot's Steinway piano — "It's also a very good room for string quartets and little jazz groups and the like. We just run mics from downstairs. I've done some quite big jobs in there with mobile studios parked outside" — and a smaller room stuffed with musical instruments, where a 24-track two-inch tape recorder is used for tracking. More demanding jobs with a bigger budget usually take Tot to a 'proper' studio: "I've got two engineers that I use regularly, Tony Harris and John Mallison, who were both resident at Livingstone Studios in Wood Green. I've been recording there for 20 years, and that's where I like to be. I usually take lots of gear. Yesterday I was recording a schoolgirls' choir, and I moved my whole bloody studio. I had six boxes of percussion instruments, celestes, a couple of sound modules, a couple of keyboards, a childrens' organ, loads of tambourines. That's the down side of trying to do something properly, rather than doing it all with samples."

Intuitive Works Intuitive MX

Audio Recording Software For Windows PCs

As recording software gets more and more complicated, French developers Intuitive Works are taking a different tack with their first product, emphasising ease of use and ergonomic design.



Intuitive MX's Montage window is its equivalent of the Arrange page found in most recording programs.

Mike Bryant

In case you hadn't noticed, there's a lot of competition out there in the mid-level software recording market, and it must be a thankless task for the smaller companies to avoid being overshadowed by the Big Names. French company Intuitive Works claim to have made ease of use the basis of their first product, the descriptively named *Intuitive MX*, but haven't forgotten to include a fresh touch with an interesting alternative mixer design, inspired, it seems, by the simple *3dmiX* application bundled with the BeOS operating system. As a bit of a BeOS enthusiast, I was interested to see how this idea would work in a more fully featured recording environment (albeit a Windows-based one), and whether it would have more than novelty value.

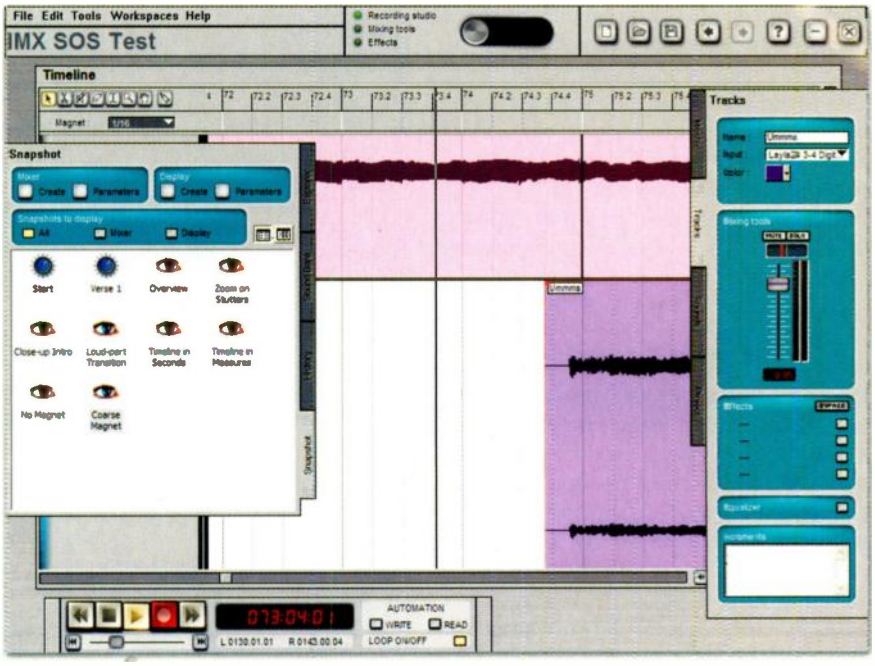
Installation & First Impressions

Installation is a doddle, and including the demo song takes up about 40MB all told. Entering the serial number is all that's

required by way of copy protection, though registration is necessary to download updates, and I duly found the newest version 1.2.5 on IW's web site. Perhaps to emphasise *IMX*'s ease of use, the brief manual is a veritable masterpiece of bad translation, and dangerously contagious in its illiteracy. I decided to lay it to one side after the inspired syntax-mangling began to infect this review. On the other hand, being concise and to-the-point, it can usually be deciphered without too much confusion, providing you bear in mind that the 'erase' tool is referred to as 'gum', and the 'glue' tool as 'stick'. It'll almost be a shame if they rewrite it, thus depriving us of classics like: "Suppression [...] You can also select a zone with gum (if you click in the vacuum) and thus erase of a blow all the objects of the zone."

Starting up *Intuitive MX* presents you with a list of recently used projects and an open file dialogue. There's also a useful Wizard for creating new projects, which prompts you to select a project folder, followed by options such as the sample rate, bit depth, tempo and the number of tracks you'd like to start off with. (See the Audio Errata box for details of *IMX*'s hardware setup options, but suffice to say that I found the default settings worked best with my Echo card.)

Intuitive Works have eschewed the regular Windows look in favour of their own, and whilst I usually find custom interface widgets to be slower and less intelligible than standard ones, I'll admit they've done a pretty good job in this respect. Although the menu bar at the top takes up a little too much screen space, the scroll bars are responsive and navigation feels quite snappy, even on a PC near to the minimum specs. *IMX* is split into three distinct workspaces, selected by the big 'switch' on the menu bar. Down each side of the main window are a selection of tabs, which open out into separate palettes when clicked, and the transport bar is immovably docked to the bottom of the screen. One thing I wasn't keen on was the program's insistence on covering the Windows Taskbar, perhaps to encourage a more immersive user experience. This is just plain annoying if you want to, say, keep an eye on the time, and if I wanted the taskbar hidden I'd enable 'auto-hide'.



Snapshots function rather like screen sets in *Cubase*, allowing you to store and recall particular window layouts.

The Workspaces

The first workspace contains the Montage, which, as you'll see from the accompanying screen shots, sticks to the standard template as a canvas for arranging Sounds. The expandable tabs — or 'drawers', as the manual terms them in a rare instance of apt translation — are divided between those concerned with general project management on the left, and something more akin to the *Cubase* Inspector on the right. These contain virtually all the program's functionality, as the menus are empty of all but the most basic commands and the Preferences, which you only need change infrequently.

The Explorer drawer allows you to browse your computer for audio files, preview them if necessary, and drag-and-drop them into the Montage. The Soundbank contains all the references to audio files used in the current project, including those deleted from the arrangement. A nice touch is the colouring distinction between imported files and those recorded in *IMX* and subsequently deleted, which makes it easier to avoid cluttering up your hard drive with myriad useless WAV files. History is self-explanatory, providing an Undo record that can be skipped back and forth by clicking the last good operation, with a theoretically unlimited number of steps. This is a very welcome feature, and although the History is cleared when you close a project, it's preserved after each 'save' operation.

The Snapshot drawer has something of a dual purpose, in that it can record both display and mixer configurations. Display snapshots can preserve the position of the windows, locators, zoom level, and timeline settings to cut down on tedious manual zooming and navigation, whereas mixer snapshots store either the whole mix or parameters relating only to individual tracks. Again, these are handy features that make life easier, and seem to suggest a thoughtful approach to usability on Intuitive Works' behalf.

The drawers on the other side of the 'Recording studio' reveal a fader and effects bypass buttons for the master output and the currently selected track — a nice touch is the text box for comments — as well as parameters for selected Sounds in the Montage, such as duration and looping. There are also controls for time-stretching and pitch-shift, which I'll cover in more detail later in this review. Only the folder for storing newly recorded files can be set from the Project drawer.

The Mixing Tools and Effects workspaces have a curtailed complement of drawers, though both have a Display tab for hiding or showing individual channels. Intuitive Works' bespoke graphical interface did cause me some initial confusion in the Effects

SOUND ON SOUND

Intuitive Works *Intuitive MX*
£100

pros

- Well thought-out, easy to use interface.
- Excellent automation capabilities for VST plug-ins.
- 3D 'Real Controller' can be genuinely useful.

cons

- Absence of snap-to-zero-crossings facility occasionally hampers editing in the Montage.
- Lack of send effect architecture requires inefficient allocation of plug-in effects.
- No punch-in/out facility.

summary

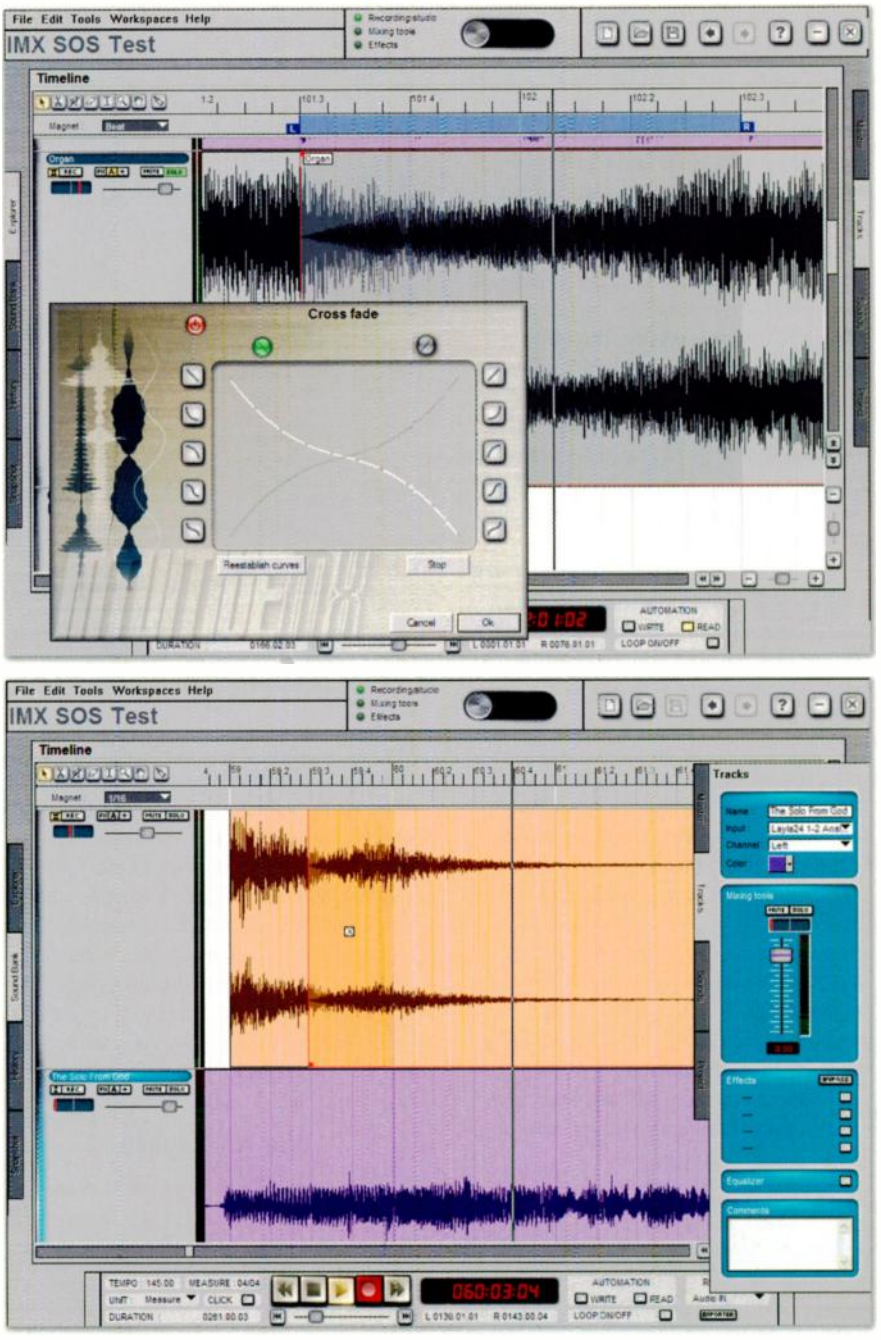
Intuitive MX is a polished and very promising new application which fulfils its brief extremely well, particular with regard to ease of use. The Real Controller won't appeal to everybody, but adds a new dimension to mouse mixing and an individual spin that sets *IMX* apart from the crowd.

workspace, because you cannot close a VST plug-in's window without removing it from the signal path. Selecting an individual channel makes visible all the plug-in windows currently used in that track. This is a very simple concept, but it demonstrates how IW have rethought some of the orthodox methods, and in practice it proved an efficient way of navigating the mix, perhaps helping to impede the onset of RSI in my double-clicking index finger.

The Montage In Use

I found the Montage very pleasant to use, not least because it sticks to some well-known operating conventions. Each track is individually resizable, and has the usual complement of Mute, Solo, and Record Arm buttons, as well as a row of three smaller ones pertaining to effects and automation settings. When zoomed to a medium size you can also adjust each track's volume and pan without opening the mixer. The 'magnet' settings allow you to choose between various snap references (song position, locators, events, grid) and the size of the grid used. Magnetic behaviour for Sounds in the Montage is active at all time unless the Shift modifier is held down, and this worked fine for me. In addition to the usual scissors, glue, and eraser tools, there's a mute tool and a range selector, which is handy if you want to copy or delete sections that don't correspond to individual Sounds. Looping is set with left and right locators on the timeline, upon which nameable markers can also be dropped.

It's difficult to see how recording could be made much easier in *Intuitive MX*. Simply select the desired input from the Tracks drawer, toggle mono or stereo operation, arm the track and press Record. A metronome can be engaged if you wish, and there is an adjustable pre-roll set by default to one bar. Multiple takes can be recorded in loop mode, and compared by selecting the desired 'catch' from the right-click context menu. It's all very straight-forward and worked perfectly whether recording from single or multiple inputs, and I enjoyed this no-nonsense approach. One mainstay of the multitracker that is missing in action is a punch-in/out facility, which is a shame considering how nicely the program covers the other bases. One could well argue, however, that punching in and out is far less important on a piece of software with a maximum of 128 stereo tracks than on a hardware machine with a much smaller number of mono channels, and I found it almost as easy to record corrections and alternate takes to a separate track and comp the results afterwards.



Where two Sounds overlap, you can call up the crossfade dialogue by clicking on the small 'x' that appears.

Something I initially found quite misleading was the visual similarity of the red box that distinguishes selected Sounds in the Montage to that in *Cubase SX*, replete with small 'grabbable' squares at the corners. Unlike in *Cubase*, the squares don't actually do anything, and sliding the edges doesn't trim a Sound — as seems to be common convention nowadays — but time-stretches it, regardless of the modifier key used. On reflection I think this does make some sense, as *IMX* simplifies the concept of the Arrange page by making no explicit distinction between files on your hard disk and abstract 'events' composed of sections of a file. This isn't to say that editing in the Montage is destructive — it isn't — but that you can only trim a Sound as you would trim file in a wave editor: by deleting a section. This takes a bit of getting used to at first if you're used to the *Cubase/Logic/Sonar* manner of editing, but it's arguably a more simple approach and perhaps more intuitive to newcomers.

But I digress. If you're accustomed to the wonders modern loop-based products can perform, you probably won't think the

Minimum Spec

- Althon/Duron or Pentium II 300MHz.
- 64MB RAM (128 recommended).
- Windows 98/ME/2000/XP.
- 16-bit soundcard.
- Monitor with 1024x768 resolution.
- Microsoft Direct X 8 or higher.

time- and pitch-manipulation features sound particularly good, unless you're into going all jungle with the drums. I was, however, struck by how easy it is to drag loops into the Montage and get them all lined up at the same tempo — particularly considering that loop composition is not the program's *raison d'être* — and if IW could add greater sophistication to the process it would really enhance *IMX*'s appeal. For the time being, time-stretching and pitch-shift are merely useful tools to have there in the Sounds drawer, and I did find they came in handy on occasion.

One feature of the Montage that rather impressed me was the crossfade dialogue (see screen shots, left). If you place one sound on top of another, a small 'x' appears in the overlap. When clicked, this opens the crossfade box, zooms the region, sets it to loop, and solos the relevant track. You can then select from a number of preset fade curves or drag nodes to form your own, and the waveform updates as you do so. It's very slick, and made more so by the fact you can fine-tune crossfades on the fly without so much as hitting Stop.

Intuitive MX doesn't currently have the ability to zoom right down to sample level like some of the more recent high-end sequencers, possibly so as to not compromise the responsiveness of scrolling and zooming. This does mean that for some operations you need to call up an external wave editor, and at the time of writing this facility was still at the alpha stage (meaning incompletely implemented, buggy, and 'use at you own risk'). A warning reminds you of this and some of the present limitations when you double-click a Sound in the Montage, but I'm inclined to be thankful that this functionality was included nonetheless. The first point to bear in mind is that the editor program will not be able to open the file if there are any spaces in its file and folder name. The second is that *IMX* is not aware of changes made to a file by external editors, which means it's important not to mess with the duration of an audio file — say, by cropping it — because it'll probably replay incorrectly in the Montage. On the other hand, using an external editor works fine if you just want to fix a glitch, denoise something, or apply an effect destructively, and unlike in some programs, you don't have to save the file under a different name and re-import it.

Another facility absent from *IMX* at this time is a snap-to-zero-crossings feature, and I did miss this when editing material with the scissors and glue. It's rather too easy to end up with clicks at split points, particularly with bass instruments, and without using an external editor you can't zoom in close enough to reliably correct those erroneous non-zeroed start and end points.

Mixing

The Mixing Tools workspace is split between a conventional horizontal virtual desk, and the 3D 'Real Controller'. Sadly, this doesn't involve green and red glasses, but rather a visual representation of the sound stage, with each ▶

Test Spec

- *Intuitive MX* version 1.2.5 build 142.
- IBM Thinkpad 600E laptop with Pentium II 366MHz CPU with 288MB RAM, running Windows XP Pro SP1 and used with Echo Layla24 audio interface with v6.08 drivers.
- IBM Celeron II 600 (running at 900MHz) with 384MB RAM, Abit BE6 motherboard, 3DFX Voodoo3 graphics, running Windows XP Pro SP1 and used with Creative Labs Soundblaster Live soundcard.

Audio Errata

Intuitive MX provides three ways to communicate with your audio hardware: Direct Sound, WDM and Wave, chosen from the Preferences dialogue. Direct Sound is the default, on the basis that it offers the best balance of performance and reliability. WDM is recommended for best performance if your hardware manufacturer has got around to writing WDM drivers yet, with the caveat that this less mature technology may be less stable. Wave is a fallback in the eventuality that neither of the others works, and carries with it the drawback of considerably higher latency. I used my Echo Layla24 in Direct Sound mode, because although WDM would work fine if I switched to it mid-session, the program would thereafter hang on start-up, necessitating a tiresome procedure resetting the Layla's drivers. The much cheaper Soundblaster Live! currently residing in my desktop PC presented no problems at all, and latency was perfectly acceptable for mixing. Since there's no VST Instrument support or facility to monitor inputs through plug-in effects, the absence of ASIO didn't really strike me as a problem. One thing to bear in mind, though, is that although *IMX* supports recording and playback of up to 32-bit, 96kHz audio, this does, of course, depend on the capabilities of your soundcard and its drivers, and some do not support the higher bit depths and sample rates in non-ASIO applications.

The feature that sets *Intuitive MX* firmly apart from the rest is the 3D Real Controller mixing window.

track as a separate coloured oblong, complete with virtual monitor speakers to give a better indication of orientation. The Real Controller allows you to control volume and pan with the mouse simultaneously, by moving an object around the 3D field. Volume operates in the 'Z' plane, with the quiet tracks furthest from the listener, and you can twirl the whole virtual mix around in three dimensions by clicking and dragging in an empty space.

You may very well be thinking that this kind of resource-hogging gimmick is exactly what you don't need in an audio application, where precious CPU would be better spent on more plug-in effects and glitch-free performance. There is certainly a gimmick factor — indeed, the 3D mix idea was originally intended partly to serve as an audio-visual demonstration of the efficiency of the BeOS system. Although the graphics are quite simple, a number of options are available in the preferences to optimise the Real Controller for slow machines, such as turning off the integral VU meters and adjusting the frame rate, and PCs will with 3D graphics acceleration should achieve better performance.

Although it won't be to everyone's taste, though, I definitely think it's worth giving the *Intuitive MX* Real Controller a try before dismissing it out of hand. Even after the novelty had worn off, I found that it added tangible benefits in terms of gauging, at a glance, the status of individual components in a large mix, and if necessary visual congestion can be avoided by hiding tracks you don't need to mess with. It's a shame you cannot save snapshots of visible track combinations, which seems like a bit of a wasted opportunity. Hands-on use confirms that achieving smooth performance with fairly decent hardware is important, as low frame rates make it very easy to overshoot the mark when trying to make fine adjustments in level or pan. Jerkiness also markedly reduces the fun of seeing an automated mix played out on the 3D stage, and a part of me that likes those smiley flowers that dance to your music will forever think this is just plain cool. Oh, and did I mention automation?...

Automation

Because the Real Controller can be used to adjust both volume and pan with one movement, I'm inclined to think its merits are best realised in conjunction with *Intuitive MX*'s automation capabilities. In keeping with the rest of the program, it's not as laden with automation features as the likes of *Cubase SX* and *Logic* 5, but provides just about everything you need to simply and easily automate volume, pan, and VST2 effect parameters with a minimum of fuss. If, for example, you want to fade a sound in and out whilst simultaneously sweeping it across the stereo field, all you have to do is engage the Write button on the transport bar and drag the track about in the Real Controller. Likewise, automating effects is a simple case of moving the appointed knob or slider with Write mode enabled.

So far so simple, but automation can also be edited as vectors in the Montage. Engaging the small 'A' button beneath the track name reveals volume and pan lanes superimposed over the waveform display, whilst the '+' sign opens a list of all automatable plug-in parameters, which if selected are shown in sub-lanes beneath the parent track, somewhat reminiscent of the method employed in *Cubase SX* or *Nuendo*. This is another well-implemented area of the program, and editing nodes isn't so fiddly as to become a chore.

Things that can't be automated include mutes and solos (which I find easier to do in the arrangement anyway), master volume changes, and bypassing effects. The latter is more of a drawback since it's not possible to reclaim CPU from intermittently used plug-ins. I also have some reservations regarding the

One of *Intuitive MX*'s many strengths is its simple and effective automation system.

way *IMX* reduces the amount of data generated by manual parameter movements, and things such as resonant filter sweeps did sound markedly less smooth in playback than when recorded. These are minor gripes, however, and I'll happily give IW full marks for the system as it works extremely well and is brilliantly easy to use.

Effects

The bad news on the effects front is that IMX currently has no facility for send effects or groups whatsoever. This is a considerable drawback, as using a separate reverb or delay plug-in as an insert on every track that requires it is a real waste of CPU even on fast computers, and the addition of some kind of send architecture would be the feature I'd lobby for loudest. For the time being, a maximum of four insert effects can be used per track, in addition to the four-band parametric EQ permanently attached to each channel. Not including the EQ and a high- or low-pass filter, *IMX* comes with 11 built-in effects encompassing the usual modulation offerings, delay, reverb, pitch-shifting, and a dynamic trio of limiter, expander and compression. Whilst nothing to write home about, some of these are quite usable, though I wasn't at all keen on was the 'house look' of the bundled effects, seemingly inspired by Steinberg's original design in *Cubase VST*, back from around the time Bucks Fizz won Eurovision. Repeat after me. Software is not hardware. Software is not hardware...

Additional Thoughts

Some of the most praiseworthy aspects of *IMX* are the least tangible. I found it just 'felt' very pleasant to use, at least when not loaded down with plug-ins. Repositioning the cursor during playback provides an almost instantaneous response; moving a Sound during playback doesn't result in any discernible glitching or dropouts; fast-forwarding and reversing with the left and right arrow keys actually does a pretty good impression of audio scrubbing and responds snappily; and the program doesn't require any time to warm up if you hit Record during playback. These are commendable traits that go unlisted in the specs sheet but — in the opinion of this reviewer at least — contribute greatly towards an enjoyable and productive user experience.

On the other hand, there are a few ways in which IW could enhance *IMX*'s usability, such as implementing more extensive use of key commands for things such as tool selection and — in particular — horizontal zoom. At a more general level, I believe providing some MIDI sync capabilities would extend *IMX*'s appeal somewhat, and make it more viable as a replacement for hardware multitrackers and portable studios.

It's also fair to point out that I encountered a few bugs, although there was little in the way of random instability. For example, I found the program would hang if I attempted to bounce down a project with a record enabled track, and on one occasion I ended up with a corrupt project file after importing a 44.1kHz file into a 48kHz project. *IMX* is supposed to automatically resample imported audio if it doesn't conform, but in this instance seemed to reset the whole project to the lower sample rate, and I could find no way of getting it to revert to 48kHz.

The current version of *Intuitive MX* does not support group tracks or any kind of send/return effects structure, so you're limited to using plug-ins as inserts on individual tracks.

Conclusions

All told, Intuitive Works have succeeded in turning out a fine first product, and the assuredness with which it fulfils its principal brief has prompted a little more lamenting of absent features than I would normally indulge in for a program in this sub-£100 price bracket. *IMX* handles the basic recording and mixing duties very well, and I think the designers have done an excellent job providing a simple and, yes, intuitive interface. This is something you only really notice if it isn't there, and, as that cliche goes, I was able to concentrate on the music rather than tracking down functions in menus. I like it a lot, and the lack of window clutter is refreshing.

The most curious aspect of the program is certainly IW's utilisation of the 3D mixing idea. Although it's a little like working with the cityscape in Microsoft's *Flight Sim* 4.0 circa 1989, I do think the Real Controller has an appeal that outlasts pure novelty value. Anything that makes it possible to control more than one parameter simultaneously using the humble mouse is welcome in my opinion, though you will need a reasonably decent PC to make the most of it. The Real Controller is also the obvious distinction that sets *IMX* apart from the competition, and it'd be great if its functionality could somehow be expanded to encompass more mixing parameters.

IMX doesn't pretend to be a do-everything program: there's not a hint of MIDI to be found, and you really need an audio editor for precise trimming and fine-tuning of files, bearing in mind the caveats mentioned above. The thing that I feel most constrains its considerable potential is the lack of send effects in the mixer, and I hope Intuitive Works can address this omission in a future version. The bottom line, however, is that whilst there are some excellent products out there which boast more features for similar or less money (Fasoft's *N-track Studio* is one), *Intuitive MX* has one of the nicest, most elegantly streamlined interfaces I've lately had the pleasure of using. If that is important to you, I'd heartily recommend giving it a try. SOS

information

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T Dark Horse Distribution +44 (0)208 204 4943.
F +44 (0)208 204 4943.
W www.dark-horse.biz
E info@dark-horse.biz

Studio Electronics ATCX

Analogue Tone Chameleon Rack Synth

The ATCX really could be seen as four synths in one, as its unassuming exterior conceals not only an adaptable true analogue synthesis architecture, but also the filter characteristics of classic synths that include the Minimoog and the TB303.

Paul Nagle

When I reviewed the Studio Electronics Analogue Tone Chameleon (ATC1) in November 1996, I was impressed by the sound of this analogue synth module, and by its switchable filter concept. Back then you were given the option to purchase plug-in cartridges which would change the filter characteristics of the synth. A little later, an external unit capable of MIDI switching between the four available VCFs was made available, and this proved to be a much slicker method than unplugging the rear-mounted filter cartridges.

Fast forward to 2003 and an updated ATCX has arrived, boasting a new look and having no need for a plug-in filter system, since all four filters are already present inside the synth.

One-knob Wonder

A compact 2U high, and with a single rotary encoder for making edits, the ATCX is best operated with two hands. It's logical enough: you push the appropriate front-panel membrane switch and update the value shown in the inscrutable 3-character display with the encoder. Sometimes you need to push the switch several times to reveal new options.

As a real-time controller, the encoder is smooth and responsive but will never supplant a bank of knobs for those of us who like to tweak at speed. There isn't even a main volume control; you must push the red Volume button and the encoder then alters volume. This is less than ideal if you need to quickly silence a wayward drone during a gig!

At the back of the synth we find the single audio output and just two MIDI sockets: In and Out. External processing is catered for by the inclusion of an input to the VCF (Voltage Controlled Filter) and a second input to the (new) analogue ring modulator. A dedicated output from the ring modulator is also present, but this is of less value than you might think. (See the 'Externally Yours' box for details.) An on-off switch is located at the rear, above the standard 'kettle' connector for the internal auto-switching power supply. The only omission in this upgraded model is the ATC1's CV/Gate connectors, to which we bid a fond farewell.

Inside The Box

Let's have a quick recap of the ATC's facilities for those of you who don't hoard your old copies of *Sound On Sound* (or, instead, you could check the review online at our web site). Essentially, Studio Electronics never stray far from classic architecture — and why should they! Thus the ATCX is a monophonic synthesizer featuring two analogue oscillators, four analogue filters, two software-generated LFOs and three software envelopes. As the unique, switchable filter design is the *raison d'etre* of the Tone Chameleon, we'll discuss it in some detail later.

The oscillators feature triangle, sawtooth and variable square waves, all of which may be active at once. Cross modulation, taking oscillator two as its source, may be directed at oscillator one or the filter, and its level is

controllable by LFO or envelope. Oscillator sync is provided, and there's the option to turn off keyboard tracking for the sync'd oscillator.

New for this model is an analogue distortion effect, accessed by an extra push of the Noise Level button. This distortion circuit, which generates varying tones according to the filter currently selected, is a superb way to dirty up bass and lead sounds. Even at low levels it imparts a degree of rawness that is tempting to over-use.

I mentioned that three envelopes are provided. Envelope one is fixed to control the VCF, envelope two the VCA, and the third envelope is freely assignable to a wide variety of modulating tasks, such as oscillator frequency and level, cross-modulation level, LFO rate and depth, pulse width, resonance and so on. Throughout the ATCX, modulation sources typically have but one destination — you can't assign the free envelope to sweep resonance and cross-modulation level at the same time, for example. This makes things simple to understand, but imposes some restrictions on the degree of wackiness achievable.

Two LFOs are responsible for cyclic modulation, with just one of these — LFO 2 — capable of sync'ing to MIDI clock, in divisions ranging from a whole note to a 16th-note triplet. Due to display limitations, there are the usual cryptic abbreviations: LFO waveforms, including triangle, noise, and random, are shown simply by the numbers 1-6. (Fortunately, a Quick Reference guide for all the display abbreviations is provided, although it doesn't take long to memorise them.) Note triggering may either be multi or single, with priorities of last or lowest note available. Only my personal favourite (highest note) is absent — wouldn't you know it?

Style Counsel

I found the original ATC1 cosmetically similar to the Moog Source with its coloured membrane switches and single-knob operation. The ATCX features a reworked panel, replacing the previous pastels with a look that is predominantly blue. Unfortunately it has gained some of the most ugly, illegible text I have seen on a synth, and the graphics offer no improvement in clarity either. Before I make this into a whinge about style, I should point out that these are opinions based on my personal taste. I think it looks horrible, but you might actually like the graphics — and even the lettering!

Having vented my spleen about the ATCX's appearance, it's time for me to have a go at the manual too. It's poorly printed, out of date and confusing. It is, actually, just the old ATC1 manual, exactly as it was, complete with diagrams and panel images that refer to the original, unfussy look. If you're overcome with nostalgia at this point, you should explore the Studio Electronics web site where you'll find another edition of the synth available — in the earlier style. Apparently an 'ATCX addendum' sheet should be supplied with the new synth too, but this is no budget synth and I don't think a full rework of the manual is too much to expect.

Four Filter Fun

This Analogue Tone Chameleon's greatest asset is its ability to switch between different hardware filters — no longer by means of cumbersome cartridges or via an external cartridge adaptor. Instead, selection is made by a push of the red 'crosshair' button marked 'Type/Inv' in the filter section. This toggles between filter type and envelope inversion. As on the ATC1, you can invert the filter envelope, the 'free' envelope (envelope three), or both of them. But it's with VCF selection that the real fun starts: a spin of the rotary encoder reveals all four of the original cartridge filters onboard and eager to be selected.

The available filter types are Mini, SEM, 303 and 2600, represented in the display as '24d', 'ob', '303' and 'ArP'. They are designed to closely correspond to the filters found on the Moog Minimoog, the Oberheim Synthesizer Expander Module, the Roland TB303 and the ARP 2600. They're well chosen in terms of classic low-pass design, with each having its own distinct character.

Much has been written about the Minimoog filter design and I won't repeat it here. All you need to know is that it sounds creamy and wonderful and is everything you'd expect. The SEM's 12dB response

SOUND ON SOUND

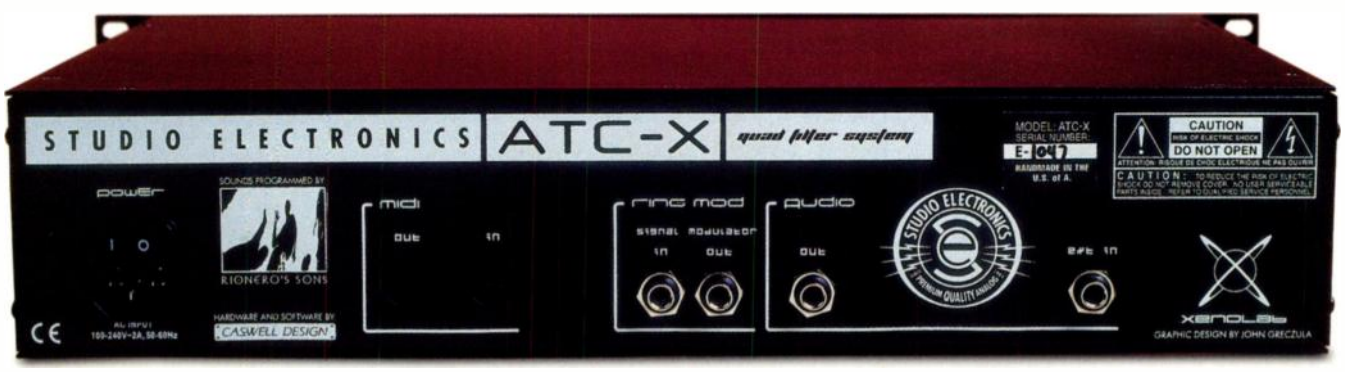
Studio Electronics ATCX £1250

pros
- 512 patches.
- Fat, powerful sound.
- Unique filter selection.
- MIDI control of parameters.

cons
- User interface feels like a cost compromise.
- But couldn't it be cheaper?
- Ugly text and graphics.
- Manual refers to older model.

summary

The ATCX sounds great and is straightforward, if a little long-winded, to use. You can generate a diverse spectrum of quality solos, basses and sound effects with it, and the filter selection system offers variations worthy of the Moog, Oberheim, ARP and TB303 filters being mimicked. It is a little expensive, given the compromises in the user interface, but has that unmistakably classy American sound that many strive for but few capture.



Externally Yours

The audio input allows you to use the ATCX as a stand-alone filter unit, processing external signals through the currently-selected VCF. It lacks any onboard means of setting the level of the external signal, and there's no provision to bypass envelope control of the filter and VCA either. You need to hold down a note before you hear any of your processed signal. That said, the results are very promising, and using external sources is a great way to become familiar with the different filters.

The ATC1 doesn't have a ring modulator, so its inclusion on the ATCX opens up welcome areas of metallic, bell-like strangeness and charm. The ring modulator has but a single control — Amount — that shares a button with cross-modulation amount (repeated pushing toggles between them). Normally, the ring mod sources are the two VCOs, but the rear panel features a dedicated ring modulator input for torturing and warping external signals. When a signal is patched into this jack, it defeats the onboard oscillator, so your audio becomes the carrier. As few people will want to fiddle around the back of a rack unit to perform patching, a patchbay will come in handy here. With this in mind, the modulator signal — an oscillator drone — is available as an output too, so you can patch it back in again when not processing external audio. Had the ring modulator's output been available too, it could have been brought into service as on a modular system — ie. audible without needing to supply a gate signal.

That small gripe aside, ring modulation of external sources is very effective and makes a welcome bonus. Ring modulation level is available as a modulation target for either of the LFOs, the various MIDI control options (mod wheel or aftertouch, for example) or envelope 3.

▶ stands out most from the others, being bright and more subtle, with a resonance that never dominates (or self-oscillates), even when the filter is set to maximum. When I scanned my original review of the ATC1, it seemed to me that this filter was my least favourite of those on offer, but times and tastes change. Perhaps it's because I've heard everyone-and-his-dog's version of a Moog filter over the years that I value more delicate characteristics now. Hey, I'm an analogue creature too, and hereby reserve my right to variations and inconsistencies!

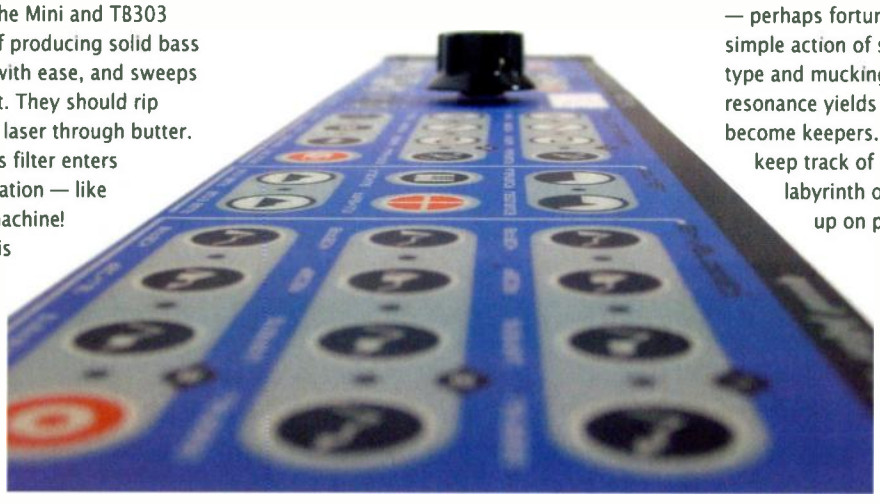
The 303 filter is suitably realistic, and really comes into its own when the analogue distortion circuit is switched in. Because of the versatile architecture of the ATCX, you're not restricted to mere acid basslines with this filter — but it can deliver them with gusto!

On my previous encounter with the ATC1, I didn't get a chance to play with the 2600 filter, so it was with some anticipation that I approached it. I was very impressed, especially as its shrill resonance behaves quite differently to the Mini and TB303 filters. It's capable of producing solid bass and upper-end fizz with ease, and sweeps are wide and elegant. They should rip through a mix like a laser through butter. At full resonance this filter enters screaming self-oscillation — like a Cat in a mincing machine! (Note to lovers of this venerable Octave synth: I'm using my imagination here. I have never subjected a Cat — or even a Kitten — to such treatment, although I did feel like it once after an unfortunate incident during a gig...)

I could continue talking about the ATC's filters, but describing the differences between low-pass varieties starts to get into 'dancing about architecture' territory. Suffice to say that you won't get bored in a hurry!

As I was about to draw a line under this part of the review, I stumbled across a mode selector by an accidental second push of the Keyboard Tracking button. Until then I had believed the choice of filter was limited to low-pass operation only, and that the ATCX lacked the high-pass switch of the original Oberheim filter cartridge. Not so! The 'hidden' mode selector I found allows you to toggle between low-pass and band-pass modes — shown in the display as 'LP' and 'bP' — for the Oberheim filter only. Once again I cursed the manual. I'd have felt pretty stupid had I completed this review but failed to spot the band-pass mode — especially as it's rather sweet!

When you select low-pass or band-pass operation in this way, a relay makes a physical clicking noise from deep within the bowels of the ATCX. Studio Electronics, in their typically wacky way, suggested popping a microphone near the synth and using this noise creatively, although this could have been their way of telling me to stop asking dumb questions.



I don't often take the gynaecological approach when reviewing synthesizers, but in this case I grabbed a screwdriver and took a curious look inside. This revealed the internal filter system mounted on a single board, the connector that previously interfaced with cartridges having been rerouted internally. It's a far neater solution than the cartridge system — except that it's 'closed'. Without an external connector, there is no provision for Studio Electronics to further extend the tonality of the synth by incorporating a state variable filter, an MS20 filter, a Wasp filter, or whatever, in the future.

Sounds

Auditioning the 512 factory patches requires a considerable investment of time. Even though they're organised into four banks of 128 patches (grouped by filter type), it's a daunting task to try to maintain a clear memory of the highlights as you spin the dial through the numbers. Nevertheless, it's my feeling that Studio Electronics have played to their greatest strengths. Thus the ATCX is packed with thick, warm basses and ripping solo patches, with occasional atonal strangeness thrown in for good measure. This synth sounds fantastic, expensive, fat, American. It's the unashamed by-product of a diet of burgers and fries, with no regard for muesli or tofu. And yet, with tweaking, you can also discover subtle, more 'Japanese' tones, the Oberheim filter being especially useful for brighter, lighter, cholesterol-free solos. However, it was to the range of basses that I turned most often; some of those bottom-heavy subs are just perfection!

All the factory sounds can be overwritten — perhaps fortunately, when even the simple action of selecting a different filter type and mucking about with cutoff and resonance yields usable variations that become keepers. The synth doesn't help you keep track of your location within the labyrinth of patches; it always powers up on patch location 1.

Conclusion

For many of us, the joy derived from analogue synthesizers is, in part, due to the hands-on control they so often provide. The ATCX's membrane panel, single

Upgraded Software

An extra page slotted into the ATCX's manual details enhancements for version 2.0 ATC software. This software upgrade is available for the ATC1 and incorporated as standard into the ATCX. The improvements include phase control and a retrigger function for the LFOs (their cycle is now restartable when you play a key), plus the ability to control two different modulation destinations from the mod wheel, each with different depths. The mod wheel accomplishes this by hijacking the current pressure (aftertouch) assignment: simply hold down the Pressure button then press 'Exit': aftertouch is then deactivated and re-routed to the mod wheel. As I forgot this combination on one occasion, I inadvertently discovered that the synth will reboot if you hold down the Pressure and Mod Wheel buttons simultaneously. Another improvement is the extension of Glide to include a 'legato' mode, and it may be selectively disabled for VCO1, VCO2 or the VCF. Otherwise glide is sent equally to all three of these sources.

Finally, MIDI controller numbers have been implemented for functions such as filter selection, LFO wave selection, oscillator 2 mode and so on. The MIDI spec of the ATCX is therefore as comprehensive as it should have been in the first place, and tweaks can be recorded via the MIDI output into your sequencer.

Owners of the original ATC1 can install the enhanced software, but the upgrade is chargeable and costs $24.95. The latest OS version is 2.2, according to the Studio Electronics website.

knob and enigmatic display are a bit of a turn-off in that respect. Nevertheless, this is a superb-sounding bit of kit, crammed full of fat, ripping, squealing mayhem. If knobs are essential to you, a MIDI Control surface would be the ATCX's ideal mate.

The four onboard filters each bestow their own character and are, without doubt, the synth's main selling point. It almost adds up to four different instruments to learn, each with their respective tonal and resonant responses. Other new additions, such as the distortion and ring modulator, sound great, and with the external processing options it all adds up to a well-rounded package.

Yet I can't help wondering if this synth has missed its window of opportunity. Expectations rise over time, and the ATCX is quite expensive, even taking into account the included filters. There are now knobby monophonic synths on the market costing not much more but offering a far better user interface, and you'd need to be pretty convinced about the elaborate filter design before parting with your dosh. After all, for another £150 you could buy Studio Electronics' own SE1X, with its Moog/Oberheim filters, knobs and display, three oscillators per voice, and so on.

In the end, it boils down to sound and versatility. The chameleon nature of this synth allows it to offer a very broad palette of tonal choices within a single monosynth, and this could be the reason for choosing an ATCX over the competition. SOS

Information

- £ ATCX as reviewed, with four filters, £1249.99; model with 'Mini' (Minimoog) filter only, £1099.99. Prices include VAT.
- T Turnkey 020 7419 9999.
- F 020 7379 0093.
- E sales@turnkey.demon.co.uk
- W www.studioelectronics.com
- W www.turnkey.co.uk

Alto Alpha Mic Tube

Tube Mic Preamp

Paul White


Photo: Mike Cameron

This metal half-rack mic preamp, powered from an included adaptor, offers variable tube drive and has combi jack/XLR sockets on the front panel with switchable phantom power. Outputs are on both rear-panel jacks and XLRs (the jack is unbalanced), and the jack input has a 1MΩ impedance, making it suitable for passive instruments as well as line signals. Other than Gain and Drive controls, each channel has phase reverse and 20dB pad, plus an eight-segment meter.

Because the voltage available from an external adaptor can only be multiplied over a limited range, I guess that the 12AX7 dual triode stage at the heart of this preamp is run at a lower voltage than it was designed for. So I wasn't expecting anything sounding too special, but it actually worked pretty well. The sound didn't have the smoothness and transparency of a real high-end preamp, but it was rather sweeter than the mic preamps in one of my budget analogue mixers — less hard sounding, but at the same time solid and reasonably detailed. When a cardioid mic is used close up to exploit the proximity effect, the warmth and character come over nicely. I've heard quieter preamps, but this one is no noisier than a competent budget mixer preamp.

The Alpha Mic Tube is well suited to close-miked vocals using capacitor microphones, where its noise performance is more than adequate, while its added 'character' should work well for those singers who need to smooth out their vocal sound or thicken it slightly. You need to work with the Drive control below the 12 o'clock position for vocal use, otherwise the distortion gets intrusive, but the extra range is handy when you're warming up synth or guitar parts, and it has a distinct character that I found quite flattering. Even if you already have a decent mixer, this unit might be worth considering for its extra character. SOS

SOUND ON SOUND

pros
- Inexpensive.
- Flattering tonal character.
- Variable valve drive.

cons
- No significant cons at the price.

summary
Given its budget UK price, the Alpha Mic Tube turns in a very creditable performance and can produce very high-quality results with close-miked sources.

information
- £ £136.30 including VAT.
- T Proel +44 (0)20 8761 9911.
- W www.altoproaudio.com

Electro-Harmonix LPB 2ube

Tube Preamp

Paul White

The Electro-Harmonix LPB 2ube is a pedal-based stereo tube preamp for use with unbalanced line or instrument sources, including guitars and basses. The all-tube signal path (using 12AX7s) has two valve stages per channel, and is run at a high voltage, even though the external power adaptor might seem to indicate to the contrary. The circuit has been designed for a nominally flat 20Hz-20kHz response.

A rotary switch sets the input level between Lo (instruments) and Hi (line), while two pots per channel provide Drive and Volume control. Overdriving the tubes can create anything from warmth to noticeable distortion, and the Right/Mono input can be used on its own, allowing a single input to be fed to both channels. Furthermore, using a cable to connect the right output to the left input places both channels in series for seriously overdriven sounds! The lack of balanced I/O and proper metering may put some studio users off, but with short cable runs noise isn't really an issue, provided that you take precautions against ground loops.

I found the LPB 2ube to work well as a DI box, adding a minimum of noise. At lower drive levels, and it firmed the sound up nicely, retaining punch and clarity. Because the unit is capable of subtlety, it also works well as a mix processor, but if you drive it to the point where hard distortion is audible, it really needs to be used in conjunction with a guitar amp or speaker emulator, as the upper harmonics of any unfiltered distortion can sound pretty nasty. Overall, however, the unit adds weight and clarity rather than fizz and mud. If you find software tube fakery unconvincing, then try the LPB 2ube. SOS

SOUND ON SOUND

pros
- Affordable in comparison with other all-tube devices in the UK.
- Classy vintage valve sound.
- Extremely good for DI'ing clean guitar or electric bass.

cons
- No balanced I/O.
- No level metering.

summary
The LPB 2ube is a useful and good-sounding Tube DI box that can also be used to process line-level tracks or mixes.

information
- £ $298 excluding VAT (around £212 including VAT).
- T Electro-Harmonix +1 718 937 8300.
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Hugh RobJohns - Sound on Sound - May 2003

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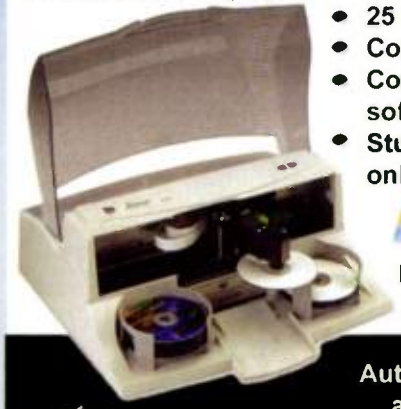

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Synchro Arts *Vocalign* & The Soundscape Mixer

If you are a Synchro Arts *Vocalign* user, you will probably have noticed that the Soundscape Mixer is not always controllable from Windows while the plug-in is being used, and that if you need to change a Mixer setting (for example to unmute a Mixer channel in order to hear the Guide, Dub or Aligned Part, or to edit an EQ parameter) you may need to close the *Vocalign* window first, and return to the *Editor*. I have found that if Always On Top is selected for the Mixer Window (in the Settings menu), the Mixer can still be controlled with the mouse as long as it is visible. Opening *Vocalign* will still cause the Arrange window to hide the Mixer, so check the on-screen Mixer position first — the Mixer will stay on top of the *SFile Manager* or Main window, and if it becomes partially hidden clicking it will bring it to the front. Note that the Soundscape Mixer will also respond to commands sent from a hardware control surface, regardless of the Always On Top setting.

(bottom) hardware devices. The section to the right has to do with the Console Interfaces, which are the software modules that allow the various hardware devices to communicate with the connected Soundscape (*Editor* or *Mixtreme*) program.

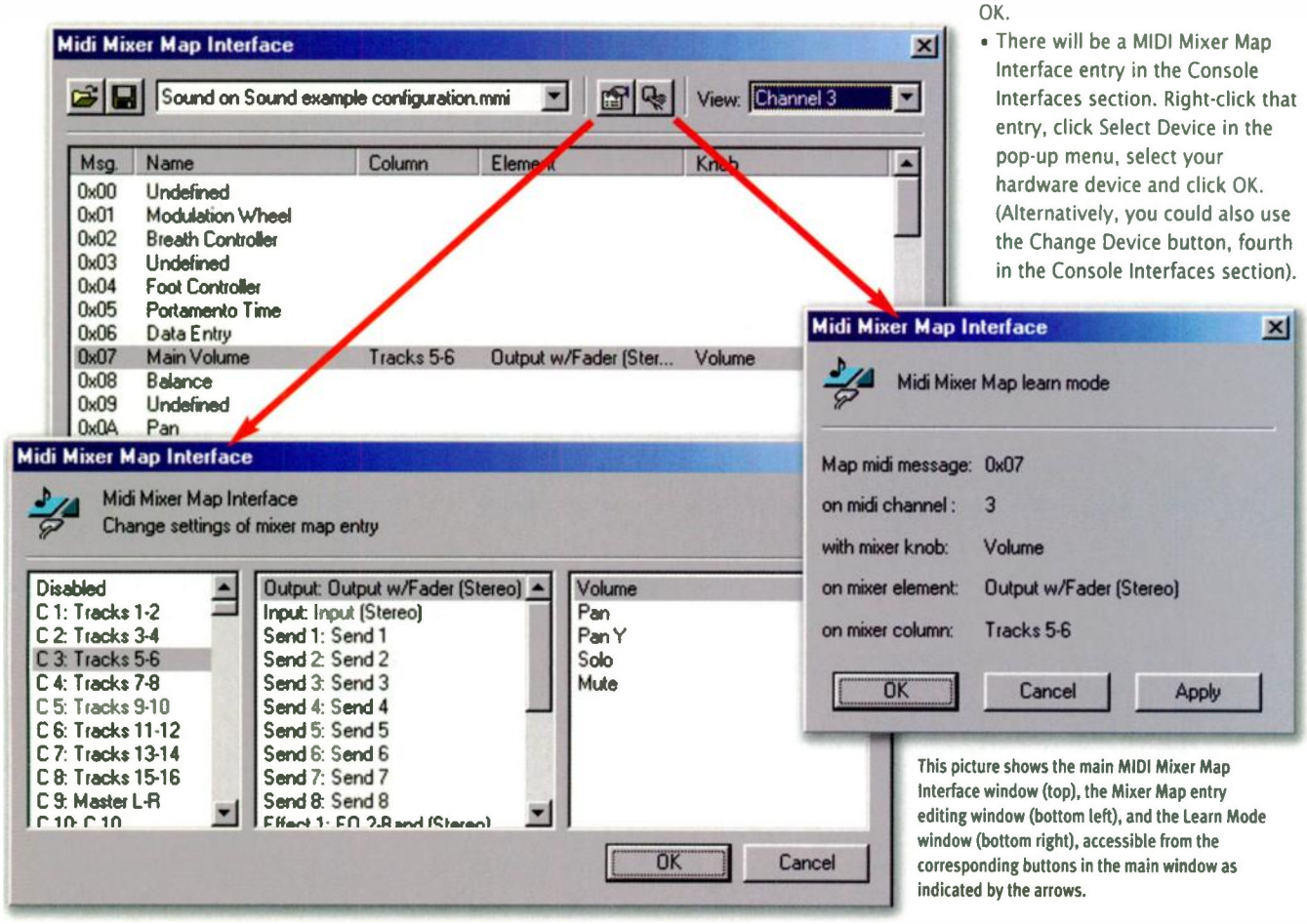
You can define a hardware device using the three buttons to the left of the relevant section (nine-pin or MIDI). The first button allows you to add a device, select its input and output serial port or MIDI channels and name it. The second button allows you to delete a selected device, and the third button allows you to check the properties of an existing device. Any number of devices can be installed in this way.

You can load a Console Interface using the first button in the Console Interfaces section, which calls up a window listing the available Console Interfaces. If your hardware device is supported, load the corresponding Console Interface and check the Readme file for details of supported functions. Any number of Console Interfaces can be loaded and, in some cases, more than one can be activated at the same time. The fourth button allows you to choose any one of the installed devices for communication via the selected interface, and the second and third buttons work as for the other window sections.

Setting Up Soundscape To Use A Generic MIDI Controller

To use a device that is not directly supported, you can load the MIDI Mixer Map Interface. Here's a step-by-step example of how to do this for Yamaha's 03D and Tascam's US428:

- First, make sure the hardware device is connected to the computer via MIDI and switched on. In the case of a US428, the connection is via USB, but uses virtual MIDI ports which appear in the Windows list of MIDI ports. The device must also be set up to act as a MIDI controller. In the case of the Yamaha 03D, you should be on a MIDI Remote page assigned to General MIDI.
- Click Connect To Console Manager, in the *Mixtreme* Settings menu or the Preferences submenu of the *Editor* Settings menu. The *Console Manager* icon will now be displayed in the System Tray. Right-click that icon, go to Mixer Selection and tick SSHDR1/R•Ed or Mixtreme as required.
- Double-click on the icon to open the main *Console Manager* window. Click the Add MIDI Device button (first one in the MIDI Devices section). A window will be displayed where you can name your device (I named mine 03D for the screenshot) and select the relevant MIDI channels (US428 Control Port for the Tascam US428). The new device will show Initialised in its status column.
- Now click the Add Interface button and a window will be displayed listing the available Console Interfaces. Select the MIDI Mixer Map Interface entry and click OK.
- There will be a MIDI Mixer Map Interface entry in the Console Interfaces section. Right-click that entry, click Select Device in the pop-up menu, select your hardware device and click OK. (Alternatively, you could also use the Change Device button, fourth in the Console Interfaces section). ▶



This picture shows the main MIDI Mixer Map Interface window (top), the Mixer Map entry editing window (bottom left), and the Learn Mode window (bottom right), accessible from the corresponding buttons in the main window as indicated by the arrows.

- To activate communication between your hardware controller and the *Mixtreme* or *Editor* software, tick the box to the left of the Interface name. Your device should now be indicated as Running in the status column of the MIDI Devices section.
- Your on-screen Soundscape Mixer should now respond to your hardware controller — in the case of the 03D, you can now change the fader/pan values.

You can keep shortcuts to a variety of different INI files on your desktop so that it's easy to start up Soundscape with different favourite configurations.

Editing The Console Interface

In addition to adjusting Soundscape parameters from your hardware controller, you can also simultaneously use the MMC Slave Interface to control on-screen transport buttons — in my case from the 03D's user-definable buttons buttons. However, for other control surfaces (such as the US428), you may need to customise the Console Interface itself.

The MIDI Mixer Map Interface is extremely easy to configure for use with any controller that uses MIDI. With your system running, select it in the *Console Manager*'s Console Interfaces section, and click the Edit Interface Properties button (see screenshot). You will be presented with the main MIDI Mixer Map Interface window which lists, for each MIDI channel, the available MIDI controllers, and the on-screen Mixer Column, Mixer Element, and Knob (ie. fader, button, or whatever) they are assigned to. There are two ways to change these assignments. The first way is to select the MIDI controller you want to assign, and click the Change Mixer Map Entry button. This will open a window where you can select a destination Mixer Column, Mixer Element, and Knob for that MIDI controller (and for the channel specified in the View box). The second way is probably the easiest, and is certainly better suited to editing a complete configuration — click the Start Mixer Map Learn Mode button, which will call up a window displaying five entries with variable values:

- Map MIDI Message: (0x00-0x78)
- On MIDI Channel: (1-16)
- With Mixer Knob: (undefined)
- On Mixer Element: (undefined)
- On Mixer Channel: (C1-C128)

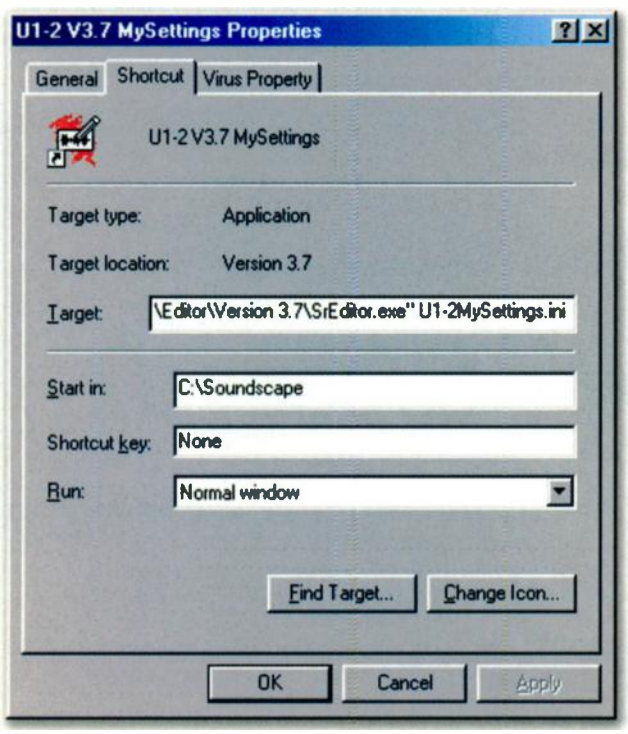
Sending a MIDI controller message from your hardware controller will automatically update the first two values. Clicking a Mixer knob with the mouse will automatically update the other three values. Clicking Apply will memorise the assignment thus defined. You can then proceed to the next one; click OK to exit the window when you're done. Note that the on-screen Mixer will not respond to the chosen hardware controller knobs until you have closed this window and the Properties window. Also note that certain plug-in parameters cannot be mapped in this way.

Configurations defined as described above can be saved or loaded using the standard Windows buttons and dialogue boxes. It is a good idea to save them with a name that refers to the corresponding Mixer. Given that the Soundscape Mixer is entirely configurable, you could end up with as many MIDI Mixer Map Interface configurations as you have Soundscape Mixers, unless you stick to the most basic controls (such as volume, pan, and mute for the channel output elements). The files have an MMI extension.

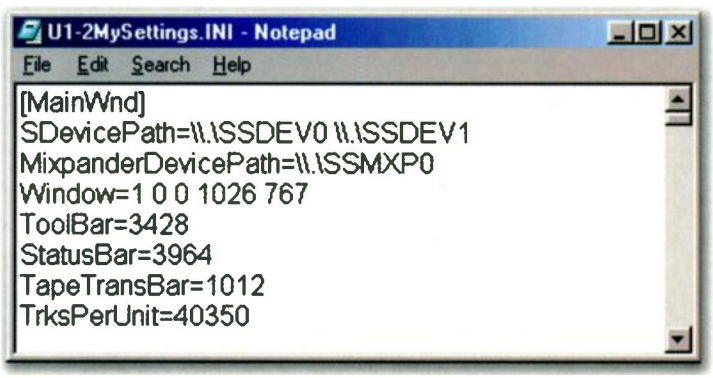
Configuring A Multiple-Unit System

If you are using a multiple-unit Soundscape DAW setup, there will be cases when it is useful to run the units independently. For instance, this will allow you to use one unit for a recording job while the other is defragmenting SDisks. You could also create sound effects using scrubbing on one unit, recording the results into another unit. Furthermore, for simple recording tasks, there is little need to fire up a 128-track system, although you may want to select a particular unit according to its optional hardware (analog I/O or sync card) or plug-ins. It is therefore useful to have shortcuts on your desktop and/or in your Start menu that reference your available units individually or in any combination. When you start up the *Editor* by clicking a shortcut, it will check the INI file referenced by that shortcut for instructions on which unit(s) should be used.

In a standard installation where the C drive is your working partition, the INI files reside in the C:\Soundscape folder and are named SSEditor1.ini, SSEditor2.ini, SSEditor3.ini, and SSEditor4.ini, corresponding to the shortcuts for one, two, three, or four units respectively. You can rename any one of these files, as long as you also modify the corresponding reference in



To the left you can see the Properties window for my U1-2 V3.7 MySettings shortcut, which I created to launch v3.7 of the *Editor* running two R•Ed units (with personalised settings) and a Mixpander connected to unit one. The corresponding INI file is shown below, and is referenced in the Properties Target field.



the relevant shortcut's Properties window (Right-click the shortcut, click Properties in the pop-up menu, and the INI file reference is at the end of the line in the "Target" box — note that there must be a space in the line before the INI file's name).

The units are listed at the top of the INI file, in a line titled SDevicePath. To use unit one only, the line should read:

```
SDevicePath=\\.\SSDEV0
```

Change the final zero to a one for unit two, a two for unit three, or a three for unit four. The lines below show examples for running two, three, or four units together — note the space after each unit number:

```
SDevicePath=\\.\SSDEV0 \\.\SSDEV1
SDevicePath=\\.\SSDEV0 \\.\SSDEV1
\\.\SSDEV2
SDevicePath=\\.\SSDEV0 \\.\SSDEV1
\\.\SSDEV2 \\.\SSDEV3
```

The INI file also contains instructions about which Mixpander(s) should be used. The Mixpanders are listed in a line titled MixpanderDevicePath, which has a similar syntax to the SDevicePath line. Although you can also edit this line to use different hardware configurations, you do need to make sure that each Mixpander is properly connected to the expansion port of the unit you want to use it with! To use one Mixpander connected to unit 1, the line should read:

```
MixpanderDevicePath=\\.\SSMXP0
```

The following lines show examples for using two, three, or four connected Mixpanders:

```
MixpanderDevicePath=\\.\SSMXP0 \\.\SSMXP1
MixpanderDevicePath=\\.\SSMXP0 \\.\SSMXP1
\\.\SSMXP2
MixpanderDevicePath=\\.\SSMXP0 \\.\SSMXP1
\\.\SSMXP2 \\.\SSMXP3
```

If you do not have as many Mixpanders as you have DAW units and you do not want the available Mixpanders to be allocated to the lowest-numbered units, you can use NOMIXPANDER in the MixpanderDevicePath line. For example, here's a line for using two Mixpanders connected to units two and four of a four-unit system — once again, note the positioning of the spaces:

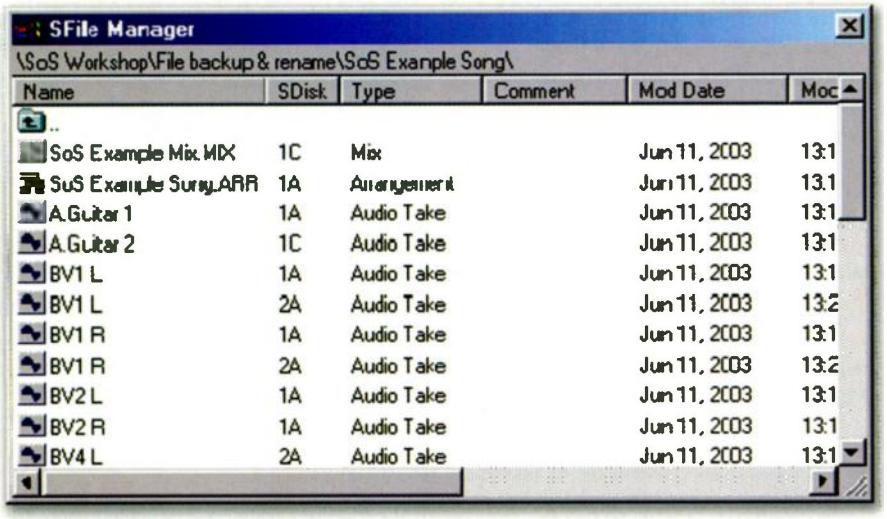
```
MixpanderDevicePath=NOMIXPANDER
\\.\SSMXP0 NOMIXPANDER \\.\SSMXP1
```

Soundscape & *Logic*

Some Soundscape users who use the *Editor* in conjunction with Emagic's *Logic* on the same PC for Mixpander streaming under Windows XP have reported that *Logic* slows down and comes close to freezing when the Soundscape Mixer is open. The solution is to close the Soundscape Mixer window, load *Logic*, launch the *Windows Task* Manager, and set *Logic*'s priority in the *Task Manager* to Higher Than Normal. Thereafter *Logic* will behave as normal, regardless of the Soundscape Mixer window's open/closed status. This seems to be a *Logic* problem, as it does not occur with other similar applications.

Backing Up & Transferring Soundscape Data

While backing up is not the most glamourous activity that can be performed ▶



Soundscape's *SFile Manager*. The current SFolder contains two SFiles named BV1 L and two SFiles named BV1 R, stored on different SDisks (SDisk1A and SDisk2A). This would not be allowed in a Windows PC folder.

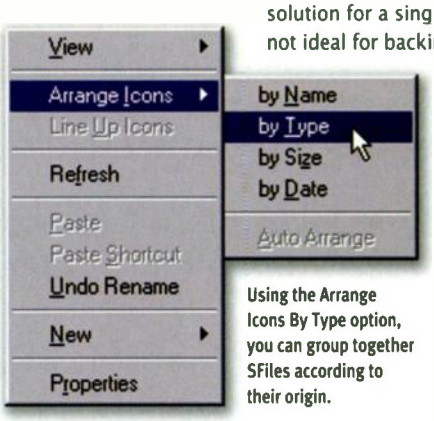
with a DAW, it is nonetheless essential. Soundscape has a lot of features relating to data backups, and the best technique for backing up depends on the particular requirements of each user. A single SDisk is enough for a single-unit Soundscape system to run to the full extent of its capabilities. However, with up to four 137GB hard disks (SDisks) per unit, the Soundscape hardware can provide storage for 2192GB of data stored across sixteen SDisks in a four-unit R•Ed or Soundscape 32 system. Moreover, a single Arrangement may use files from all these SDisks simultaneously.

The Soundscape Disk Filing System (SDFS) is proprietary, and specifically designed to be capable of loading Arrangements from different Soundscape setups (within the limits of available track count on the destination system) and to offer better data security than is available on a typical PC. The Soundscape *SFile Manager* has been developed to provide maximum efficiency in this very special context. While it looks superficially similar to *Windows Explorer*, it is different in its layout, particularly with regards to the way in which SDisks are handled. In the *SFile Manager*, the root level contains any number of SFolders and SFiles created by the user. A given SFolder may contain SFiles that physically reside on any SDisk in the system (by way of comparison, in Windows Explorer, a given folder and all its contents always reside on the same logical drive). This is a substantial difference, because, while Windows does not allow several files within the same folder to have the same name, this is possible in a Soundscape SFolder, as long as the SFiles are on different SDisks. There is no doubt that the Soundscape system has benefits for music, but it's not always straightforward to directly export the contents of a Soundscape SFolder to a PC folder.

It is useful to be aware that, within Soundscape, an Arrangement references Takes according to a unique Take Stamp. Because of this, when you change the name of a Take, any Arrangement that references that Take will still be able to locate it. Furthermore, even if a Take is moved to a different SDisk within the system, any Arrangement that references it will locate it and load it properly (the only restriction being that, if the Take has been transferred to an SDisk in a different unit, its track assignment will be changed and it will be muted).

The Take Stamp is the basis of the *Editor*'s built-in solution to avoid the name conflicts that arise in Windows when Takes with the same name are exported to the same PC folder. If the Use Unique 8.3 Format Filenames For Exported SFile Takes option is enabled (in the Settings menu's Preferences submenu), Takes are exported under unique names such as 'o4idnake.t1c', and recover their proper names automatically by reference to the Take Stamp when imported back to a Soundscape SDisk. This solves the problem and may be all that you need. However, using this feature makes it impossible to quickly identify a particular Take on the PC (in order to re-import it individually, for instance).

To save an Arrangement with all the Takes it references and its corresponding Mixer, the best solution is to load the Arrangement and Mixer, go to Export SFile To PC File under the File menu, select Active SFiles and any listed SDisk or all SDisks as appropriate. If you are not using 8.3-format filenames and files with duplicate names are exported, you will be prompted to either rename, overwrite, or skip files. You will also have the option to recreate the complete SFolder structure inside the destination PC folder. This is an excellent solution for a single Arrangement, but it is not ideal for backing up a whole project, because a single project may contain many Arrangements. Also, alternate Takes that are not used in any of the Arrangements will not be backed up following this method, even though they may be needed later.



Using the Arrange Icons By Type option, you can group together SFiles according to their origin.

To back up a whole project, the best solution is to have all the relevant SFiles within a main SFolder named after the project — this main SFolder can also include subfolders. Then you select the contents of this SFolder and export them using Export SFile To PC File under the File menu. There is a risk with this method: any SFile belonging to the project that does not reside in the main project SFolder will not be backed up. Version 3.7 of the *Editor* has new features that help take care of this, such as Move All Active SFiles To Current SFolder or Copy All Active SFiles To Current SFolder, under the SDisk menu. However, this only applies to SFiles active in the current Arrangement. I would

Extra Busses

If you have free physical inputs and outputs on a Soundscape DAW, they can be used as extra busses. For instance, if the TDIF A socket of a R•Ed is connected to a hardware mixer with only one TDIF port (such as a Yamaha 03D or 01V), this will leave two free TDIF ports on the back of the R.Ed (TDIF B and TDIF C). If these two ports are linked via a TDIF cable, the corresponding inputs and outputs (TDIF 9 Ux to TDIF 24 Ux) become usable as busses in the on-screen Mixer. TDIF outputs 9-16 will be linked to TDIF inputs 17-24 respectively, and TDIF outputs 17-24 will be linked to TDIF inputs 9-16 respectively, so in practice this can add 16 'external I/O busses' to the 16 internal busses, for a total of 32 busses per unit, or 48 per unit with a Mixpander. This trick can also be applied to take advantage of any free AES-EBU, S/PDIF or analog inputs and outputs.

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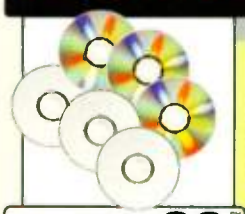

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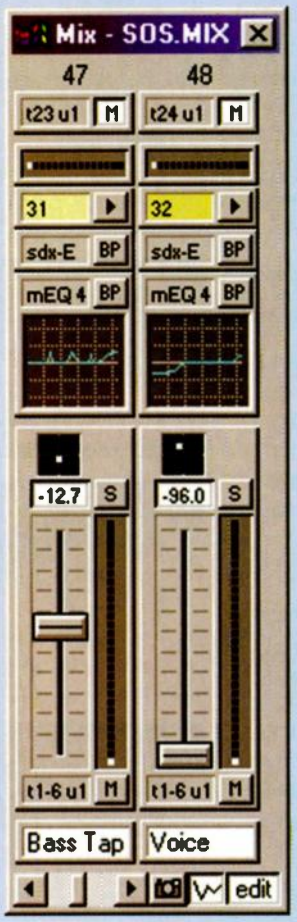
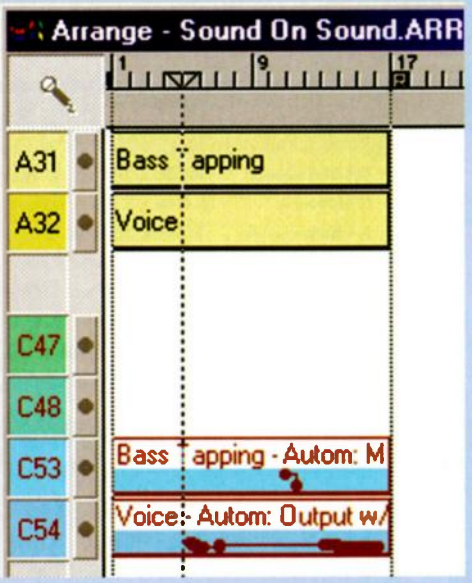
recommend always exporting SFiles from different SDisks to different PC subfolders inside the main project folder, since it makes it easier to transfer them to the appropriate unit in a multiple-unit system and completely avoids Windows name conflicts. Note that the suffix of the exported files suggests their type and origin: for example, an audio Take from SDisk1C will have an ATAK1C suffix, and an automation Take from SDisk1A will have a CTAK1A suffix. Therefore, if you export SFiles from all SDisks to the same PC folder, when re-importing the project you can right-click inside the Windows dialogue box, go to Arrange Icons in the pop-up menu and select By Type, so that the files are grouped and can be selected easily according to their origin.

When your source and destination Soundscape systems have the same number of units and the same track count per unit, but different SDisk configurations, as long as you restore to units with the same number, the restored Mixers should work first time with the corresponding Arrangements. For example, Takes with the extension ATAK2B can be restored to SDisk2A, SDisk2B (original), SDisk2C, or SDisk2D. If the source and destination systems have different numbers of units or different track counts per unit, then you may need to reassign certain audio and automation Parts to different tracks, or to load Takes from one single original unit into two different units of the destination system. For example, when loading an Arrangement created on a four-unit, 48-track SSHDR1+ system into a two-unit, 64-track R•Ed system, audio Takes from the third SSHDR1+ unit (file name suffixes ATAK3A and ATAK3B) that would have been assigned to tracks 25-36, should be loaded into both R•Ed units. R.Ed unit one will use the Takes for tracks 25-32, and R•Ed unit two will use the Takes for tracks 33-36. The Mixer configuration will also need to be tweaked to work on the destination system. Automation Takes can be loaded to any unit of the destination system regardless of their origin.

How Editing The Mixer Affects Automation Track Assignments

If the Mixer configuration is changed after automation data has been recorded, the Automation tracks have to be reassigned unless the default settings for automation have been changed. In other words, if a new channel is inserted between existing Mixer channels, for instance, causing other channels to be moved one notch to the right, the Automation tracks must be moved up by one track number. The Adopt Virtual Track Output Assignment When Moving/Copying Tracks option is useful then. As long as the automation tracks are grouped and ordered logically, it is easy to create the necessary record tracks in the record track Column, and 'group drag' the Parts that need to be reassigned to the corresponding virtual tracks with the Move Vertical tool. In fact, if the tracks are laid out in descending order, creating all tracks with one mouse click may be handy (unless existing record tracks are still needed, because you cannot undo; it would also undo the new track assignments). There is another solution: using the global command Select All Parts With Same Output, then reassigning them. But the global command doesn't reassign muted tracks, and in most cases it means more mouse clicks.





When the Mixer channels shown to the left were moved to columns 53 and 54, their corresponding Automation Parts in the Arrangement needed to be reassigned. With the Adopt Virtual Track Output Assignment When Moving/Copying Tracks option selected, clicking and dragging does it automatically.

Backing Up To A Removable SDisk

For busy professional users, backing up an internal or removable SDisk to an empty, removable SDisk is often convenient. Keeping an individual SDisk for a particular client is practical and comparatively inexpensive, although it still makes sense to also back up to CD-RW or DVD-RW for safety purposes. The manual states that only two SDisks should be present when backing up in this way, the one that needs backing up and the empty destination SDisk itself. This is because there is no way to select all the SFiles on a single SDisk from the root directory of the *SFile Manager*. Selecting all the SFolders will select all the SFiles from all SDisks. Removing an internal SDisk is time-consuming, and not the kind of thing you want to be doing every day. In fact many users stick to using the two removable SDisks. However, there is a solution if internal SDisks are installed:

- Initiate the Format SDisk procedure (under the SDisk menu) for each SDisk that you do *not* want to back up.
- Click Cancel. The contents of the SDisk will not have been erased, but they will now be invisible to the program, as the SDFS file (table of contents) will have been removed.
- When only the SDisk that needs backing up and the empty destination SDisk are visible in the SFile Manager, select all SFolders and SFiles in the root directory, then click and drag them. When you release the mouse button, the Move/Copy SFile dialogue box will be displayed. Select Copy, select the destination SDisk as appropriate, and click OK.
- When the backup is complete, use the Recover SDisk function (under the SDisk menu) to restore the SDFS files of the hidden SDisks.

Please make sure you are familiar with the Recover SDisk function before you attempt to use this technique. While the SDFS filing system is exceptionally safe in that it allows data recovery, anything that has to do with the very existence of your data should not be taken lightly! SOS

Thanks to Christo Curtis and Wolfram Dettki for their help with this article.

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Cycling '74 Radial

Loop-based Performance Software For Mac OS

Options are growing in number for electronic musicians who want to perform live, and the latest real-time loop manipulation tool, Cycling '74's *Radial*, promises a new and uniquely intuitive user interface.

Paul Sellars

Radial — or, as the box calls it, *radiaL* — is described by its creators as "loop-based performance software with a beautiful and unique interface thoughtfully optimised for playing live or composing and designing in the moment". It has been written using the highly-regarded Max/MSP graphical programming environment from Cycling '74 (www.cycling74.com), who are also responsible for bringing it to market. At the time of writing, *Radial* is available for Mac OS versions 8.6 to 9.2.2. A Mac OS X port is in development, and will be available as a free upgrade to registered users, but no Windows version is currently available.

After installation, *Radial* must be authorised at the Cycling '74 web site, via the familiar challenge-and-response system. *Radial* will run fully functionally without authorisation for 15 days, but I received my authorisation by email the same day I submitted my request. Cycling '74 will routinely issue two authorisations per user, with further authorisations made available if there's a reasonable explanation for why they're needed (such as because your hard drive died, not because your mate Dave wants a copy).

Getting Around The Screen

When launched, *Radial* takes over the whole of your screen, replacing the desktop with its own workspace, which contains several smaller windows. This workspace is black, and most of its windows are similarly dark, with only the most important details picked out in brighter colours. At first, this is slightly disconcerting — but in practice it provides an effective high-contrast display, ideal in the kind of poor lighting conditions likely to be encountered in a live venue.

The most important of *Radial*'s windows is the Channels window. By default, this contains four circular elements (any number can be configured), vaguely reminiscent of CD players or turntables, into which sampled loops can be loaded. Loading a sample is as simple as dragging and dropping it from the

SOUND ON SOUND

Cycling '74 *Radial* £196

pros

- Intuitive, user-friendly design.
- Easy synchronisation of sampled loops.
- Endless sound-mangling possibilities.
- Nice bundled *Pluggo* plug-ins.
- Excellent manual.
- An original idea, well implemented.

cons

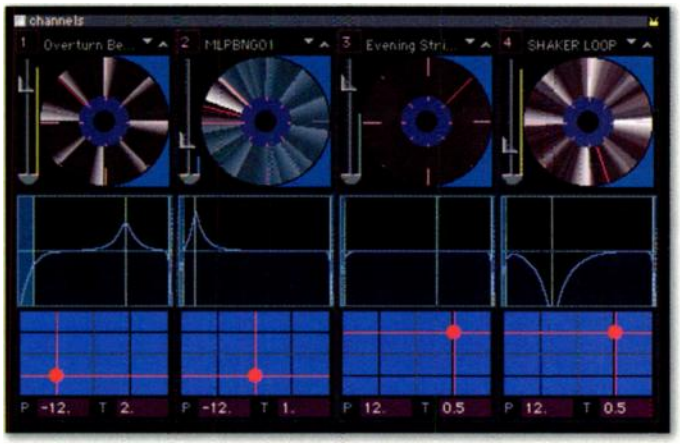
- RAM-based sample playback may make working with very long audio files impossible.

summary

An innovative and original application, which works well and is great fun to use, *Radial* is more or less unique, and could provide electronic musicians with an entirely new way to approach live performances. It could also serve as a useful compositional and production tool.

Files window, which provides a standard browser for searching your hard drive. Other windows include the Outputs window, with its master faders and easy-to-read VU-style meters, an Effects window where VST plug-ins can be loaded, and the Top window, which displays the current tempo along with information about the available memory and current CPU load. The Top window is also home to a circular icon, which rotates when *Radial* is playing and freezes when it's paused (the space bar toggles pause on and off). Clicking once on this icon causes *Radial* to retrigger all loaded loops.

Before we go on, a few words about *Radial*'s manual. *Radial*'s manual is printed on paper. It's clear and well written. It avoids long words and unnecessary technical details. It tells you how the software works, and what sorts of things you can do with it. In short, *Radial*'s manual is how all software manuals ought to be. If you opt to buy *Radial* as a download, you'll have to forego the paper manual (and a rather snazzy box as well), but a PDF version is included in any case. All due credit to Cycling '74 for taking the trouble to get the manual right: it makes learning the software a pleasure instead of a headache.



The Channels window offers a number of easy ways to modify the playback of each loop with a click of the mouse.

The Channel Inspector provides many of the functions of a conventional sample editor.

The key to getting started with *Radial* is learning your way around the aforementioned Channels window. When you load a loop into a sample channel, it immediately begins playing at the current tempo. *Radial* assumes your sample will have been trimmed to a more or less sensible length, such as one or two bars, and automatically pitches it up or down to loop in sync.

Changing *Radial*'s tempo thus changes the samples' pitch, although there are ways to control pitch and time independently, as we'll see. Interestingly, changing *Radial*'s tempo to a negative value (by clicking on it and dragging downwards) causes your loops to play backwards, resulting in some nice turntable-style 'rewind' or 'spin-back' effects. Moreover, *Radial*'s tempo can be set to quite ridiculous extremes (9000bpm anybody?), to the point where your samples cease to be loops and effectively become wavetable oscillators. Scary stuff.

When a loop is playing in a sample channel, a red 'clock hand' travels around the circular display, reflecting the speed at which the sample is being played. Using the mouse, it's possible to adjust and affect sample playback in a number of ways. Clicking in the centre of the circular display retriggers the loop from the beginning. Clicking and dragging in the middle ring causes a section of the loop to be selected and cycled. By default, one eighth of the loop will be selected initially, with the selection increasing in increments of one eighth as you drag, although it's possible to set *Radial* to work in larger or smaller increments as required. You can move the start and end points of a selection by clicking in the outer ring. Double-clicking allows you to return to playing the whole loop again.

A vertical fader to the left of each channel display controls the level of the channel's output, and clicking and dragging on the small semicircle at the bottom of the fader allows you to control panning as well. Clicking on the small yellow 'lock' icon in the top right-hand corner tells the Channels window to expand and display some other useful controls. Beneath each of the channel displays sit a filter display and a pitch/time grid. The filter display works like a simple, hands-on EQ curve. Using the mouse pointer you can click and drag to create peaks and troughs in the curve. You can add as many peaks or troughs as you like — just keep clicking. Once you've created a suitable curve, you can fine-tune it in various ways. For instance, by clicking and dragging you can adjust the centre frequency of each peak or trough, as well as the filter bandwidth or Q. Each channel also has its own built-in low- and high-pass filters, which can be used to roll off any unwanted low or high frequencies. Double-clicking in the filter window removes all filter settings.

Beneath the filters are the pitch/time grids, which can be used to independently adjust the pitch and tempo of your loops, so that all kinds of sampled material can be made to sit together in time and in tune. The grid is fairly self-explanatory. Each step vertically up or down in the grid represents a pitch change of one octave above or below the sample's initial pitch. Each step horizontally to the left or right represents a halving or a doubling of the speed (tempo) at which the loop is played back. You can make smaller changes by dragging on the number boxes below each grid.

With subtler settings, pitch and tempo changes sound quite natural. However, *Radial* allows you to be anything but subtle, and more extreme pitch and time changes can be used to warp loops in any number of interesting ways. It's possible to take two or three loops that just 'don't work' together and simply force them to work... although you may find they end up working in quite unexpected ways. Tremendous fun.

In The Loop

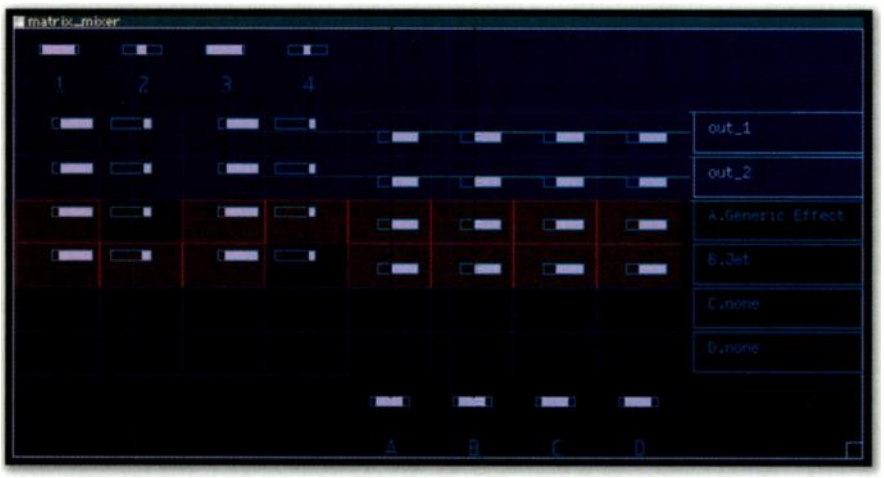
Each loop channel has a small upturned arrow icon in its top right-hand corner. Clicking this opens the Channel Inspector window for the channel in question. The Channel Inspector resembles a conventional sample editor, with a standard linear waveform display. Here you can do a variety of useful things, such as adjusting the start point of a loop, or nudging it very slightly backwards or forwards to aid synchronisation. The Channel Inspector also allows direct access to the 'behind the scenes' mechanics used by *Radial* to control the tempo and pitch relationships between loops, with numerous options available.

Briefly, whenever you load a loop, *Radial* automatically chops it into a number of slices, the number being determined according to its length. By adjusting a couple of parameters called Slice and Xloop, you can alter the number of slices used and the method by which *Radial* uses them to perform tempo changes and pitch transpositions. Experimenting with these settings allows you to come up with results that sound more natural... or less natural, or just plain different.

Another very nice feature worth

mentioning here is the Dice button. When activated, this causes the slices in a loop to played in a random order. With the slice value set low, this can produce excellent, seemingly never-repeating variations on drum patterns. Higher values, meanwhile, yield mind-bending glitchy noises. Lots of fun either way.

Once you've loaded up and tweaked a handful of loops to your heart's content, you'll want to be able to balance their levels, add some effects, and set up a mix. *Radial*'s Matrix Mixer window makes this easy. The Matrix Mixer is fairly self-explanatory: it's a simple grid, with the sample channels along the top (four by default, but remember that any number can be configured), *Radial*'s main outputs (two by default, but more can be configured) in the top right-hand corner, and your effects send/return busses (you guessed it: any number can be configured) arranged below. Clicking and dragging at the point in the grid where a column and a row intersect allows you to control the amount of signal flow between the source and the destination. Shift-clicking allows you to mute or unmute a particular square in the grid, and whole channels can be muted or soloed as required by Shift-clicking or Option-clicking at the top of the relevant column. These shortcuts soon become second nature, and working with the Matrix Mixer is easy.



Radial's clever Matrix Mixer offers flexible real-time control over levels and effects sends.

You can record *Radial*'s output to an audio file simply by clicking a Record button in the Outputs window, and the program also offers support for Propellerhead's Rewire and Digidesign's Direct Connect inter-application audio protocols. Additionally, any audio card supporting the ASIO driver standard can be used, and any OMS-compatible MIDI device can send Controller data — for instance, to be able to mute and unmute *Radial* channels from your keyboard. Finally, *Radial* can be sync'ed to MIDI clock, to a 'tapped' (mouse-clicked) tempo, and even to an audio signal, provided it contains regular enough peaks for the program to recognise.

Radical *Radial*?

Whether or not *Radial* appeals to you will depend entirely on whether you're interested in working with sampled loops and phrases. If you are, chances are you'll already be interested in trying it, and personally, I can't think of a single serious complaint. The fact that *Radial* loads its loops into RAM, rather than streaming them from disk, makes it rather less suitable for extended laptop DJ sets than, for example, Ableton's *Live*. However, for real on-the-fly improvisational performances — for "designing in the moment" as Cycling '74 put it — *Radial* seems to have the edge. In other words, while *Live* might be a better tool when you already know more or less what set you want to play, *Radial* is probably preferable when you literally want to make it up as you go along.

Radial's ability to utterly transform sampled loops and effortlessly recombine them in dozens of different ways could also make it a useful tool in the studio. If you're struggling with writer's block, or you feel the need to break out of your usual routines and habits, *Radial* could be a great aid to get you thinking in new ways. Choose four or five sound files at random, start them spinning, and get experimenting. Nine times out of 10, you'll be able find something that grabs your attention. Since a fully functional 15-day demo version is available, you really have nothing to lose by trying it. Take it out for a spin! SOS

In Full Effect

Radial supports the ubiquitous VST plug-in standard for effects, and comes complete with 14 fully functional plug-ins, all but one of which are taken from Cycling '74's well-known *Pluggo* bundle. These include the aptly named *Space Echo*, the *Jet* flanger, *Generic Effect* (a modulatable comb-filter capable of chorusing, flanging and more), *Average Injector*, the bizarre but fascinating *Feedback Network*, *HF Ring Mod*, *Filter Taps*, *Resonation*, *Resosweep*, *Chamberverb* (a great-sounding and flexible reverb), *Limi* and *Spectral Filter*. You're not limited to using *Pluggo* plug-ins with *Radial*; any effect adhering to the VST standard should work as well, and every third-party plug-in I tried loaded without a glitch.

Whether you're using *Pluggo* or third-party plug-ins, *Radial*'s effects window allows you to adjust parameters with its own built-in sliders, avoiding the need to clutter your workspace by opening editor windows. A nice feature available when using *Pluggo* plug-ins is the option to Command-click in the editor window and select a Randomize All option, which automatically assigns a random value to every parameter. This did not seem to work with any of the third-party plug-ins I tried, sadly, so presumably it's a feature unique to *Pluggo*.

It's also worth pointing out that a limiter and a saturation effect are both built-in to *Radial*'s Output window, and can be used not only to prevent clipping in the event of excessive gain, but also to 'warm up' or even distort the program's output.

By default, *Radial* is set up to address two outputs, but more can be configured.

Test Spec

- Cycling '74 *Radial* v1.0.
- Blue & white 400MHz G3 Apple Power Mac with 448MB RAM, running OS 9.2.2.
- Emagic Audiowerk 2 soundcard.

information

£	£195.90 including VAT.
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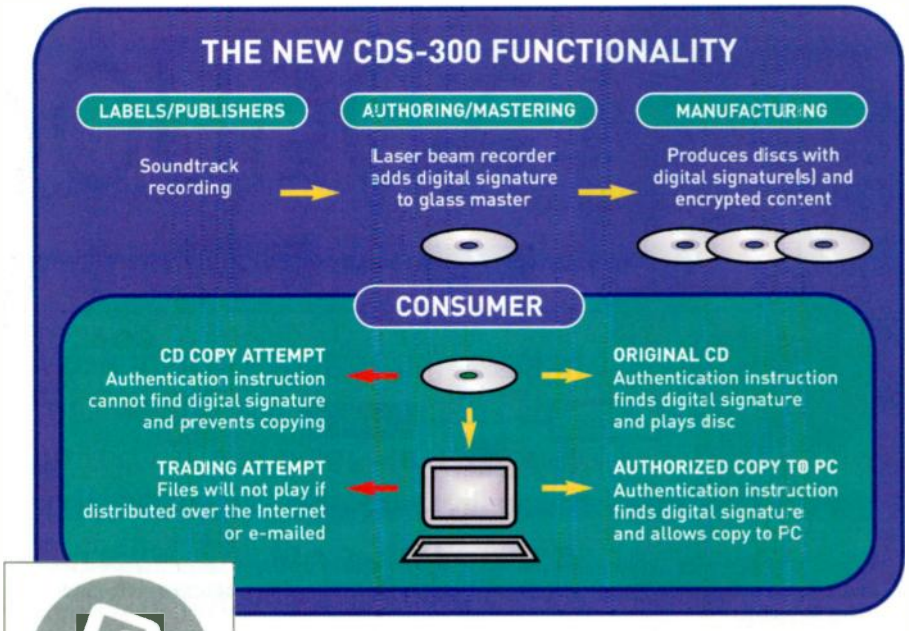
W	www.cycling74.com

practice of making lossy compressed audio files, such as MP3s, from CDs. These systems include the Cactus 200, Key2Audio and MediaCloQ formats, as well as undocumented methods, and the use of these techniques is not always indicated on album packaging.

Taking advantage of the fact that CD-ROM drives are different from typical audio CD players, these systems use corruptions of the error-correction system to make the CD-ROM drive reject the disc as faulty, or otherwise prevent playback. Some systems offer an inferior alternative by making the computer play a lo-fi version of the music, instead of the uncompressed CD audio data. Recent releases have featured mixtures of corrupt and normal CDs in different regions, perhaps as part of test marketing.

Despite these measures, music from the earliest CDs to be 'protected', such as the promo for Michael Jackson's 'You Rock My World', still appeared on peer-to-peer systems overnight. An analogue output from a domestic CD player connected to a computer's soundcard makes ripping still possible, while owners of CD players with digital outputs can often make perfect serial copies. One CD protection scheme can even be defeated with a felt-tip pen drawn carefully over a certain track of the CD.

Older CD audio players and high-end machines have been reported to reject the corrupted discs, while some models of Apple computer have been known to lock the CD inside, requiring a return of the computer to the dealer. Interfering with error correction could mean that these discs have a shorter lifespan too, as players are less likely to be able to cope should these discs become scratched.



Midbar Tech's Cactus system is designed to prevent audio being 'ripped' from CDs by making them unreadable by computer CD-ROM drives. Some record labels put obvious warnings on corrupt CDs, while others use minuscule print or don't mention the DRM system at all.

The theory that corrupting established CD specifications can help protect record company profits has yet to be proved. Listening habits are changing, and it seems people want to play CDs on their computer, without necessarily ripping them to an inferior lossy format. Some legitimate CDs now have less reliability and utility than counterfeit versions without copy protection, and computer owners might be even more likely to use peer-to-peer networks if they can't be

DRM And DVD

The perils of attempting to implement a DRM system that inconveniences users have been amply illustrated by the system used on DVDs. When DVD was invented, Hollywood could see the potential profit in a retail price hike combined with reduced unit cost — just as the record labels had done in moving from vinyl to CD. But movies have a critical period for profitability, between the time of the cinema release and the appearance of the film on terrestrial TV. Understanding that perfect serial copies of movies could be made from DVD, Hollywood agreed to support the format only on the condition that a 'secure' form of DRM was included.

The result was the Content Scrambling System or CSS, which apart from ruining the picture for people who try to watch the movie they have bought on a non-approved player, supports the region code system which allows for delayed releases in non-US markets, extending the profitable period for the movie around the world. CSS was also supposed to enable higher retail prices in markets that were considered able to bear them — such as the UK — by making Internet shopping for DVDs across borders pointless.

As DVDs became available to the public, anomalies of the CSS system became apparent. What if you bought a legitimate DVD on holiday, to take it home and find that it didn't work on your player? Or found that Hollywood did not want to release CSS decoding software for your particular computer?

This is supposedly what happened in 1999 to a 15-year-old from Norway called Jon Johansen. An anonymous German associate of his wrote an extremely short computer program which defeated the DRM system on DVDs. Jon is said to have added a more user-friendly interface to the software and to have made it available on the internet as a a program called *DeCSS*. Once Jon released *DeCSS* to the public, other people could see the flaws in the CSS design, and independent programs that could also unlock DVDs were written.

Meanwhile, many DVD players became readily adaptable to be 'region free' through trivial conversions, firmware upgrades or the fitting of a chip. One manufacturer of DVD drives even included a jumper on the back of the unit with the label 'do not remove', and it didn't take users very long to figure out what that did. The hardware manufacturers were clearly uninterested in supporting CSS, which only inconvenienced their customers.

Despite the fact that you do not need *DeCSS* for unauthorised duplication of DVDs — they can be copied verbatim with the DRM system intact — Hollywood has attempted to prosecute a number of individuals in the USA who had copies of *DeCSS* on their web sites, or simply linked to those sites. They have even attempted, unsuccessfully, to have Jon Johansen prosecuted in his own country, where he was threatened with a prison sentence of up to two years. In the meantime, Jon won the Karoline Prize, a national award in Norway for promising high school students who have made a contribution to society.

Jon Johansen (left) being awarded the Karoline Prize. He's quite popular in his native Norway, where he's known as 'DVD Jon'.

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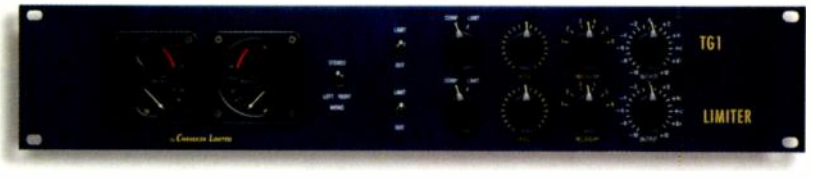

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Safe Sound?

Digital Rights Management & Music

Daniel James

Music industry sources suggest that soon all CDs will have built-in copy protection, and plans are underway to fit PCs with a chip that will police audio use. Will this protect creative rights, or become a barrier to creativity?

It's been said that you can no more make a digital music file uncopyable than you can make water unwet. In other words, the transition from analogue to digital forms of music distribution has resulted in formats which are fundamentally redistributable without loss of quality. Almost 20 years after the compact disc was introduced, the music industry is only just beginning to face this reality. Back in the 1980s, CDs promised higher profit margins, and vinyl rapidly disappeared from the high street, even when music lovers were still asking for it.

In the present, the record labels report declining profitability, and blame piracy. In their definition of piracy, the labels include both unlicensed commercial operations and end-user redistribution of music, be it on CD-R or via peer-to-peer computer networks. Other possible explanations for declining music sales — such as the economic downturn in the USA, or the fact that teenagers are spending their money on console games and mobile phones — don't grab the headlines in the same way.

There is no doubt that counterfeiting is a serious problem for the manufacturers of all kinds of branded goods, including CDs, and the recording industry is becoming increasingly aggressive in pursuing counterfeiters through the courts. However, the legal remedies used against large-scale unlicensed CD pressing operations are usually too expensive and impractical to be used against millions of individuals, so the music business is trying to control end-user redistribution by technological means instead. To this end, a sub-industry has emerged which promises control over the end users of music and other digital content. These firms describe what they do as Digital Rights Management, a term that seems to imply some sort of fine-grained control over different kinds of users, with royalty payments collected where appropriate.

'Digital rights management' suggests an electronic equivalent of the work that the Mechanical Copyright Protection Society does in the UK, collecting money to make sure musicians are rewarded for their work. However, what all currently available DRM vendors' products have in common is that they attempt to restrict the playback or copying of music, which is not the same thing as collecting payment for it. A better name for the technology might therefore be 'digital rights enforcement'.

In many countries it's actually legal to make personal copies of media in some circumstances, under 'fair use' laws that date from the era of analogue tape, but the goal of most DRM systems is to prevent or limit personal copying. It might be a watermark to prevent serial copies, or a corrupt track on a CD to stop it working in a computer, but so far the implementations of DRM available are all negative: they reduce the potential of digital media rather than add features. This makes DRM-enabled music a less compelling purchase than standard CDs, in a crowded marketplace where plenty of other items compete for the music lover's disposable income. Negative forms of DRM also create another problem. The global community of music listeners has far more resources at its disposal than any DRM vendor: time, motivation, and even programming skill. It takes only one frustrated teenager with a talent for cryptography to break the most expensive and complex DRM system. The reality is that there are thousands of people around the world who have that ability, and they have worked together to defeat nearly all of the significant DRM systems established so far.

SDMI

The Secure Digital Music Initiative was an early casualty in the war on music sharing. The SDMI was relatively unusual among groups advocating DRM, in that it was a wide-ranging coalition including companies from the technology and music industries, as well as artists' representatives such as the American Society of Composers, Authors and Publishers.

A competition was announced in September 2000, in which a cash prize was offered to anyone who could break one of four different SDMI watermarking schemes. A team of academics from Princeton University and Rice University in the USA, among over 400 other entrants, decided to give it a go. Watermarking is designed to incorporate inaudible data into a digital music file which would enable unauthorised copies to be identified. It's claimed that the technique does not affect perceptible audio quality, although some audiophiles have doubts about this.

The challenge in the 'HackSDMI' contest was to remove the watermark and produce a file which sounded like the original. Presumably, the SDMI consortium must have been reasonably confident of the technologies in order to offer them for public scrutiny. The Princeton/Rice team successfully removed watermarks from all four examples, but declined the cash prizes because they would have meant signing a gagging agreement. Instead, the academics produced a paper for a technical conference in April 2001.

Before this paper was presented, the SDMI tried to suppress the information, indicating that they still believed the watermarking techniques were viable, despite the flaws discovered during the contest. The Recording Industry Association of America threatened to have the research team prosecuted (and possibly jailed) under the notorious Digital

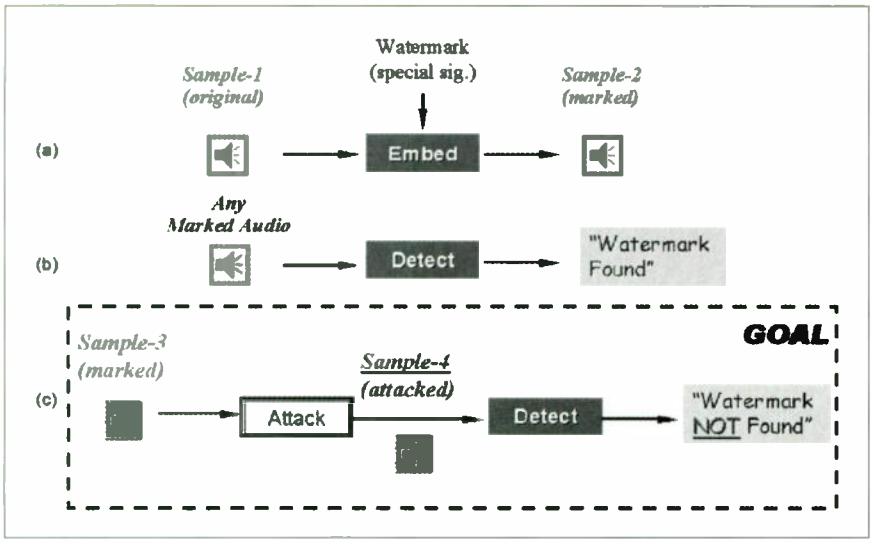


Figure 1: The SDMI watermark attack problem. For each of the four watermark challenges, Sample-1, sample-2, and sample-3 are provided by SDMI. Sample-4 is generated by participants in the challenge and submitted to an SDMI 'oracle' for testing.

Millennium Copyright Act, on behalf of the SDMI and Verance. The Verance watermark was one of those defeated by the Princeton/Rice team, and is the DRM technology used in DVD-Audio discs.

The academics went ahead and published their research at another conference in August 2001. The RIAA eventually backed down, agreeing by 2002 that the publication of scientific research exposing flaws in watermarking was in the best interest of all parties. The SDMI consortium became dormant, although its web site still exists. A note entitled Current Status, dated May 18, 2001 says "it was determined that there is not yet consensus for adoption of any combination of the proposed technologies. Accordingly, SDMI is now on hiatus, and intends to re-assess technological advances at some later date."

Windows Media

Microsoft has its own multimedia delivery system based around the Windows Media Player, and this has a system of DRM built in. Based on encryption, unique identifiers and one-time licences that can't be shared by end users, the system is based on 'security by obscurity': no-one outside of Microsoft was supposed to be able to understand it.

In October 2001 an anonymous man, woman or group going by the name Beale Screamer posted a series of messages to the sci.crypt newsgroup, revealing the secrets of version 2 of the Microsoft DRM system used with WMA files. The source code for a program called *Free Me* was also posted, which could remove the DRM protection from those files. Rather than an insider, Beale Screamer seemed to be a rogue cryptanalyst who had taken a dislike to the way media companies were implementing DRM systems.

Included with the technical information was an extraordinary message explaining why Beale Screamer had set out to break the DRM system. Addressing artists, it said "Don't fear new distribution methods — embrace them. Technology is providing you the means to get your art directly to consumers, avoiding the big record companies. They want a piece of the action for *your* creativity, and you don't need to let them in on it any more. Your fans will treat you nicely, unless you treat your fans poorly. Bo Diddley didn't have anything to fear from his fans, but a lot to fear from Leonard Chess. Think about that."

A paper written by four Microsoft software engineers entitled *The Darknet And The Future Of Content Distribution*, presented at a DRM conference in November 2002, argued that the digital genie was most definitely out of the bottle. The 'darknet' was their term for all unofficial distribution on computer networks. Following their research, the authors were quite confident that the darknet will survive, even if today's peer-to-peer networks do not.

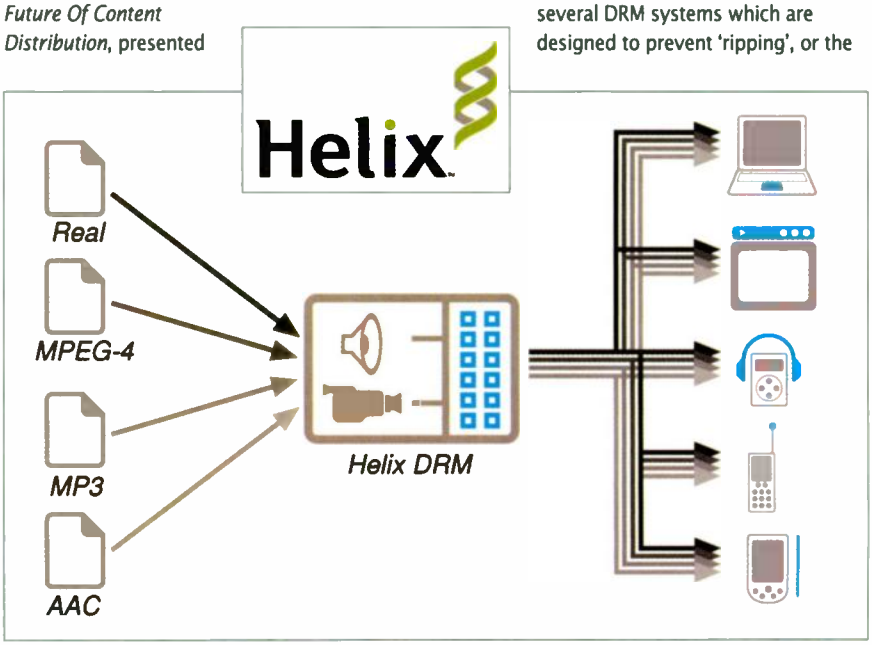
Liquid Audio And Real Networks

Another DRM format that was once touted as the future of secure internet music distribution was Liquid Audio. However, it was never very popular with end users, and the two founders of the company behind the format resigned from their executive posts in November 2002. Earlier that year, the company had sold its DRM patents to Microsoft, so if we see Liquid Audio technology again, it may be as part of Windows Media Player.

Real Networks remain the only company providing an Internet media system with significant market share, other than Fraunhofer — who devised the MP3 format — and Microsoft. Real Networks recently announced a new system called Helix DRM, which is designed to package a number of formats including Real Audio, Real Video and MP3 inside a DRM wrapper. Whether secure media distributed via the Helix system proves popular with content creators or end users remains to be seen.

CD Corruption Systems

If you can't stop music being shared once it's uploaded to the Internet, why not stop people from putting it there in the first place? That would appear to be the rationale behind several DRM systems which are designed to prevent 'ripping', or the ▶



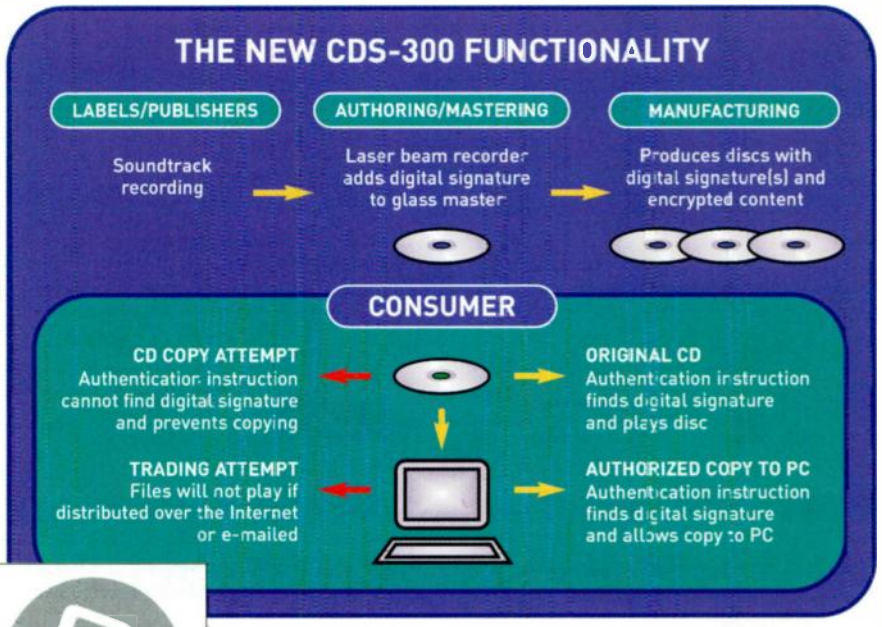
Real Networks' Helix DRM system is conceived as a format that can be used to package various forms of content including audio and video.

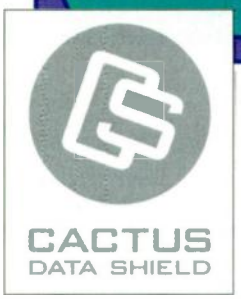
practice of making lossy compressed audio files, such as MP3s, from CDs. These systems include the Cactus 200, Key2Audio and MediaCloQ formats, as well as undocumented methods, and the use of these techniques is not always indicated on album packaging.

Taking advantage of the fact that CD-ROM drives are different from typical audio CD players, these systems use corruptions of the error-correction system to make the CD-ROM drive reject the disc as faulty, or otherwise prevent playback. Some systems offer an inferior alternative by making the computer play a lo-fi version of the music, instead of the uncompressed CD audio data. Recent releases have featured mixtures of corrupt and normal CDs in different regions, perhaps as part of test marketing.

Despite these measures, music from the earliest CDs to be 'protected', such as the promo for Michael Jackson's 'You Rock My World', still appeared on peer-to-peer systems overnight. An analogue output from a domestic CD player connected to a computer's soundcard makes ripping still possible, while owners of CD players with digital outputs can often make perfect serial copies. One CD protection scheme can even be defeated with a felt-tip pen drawn carefully over a certain track of the CD.

Older CD audio players and high-end machines have been reported to reject the corrupted discs, while some models of Apple computer have been known to lock the CD inside, requiring a return of the computer to the dealer. Interfering with error correction could mean that these discs have a shorter lifespan too, as players are less likely to be able to cope should these discs become scratched.





Midbar Tech's Cactus system is designed to prevent audio being 'ripped' from CDs by making them unreadable by computer CD-ROM drives. Some record labels put obvious warnings on corrupt CDs, while others use minuscule print or don't mention the DRM system at all.

The theory that corrupting established CD specifications can help protect record company profits has yet to be proved. Listening habits are changing, and it seems people want to play CDs on their computer, without necessarily ripping them to an inferior lossy format. Some legitimate CDs now have less reliability and utility than counterfeit versions without copy protection, and computer owners might be even more likely to use peer-to-peer networks if they can't be

DRM And DVD

The perils of attempting to implement a DRM system that inconveniences users have been amply illustrated by the system used on DVDs. When DVD was invented, Hollywood could see the potential profit in a retail price hike combined with reduced unit cost — just as the record labels had done in moving from vinyl to CD. But movies have a critical period for profitability, between the time of the cinema release and the appearance of the film on terrestrial TV. Understanding that perfect serial copies of movies could be made from DVD, Hollywood agreed to support the format only on the condition that a 'secure' form of DRM was included.

The result was the Content Scrambling System or CSS, which apart from ruining the picture for people who try to watch the movie they have bought on a non-approved player, supports the region code system which allows for delayed releases in non-US markets, extending the profitable period for the movie around the world. CSS was also supposed to enable higher retail prices in markets that were considered able to bear them — such as the UK — by making Internet shopping for DVDs across borders pointless.

As DVDs became available to the public, anomalies of the CSS system became apparent. What if you bought a legitimate DVD on holiday, to take it home and find that it didn't work on your player? Or found that Hollywood did not want to release CSS decoding software for your particular computer?

This is supposedly what happened in 1999 to a 15-year-old from Norway called Jon Johansen. An anonymous German associate of his wrote an extremely short computer program which defeated the DRM system on DVDs. Jon is said to have added a more user-friendly interface to the software and to have made it available on the internet as a a program called *DeCSS*. Once Jon released *DeCSS* to the public, other people could see the flaws in the CSS design, and independent programs that could also unlock DVDs were written.

Meanwhile, many DVD players became readily adaptable to be 'region free' through trivial conversions, firmware upgrades or the fitting of a chip. One manufacturer of DVD drives even included a jumper on the back of the unit with the label 'do not remove', and it didn't take users very long to figure out what that did. The hardware manufacturers were clearly uninterested in supporting CSS, which only inconvenienced their customers.

Despite the fact that you do not need *DeCSS* for unauthorised duplication of DVDs — they can be copied verbatim with the DRM system intact — Hollywood has attempted to prosecute a number of individuals in the USA who had copies of *DeCSS* on their web sites, or simply linked to those sites. They have even attempted, unsuccessfully, to have Jon Johansen prosecuted in his own country, where he was threatened with a prison sentence of up to two years. In the meantime, Jon won the Karoline Prize, a national award in Norway for promising high school students who have made a contribution to society.

Jon Johansen (left) being awarded the Karoline Prize. He's quite popular in his native Norway, where he's known as 'DVD Jon'.

INTRODUCING...

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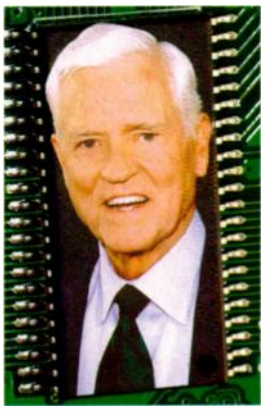
TCPA And Palladium

Having established that digital audio is hard to make uncopyable, and that interfering with CD formats provides limited protection at best, the next logical step is to put DRM technology into hardware — as a legal requirement, if necessary. Intel, as the largest manufacturer of computer CPUs, has been working on this for some time. Each Pentium III chip was planned to have a unique ID number which could be used to police the use of unlicensed software, but the company withdrew the feature after finding that customers were unhappy about the implications for privacy.



Fritz Hollings would like every American to have DRM technology in their computer, whether they want it or not.

To make hardware-based DRM work, the CPU and motherboard manufacturer needs the cooperation of the company making the operating system. Microsoft's solution is to put DRM into the lowest level of Windows, where the user supposedly can't do much about it — see Dave Shapton's article on Secure Audio Path (Cutting Edge, December 2002). In to this picture comes a group called the Trusted Computing Platform Alliance, and a Microsoft scheme called Palladium. TCPA is a consortium founded by Intel, Microsoft, Compaq/HP and IBM, which now includes many other firms from the computer industry. These companies aren't record labels, and are arguably more concerned with unlicensed software than they are with music distribution. However, they are interested in the security of digital goods generally, as part of the continued growth of e-commerce.

The TCPA isn't offering a DRM system, but it is attempting to provide the foundations for one in hardware. The TCPA wants to have a chip on every motherboard which uniquely identifies a computer, and is able to report details of that computer over the network — details such as what music software is running. Some machines have already been fitted with these chips, including one model of IBM Thinkpad laptop. Later, the chip may be integrated into Intel CPUs to make it harder to tamper with. AMD, the manufacturer of the Athlon CPU, is also said to be considering including the chip in its products.

In the USA, entertainment industry lobbyists have been trying to persuade the government to make TCPA and DRM a legal requirement for any hardware which could conceivably play or copy digital media. A notable crusader for compulsory DRM has been Senator 'Fritz' Hollings, who enjoys the sponsorship of media companies including AOL Time Warner, News Corporation and Disney. In his honour the TCPA reporting device is often referred to as the 'Fritz chip'.

Microsoft's complementary Palladium system is being introduced gradually, with the foundations already in Windows XP and the second phase in XP Service Pack 1 and NET Server 2003. The third phase is due to arrive with 'Longhorn', the next version of Windows. While the details are still obscure, Palladium builds on TCPA hardware to create a system which is supposed to be secure 'from fingertip to eyeball'. This means that secure content, such as music, will only be able to be accessed using trusted keyboards, trusted video cards, and trusted applications. These computers will be 'trusted' not to perform certain tasks, which will almost certainly include the copying of music.

Starting with the assumption that anyone who wants to copy music must be doing something wrong makes creative activity marginal at best. Music has always been about reinventing the past, and sampling culture has been part of that for the last 20 years. Palladium doesn't care if you want to sample a song, obtain the necessary clearances and pay the due royalties. It might prevent you from doing anything that isn't within the narrow boundaries that its creators define. The audio professional might argue that measures such as Palladium will only affect consumer equipment, and that their own studio hardware will retain its full creative potential. However, general-purpose PCs have become a feature of studio operations over recent years, and if the TCPA system is built into motherboards or CPUs, people who make their living recording music might find it hard to avoid.

A key question remains over the ownership of the technology. Would an independent studio be recognised as a legitimate content creator, and therefore have access to the protection offered by TCPA? If you have to get all your content digitally signed by Microsoft, will the service be affordable? How would a self-employed sound engineer be distinguished from an 'end user' of music? The security of a system like Palladium depends on Microsoft retaining tight control — spread access too widely and it would almost certainly be compromised.

Potentially the greatest flaw in TCPA and Palladium is that it depends on people continuing to buy Intel or AMD-based PCs running Windows. Yet the computers of the future might look very different from PCs, and might not be based on the Intel architecture.

Where Next?

So where does this leave the musician or producer who wants to take advantage of digital distribution, but doesn't want to be ripped off? Faith that the computer industry will come up with a solution hasn't served the professional audio community very well so far. It's more likely that a better system of DRM will come from within that community, because people who make music their life's work understand it as more than just another commodity. Potentially, there could be many positive uses for DRM which would align artist and listener interests, instead of setting them up in opposition. Digital signatures are already in widespread use on the internet to help guarantee identities, and they could be used to establish the quality and authenticity of a particular music file.

There seems little doubt that some of the music currently available on peer-to-peer systems is fake, or mislabelled. When previously unreleased 'lost' material appears it can be difficult to verify independently, particularly if the artist is no longer alive. In the same manner, poor audio quality of material culled from demo tapes or bootlegs might only be discovered after a download has been made. If network distribution is to become an official established alternative to tangible media, these issues will need to be addressed.

If we download a Frank Zappa track for

Some Web Links

SDMI homepage
W www.sdmi.org/

Princeton/Rice team SDMI paper
W www.usenix.org/events/sec01/craver.pdf

Archive of Beale Screamer postings
W http://cryptome.org/beale-sci-crypt.htm

Darknet paper by Microsoft engineers
W http://crypto.stanford.edu/DRM2002/

Midbar Cactus homepage
W www.midbartech.com/

List of known and suspected corrupt CDs
W http://ukcdr.org/issues/cd/bad/

TCPA homepage
W www.trustedcomputing.org/

Unofficial TCPA/Palladium FAQ
W www.cl.cam.ac.uk/~rja14/tcpa-faq.html

Is Copying Always Bad?

The recording industry has been quick to condemn music sharing among consumers, but it isn't obvious that its consequences for record companies must all be negative. After all, labels expend a lot of effort getting their music heard by the public, with radio pluggers, promotional videos and free CDs on the covers of magazines, so digital distribution and redistribution could be seen as another source of publicity. Whether people who listen to CD-Rs compiled by friends and use peer-to-peer music download services buy more or fewer CDs is debatable, but it remains a fact that music buyers cannot ask at the shop counter for music that they have never heard about, let alone heard. The statistical evidence is mixed, and it's certainly not all doom and gloom for musicians. Sales in America do seem to be falling, but according to the BPI, in the three months to the end of September 2002, UK sales of music grew 3.5 percent, with album sales up 9 percent.

instance, it would be reassuring to know that it was digitally signed by a representative of the late artist's family. Faking a signature in order to sell a bogus track would presumably be a straightforward case of fraud, legally speaking. In the case of the recently released new Nirvana material, digital signatures from surviving members of the band would have offered strong evidence that it really is Kurt Cobain you can hear, and not just a good impersonator who recorded the songs last week.

The International Standard Recording Code (ISRC) system might not yet be implemented by every royalty-paying commercial music user, but it offers an established and regulated international scheme which could be integrated with a positive DRM system. Just as CDs can have ISRC codes tagged onto each track which automate royalty accounting, it's straightforward for a network-distributed format to have an ISRC alongside artist and title details. The Ogg Vorbis lossy compression format already supports ISRC tags, for example, and an ISRC-aware computer can make sure that the code is preserved when transferring formats.

Since end users don't pay a royalty every time they listen to a piece of music, there is little incentive for them to interfere with ISRC codes. Passing off someone else's music as your own in order to collect their royalties, by tampering with the ISRC, would be likely to get you ejected from the ISRC scheme for life. This penalty should deter any nefarious members of the industry from fraud, especially if the ISRC becomes the principal method of royalty collection in future.

DRM features could also be used to help build the relationship between musicians and the people who buy their recordings. A counterfeit CD is just a copy of the music, and perhaps the inlay booklet, but a unique identifier on a genuine CD could be used to register the owner as a fan of that particular artist. This could in turn unlock features on a web site, or add that person to a mailing list for tour dates and new releases. The Beatles had a serial number on the cover of the *White Album*, so it would be nothing new. It would be pointless to duplicate the unique identifier because it could only be used once. Anyone with privacy concerns could decline to register, and opt out of the associated benefits.

Artists have seen shellac, vinyl and tape formats come and go over the last 100 years — but the music is still with us. Record labels who pay artist royalties will never be able to beat the counterfeiters, home duplicators and peer-to-peer networks on price, so they will have to compete on quality and value if they are to survive the digital era. SOS

Hartmann Neuron

What if an instrument could combine the realism of a sampler with the complete control over its sounds that only a true synth can offer? That's what the long-awaited Hartmann Neuron claims to do. Over the next 10 pages, we put it to the test...

Gordon Reid

This seems to be the year of long-awaited synths, some with gestation times extending to more than half a decade. Of these, one of the most eagerly anticipated is the Hartmann Neuron which, through what its German manufacturers rather fancily describe as a "nervous system endowed with artificial intelligence" promises a vast array of exotic new sounds. One of these is no less modestly described in the Neuron's promotional literature as a sonic event which "changes in size, growing to a towering spire of sound whose body — originally wood — gradually metallises. It picks up momentum, darting past my left ear, describing a great curve behind my back before bursting in a mist of mercurial droplets at the centre of my brain". I don't know what drugs they're taking in Ravensburg at the moment, but I strongly suggest that they stop. While such flowery hyperbole may appeal to some people, I doubt that it will excite many serious professionals with £3500 of disposable cash in their pockets.

On the other hand, wouldn't it be wonderful if Hartmann's grandiose and psychedelic claims proved to be justified? So let's see if they are...

As the Neuron's connections are all located on its side, the rear panel contains only the stylish Hartmann logo, which doubles as the On switch.

The Basics

At first sight, the Neuron is a daunting synthesizer, overflowing with strange controls and even stranger parameter names. It's also an odd synthesizer. This is not altogether surprising since Axel Hartmann, the man behind the unconventional Waldorf Wave, the Q, and the Alesis Andromeda, designed the cosmetics. And the Neuron, with its one wooden end cheek, is certainly another unconventional design to add to his portfolio (though personally, I'd rather it had one end cheek, or none). Another example of its non-standard design is that all the Neuron's connections, normally located on the rear of a synth, are on the non-wooden side panel, leaving the rear empty save for a huge, illuminated on/off switch. The I/O itself includes three stereo pairs of analogue outputs that you can also configure as a 5.1 surround system, plus a stereo headphone socket. Alongside these, you'll find two analogue inputs, 24-bit, 44.1kHz S/PDIF inputs and outputs, and inputs for three pedals: a continuous controller, a switch, and a sustain pedal. Finally, there are the ubiquitous MIDI In/Out/Thru and a USB socket for connection to a Mac or PC.

Of these, the most curious are the audio inputs. Despite references to them in Hartmann's promotional literature in the context of real-time processing of audio, mention of them is absent from the current draft of the manual (except in the specification), and they are currently inoperative. According to Hartmann, they will not become active until the Neuron's OS reaches version 2.0, which may take a while; the next planned revision is v1.3.

Having connected the Neuron's outputs to a suitable audio system, you're ready to switch on. Happily, the universal power supply accepts 100-240V, 50/60Hz, so you'll have no worries before doing so. The synth then takes about 40 seconds to boot, with a pyrotechnic display from its copious LEDs during the first half of this, and significant whirring from its high-powered cooling fan and internal hard disk drive throughout. To my mind, this makes the Neuron less than ideal for live work because the boot cycle is too long for comfort in the event of a power failure. Mind you, it's a lot better than waiting for Windows XP or Mac OS X to get their acts together. And, to the Neuron's credit, it didn't crash once during an extended and punishing review. This is more notable than it may seem, because the Neuron is based on PC architecture, and its stability is greater than could be expected of any conventional PC-based system.

Once running, the Neuron continues to make a lot of noise, most of which is contributed by the large fan mounted within the underside of the case. Hartmann implore ▶

SOUND ON SOUND

Hartmann Neuron £3500

pros

- For most of us, it's a new method of synthesis.
- New, animated sounds are possible.
- It's clearly suitable for SFX and foley.
- It holds promise for the future.

cons

- Some factory sounds have discontinuous, glitching models, and it's all too easy to recreate similar sounds yourself with *Modelmaker*.
- The sounds are flat without the effects.
- Polyphony is limited.
- *Modelmaker* requires an external computer, and its communications system is overly complex.
- The sound engine is not suited to deterministic programming, and users trying to fathom it will be frustrated by the esoteric terminology.
- It's too noisy for a quiet studio.
- At present, it's far from finished.

summary

At present, the Neuron is something of a mixed bag. The original concept of an 'intelligent' modelling instrument capable of deriving all a sound's parameters and model information from the source samples has been downgraded, and what's more, it currently exhibits deficiencies in its sound generators, very limited polyphony, and poor programming. On the other hand, it shows promise for the future. I suspect that you're either going to view it as an expensive work-in-progress, or love it unreservedly and defend it against all and any criticism.

Resynthesizing Keyboard

Everything on the side; even mains power is provided via an IEC socket on the side of the Neuron. The all-important USB jack here is where the *Modelmaker* software is connected (via a suitable USB-to-Ethernet adaptor). Sadly, the two audio inputs are not yet functional.

▶ you not to obstruct the air vents that permit the considerable airflow out of the synth, and I can see why. But there's a problem. The fan generates a level of noise that I would classify as annoying in a studio. Were this a piece of outboard equipment, you could shove it into the machine room, but as it's a performance synth, you'll have to live with the noise.

Initially, I found the Neuron's distinctive control panel rather ugly, but once I got to grips with it, I found that parts of the operating system are quick and simple to navigate. The most prominent features are the four bright orange X-Y joysticks. Three of these lie in the programming sections, and as soon as I started to think of them as vector synthesis controls, they made sense. The fourth is a pitch-bend/controller joystick, and, in my opinion, it's not well suited to this purpose; it's too short, and offers far too short a 'throw' in all directions for exact performance control.

Programming the Neuron is achieved using the joysticks, plus a smaller, black joystick that moves you one step at a time up/down and left/right within the menu systems (there's no scrolling, sadly), numerous buttons, 'endless' wheels, 'endless' rotary knobs, an Edit knob that you can also press to confirm some changes, and a small 16 x 2 display (see right).

Some aspects of this user interface quickly gave me cause for concern. Even after making allowances for their velocity sensitivity, the wheels appear to be inconsistent in their response. The Confirm/Enter function accessed by pressing in the Edit knob also behaved inconsistently, but in a different way; in some menus you must press the knob to input a value, while in others doing so reverts to the previous value. To be fair, nothing on the Neuron failed to work throughout the review, but user-interface niggles like this can drive you mad. Happily, it would seem that Hartmann's programmers are aware of such matters; one of the planned improvements in the v2.0 Neuron OS upgrade is improved wheel and dial handling. Good.

There are no fewer than a dozen sound programming sections, although two of these — the so-called Resynators — are identical in form and function. The others are the Blender, the Shapers (1, 2 and 3), Mod, the Slicer, Silver, Effects, the Programmer, and the Controllers. Hang on a moment... Resynators, Blenders, Slicers, and a Silver module? For me, these odd labels cloud the true purpose of the Neuron's facilities, and I wish Hartmann had used simpler, more intuitive names, instead of trying to make their synth sound different with deliberately esoteric ones. OK, there are precedents for the use of 'Shaper' to describe an envelope, and 'Resynator' is a contraction of 'Resynthesizing Oscillator'. The 'Blender', which, in Hartmann's words, "arbitrates between the two Resynators", is also not unreasonable, because it's far more than

What Is Resynthesis?

The Neuron generates its sounds using a form of resynthesis named 'Multi Component Particle Transform Synthesis' by designer Stephan Sprenger. However, resynthesis has already been with us for a long time.

Many people have suggested that the PPG Realiser (born 1986, died 1987 when the company folded) was the first commercial resynthesizer, but I view it as more of a modelling synth, similar in concept to today's virtual analogue synths. Nonetheless, there was one true resynthesizer announced in the 1980s. It was the Technos Axcel.

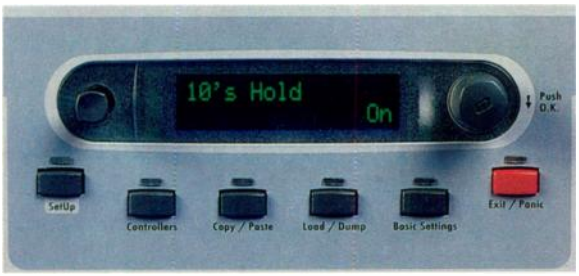
The basis of the Axcel was radical at the time, although it is far more widely understood today. In short, the system loaded a sample, analysed how the frequencies that comprised it changed during the course of the sound, and then rebuilt a close approximation to the original using a bank of amplitude-modulated digital oscillators. Of course, you could have done the same thing using an enormous additive synth, but you would have had to define incredibly complex multi-stage envelopes for every frequency contained within the sound. Thankfully, the Excel did this for you.

One advantage of this form of resynthesis is that the model of the sound can be much smaller than the original sample, and it becomes even smaller if you are prepared to compromise the accuracy somewhat. The second is that you can manipulate the parameters of the model to create new sounds based on the original, warping it into completely new timbres, or retaining enough of the original to be recognisable. Depending upon the complexity of the system, you can also perform tricks such as formant detection, which enables you to transpose sounds over a wider range with reduced munchkinisation. Furthermore, whereas short samples turn into brief blips at high pitches, the sound regenerated using a model can be extended in ways that cannot be achieved when replaying the original.

You might expect the Axcel to have been extremely basic compared to today's resynthesis systems, but it was not. It offered 1024 multi-waveform 'harmonic' generators, with 'intelligent' 1024-step pitch envelopes, plus similarly 'intelligent' volume envelopes and amplifiers. After resynthesis, the output from the Axcel's sound generator was passed through a pair of multi-mode filters, and you could affect aspects of the sound using 'intelligent' modulators, all adjustable in real time. If this sounds familiar, I'm not surprised; it is in essence the structure of the Neuron. Indeed, it's uncanny how much of the philosophy behind the Axcel is evident in the Neuron... not just the signal path, but even the real-time modification of the models (performed on the Axcel using a touch-sensitive screen rather than joysticks).

Things have moved forward considerably since 1988. Resynthesis is no longer the mystery it once was, and numerous hard- and software synths offer some form of it. Likewise, the science of resynthesis itself has progressed, and Stephan Sprenger's system goes way beyond building simple FFT models.

There's no reason why resynthesis *should* be based on sine waves, and any number of alternatives exist, each with individual strengths and weaknesses. This then leads us to the aspect of the Neuron that — if Hartmann Music's claims are to be accepted at face value — makes it different from other resynthesizers. Instead of using a single type of model to analyse and recreate all the sounds



The small joystick to the left of the LCD moves you through the Neuron's programming menus, while the Edit knob to the right of the display adjusts the displayed values, and may also be pressed to enter or confirm values, although this is not always necessary.

merely a two-channel mixer. But as we shall see, some of the other names sound rather more impressive than the facilities they provide. The handbook — which in some places is written more like an advertisement than a manual — explains all of the sections in conventional terms, but you then have to ask why unconventional names were adopted on the synth itself.

Resynators

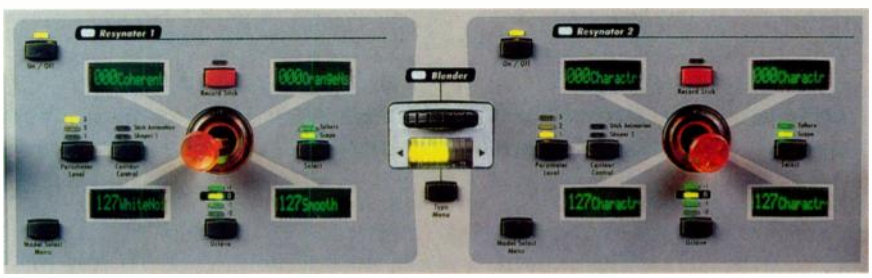
When reviewing any synth, no matter how it works, I usually start by taking a look at the oscillators (or, in the case of FM synths, the operators). For all its unconventional terminology, it's still possible to treat the Neuron's dual Resynators as oscillators which allow you to manipulate a sound using parameters similar in philosophy to those found on physical modelling synths such as the Korg Z1.

However, the Resynators are not conventional waveform generators, nor do they play back simple PCM samples. Instead, they draw upon 'models' of a sound derived from a sample or set of samples. Creating these models is called 'resynthesis', and for an explanation of this, I direct you to the 'What is Resynthesis?' box below.

In short, the act of turning a sample (or samples) into a model provides an opportunity for the resynthesis software to recognise prominent attributes within the sound, and assign a number of parameters to them. This is where the 'Neur...' in Neuron comes from; designer Stephan Sprenger claims that the *Modelmaker* software that performs this task is based upon neural-network technology derived from research into pattern recognition and artificial intelligence (for more on Neural Networks, see the box on the next page).

As the model is built, its parameters are divided into two subsets called Scape and Sphere. These are meaningless names, although Hartmann claim in the manual that they relate roughly to the excitation and resonant response of the models. This division represents the way that the real world works, and the parameters in physical-modelling synths such as the Yamaha VL1 and Korg Z1 are separated in exactly this fashion. Very broadly speaking, the excitation parameters (as the name suggests) usually relate to the way in which an instrument is energised (for example, blowing into a wind or brass instrument, strumming a guitar, hitting the keys on a piano or striking a drum). On the other hand, the resonant response parameters define what happens to that energy following the initial excitation (causing air to resonate within the body of the wind/brass instrument, exciting the strings and body of the guitar or piano, or causing the drum skin and shell to resonate enharmonically, to continue the previous examples).

Returning to the Neuron, each Scape and Sphere contains up to 12 parameters, distributed in three groups of four. When loaded into the Neuron itself, you move through these parameter sets using the Parameter Level buttons. Parameters placed diagonally across from one another are exclusive attributes (the manual cites Scape parameters of metal/wood and large/small as examples — see below) so you have two ▶



presented to it, the Neuron (or, rather, the *Modelmaker* software that creates the models) uses a form of processing called a Neural Net to create a unique model for each sample, such that it can be recreated and manipulated within the synth.

As discussed in the main part of this review, the natures of these models are *not* completely free on the Neuron, but are constrained by the 10 parameter sets provided by *Modelmaker*. Nonetheless, these provide significantly greater freedom than was available using the Axcel's single frequency/amplitude analysis. What's more, rather than create a single model for an evolving sound — which may be appropriate for some moments, but not for others — it is claimed that *Modelmaker* is capable of generating an evolving set of multiple models that 'morph' smoothly from one to the next. Confused? Then imagine a drum loop that contains kick drums and cymbals playing at different times. Clearly, a single model would be less than ideal for resynthesizing this, so the idea of creating several sub-models and stringing them together is sensible.

Unfortunately, no-one at Hartmann is handing out any information regarding the exact nature of the models generated for the Neuron. This makes it virtually impossible to test the veracity of their claims. Nonetheless, it's not difficult to understand what's going on, at least in part. Take, for example, the sample of my flute that I created when investigating *Modelmaker*. A suitable model derived from this sample should contain information about the frequencies contained in the note, the relative amplitudes of the tonal and noise components, the positions of the formants, the overall frequency response, and the perceived size of the cavity within which the sound acquires its unique timbre. If these are modelled successfully, you could then attach parameters to them, with names such as Low Turbulence, High Turbulence, Warm, Cold, Large, Small... and so on, each controlling an aspect of the resynthesized sound. And that's what happens when you use *Modelmaker* and the Neuron.

Some people have questioned whether the Neuron really *is* a resynthesizer, or whether the internal drive is holding samples that are mangled in some way by the synth engine. To a large extent, this is Hartmann Music's fault. By inventing meaningless terms, they have obscured many aspects of the synth.

The facts are these — after invoking *Modelmaker* and asking it to process the source samples, a minimum of four files are produced: 'Mname', 'map.script', and as many Scapes and Spheres as are appropriate. 'Mname' is a text file that contains exactly what you would expect: the Model Name. The 'map.script' file is another text file, and contains the information about which source samples were used where, and what user-defined parameters you have applied.

The Scape and Sphere files are much larger... indeed, the Spheres are much larger than the original samples. Whether these contain the original sound or not is open for debate. On Hartmann's web site at www.hartmann-music.com/home/us/neuron/soundengine/soundengine_basics.html, it says that "these models contain the actual sound", while at www.hartmann-music.com/home/us/faq/#5 on... umm... Hartmann's web site, it says that "after analysing the sampled audio data you feed into it, the samples are discarded and only the model information is kept". Who's right? Hartmann or Hartmann? You tell me.

orthogonal pairs on each level.

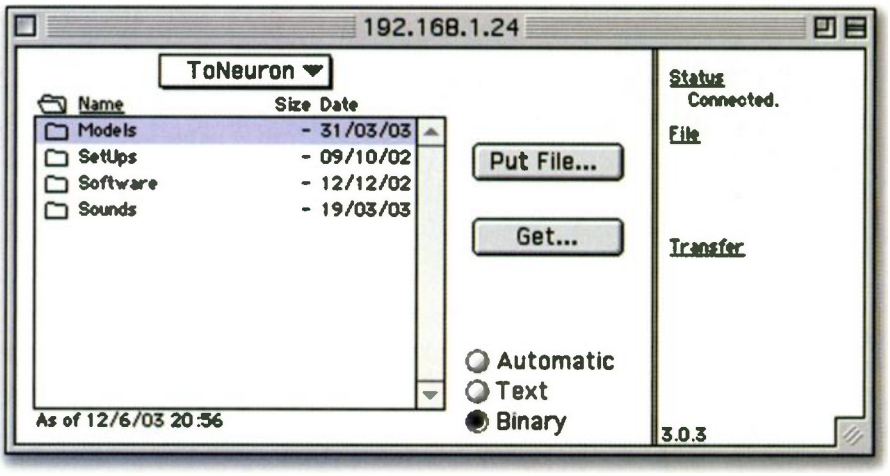
You can edit the values within the parameters levels using the joysticks, which allow you to change the character of the sound in a dynamic and recordable fashion that Hartmann call 'stick animation'. For precise programming, you can fall back on the editing system (mini-joystick, screen and Edit knob) and for precise animation there are envelopes hard-wired to each Resynator. The Resynators also respond to conventional synthesis parameters including such time-honoured favourites as LFO pitch modulation, velocity sensitivity, key tracking and so on.

By the time I had fathomed all of this, I was becoming confident that I understood the fundamental nature of the Resynators. But I soon found that things did not react as I expected. For example, when I chose a sine wave as my basic PCM (model 511) and twiddled its Scape (roughly speaking, excitation) parameters, I expected that nothing would happen. After all, the fundamental nature of a sine wave is that it contains a single frequency... nothing more, nothing less. To my surprise, two of the three Scape levels changed the sound considerably, until it bore no resemblance whatsoever to a sine wave. The Sphere parameters also changed the sound, but this is to be expected; pass a sine wave into a physical resonator such as a soundboard or instrument body, and what you get out is far removed from the initial sound. Experiments with other models generated equally unexpected results; some pleasing, others less so. I therefore assume that the sub-divisions into Scape and Sphere are to some extent arbitrary, and not precisely related to conventional excitation/resonance models.

Modelmaker

Hartmann have now released *Modelmaker*, a piece of software that makes it possible for users to generate new Neuron models from monophonic 44.1kHz AIFF files. The current restriction to a single data format is a bit limiting, and it's in marked contrast to Hartmann's original claim that *Modelmaker* will recognise "any standard audio file format for analysis/conversion" but, hopefully, most potential users will be able to convert to mono AIFF format if need be.

By the time you read this there may also be a PC version of *Modelmaker* that works with WAV files (one is in preparation), but at the time of writing, the Mac reigned supreme in Neuronland. No matter... I ran the OS 9.x review copy within the Classic environment on my 1GHz G4 Titanium Powerbook, and encountered no operating problems. Strangely, Hartmann will only send you



An FTP client communicating with the Neuron.

Modelmaker once you've registered the Neuron. This is odd, because the software is useless without the Neuron itself, and will remain so until the day comes when you can create a pirate copy of a *hardware* instrument using your PC.

The Neuron communicates with the Mac via FTP. At this point, if you are less than comfortable with configuring networks, you should turn away, because getting the Neuron, *Modelmaker* and a Mac up and running together is *not* like plugging two MIDI devices together. For one thing, you need to buy a USB-to-Ethernet converter. This could cost you anywhere between £20 to £50 in the UK depending on where you shop. You must then connect the former end to the Neuron and the latter to the computer. Given that the Neuron costs £3500, I thought that Hartmann might have thrown in the converter, but there you are. Secondly, you need to be able to configure the computer's network software, give it a unique Ethernet IP address, and then run a suitable FTP client application. One is supplied with the Neuron, but you can download a shareware one from the Internet if you know where to look.

Since the Neuron is, at heart, a PC, I can see how a USB-USB communications link would be problematic (you can't have two USB masters, one at either end of a cable). But why didn't Hartmann use a simple Ethernet link? Well, I'm guessing here, but the adoption of USB-to-Ethernet allows the Neuron to fulfil all its communication and backup responsibilities through one connector, which is cheaper than providing both USB and Ethernet connectors on the Neuron. Happily, another email I received just as we were going to press informed me that a USB-to-USB link is also planned for when the Neuron receives its OS upgrade to version 1.3. This is welcome news.

The Neuron's 20GB internal drive contains two folders — 'ToNeuron' and 'FromNeuron' — that themselves contain four sub-folders named Models, SetUps, Software and Sounds (see screenshot above). Once you've set up the network between your computer and the Neuron, you can see the contents of the folders in your FTP client software. You place files in an appropriate folder to send data to the Neuron, but placing a file in the correct folder is not enough to load it; once it is there you must activate a Load routine from the front panel get it into the Neuron so that it is available for use. Weird. The transfer procedure is painless — unless you're in a hurry. The factory set of just under 300 models and associated Sounds took 29 minutes to dump to my G4, even with the FTP client permanently in the foreground. The data occupied a hair under 1GB.

If you've got this far, you're ready to use *Modelmaker*, to load new factory sounds and models, and also to update the operating system if need be. But I fear that many potential users will shy away from this, simply because this method of interfacing with the Neuron is so involved. Sure, if *SOS* were a computer magazine, it would be reasonable of Hartmann to expect you to be comfortable with network configuration, IP addresses and running FTP clients. Judge for yourself, but I'm

A Neural What?

Throughout this review, several mentions are made of Neural Networks without explaining what they are. In brief, they are simplified computer models of the parallel processing that takes place in the human brain. Millions of times less complex than a real brain, Neural Nets are hopeless at the conventional computing tasks for which billions of sequential calculations per second are so appropriate, but they have the ability to detect patterns within large amounts of data. This makes them highly suitable for use in areas such as speech recognition and resynthesis (yippee!), but also for recognising your number plate as you pass through an electronic speed trap (boo!).

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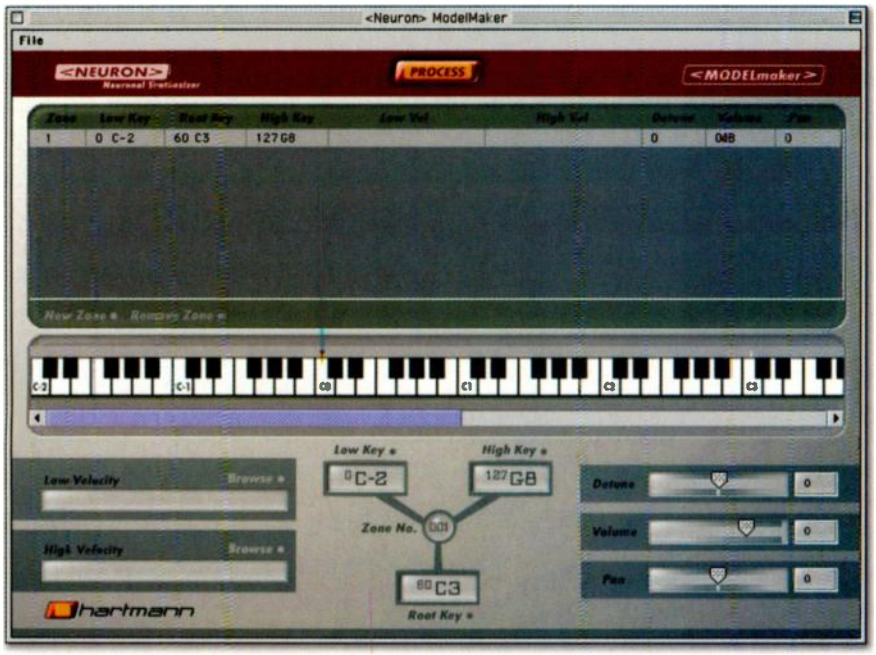
HARTMANN NEURON



The *Modelmaker* startup screen.

▶ not convinced. More generally, I'm not happy that you must connect the Neuron to a computer to get full use from it. If you don't, you will be forever limited to using the models generated at the factory, and that would be a terrible waste.

Launching *Modelmaker* presents the screen shown above. Unfortunately, there's no context-sensitive Help file and only the skimpiest of manuals to guide you through its use, so what follows was largely discovered by trial and error.

Firstly, *Modelmaker* allows you to create zones across any part of the 61-note semi-weighted keyboard, and to create a two-part model derived from two samples — one that determines the nature of the model at high MIDI velocities, and one for low MIDI velocities — within each. If we keep things at the simplest level, we can use a single zone, insert the same AIFF file into both the high- and low- velocity windows, and press the 'Process' button in the top centre of the screen to generate a model that is playable across the whole keyboard.

Once you have done this, a new window appears (see right) and asks you some questions regarding the type of model you wish to generate. This is the moment at which you realise that the alleged intelligence of the Neuron — its promised ability to take a sample and create a unique model and unique parameters derived solely by its Neural network — is not what it claims to be.

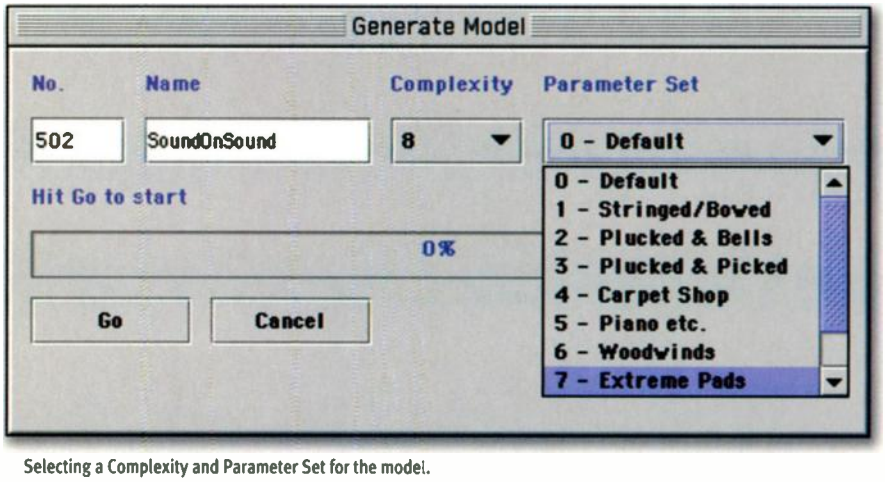
In the FAQs on their web site (or more specifically, at www.hartmann-music.com/home/us/faq/#7), Hartmann state: "Neuron analyses and recognises the sounds that are played into it. From that, it selects a set of specific parameters that characterise this sound". As things stand, this is not true. As you can see in the screenshot below, the model generator offers just a handful of options; 10 complexities, and 10 parameter sets, to be precise. What's more, the *user* decides which of these to use to process the samples, not the Neuron. The parameter sets (which become the Scape and Sphere parameters in the processed model) have been set up to be most suitable for particular types of sound: bowed instruments, plucked instruments, pianos, woodwind... and so on. The fact that you select these manually does mean that you can create models with, for example, a vocal sample manipulated using 'string' parameters, or a piano sample manipulated using woodwind parameters, but this is rather different from the claim that — for each model — the Neuron itself generates unique parameter sets derived from the source sample(s).

'Complexity' determines how accurately the sample is modelled. Hartmann suggest that maximum complexity produces an output identical to the input, whereas low complexities give interesting results. The former is not always true — the differences are plainly audible — and whilst I expected to find interesting side-effects from deliberately setting low complexities (much as you might deliberately sample at eight-bit resolution for creative reasons), this was not always evident either. Indeed, experiments with vocal samples (mine) and real flute samples (also mine, although you wouldn't pay to hear me produce them) demonstrated that the differences between complexities '1' and '10' could sometimes be very subtle, despite the significant differences in model sizes produced using these options (of which more in a moment).

Notwithstanding this, the combination of the Complexity and Parameter Set controls means that, for any given sample or set of samples, you can create 100 different models with subtly different characteristics. It's not as flexible as the Neuron's marketing materials lead you to expect, but you have to admit that it's more adaptable than the one set of voice parameters provided by all other synths (with the honourable exceptions of the Korg Z1 and a handful of other multi-model physical modelling instruments).

If you now press 'Go', and if everything works as it should, *Modelmaker* gives you a 'Successful' message, and you are then free to drag and drop the created folder (which contains the model and its associated files) into the appropriate folder in your FTP client, after which you can load it into the Neuron itself. It will then appear in the location you specified as its 'number'. There are such 512 locations, but beware... the number you specify in *Modelmaker* (which is '502' in the screenshot below) is where the model will appear, overwriting anything that previously existed in that location.

Once loaded, your model is treated no differently from the ones that resided in the instrument when shipped from the factory.



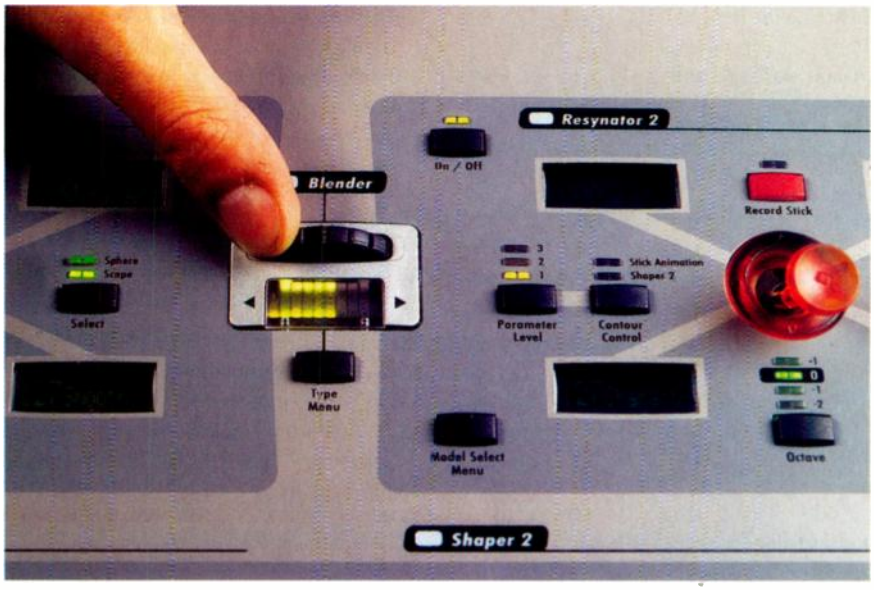
Selecting a Complexity and Parameter Set for the model.

However... I encountered two significant problems with *Modelmaker*, one in the time domain, and one in the frequency domain.

Firstly, I could find no way at first to make the models continuous. Using short sounds as the basis for the models created short, one-shot models. I have no problem with this, because one could argue that sometimes the percussive nature of a sound is an important factor that should become part of the model. But when I offered *Modelmaker* extended samples, I expected to obtain models that I could set to sustain indefinitely. However, I was not able to create sustaining sounds in this way, and no solution was available on the Hartmann web site, in the Neuron manual, in any of Hartmann's promotional literature, or in *Modelmaker* itself. I contacted Hartmann, who explained that if you set loop points in your source AIFF(s) using a sample editor capable of doing this, such as BIAS *Peak* or TC *Spark*, these loop points are carried over into the model when *Modelmaker* does its construction work. Having learned this, I went to look at some sustaining sounds in the Neuron's factory set to see how they had been achieved, and discovered that many of the continuous models display prominent loop points, which are possibly discontinuities in the models that have been generated at the transition points of looped samples. To be fair, Hartmann say in their on-line FAQs (see www.hartmann-music.com/home/us/faq/#39) that "If you want the model to sound perfect, the loop of the original sample has to be perfect as well".

The second problem lay in the way that the models work across the keyboard. I had expected that a model derived from a single sample would produce smoothly varying timbres with no discontinuities (which, by and large, it did) but also that models built from multisamples placed in multiple *Modelmaker* zones would interpolate smoothly from one note to next as you play up and down the keyboard (which they do not). Indeed, building a complex model from a multisample showed that the Neuron is extremely prone to generating shocking discontinuities of tone and amplitude as you play from, say, C to C#, or from C# to D.

Thinking about it, I realise that this disassociation of one sample from the next in the model-making process allows you to place sounds with different characteristics on different notes within a single model (much like a multisampled drum map). But, if asked which facility is the more important — smooth modelling that creates a sound that is useable from the bottom of the keyboard to the top, or the ability to mimic multisampling, I would say the former. After all, if you want to place different sounds in different areas of the keyboard, you can always use the Neuron's four-part multitimbral Setup mode (of which more in a moment).



Building models at high complexities can take many, many, times real time. Sample a couple of notes with a total duration of a few seconds, and you can wait minutes before *Modelmaker* finishes its deliberations. Only then can you undertake the tasks of FTPing, loading and using the model. What's more, the models are much larger than the original samples. To demonstrate this, I took a 268K AIFF file and processed it using the default parameter set at complexity '1' and complexity '10'. The resulting models filled 1.1MB and 3.0MB respectively! Of this, most of the space was occupied by the Spheres which, depending upon the nature of the sample and the model parameters used, required between 80 percent and 90 percent of the total data.

Given these figures, one could conclude that you will fill the Neuron's 20GB drive using models derived from just 2GB of sample data, which is a little over six hours of monophonic, 16-bit 44.1kHz audio. It may sound a lot, but it's not the 60 hours that a 20GB drive would initially suggest.

The Blender

As already noted, the Blender (shown above) is far more than a two-channel mixer for the outputs of the dual Resynators: it also offers a range of configurations that allow you to apply the Scape of one Resynator to the Sphere of the other.

There are numerous options to control this, including the exotically named Mix Singlesphere, Chromophonic, Dual Sphered, Intermorph, Dynamic Transsphere... and others. To explain what each of these does would be to rewrite the manual, and there is neither time nor space for this. To summarise, they control which Scape or Scapes are passed to which Sphere or Spheres, and — where crossfades and blends are concerned — how long it takes from one configuration to evolve into another. One of the simpler examples of this is Dynamic Transsphere, which cross-fades Scape 1 to Scape 2 and passes the result through Sphere 2.

It took considerable time to get to grips with the possibilities offered by the Resynators and Blender, but it's actually rather simple when you become familiar with things. The difficulty is not in understanding the components, but in getting anything useful out of them. Just as early synthesists discovered that Moog Modulars and ARP 2500s offered infinite possibilities that yielded silence or — at best — unusable noises, so it is with the Neuron. These noises will do little for conventional musicians, who will find that it takes longer to coax anything they might find useful from the synth. On the other hand, strange noises may well excite those working in Hollywood's sound-effects suites no end!

Slicer & Mod

Next in the signal path lies the Slicer. This is an LFO with two modes called Vertical and 3D, and just two parameters: Depth/Spread and Rate. You would think that, with such limited options, it would be simple to describe this, but Hartmann have again chosen to be obscure in the manual, talking of Slicer generating updrafts and downdrafts which change the altitude of a 3D sonic cloud... To find out what was going on, I selected the sine wave for Resynator 1, removed all modulations within the sound, and defeated the Silver section and effects that we will discuss shortly. I now had a pure tone emitted by both channels, left and right. ▶

▶ Switching the Slicer to 'Vertical', selecting the triangle waveform and dialling in an appropriate rate and depth, I achieved nothing more than amplitude modulation in each channel, but applied 180 degrees out of phase with one another: in other words, when the left channel was loudest, the right channel was quietest, and *vice versa*. This was rather disappointing; I had achieved nothing more nor less than LFO panning. Selecting some of the other models produced the same result, and selecting the sine and square waves in the Slicer produced amplitude modulation: in other words, tremolo. So much for updrafts and downdrafts!

The description of the 3D mode is equally pretentious, talking about clouds sweeping crossways through sonic soundscapes. What this appears to mean is that, if the Neuron is in Surround mode (of which more shortly), the LFO operates in three dimensions: left/right, front/back, and modulation depth. Performing the same experiments as above showed that, in addition to amplitude modulation, the 'spread' parameter creates pitch modulation for a range of chorus-style (and more extreme) effects.

A more conventional LFO resides in the Mod section (shown below), and offers rate (zero to 20Hz), delay, global depth and waveform parameters. On their web site, Hartmann claim that these depth and rate parameters are infinitely variable, but they are not; as explained in the manual, the rate is quantised in 0.1Hz steps.

There are 12 LFO waves, including random and the 'positive' sine and triangle waves that are essential for correct imitations of some forms of vibrato. You can route the LFO simultaneously to the volume, pitch and modelling parameters of each of the Resynators, as well as to the Blender and the filter cut-off frequency, with the depth determined individually at each destination.

Unfortunately, neither the Slicer nor Mod currently offers MIDI Sync, which I think is an oversight. Given that so many of the Neuron's characteristic patches are sliced and diced, it seems crazy that you can't sync them to the rest of a track. A fix for this is apparently on the way, but not until that fabled OS v2.0 upgrade.

Shaper1 & Shaper 2

Like much of the Neuron, the first two velocity-sensitive Shapers offer more than might be indicated by their controls (shown below). Sure, each can act as an ADSR and affect multiple destinations simultaneously, but you can also combine them in a 'free' mode, in which they can act as a single five-stage envelope with the levels and transition times determined by the user. Well, this isn't strictly true. The Sustain time is the Gate time, and the Release level is always zero. This means that there are eight parameters, rather than the 10 you might expect. This explains the name '4L/4T' (four levels, four times) used in the Neuron's manual. The '4L/4T' mode is mutually exclusive of the dual ADSRs (ie. you can't have both simultaneously). There's also a repeat mode that turns the Shapers into three-stage ADR waveform generators that you can use as complex LFOs. This is welcome and useful, recalling the trapezoid envelope generators of the EMS VCS3.

In ADSR mode, the Shapers have numerous destinations within the Resynators, although there's no modulation matrix as such. Shaper 1 is hard-wired to the amplifier controlling Resynator 1's audio level, and is also wired to each of its model parameters. Sure, this means that the same contour is used in all cases, but you can determine the level at which it is applied in each case. Likewise, Shaper 2 controls Resynator 2. There are fewer destinations in free mode.

Silver, Setup, Surround, & Master Effects

Following the Slicer, the audio signal reaches the module that "lets you put a lustrous shine on sounds", as Hartmann put it. Despite its high-falutin' title, Silver is simply a multimode filter plus a brace of insert effect units. The filter types on offer — but only one at a time — are low-pass (6dB, 12dB and 24dB/octave), 6dB/octave high-pass, and a band-pass of unspecified slope. Each is resonant, but none self-oscillate in the true sense, needing an input from elsewhere to produce a sound. You can modulate each of the filters using Shaper 3 (which is similar to Shapers 1 & 2, but, for obvious reasons, lacks the '4L/4T' mode), the LFO, and keyboard velocity.

Alongside the filter lie the effects, split into Frequency-based effects and Time-based effects. The former includes EQ, compression, distortion, ring modulation, decimation, and Sp-warp, which is a form of frequency modulation. The latter includes Stereo Spread (which delays one channel with respect to the other to create out-of-phase effects), delay, a phaser, a flanger, and chorus. Some of these are well specified with, for example, selectable modulating waveforms and acoustic feedback in the ring modulator. Others, such as the EQ, are basic, while yet others — the phaser, flanger and chorus — are as you might expect.

The third of the Neuron's orange joysticks lies in Silver and, as in the Resynators, you can use this to determine the parameters for the Silver module. And, as in the Resynators, you can record and replay the stick's movements to generate one-shot or cyclic modulations within the sound.

The final element within Silver is a button to select Surround mode. Hartmann claim that the Neuron is the first synth designed to work in 5.1, and I must admit that — while I use many keyboards and modules with six or even eight outputs — I can't immediately think of one that treats them as a surround setup allowing panning across the soundfield. Nonetheless, the Neuron doesn't offer complete 5.1 freedom; for the moment, Surround only operates in the Neuron's four-channel multitimbral mode (named 'Setup' by Hartmann). Surround capability in the single-patch Sound mode is yet another upgrade slated for OS revision 2.0.

There are 512 Setups, and each allows you to allocate up to four sounds on up to four MIDI channels, with independent volume, pitch, stereo output assignments and pan for each. You can also define highest and lowest notes for each, and highest and lowest velocities, meaning that this is where you define keyboard- and velocity- splits. In addition, there are parameters for each Sound that define its mix level, its master delay send,

and its master reverb send (I'll come to the Master Effects in just a moment). In Surround mode you can also position each sound in the front right/ front left/rear right/rear left field, with additional parameters to boost or cut the level of the sound in the centre and low-frequency effects (LFE, or subwoofer) channels. The simplest way to do this is with the joystick in the Silver module, which is why — although it is not strictly a 'Silver' function — the surround on/off button is found here. As always, you can record and replay movements of the joystick, allowing you to create 5.1 pans and sweeps. I was unable to test the Neuron in a true 5.1 context, because my review studio is as yet stereo, but by monitoring each of the channel pairs in turn, it seemed that everything was functioning correctly.

Following the Silver module, there are two master effects: a stereo delay followed by a stereo reverb, the output from which appear only on stereo output 1. Output pairs 2 and 3 are always dry, except in Surround mode, in which case the affected signals are sent to the front/rear pairs, and the centre and LFE channels are dry.

The number of parameters provided for the master effects is not overwhelming. So, although there are independent delay times for the left and right channels, the feedback, damping and mix values are the same for each. Disappointingly, there are no multi-tap or cross delays. Likewise, the reverb offers just five types — small room, medium room, hall 1, hall 2, and plate — with just mix, reverb time, diffusion, and damping parameters. Two extra parameters offer detune amount and time for the reflected signals. These are confusingly named: the effect is actually LFO pitch modulation of the reverb, with depth and rate controls.

In addition to providing the envelope for the filter cutoff frequency, Shaper 3's Attack and Decay controls also double as mix controls for the master Delay and Reverb.

Controllers & MIDI

The last of the control sections contains the performance controls: a joystick, a wheel, and a knob (shown on the next page). These are complemented by the inputs for the pedal controllers and, of course, the keyboard's velocity and channel-pressure sensitivity.

Of these, the one that I like most is the aftertouch, because it allows you to select four destinations, with individual depths for each. This, together with the three physical controllers (each of which can also affect four destinations) and the pedals, form a true control matrix, allowing you to route each to almost every parameter within the Neuron. There are far too many destinations to list here, or even to present in a table, which gives you an idea how flexible the system can be. Strangely, the factory sounds do not take advantage of the control available, which is a shame.

The Neuron's MIDI system is straightforward, offering SysEx dumping and loading of individual sounds and setups as well as complete dumps/loads of all of each, albeit, of course, at a much slower rate than using the USB/Ethernet/FTP connection.

I found a couple of significant bugs in the MIDI implementation. Firstly, there seems to be a slight latency that becomes particularly noticeable when playing rapid passages using a remote keyboard. Secondly, the Neuron seems neither to send nor receive Program Change messages (I checked using Korg and Roland synths at the far end of the MIDI cables, with the same results in each case). Again, Hartmann are apparently aware of these problems, and they are due for correction in OS revision v1.3. More interesting, and certainly more positive, are more than 100 fixed MIDI CCs that control many aspects of the sounds, including the Scape and Sphere parameters. The opportunities offered by this are obvious, and I can see many users

creating hugely complex sounds by drawing CC curves in computer-based sequencers.

In Use

There's been much talk about the Neuron's sounds, so, as soon as I received the review instrument, I was keen to hear what it had to offer. On the basis that most manufacturers place their most impressive sound in the first patch location, I waited for it to boot, saw the name 'Nata' appear, and began to play. My first impressions were good: it's a vaguely oriental sound comprising an ethereal pad and a plucked arpeggio. However, the sound is swamped in effects and reverb, so I switched them off, and was presented with something which to me, sounded very Wavestation-esque. The next patch, was based upon a drum loop and sounds like... a treated drum loop. You may be tempted to think that it's the Neuron itself creating the rhythmic patch, but it's not; it's merely using the rhythmic model of an existing sample.

After a few days of experimentation, I was becoming discouraged. Many of the Sounds were of high quality, but the interest was coming from the effects, not from the unaffected Resynators. I would happily have used some of these sounds, although there was little to tempt me to replace my Korg Trinity or Triton, or indeed to give a Yamaha Motif or Roland V-Synth a run for its money. Where were the towering spires of sound, the ephemeral tinkling, and the celestial beehive that I had been promised? To be fair, the ability to choose inappropriate parameters in *Modelmaker* later opened the door to a great deal of experimentation, but the results were still not as diverse or radical as I had expected.

Other problems revealed themselves as I delved deeper. Take model 157: 'Tape Choir' as an example. This is clearly intended to be an imitation of the Mellotron eight-voice male choir, even to the extent that the bottom 'C' lasts for just eight seconds or thereabouts. But the duration of the notes becomes shorter and shorter, and the timbre becomes progressively more 'munchkinised' as you play up the keyboard until, at the top, the sound goes 'eep' and expires after less than a second. This, of course, is exactly what you would expect from a single, one-shot sample mapped across a keyboard, and *not* what you should expect from a physical model. From what I know of physical modelling, it seems to me that a better way to create this type of patch would be to map a continuous version of the sound across the whole keyboard and then specify a fixed duration at any pitch. Unfortunately, the Neuron does not work like this.

Test Spec

- Neuron OS version reviewed: v1.1.0.
- Engine Version 1.10 (27th January 2003).
- *Modelmaker* version reviewed: v1.0.

The problems with 'Tape Choir' don't stop there, though, because as you play up and down the keyboard, the patch displays unpleasant side-effects that sound like the results of bad multisampling. There's a particularly ghastly jump between C3 and C#3, worse than anything I've heard coming from a PCM-based synth in many, many years.

I decided to look for a better choral model that was already 'looped'. This was where I ran into yet another problem. Consider model 283: 'Ohhchoir': this displays exactly the sort of 'bump' that you would expect from a badly looped sample. This bump is particularly noticeable on C3 (in fact, on all the Cs) as well as other notes such as F3. Again, you have to ask what's going on. If the bump were the result of bad looping in the source sample, why didn't Hartmann reject it, as any PCM synth manufacturer would? If the bump is a consequence of discontinuities in the model, why didn't Hartmann generate a new model?

I soon discovered that the deficiencies in 'Tape Choir' and 'Ohhchoir' were not aberrations, as I found when I switched off the effects swamping a patch that uses model 156: 'Classchoir'. This suffered from similar problems. What's more, there were even octave discontinuities within this model; A2 is 13 semitones above G#2! And 'Classchoir' wasn't the only model to suffer from this problem, as I discovered when experimenting with some of the brass models.

I suspect that these bumps and discontinuities are in part a consequence of the current limit on Neuron model sizes to just 12MB. Given the storage figures discussed earlier, it would seem likely that it's only possible at the moment to create three or four high-complexity zones across the keyboard, so it's little surprise that problems of this kind arise. Apparently, this limit is due to disappear in OS version 1.3, so the problem may be ameliorated in the future. But until then, it's not nice.

Equally disappointing is the discrete nature of the two sounds generated from the high- and low- velocity samples in *Modelmaker*. I think that — at the very least — we could expect these to crossfade from one to the other. As it is, they are discrete, resulting in unpleasant transitions across their boundary. Finally, I also noticed some granularity becoming audible in some of the parameters if you switch off the effects and wiggle the Resynator joysticks. To be honest, I could continue describing the models' and Resynators' deficiencies, but I think it's clear that some things are awry, and whether they are problems with the initial software release, or just bad factory programming of the supplied models, Hartmann should fix them.

Putting these worries to one side for the moment, let's assume that the Resynators and models work as they should. How does the rest of the Neuron perform?

Hartmann make huge claims for the user interface, describing it as "something entirely apart from what users have encountered with conventional synthesizers". However, there is nothing on the Neuron's control panel that has not been seen before, whether it is opto-encoders (the knobs), continuous wheels, X-Y joysticks, or LCD menus. What is true, however, is that they have not been combined in this way before. Sure, the tiny screen makes the parameters rather inaccessible, and the Resynators' parameters offer only the merest hint as to the changes you'll obtain when you alter them, but if you treat the Resynators, Blender and Slicer as largely serendipitous controls, and the Shapers, Silver and Effects as you would on any other synth, it all comes together. I liked the inclusion of the Snapshot function, which records the current parameter values, allowing you to backtrack along a chain of user-defined 'Undos' if you find that you've travelled up a sonic cul-de-sac.

Now, what about polyphony? Hartmann claim that the Neuron "has at least eight voices of polyphony and a maximum of 32". In the single-patch Sound mode, you'll be lucky to get eight voices, but 32 is out of the question. Many Sounds started

Moving the Resynator joysticks can effect dramatic changes in the character of the selected Neuron sound, depending on the source sound and the model parameters that appear on the four screens surrounding each joystick — and thanks to the Stick Automation feature, these joystick movements are recordable.

stealing voices on the sixth or seventh note. In the four-part multitimbral Setup mode, even eight is an exaggeration. I managed to program Setups that made the Neuron monophonic, but there's worse; listening to the voice-stealing and glitching that occurs as the Neuron attempts to allocate six voices to a four-part Setup is simply awful.

Finally, there's another quirk; the lack of any conventional transposition capability in Sound mode. The transposition controls in the Resynators are not simple pitch controls; they fundamentally affect the nature of the sound. Only in Setup mode can you transpose a Sound so that it plays in the same way at a different position on the keyboard.

So, what's good about the Neuron? Firstly, there's stick animation — the joysticks in the Resynators offer a form of control not found elsewhere, often over sound-shaping parameters that are not found elsewhere. This is particularly true when you start using stick animation, making it simple to create sounds that are not obtainable from any other source. To my ears, the Korg Wavestation comes close, but there are places where the Neuron leads but the Wavestation cannot go. Furthermore, another enhancement promised in v2.0 is 'stick zoom', which I assume means increased resolution for finer adjustments. That would be nice.

Secondly, there's the sound quality of the pads and textures. Despite the limitations of *Modelmaker* and the problems with the models and Resynators, the Neuron's effects can turn a rather dry sound into something much more interesting, and for this the instrument has a character that you may like. Whether the resulting patches are enough of an improvement over similar sounds available from cheaper alternatives, and whether they justify the Neuron's price tag is, of course, another question (or two).

Thirdly, there's the serendipitous nature of the programming system. Normally, I'm not a fan of the 'infinite number of monkeys' approach to synthesis, but nonetheless, uninformed twiddling with the Resynators can lead to interesting results. But having said that, I'm still convinced that it will take time and understanding to get the best from the Neuron.

Finally, if you have a penchant for sampling and mangling existing sounds, or warping vocals, the Neuron is ideal; you're more likely to create something odd and interesting here than on a conventional sampler.

And the Future...?

Clearly, The Neuron is still a work in progress. Many facilities within the synth itself are unimplemented (the ability to receive external audio being a particularly obvious case) and I hope that *Modelmaker* is still in its infancy. I have mentioned a number of upgrades and bug fixes planned for release in versions 1.3 and 2.0, and Hartmann Music are also promising RAM upgrades, external drives, CD burners, and USB memory sticks in version 1.3. At some undetermined point in the far future there may even be a 'digital 5.1 edition' with an ADAT interface offering six-channel surround without going via the analogue domain.

These are all useful ideas, but I would like to propose a more fundamental improvement. Given that the Neuron is essentially a PC in synth clothing, why not give it a video monitor output and a full operating system? The Technos Axcel mentioned elsewhere in this article was fully integrated in 1988, and samplers of that era — such as the Roland S770 — offered full, graphical user interfaces, so this should not be beyond the Neuron's capabilities.

The other alternative would be to take this process one step further; the Neuron could be implemented as a software environment combining both the *Modelmaker* and Neuron components on one computer. This would make it cheaper, more open-ended, and probably more flexible. With a dedicated control surface featuring the joysticks for use alongside a MIDI keyboard, this could provide all the existing facilities, and more. The only disadvantage would be the entirely computer-dependent nature of the resulting system, with all that this entails for portability and stability — but the Neuron is already tied to a computer for all its *Modelmaker*-related resynthesis functions anyway.

Conclusions

Hartmann Music's literature suggests that a "trailblazing technology" appears every 15 to 20 years, and that the Neuron is one such product, containing "technology that in the near future will reshape the perceptions of the entire computer industry". Wow! I think that that is the boldest claim I have encountered in over 30 years of gear lust and nearly two decades of product reviewing. But quite apart from Hartmann's own contribution to the art of hyperbole, there has also been a fair amount of eulogy heaped upon the Neuron by the press, to the extent that it has been nominated for — and even received — various awards, one of which was presented fully nine months before the first units were shipped from the factory. Given its current condition, I feel this was unwise, and suspect that people have been carried away by the undeniable fact that it is different, without waiting to investigate its weaknesses as well as its promised strengths. When it works as it should (which, in my view, means waiting for OS v2.0 or beyond) it may look rather different, but for now, I can't wholeheartedly praise it; the best I can offer is, "watch this space". SOS

information

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Red Submarine Mini-Sub

PC Music Workstation

Photos: Mark Ewing

Does a standard PC take up too much space in your studio? Red Submarine's Mini-Sub system packs all the performance of a full-sized desktop PC into a diminutive Micro-ATX case.

Martin Walker

In the past, musicians have often needed their computers to be physically large, to house several soundcards used in tandem, three or four hard drives, and the usual assortment of graphics, modem, and other expansion cards. For many of us, however, the situation has changed over the last few years. Now that hard drive sizes have increased, most of us never need more than one or two, and since most modern soundcards provide the majority of features we need in one neat PCI card, and the graphics card has moved to its own dedicated AGP slot, we simply don't need six PCI slots either.

With this in mind, Red Submarine are now offering two PC systems designed specifically for musicians who value their space as much as their specification. The cutest is undeniably the Micro-Shuttle, which is claimed to be the smallest computer available at 18.5 x 20 x 30cm. Despite its small dimensions it can house a hard drive of up to 200GB, a 3GHz processor, and 1GB of DDR memory, though there's only one AGP and one PCI slot.

For those of us who have more cards to fit, the Mini-Sub under review here still manages to be considerably smaller than most desktop systems, with a width of just 36cm, a height of 14cm, and a depth of 43cm — about the size of video recorders from a few years back. However, it still has one AGP and three PCI expansion slots, and manages to be smaller by incorporating a smaller Micro-ATX format motherboard (see Case Sizes box) and a PSU whose internal fan vent faces the motherboard, along with two 5.25-inch front-panel drive bays, and two internal 3.5-inch ones for hard drives. No floppy drive had been fitted in the review model, but this won't be a loss to many musicians, and you can replace one of the two 5.25-inch bays with a 3.5-inch front-panel adaptor if you really need one.

With its aluminium construction and black bezel trim, the system case was instantly recognisable as a Lian-Li product — in this case the PC9300. Front left to right across the bottom half of the front panel are two USB 2.0 ports, a red drive activity indicator, a recessed reset button, a blue power indicator, and a power switch, while on the review model the two 5.25-inch drive bays housed an LG CD-R/W drive capable of 52x read and write and 24x rewrite speeds, and a Terratec DMX 6Fire soundcard module. The back panel looked almost identical to that of a Midi Tower case, with its selection of PS/2 mouse and keyboard ports, a further four USB 2.0 ports, a single serial and parallel ports, plus the usual selection of redundant motherboard sockets.

An Internal Tour

Like the popular PC60 model, the PC9300 comes without a PSU, and Red Submarine had sourced a low-noise 235W model — not that powerful by today's standards, but good enough for this machine unless you later want to significantly expand it. They had also taken great trouble to reduce acoustic noise to the absolute minimum. Both of the case side panels had a sandwich of damping panel/acoustic foam, while the top panel was also completely covered in damping material. All unused space on the front panel plus the one empty internal 3.5-inch drive bay had been filled with blocks of acoustic foam, while the single 80GB 7200rpm hard drive was surrounded by a custom acoustic sleeve of damping pad and foam block (with both front-panel 5.25-inch bays already used, there's no space to fit a Silent Drive sleeve).

The motherboard fitted was an Asus P4B533-M, one of the family of at least four P4B533 socket 478 models featuring the Intel 845E chipset and supporting Pentium 4 processors up to 3.06GHz. They also support the latest hyperthreading technology, which Intel introduced with the 3.06GHz model, and which fools Windows into thinking there are two CPUs. This only benefits music applications that are specially compiled to take advantage of it, and currently the only one I know of is Steinberg's *Nuendo* 2. In any case, the review system was fitted with a somewhat more reasonably priced 2.8GHz Pentium 4 Northwood model. To complement the other low-noise components, Red Sub had also fitted it with a Zalman CPU cooler and Fan Mate speed control.

This 'M' version motherboard dispenses with the integrated graphics, RAID, LAN, Firewire, audio, MIDI and Gameport options of other models in the series, to provide a more straightforward choice for the musician. There are still six USB 2.0 ports available, and the two 184-pin DDR DIMM slots support up to 2GB of memory using DDR200 or DDR266 DIMMs. However, a ▶

SOUND ON SOUND

Red Submarine Mini-Sub

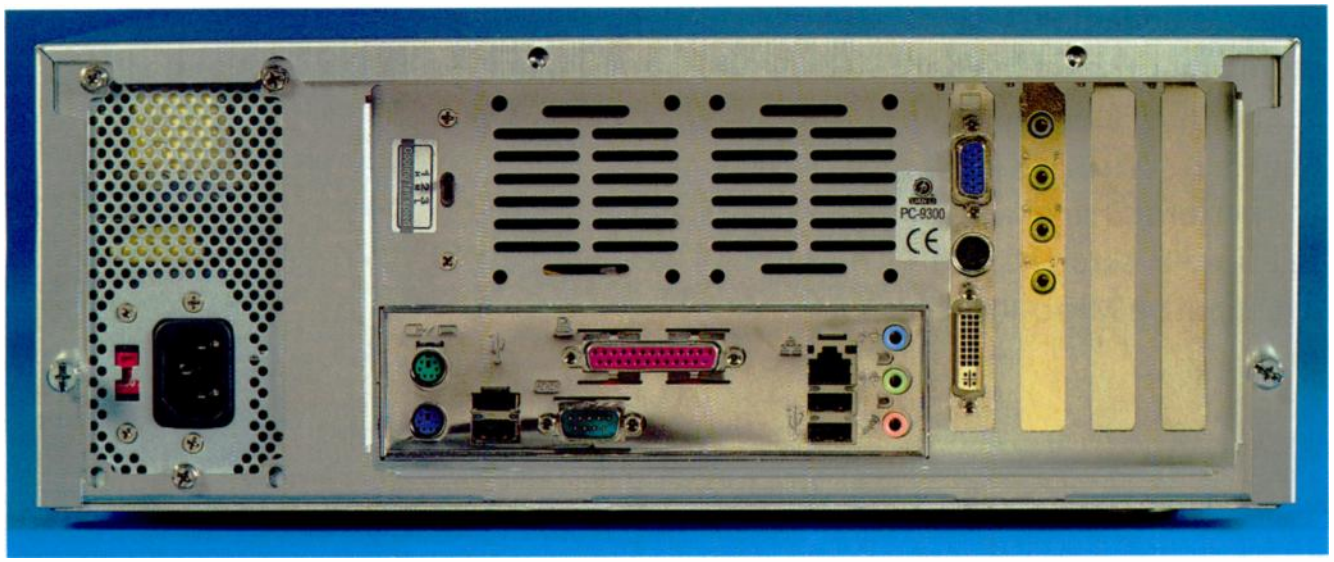
pros
- Significantly smaller than standard PC cases.
- Commendably low acoustic noise level.
- Still space for two more PCI cards and one more hard drive if required.

cons
- 235W PSU might need upgrading after further expansion.
- Installing Windows in Standard Mode loses the extra IRQ advantages of the APIC controller.
- Floppy drive option not disabled in BIOS.

summary
The Mini-Sub is the fastest, quietest, yet smallest desktop PC I've reviewed to date, but manages to do all this without significantly sacrificing expansion potential.

Specifications Of Review PC

- **Case:** Lian-Li PC9300 aluminium desktop, fitted with 235W low-noise PSU, and lined with sound-dampening material.
- **Motherboard:** Asus P4B533-M socket 478, with Intel 845E chipset running 400/533MHz system buss, and 2 DDR DIMM sockets supporting up to 2GB of PC2100/PC1600 memory.
- **Processor:** Intel Pentium 4 2.8GHz 512kb cache (Northwood B), 4 times 133MHz Front Side Buss.
- **CPU heatsink & fan:** CNPS5100-CU Zalman Ultra Quiet with Fan Mate controller.
- **System RAM:** PQI 512MB PC2700 (DDR333) CAS2 DDR-SDRAM.
- **Hard drive:** Seagate Barracuda ATA V, model ST380023A, 80GB, 7200rpm, ATA100, 2MB cache.
- **Graphics card:** ATI Radeon 7500 dual monitor with 64MB RAM.
- **CD-R/W Drive:** LG model GCE-8520B, E-IDE interface, 2MB buffer, 52x read, 24x rewrite, and 52x write, buffer under-run protection.
- **Floppy drive:** none fitted.
- **Modem:** none fitted.
- **Monitor:** LG Flatron L1510S TFT flat-screen, with 15-inch diagonal.
- **Keyboard & mouse:** Microsoft wireless optical desktop with enhanced 105-key keyboard and wireless optical mouse.
- **Installed operating system:** Windows XP Home Edition with Service Pack 1.
- **Installed soundcard:** Terratec DMX 6Fire with version 5.00.2000.126 drivers.
- **Installed audio software:** Steinberg *Cubase SX* version 1.0.5.61.



The Asus P4B533-M motherboard lacks options such as Firewire and integrated LAN, but does offer six USB ports.

single stick of even faster PQI 512MB DDR333 PC2700 memory had been fitted to the review model, apparently because Red Submarine had managed to buy PC2700 RAM for the same price as the required PC2100. By the time you read this they will be offering a more upmarket Asus P4PE motherboard option that does support DDR333 memory, as well as Firewire and LAN for those who want them, for about £30 extra — I think it will be worth the small additional cost.

The two IDE channels support up to ATA100 protocols, which is perfectly adequate for hard drive recording and playback, and the single 80GB Seagate Barracuda V hard drive had been fitted as Primary Master, with the LG CD-R/W drive as Secondary Master.

The AGP slot was fitted with an ATI Radeon 7500 graphics card with 64MB of DDR RAM, supporting dual monitors in a variety of configurations with its 15-pin VGA analogue out, DVI out for digital flat-screen monitors, and TV out, and a bundled DVI-to-VGA adaptor for those who want to plug in two VGA monitors. Originally introduced in 2001, the Radeon 7500 chipset doesn't have the fastest 3D performance around, but more importantly, this particular card from HIS doesn't employ a cooling fan, and is a good budget card for dual monitors.

Only one of the three PCI slots was occupied in the review model, by a Terratec DMX 6Fire soundcard; Red Submarine list several dozen other soundcard options on their web site, along with various other system options. This leaves plenty of room for expansion, although you can only install expansion cards up to 'half-length' (about seven inches). Very few are longer than this nowadays, and looking back through my dozens of *SOS* soundcard reviews, the only ones that wouldn't fit are Creamware's Pulsar and Lexicon's ill-fated Core 32 and Core 2 models. Having fewer PCI slots ought to help avoiding IRQ sharing at the motherboard level, and sure enough, slots one and two get their own interrupt allocation on the motherboard, although slot

Despite its compact size, the Mini-Sub's case has two 5.25-inch drive bays.

Case Sizes

This system's Micro-ATX format will be unfamiliar to some *SOS* readers, so it's worth comparing it with the more familiar options. The majority of modern PCs house standard ATX-format motherboards, which can be fitted in Mini Tower, Midi Tower, Full Tower or Rack cases. Most musicians opt for a Midi Tower, which typically offers four 5.25-inch drive bays plus four or five internal 3.5-inch bays for hard drives, and two or three external 3.5-inch bays for floppy drives.

Rack cases for musicians vary considerably, but typically offer a smaller number of bays, depending on their height, while Full Tower systems provide more space for those with large ambitions, and typically provide six 5.25-inch drive bays, six internal 3.5-inch bays for hard drives, and three 3.5-inch bays for floppy drives.

Some companies also offer Mini Tower cases, such as Lian-Li's PC30, which measures a diminutive 21 x 36.5 x 49cm, but still supports a standard ATX-format motherboard, has two 5.25-inch and two 3.5-inch drive bays on the front, and a further three 3.5-inch bays internally. This is effectively a Midi Tower with about three inches lopped off the top, but this is still a useful reduction for those with space problems.

The Mini-ATX motherboard format is only slightly smaller at a maximum 11.2 x 8.2 inches compared with the maximum 12 x 9.6 inches of the standard ATX format, and to get a significantly smaller PC means using the Micro-ATX format of the review system, which drops overall dimensions considerably to a maximum of 9.6 inches square. This format still provides reasonable expansion potential, and if you drop any further in size to the ultra-compact Mini ITX format at 6.76 inches square, you're likely to only get a single PCI slot and integrated graphics chip, as found in Red Submarine's Micro-Shuttle PC.

M&M

Echo Mia MIDI is the most affordable professional quality audio interface for your Mac or PC with true 24-bit, 96 kHz capable precision A/D/A converters and balanced analogue I/O via 1/4" jacks.

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Mia MIDI provides driver support for Win 95/98/Me/2000/XP and Mac OS 8.6/OSX.

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three does share with USB ports five and six, and the AGP slot shares with ports one and two.

Also Included

The remaining components were of good quality, consisting of one of the well-respected LG Flatron LCD monitors, in this case an L1510S 15-inch model, a Microsoft wireless multimedia keyboard and an accompanying wireless optical mouse, both using PS/2 connections. All three worked well during the review period. Wireless components are popular with musicians because you can still use them well away from their base unit when recording, although this does mean that the mouse is heavier due to its batteries, and the extra keys of this particular multimedia keyboard make it 50 percent deeper than some other models. It incorporates dual-functions for each 'F' key, plus 17 extra user-definable keys that by default open various Microsoft utilities, including six for transport control of Media Player. Sadly it hasn't proved possible to redefine these for use with the supplied *Cubase SX*.

On the software side, Windows XP SP1 had been installed, along with the latest *Cubase SX* version 1.0.5.61 and Norton's *Ghost* imaging software, while as often seems to be the case, the CD-R/W drive came with a bundled copy of Ahead's *Nero* 5.5 CD burning software. Intel's Application Accelerator had also been installed to get the best performance from the Pentium 4 processor.

Technical Support

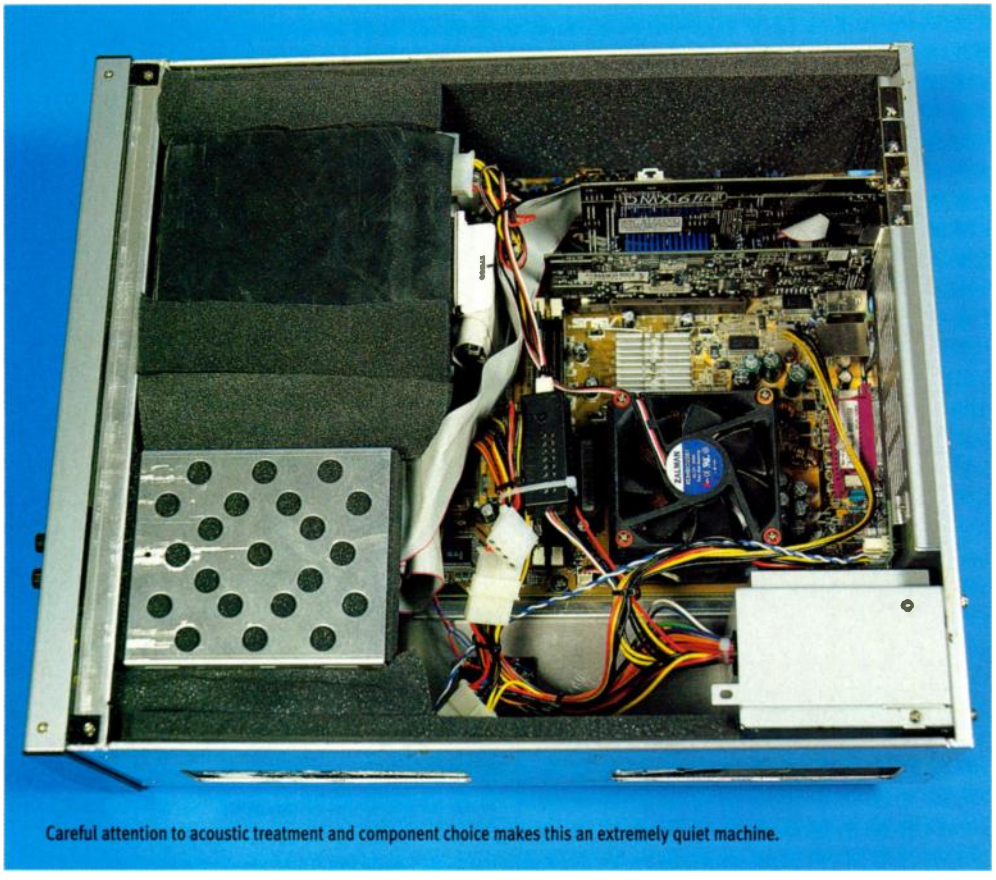
Red Submarine provide a year's on-site warranty support, followed by a further two-year return-to-base warranty. A helpful Confirmation slip is supplied detailing all the components in the supplied system so you can double-check that you've received exactly what you've ordered (not always the case it seems from some suppliers), and then there's a two-page setup guide for beginners detailing all the basic connections, how to connect a TV as primary or secondary monitor, how to restore the two CD-R-disc backup image using the bundled copy of Norton's *Ghost 2003* in case of user accidents, and how to create your own updated images.

I was impressed with the Quality Assurance Worksheet, which details all the tests carried out on the system, as well as how it has been set up, including IDE Master/Slave setup, partition info, BIOS settings, physical checks, soundcard audio and MIDI driver settings and checks, audio software setup, plus details of any dual boot (not used on this system) or ghost image creation. To cap it all, the engineer who completes this comprehensive list is named at the bottom, just in case you have any queries. If you do, technical support can be obtained by both email and telephone during office hours from Monday to Saturday.

Powering Up

Switching the Red Sub Mini-Sub on lights up a smart six-inch-long blue strip above the drive bays, in addition to the blue power indicator LED, but the biggest surprise was the acoustic noise — or rather the lack of it. While most of the specialist PCs I've reviewed over the last couple of years have been fairly quiet, this is the first one that's been even quieter than my own. Since I've tweaked mine in almost every possible way, this is no mean achievement for a 'production line' model, especially since its CPU is nearly three times as fast as mine. I can therefore pronounce the Red Sub Mini-Sub the quietest PC I've ever had the pleasure to use, thanks to its acoustic lining, extremely low-noise PSU fan, and a carefully chosen CD-R/W drive that idles quietly.

The Seagate Barracuda V 80GB hard drive had been divided into two partitions — a 20GB one for system use, and the remaining 60GB for audio, with cluster sizes of 4k and 32k respectively. *Dskbench* showed the C partition capable of 41MB/second write and 42MB/second read speeds, while the D audio drive managed 41MB/second for both read and write, and 125 simultaneous tracks of 16-bit/44.1kHz audio with a 64k buffer size — as fast as any drive I've yet measured. This is the first time I've tried one of the new Seagate Barracuda V series drives, and I know quite a lot of musicians still search for the popular 80GB Barracuda IV model, since this is claimed to be even quieter. However, both have an ATA100 interface, Softsonic motor, 7200rpm spin speed, and almost identical seek times, and judging by the review model, the V is slightly faster and seems just as quiet.



Careful attention to acoustic treatment and component choice makes this an extremely quiet machine.

Windows Performance

Windows had been installed in Standard rather than ACPI mode, while APM had been enabled to allow soft power-down. This is the first PC I've reviewed with the APIC (Advanced Programmable Interrupt Controller) that I discussed in *SOS* February 2003, but unfortunately the extra interrupts it provides (24 instead of the normal 16) are lost in Standard mode — perhaps Red Submarine should reconsider their decision to abandon ACPI.

All the usual OS tweaks had been made, including processor scheduling set to background services, a fixed 512MB page file, Start Menu to the Classic view, Visual Effects set to best performance, System Restore, System Sounds, Automatic Updates, Auto Insert Notification disabled, and so on. Wisely, no Services had been disabled, since it's impossible to tell exactly what an end user may require.

Memory bandwidth, measured with SiSoftware's *Sandra 2002 Standard*, measured 1973MB/second for integer calculations, and 1972MB/second for floating point — around 3 percent lower than the Digital Village and Digital Systems PCs I reviewed recently. I'm not sure why this was, but I suspect that with the DDR333 SDRAM Red Sub could tweak more aggressive timings in the BIOS to make up for this. I also spotted while in the BIOS that Legacy Diskette should have been set to 'None' to prevent the non-existent Floppy A appearing in Explorer.

The 2.8GHz Pentium 4 was certainly no slouch when running music applications, and I measured anywhere between 20 and 30 percent improvements compared with a Pentium 2.4GHz Northwood B processor, with Waves *Rverb* taking just 4.8 percent and the *C4* multi-band parametric processor 3.6 percent.

The write and rewrite performance of the LG CD-R/W drive also proved to be excellent, although you may have to be a little careful to choose suitable media to achieve the top rated speeds. Digital audio extraction isn't quite as fast, but still pretty speedy at around 40x. The DMX 6Fire soundcard had been set up for a 4ms latency at 44.1kHz, and I experienced no glitching problems running it with a variety of music software, including the supplied *Cubase SX*, *Wavelab* 4.0, *Pro 53*, and various Waves plug-ins.

Final Thoughts

When I first saw the ads for the Mini-Sub, I imagined that it must involve some compromise either to performance or expandability. However, this simply isn't the case: you can install processors up to 3GHz, two hard drives, and still have two PCI slots available after fitting your soundcard and AGP graphics card, just in case you need a modem for instance. Few people will miss a floppy drive, but you could still add a USB floppy if you really needed one.

The Mini-Sub should certainly interest any musician who is fed up with big PC cases that are full of hot air. Of course you can't build a PC without generating some heat, but Red Submarine have managed to put together a significantly smaller system than most, with the fastest processor I've tested to date, and still cool it without resorting to noisy fans. It may not be totally silent, but it's the closest to it that I've yet experienced on a production PC, and this is particularly commendable considering its 2.8GHz CPU. SOS

Information

- £ Total system as reviewed, including LCD screen, *Cubase SX*, and Terratec DMX 6Fire, £2199; basic system as reviewed but without monitor, music software, or wireless keyboard/mouse, £1399; basic system as reviewed without monitor, music software, wireless keyboard/mouse, or acoustic insulation, and with 2.4GHz instead of 2.8GHz processor, £1165. Prices include VAT.
- T Red Submarine +44 (0)870 740 4787.
- F +44 (0)870 740 4788.
- E info@sub.co.uk
- W www.sub.co.uk

Swarshala & Swarplug

Combining impressive educational resources with a huge library of MIDI files and high-quality samples in stand-alone and VST Instrument formats, Swar Systems' software promises to open up the world of Indian music to anyone with a PC or Mac.

Jyoti Mishra

The Practice pane sets up a virtual Indian group for you.

Indian Instrument Synths & Software For PC & Mac

When I was growing up, Indian music in Britain was a very underground thing. Apart from immigrant families like mine and perhaps a few Beatles-influenced Western fans, there wasn't a great market for it or appreciation of its unique possibilities.

Now, however, nary a day goes by without another advert Bollywooding it up or trance act sampling some 'Indian atmosphere'. Add that to the mainstream success of artists like Asian Dub Foundation, Nitin Sawhney and Talvin Singh and you can see that Indian music is finally becoming a visible part of British musical culture. And American too, judging by the Indian flavour in tracks from Missy Elliot, Redman and other hip-hop/R&B heavy hitters.

I'm lucky in that I grew up listening to my parents' record collection. So I'm naturally familiar with the sound of Indian music, whether it's the pukka classical tunes my dad prefers or the more poppy Hindi film soundtracks my mum sings along with. But to a puzzled outsider, Indian music may seem initially intimidating and they may approach it filled with questions. Is it true the classical form doesn't change chords? What are the different instruments you need to get that Indian flavour? What's that instrument that sounds like a goose being throttled?

Into this breach step Swar Systems (www.swarsystems.com), a Swiss company who specialise in Indian music software. Their *Swarshala 3 Pro/Swarplug* bundle can provide not only Indian instruments in VST Instrument form (*Swarplug*) but also teach you about Indian music and provide a virtual Indian backing band for you to practise with (*Swarshala*). For those who prefer to use a hardware sampler, *Swartrax* packages the same sample library in Akai format, but includes the MIDI files and *Librarian* application, which are important components of the product.

Swarshala

Swarshala 3 Pro is Windows-only (although its Learn section is available separately as a $50 cross-platform application called *Swar Tutorial*) and installed painlessly on my XP PC. After the CD self-ran and installed *Swarshala*, I simply inserted the authorisation floppy and, following the obligatory chuntering and whirring, *Swarshala* was authorised.

The program is divided into three main sections: Learn, Practice and Compose, all aptly labelled. The Learn section is a virtual encyclopaedia of Indian classical music. This is not to say it deliberately excludes Indipop but rather that modern Indian pop is very cross-fertilised with Western music as well as still having obvious Indian roots both in classical and folk songs.

Learn is further sub-divided into three sections, the first of which is Initiation. This is, thankfully, not some *A Man Called Horse*-type ritual but the background to Indian music, its basic building blocks and a very detailed history of its development. I found this section fascinating, especially the little jewels of information about the influence the Muslim conquest of India had. Once slight criticism I'd make is that the information in all of *Swarshala* is presented in a scrolling window which has a kind of wood-grain pattern behind it to match the rest of the interface. Although this looks attractive, it does make it more difficult to read and I found myself squinting several times. Perhaps if the background was rendered lighter it would contrast more with the text?

In the Raga subsection the melodic basis of Indian music is explained. Many examples are presented to listen to, in both aroha (ascending) and arova (descending) form. A couple are also presented with improvisations within the raga, as you may hear them in performance. These samples are quite long and since they're of a singer, it's easy to couple the notes they're singing

(which are in the Indian do-re-mi form) with Western equivalents. This makes it far easier to translate into your own playing, on whatever instrument you use. On the shorter samples, it's worth pointing out that each note in the raga displayed is clickable — I had quite a bit of fun building up my own chords from clicking around here. I wouldn't be at all surprised if someone based an entire track just around this learning function!

The Tala subsection is probably my favourite in the Learn section. Here, the essence of Indian rhythmic accompaniment is explained, again in clear, concise detail with many accompanying examples. This, of course, is the joy of interactive media — as you read about the subject, you can also hear it come to life. And with any music, hearing is understanding. I love the way the bols are presented in both voice and tabla form so you can immediately hear the correspondence between the two. The section where the tabla are presented alongside beautifully animated clickable explanations of the different strikes is simply stunning. There's a level of detail here that I haven't seen in any other interactive explanation of Indian music.

Practice

The Practice section of *Swarshala* sets up a virtual Indian group for you. You're presented with three different panes, one for the Rhythmic element, one for Melodic and one for Tanpura (the drone element). Each pane has controls specific to its purpose: the Rhythmic pane lets you select cycle type, the Melodic part lets you select instrument and composition and the Tanpura part lets you select string order and style. All the instruments have a volume control and stop/start buttons. At the bottom of the panes is the part definition section which holds global elements like scale, duration of the whole piece and initial tempo. The best part of this section is the option to increase tempo every n cycles by a chosen percentage. This brings the practice session to life, mimicking the tempo increases in live classical music that build to the climax of a piece. It's possible to define three different Parts — which, confusingly, actually means three different types of practice, each with their own settings.

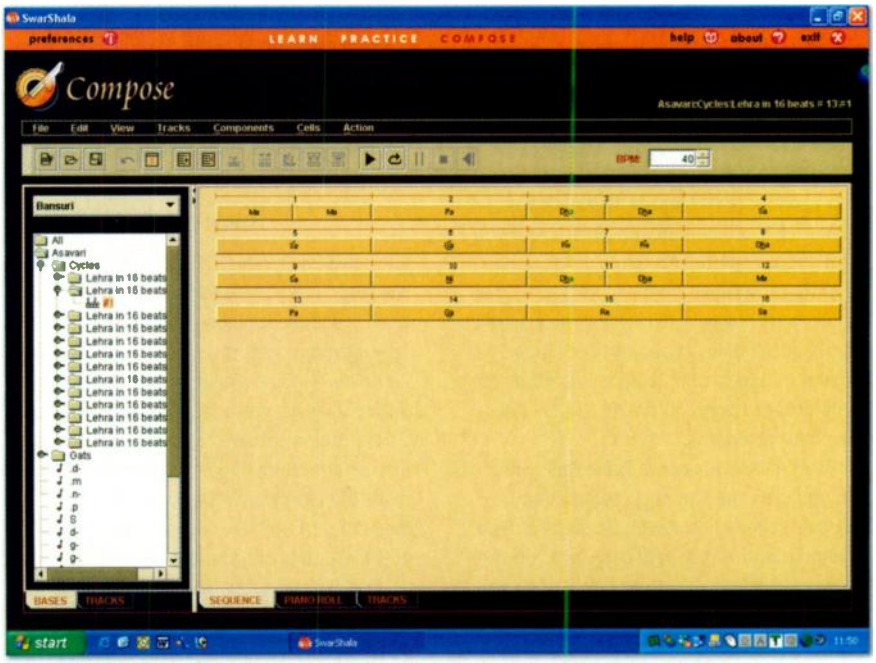
I did notice a few quirks in the Practice section. Firstly, anytime you change a parameter, the whole lot comes to a sudden halt. Say you're tinkering with a session, its tempo is building nicely, and you think 'How would this sound with a santoor instead of a harmonium?' You click the drop-down selector in the Melodic section — but instead of changing instrument, the whole session stops. Not only that but you have to re-select composition, which is a pain in the bum if you forgot what you'd left it set on. Similarly, any changes you make in the volume of a pane aren't heard in real time: you have to stop the whole lot and start again. This limits the real-time tweakability.

Another puzzler is the drop-down selector for Raag in the Melodic pane. Firstly, it should really be labelled Raga to be consistent with the rest of *Swarshala* (yes, I know that it means Raga but it adds confusion for novices). Secondly, when I first tried it, it didn't appear to do anything — the only raga choice was 'All'. Fortunately, I checked the FAQ in the manual and discovered that you can load any raga you wish within the Compose section and then it becomes available in the Practice section. Hey presto! Yaman, Asavari are all there to play with in the Practice pane.

This loading methodology also applies to the instrument selection in the Rhythmic pane. The default is tabla but you can load in dholak, manjeera and other suitable instruments in the Compose section, whereupon then that instrument is available in the Practice section. I found this to be a bit confusing. I'd much rather all the instruments and ragas were available in the Practice section on startup. Indeed, you can kludge this yourself by entering their names into the auto-load section of the Preferences, but it's a bit of a laborious workaround. At the very least, you should be able to load instruments in the Practice section without having to switch to the Compose section.

Test Spec

- *Swarshala Pro* v3.0.5; *Swar Librarian* v1.0.
- Packard Bell 2.66GHz Pentium 4 PC with 512MB RAM, running Windows XP Home Edition.
- Apple G4 dual 1GHz Mac with 1.25GB RAM, running Mac OS 9.2.2 and 10.2.6.



Swarshala's Compose pane allows you to construct your own compositions by piecing together MIDI loops. These can be examined more closely in the piano-roll view.

Compose

The Compose section is a simple pattern arranger; there are no facilities here for you to hit Record and then twiddle in your own majesty. Instead, you create a new composition, create specific tracks for different instruments and then add what Swar call 'components' to these tracks by using the component selector on the left whilst in Track view mode. Using tabla as an example, you'd ▶

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Swar Systems
Swarshala Pro/Swarplug **$295**

pros
- Meticulous attention to detail.
- Well-written and laid-out interactive content.
- Great resource for authentic Indian MIDI sequences.

cons
- Some instruments could benefit from more multisampling.
- Some counter-intuitive interface quirks.
- Practice pane controls could work better in real time.

summary
More than just a sample library of Indian instruments, this product also offers an introduction to Indian music coupled with eminently usable MIDI files.

SWAR SYSTEMS *SWARSHALA* & *SWARPLUG*

create a tabla track in a new composition and then drag and drop tabla components from the left. By right-clicking, you can resize these phrases — in effect, time-stretching or compressing them — or repeat them.

If you double-click a component, this opens it up in the Sequence view window. Here, you can see exactly what parts the phrase is made of and then change them by dragging and dropping a new hit or note name. In this way you can muck around at root level with the preset elements, changing hits or creating your own bizarre cycles for the melodic instruments. Before you add a particular component, you can double-click on it, which also opens it up in the Sequence window. Since the different elements are meant to be played at different tempos, this can be handy to make sure you're not adding a cycle that was originally meant to be played at 60bpm to your gabba masterpiece. Or maybe this is exactly what you want?

A quirk of the Compose section is that each track is divided up into cells, and if you drop a new component onto a cell it won't automatically expand beyond its boundaries. Hence, a seven-beat element will play within a four-beat cell unless you right-click it and expand it to its proper length. I would prefer it if the dropped parts automatically assumed their natural lengths.

The final view mode is Piano Roll, which lets you view the particular component alongside the typical keyboard graphic. Bear in mind that this is a view only, and you can't start dragging notes up and down or try to change the timing of notes side-to-side. I wish you could — perhaps I've been spoilt by years of fully editable piano-roll displays...

Once you've arranged your composition, *Swarshala* lets you save it in its own proprietary format or export it in either Wave or MIDI file formats. I experimented by assembling some inelegant combinations of components and then exporting the results as a MIDI file. I then imported them into *Logic* and listened to my ambient masterpiece. OK, it actually wasn't very good, but that's the workman not the tools.

Swarshala Standard

For those who don't want to stretch to the full *Pro* version of *Swarshala*, Swar Systems also offer the cut-down *Standard* version. This is limited to three instruments — tabla, harmonium and tanpura — and lacks the Compose section and piano-roll view, plus the ability to export in Wave or MIDI file formats.

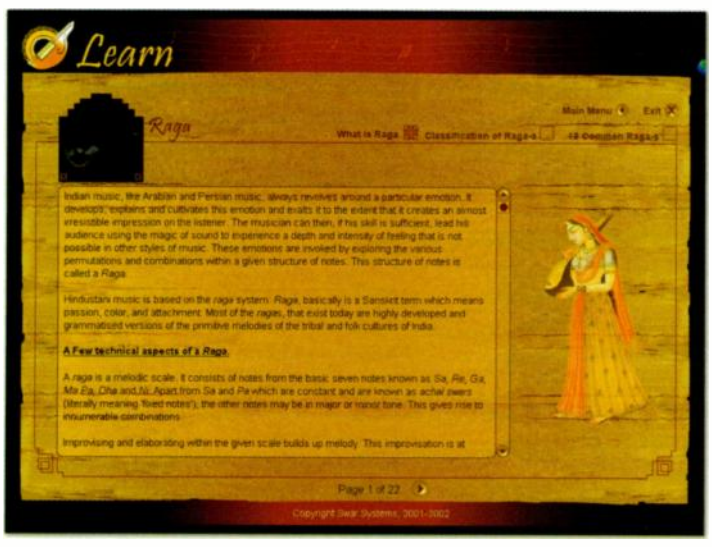
Swarshala Pro 3 also comes with a little application called *Swar Sampler*. Ostensibly, this is to enable you to play those lush Swar samples from the outside world (or inside, via another sequencer). I say ostensibly because I simply couldn't get it to work — it kept crashing Windows so, beleaguered, I gave up... thank goodness for *Swarplug*!

Swarplug

Swarplug itself, which is compatible with Windows, Mac OS 9 and Mac OS X, consists of a VST Instrument plug-in plus the *Swar Librarian* Java application, although the *Librarian* is not available in Mac OS 9. *Swarplug* gives you access to the sounds of 21 instruments (there are actually 16 unique instruments, some presets being variations) while the *Librarian* lets you browse MIDI loops of performance components and then add these to your seqencer.

Installation, again, was painless. Testing this on a Mac, I had to uncompress a SIT file and I dumped the resulting directory in my *Logic* VST plug-in folder. I ran the authoriser, entered the code and when I booted up *Logic*, there was *Swarplug*. The plug-in itself takes up very little screen estate, consisting as it does of a little graphic, drop-down selector and three virtual knobs. These control, from left to right, Gain, Pan and PBR (pitch-bend range).

I started with the bansuri (flute). Yep, it sounded as good as in *Swarshala*, breathier than Western flute but with more body and roundness than pan pipes. Next, the santoor (hammered dulcimer). This instrument excelled. I immediately started trying to play Ghulam Ali riffs but, unfortunately, I sucked. Which is a shame since the santoor is one of my favourite instruments, an import into Indian music with a rich history (www.santoor.com/santoory.html). I defy anyone to play this preset and not be inspired by the timbre of the instrument. It will lead you instantly into John Barry territory.



Swarshala's Learn pane, also available as the stand-alone *Swar Tutorial*, is a beautifully designed interactive tool for learning about Indian music.

Another standout for me was the sarod (a "short-necked, unfretted, waisted lute" according to www.sarod.com/thesarod/thesarodframes.htm), which again had a wonderful presence and zinginess. The only thing that let it down slightly was that the attack seemed slow in the lower range, something you expect with a harmonium sample but not with a plucked instrument. Moving onto said harmonium, it's another gem. It's grunty and groany and could suit a sea shanty as easily as Indian music. The only inaccuracies I could find compared to my dad's harmonium were the lack of mysterious internal clacking sounds, and the fact that it didn't smell of mothballs.

Included in the samples are two vocal-based instruments: bols and sargam. The first is the spoken notes representing hits that you may have heard when an Indian singer is duelling with a tabla player. The second is the Indian do-re-mi being sung. I'm not sure how much use I'd find for the latter instrument but the bols are eminently usable in a rhythmic context — just think of it as Indian beatboxing.

I didn't like the shehnai very much because it does sound like a goose being brutally murdered. But then, so does the real instrument so I can't really fault Swar Systems on that score.

The sitar is the instrument most associated with Indian music in the West and it's well represented here. The low notes drone and build pleasingly (they're not loops, you do have to retrigger them) and the mid to highs have a crisp attack and voicing. Unfortunately, I'm nowhere near skilled enough to emulate the pitch-bend that real sitar players use. Without that element, the preset can't help but sound a little artificial but, again, that's beyond Swar Systems' control.

The three tanpura presets round off the selection with some fine, raspy tones. As a drone instrument, the tone of the tanpura is crucial to the atmosphere of the music. The plus with *Swarplug* is that the separate strings are sampled, unlike some other virtual tanpuras I've heard. Because of this, you can quickly get a good drone going as the bed of your composition.

The *Swarplug* VST Instrument itself is a simple plug-in with only three controls.

The only thing I really missed from the plug-in was some form of release control. Yes, you can pedal-sustain samples but I wanted an intermediate amount of control. Perhaps Swar Systems could add a small Release knob next to the pitch-bend parameter?

Throwing authenticity completely out of the window, I fired up *EXS24* and imported the *Swarplug* instruments via the Sample Cell-format folder Swar kindly provide. After a bit of minor tweakage (switching on Pitch for the melodic samples) I was free to mangle Swar's lovely samples in all kinds of nasty ways. Yummy! I could also now see the internal sample basis of each instrument: some, like the santoor, have numerous one-note samples, others are more stretched. The entire sample library is about 100MB in size. I was happy overall with the level of detail and realism in the instruments, but as always, do try to hear them yourself before you decide whether to buy the product.

Each *Swarplug* instrument comes with a comprehensive library of MIDI file loops, which can be previewed and auditioned in the *Swar Librarian* application, then loaded into your sequencer.

Swar Librarian

Faced with these presets, it's easy to get bewildered. I was playing the tabla preset and although I was getting good rhythms out if it, they just didn't sound authentic enough. So, after a quick boot into OS X, I started up *Swar Librarian*.

The interface looks a bit like the left-hand pane of *Swarshala* in the Compose section and that's because it serves partly the same function. You select your instrument from the top left drop-down menu and then choose an element from the folders below. For the melodic instruments you may get subfolders for different Ragas and for the percussion instruments, different taals. Double-click on the clip you fancy and it's loaded in the right-hand pane, revealed in detail.

The difference here is that the right-hand window is read-only, unlike the equivalent in *Sharswala*. Above the window you can start the loop playing, cut and paste it (they're all MIDI files) and that's about it. There's no overall tempo control since each component plays at the tempo it's meant to. This is very authentic, but it might be nice to have an inauthentic tempo slider too...

Despite this, the *Librarian* is very handy as a small application to audition what the Swar instruments should be doing in traditional terms. Listening to the tabla patterns I was very impressed with the realism of the result because of the attention to detail Swar have put into sampling all the tiny nuances of tabla playing. I wouldn't say it's as good as the real thing because, as with Western drummers, when you hear a top-class tabla player, it's impossible to replicate their timing and passion. But it's certainly the closest I've heard yet.

Conclusion

Despite my passing criticisms, the *Swarshala 3 Pro/Swarplug* bundle is a very impressive package. It takes you by the hand and leads you into the basics (and not-so-basics!) of Indian musical theory, each step of the journey being signposted by appropriate audio examples. Then, armed with this primer, it opens up Indian timbres to you via *Swarplug*. As with all sampling or synthesis, how 'realistic' your performance sounds depends greatly on how you play as much as what you play. You can take the greatest guitar samples in the world but if you just plonk down keyboard-style root triads, the result will sound cheesy and unconvincing (which of course may be a valid style in itself).

Where *Swarshala/Plug* wins out over naked sample libraries is in the time and effort Swar have put into assembling the preset example patterns. Even a total newcomer to Indian music would have little trouble firing up their sequencer and assembling the base of a convincingly authentic Indian performance. You'll soon be breaking the Western norms and adding a sarod lehra of seven beats over a 13-beat tabla pattern. If you're new to Indian music this software will help you think creatively and differently. If you already know Indian music you may find the Practice section of *Swarshala* a great aid in composition as well as practice. I quickly assembled a practice based around Raga Yaman when my dad came round, and he couldn't help but start singing. Again, it's all very easy and spontaneous.

I do have a few niggles with certain elements of *Swarshala* and *Swarplug*. The Practice pane could benefit from being a bit less stop-start — more real-time controls please! And I'm sure it won't just be me who's confused by the loading system in the Compose pane. Perhaps, being extremely picky, some of the instruments could have benefited from a few more multisamples. I'd rather lose the sargam and gain some extra sitar or santoor. And how about a Mac version of *Swarshala* and an OS 9 version of *Librarian*?

But overall I recommend that anyone even slightly interested in Indian music auditions this software. The combination of a very useful sample library coupled with well-programmed example patterns and the musical theory to put it all together convincingly makes for a formidable addition to any electronic musician's palette. SOS

information

£ *Swarshala Pro/Swarplug* bundle $295 (boxed)/$280 (download); *Swarshala Pro/Swartrax* bundle $295 (boxed only); *Swarshala Pro* $165/$140; *Swarshala Standard* $105/$80; *Swarplug* $195/$170; *Swartrax* $195 (boxed only); *Swar Tutorial* $50 (download only).

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Waves Renaissance Maxx

Plug-in Bundle For Mac & PC Native & TDM Systems

Sam Inglis

Waves' latest plug-in bundle combines their celebrated *Renaissance Collections 1* and *2*, with the added bonus of a new 'channel strip' plug-in.

There are plenty of brand names that stand for quality in hardware effects units; and some, like TC Electronic, have gone on to bring an established reputation to the field of software plug-ins. Israeli developers Waves, though, are more unusual in having built up a premium brand solely through their software effects and processors. Waves plug-ins have never been cheap, but their reputation is second to none.

Over the last year or two the quality of freeware and budget plug-ins has risen dramatically, and some computer musicians must be wondering whether they really need to spend hundreds of pounds on a suite of basic effects and processors. But Waves haven't been standing still either: as well as developing new plug-ins and optimising existing ones for better performance, they're busy creating new and enticing ways of bundling them. The *Renaissance Maxx* bundle under review here, for instance, combines the existing *Renaissance Collections 1* and *2* and adds a new plug-in, *Renaissance Channel*. As the name suggests, the emphasis in the *Renaissance* range is on 'virtual vintage', and adjectives like 'warm', 'rich' and 'fat' feature heavily in the promotional bumph.

SOUND ON SOUND

Waves *Renaissance Maxx*
£559/£1118

pros
- All the plug-ins are easy to set up and use.
- Compression and EQ plug-ins sound great, particularly if you're looking for a classy 'vintage' effect.
- De-esser works very well.
- Compatible with all major real-time plug-in formats.

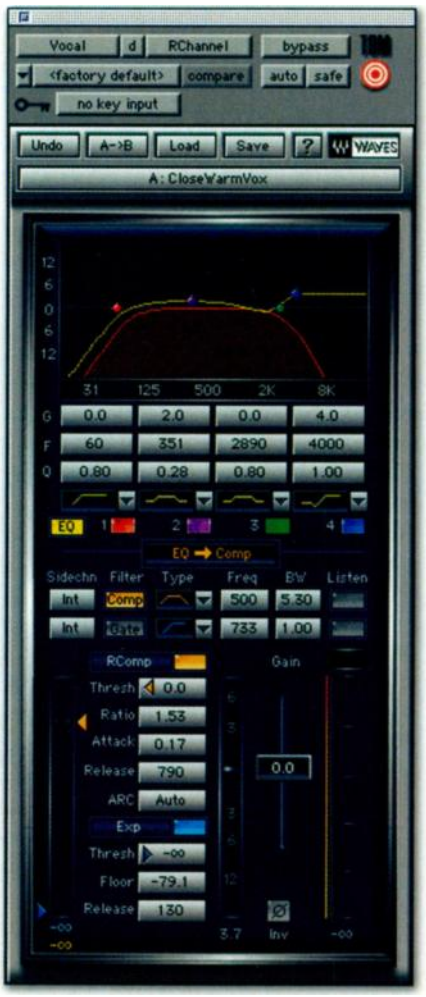
cons
- A few anomalies with the electronic documentation.
- *Renaissance Reverb* wouldn't be my first-choice Pro Tools reverb.

summary
With their 'vintage' character, the *Renaissance Maxx* plug-ins perfectly complement the blander effects bundled with most sequencers, and demonstrate that there is still a gulf between budget plug-ins and professional software.

Getting Installed

Waves do their utmost to make their plug-ins available to all. As well as making them available for download, they seem to give away almost as many CD-ROMs as AOL, so it's very easy to try them out for the free two-week demo period. If you then decide you want to buy them, you then hand over your money in return for a licence number. Feeding this into your computer will generate a challenge, and once you get the appropriate response from the Waves web site, your plug-ins will be unlocked.

One of the best features of Waves' plug-ins is their almost universal compatibility with the bewildering array of formats out there. The effects themselves are accessed through 'shells' which, on the Mac, allow them to be used as RTAS, VST or MAS-format native plug-ins, with Audio Units support promised soon. Pro Tools users can also run them off-line as Audiosuite devices, while those willing to pay out the extra can get TDM versions to run on their Mix or HD cards. One of the advantages of this 'shell' system over some rival plug-ins is that if you run several pieces of audio software which use different native plug-in formats, you should be able to run the Waves plug-ins in all of them. Buying the TDM version, for instance, also gives you access to the native versions of each plug-in in all formats. It's also worth pointing out that the Waves plug-ins use their own system for storing and recalling presets rather than the host sequencer's, so if you do use them in different plug-in formats, you should be able to see all your presets in all the applications you use. Buying the boxed version gives you a printed manual, while PDF-format documentation is accessed by clicking the question mark button on each plug-in (except for *Renaissance Channel*, where doing so generated an error on my system).



The Plug-ins

The *Renaissance Maxx* bundle features seven plug-ins in total. From the original

Renaissance Collection come *Renaissance EQ*, *Renaissance Compressor* and *Renaissance Reverberator*, while the *Renaissance Collection 2* yields *Renaissance Vox*, *Renaissance Bass* and *Renaissance De-esser*. The new *Renaissance Channel* is exclusive to this bundle, and combines elements of the other plug-ins to create a virtual voice channel offering compression, expansion and EQ.

Renaissance Vox and *Renaissance Bass* are both clever adaptations of other Waves plug-ins intended to fulfil a specific task with the minimum of fuss. *Renaissance Vox* combines expansion, compression and output limiting, and offers only three controls: expander and compressor thresholds and output attentuation. If you want to get involved with messing around with attack and release times, or if you want to vary the character of the compression, you'll need to choose a different plug-in.

More often than not, however, simply inserting *Renaissance Vox* on a vocal track and lowering the compression threshold to taste leaves you thinking 'Ah yes. That's what I wanted it to sound like.' The results have a thick, slightly middly warmth that suggests classy vintage gear, while the expander is gentle but effective. *Renaissance Vox* wrenches a vocal track to the front of the mix, and is particularly effective at adding weight to a thin-sounding voice.

Renaissance Bass is a simplified version of Waves' *Maxx Bass* bass enhancer, and also provides just three sliders. You can specify the frequency cutoff point where the process begins, the Intensity of the artificial harmonics added to the signal, and output attenuation. There's also a button to choose whether the original bass frequencies below the cutoff point are retained or discarded. Again, *Renaissance Bass* works surprisingly well despite its apparent inflexibility. Compared to Aphex's *Big Bottom*, for instance, it seems to produce a slightly more punchy sound, although I feel that the lack of controls is more limiting in this case. Despite Waves' claim that *Renaissance Bass* suffers from "no distortion", I found that Intensity settings above -2dB or so usually produced an ugly fuzz bass effect, so you need to be a little careful.

Renaissance Compressor is one of the most widely used Waves plug-ins, and also works on the principle that most users don't want to spend hours twiddling with controls in order to get results. The main window offers the basic parameters that you'd expect from any compressor — attack and release times, ratio, and threshold and make-up gain levels — plus three radio buttons that change the compressor's behaviour. The first switches between a fully manual release time setting and Waves' proprietary ARC auto-release mode, which uses the manual setting as a starting point, and can make the compression sound less obvious on some material. The second gives you a choice of Opto or Electro, each providing a different flavour of vintage character, while the third offers you the choice of Warm or

Smooth, the former acting on low-frequency information to add extra harmonics to the processed signal. Unsurprisingly, the effect of the Warm setting is more noticeable on bass-heavy signals, and in other cases it can be hard to discern much difference. Once again, the general bias is towards compression with a definite sonic character, and *Renaissance Compressor* tends to add a nice mid-range solidity to most sources. A transparent output limiter means you don't have to worry about boosting the make-up gain too much.

All EQs Are Not Created Equal

Digital EQ, like compression, can be too transparent for its own good. If you've ever found yourself thinking "But I've cut 12dBs and I still can't hear any difference!", then the Waves *Renaissance EQ* may be the plug-in for you. As soon as you move any of the coloured dots on the graphical frequency plot, you'll hear a clear change in the character of your source sound — and if you do apply anything like 12dBs of cut or boost, you may end up in special effects territory. ▶

Let Me Count The Waves...

The structure of Waves' range is such that they sometimes appear to have more bundle deals than they have plug-ins. There are six basic bundled products, which are in turn grouped together to make super-bundles such as *Gold*. *Renaissance Maxx* supersedes the old *Renaissance Collections 1* and *2*, and the other basic bundles that are still available are *Native Power Pack*, *Masters*, *Restoration*, and the TDM/HD-only *Surround Tools*. The *ProFX* bundle has been discontinued as a separate product, but is still available as part of the *Gold* bundle, which also includes *Native Power Pack* and *Renaissance Collection 1*, plus the additional *C4*, *Audiotrak* and *Maxx Bass* plug-ins. The ultimate Waves bundle is *Platinum*, which includes everything except *Surround Tools*.

WAVES *RENAISSANCE MAXX*

▶ The plug-in is supplied in two, four and six-band versions, each band offering a choice of parametric or shelving filter types, with the first and last band adding the options of high- and low-pass filters respectively. Option-clicking and dragging on the coloured dots alters the Q value of the respective bands, and the Q setting works for the shelving filter types as well as the parametrics. In particular, shelf filters with high Q values exhibit a pronounced resonant peak, which Waves say is characteristic of the classic analogue Pultec design. The behaviour of the parametric bands, meanwhile, is asymmetrical, with the same Q value providing a broad frequency boost but a much narrower cut. Waves say that this is because cutting is more often used to eliminate "bothersome artifacts" whereas boost is more usually applied for general tone-shaping. Even if you don't buy this argument, it's always possible to achieve a broad-band cut by lowering the Q value.

In use, *Renaissance EQ* is another classy plug-in which is not afraid to impose some character on your sources. You need to be more restrained with the gain controls than is the case with most software equalisers, and it's definitely possible to push things into the realm of harshness, but in general it's a musical and very usable tool.

Renaissance De-esser is, as the name would suggest, designed to tone down excessive sibilance in male and female vocals. I'm not quite sure how this fits in with the 'vintage' theme of the other *Renaissance* plug-ins, but it's very effective. Like any de-esser, you set it up by listening to the side-chain and adjusting the frequency of a high-pass or band-pass filter to home in on the offending esses. *Renaissance De-esser* then uses Waves' proprietary Adaptive Threshold Control to duck either the entire signal (in Wideband mode), or just the frequencies being let through by the side-chain filter (in Split mode), when a sibilant consonant is encountered. In Split mode, particularly, it's possible to tame rogue esses and tees with very few audible consequences for the rest of the signal.

Usually I'd be reluctant to use a de-esser on a lead vocal, but you could certainly get away with using this one in a lot of circumstances. My only complaint is that you can't click and drag in the graphical window to set the filter frequency — instead you have to click on the numerical value and drag it up or down with the mouse, which is a bit of a pain.

Room Sounds

Renaissance Reverberator is a thoroughly workmanlike reverb plug-in, offering control over most of the parameters you'd expect to find in a mid-priced hardware unit. A 'compact' version, which provides the same controls but uses less DSP power, is also included (but the separate *Reverb Tail* plug-in described in the electronic documentation is nowhere to be seen). There are 12 algorithms ranging from halls and rooms to plates, chambers and special effects like Resoverb and Echoverb. These, in turn, are linked to a variety of other controls. In essence, you have control over four main aspects of the effect: early reflections, the reverb itself, its damping and its overall equalisation. Other parameters of interest include Decorellation, which affects the relative timing of the early reflections in the left and right speakers, and Decay, which is continuously variable between a 'natural' decay at one end of the spectrum and a sharply gated effect at the other. Predelay offers both negative and positive values, the former delaying the dry signal so that the reverb sounds first.

As usual, Waves use words like 'classic'

Test Spec

- Waves plug-ins version 4.0.
- Digidesign Mix Plus system with *Pro Tools* 5.1.3.
- Beige 300MHz G3 Mac with 256MB RAM, running Mac OS 9.1.

DSP Usage

The first instance of any Waves plug-in you load into a Process, Mix or DSP Farm chip uses up slightly more of its DSP power than subsequent plug-ins sharing that chip, as it has to load the Waveshell as well as the plug-in itself. Several different types of Waves plug-in can be hosted by a single Mix chip. Here's a rough guide to how many of each plug-in a single Mix card DSP chip can host:

Plug-in	Number per Mix card DSP chip
Renaissance Channel	2
Renaissance Compressor	4
Renaissance De-esser	4
Renaissance EQ (two-band)	12
Renaissance Reverb	1
Renaissance Reverb Compact	1
Renaissance Vox	5
Renaissance Bass	4

and 'vintage' to describe the sound of *Renaissance Reverb*, and it does offer a decent range of plate and spring emulations, if that's your thing. If providing good-sounding halls and large rooms can be considered 'vintage', then it does that too. Surprisingly, though, there's no dedicated ambience algorithm. On the down side, the early reflections can sometimes sound a little ragged, and I occasionally found it hard to avoid a slight ringing in the mid-range. *Renaissance Reverberator* knocks spots off most native reverbs, but competition on the TDM platform is stronger, and to my mind it doesn't quite match the controllability, smoothness or sense of realism you can get from something like Universal Audio's *Realverb Pro*.

And so, finally, to *Renaissance Channel*. The only new plug-in in the *Maxx* bundle, this combines a four-band EQ, an expander, and a compressor/limiter, drawn respectively from the *Renaissance EQ*, *Vox* and *Compressor* plug-ins. The order of the EQ and dynamics sections can be swapped round as desired, while a single graphical frequency plot shows the EQ response and also the frequency response of optional separate side-chain filters for the compressor and expander. As well as the option to use an external key signal, there's also the option to use the pre-EQ signal as a key if the EQ is before the dynamics section in the signal path. The compressor can be switched to work like *Renaissance Compressor* or *Renaissance Vox*, the latter mode denying you the use of a Ratio control. Finally, if the plug-in is used in mono-to-stereo or stereo modes, a Rotation control allows you to pan its output or 'rotate' it through the stereo field.

Renaissance Channel works as well as you'd expect, though it adds little except convenience to the other Waves *Renaissance* plug-ins. If you already have their *Renaissance Collections 1* and *2*, there are probably better ways to spend your money than on *Renaissance Maxx*. If you don't, however, *Renaissance Channel* provides yet another good reason to try this plug-in bundle out. Once you've tried it, you may find it hard to live without it! SOS

information

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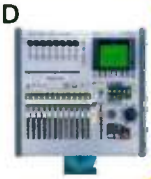

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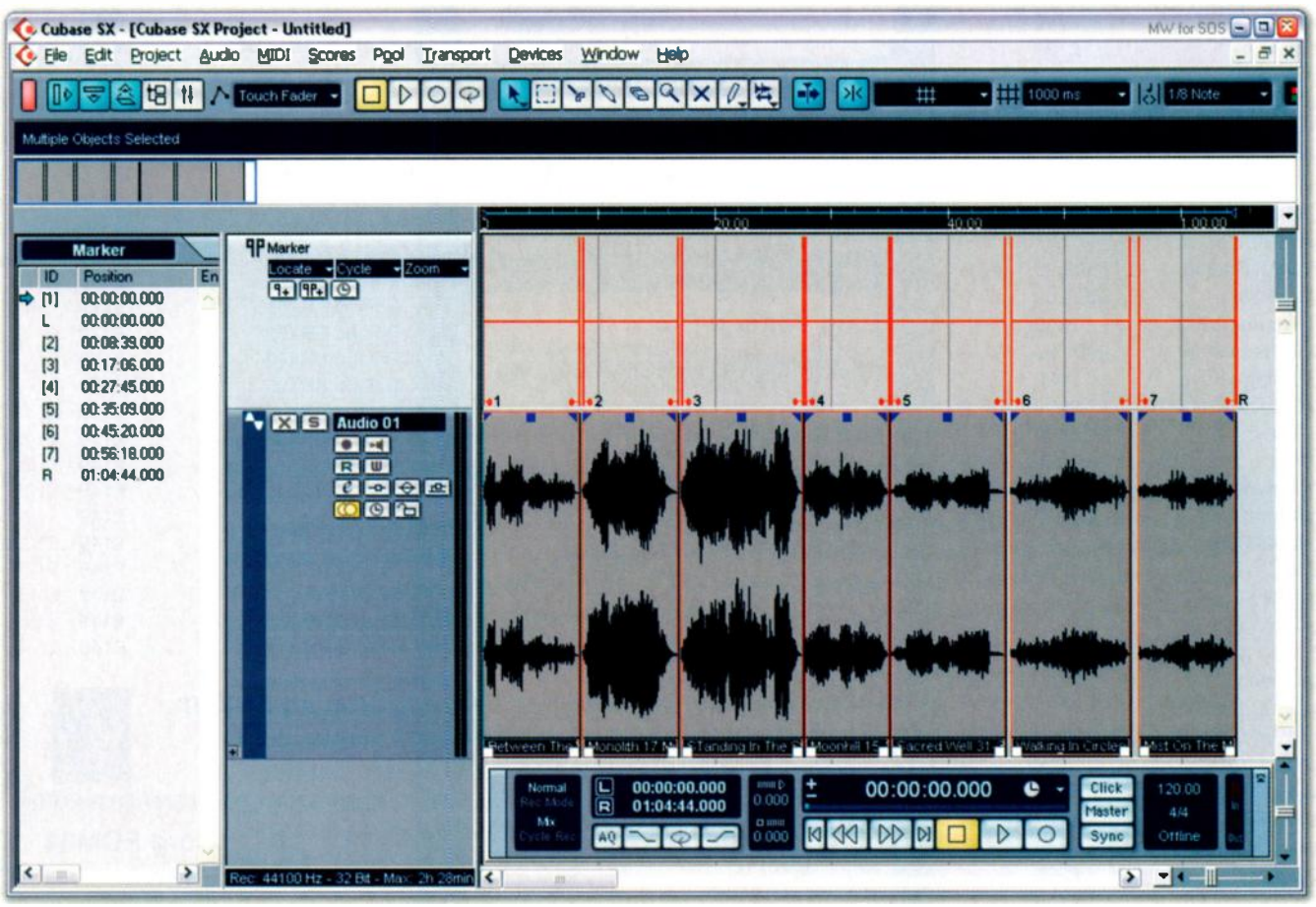
Mastering CDs On Your PC

Software Mastering Tools & How To Use Them

Recording and mixing an album's worth of tracks is a big enough challenge, but turning the results into a consistent-sounding CD requires specialist tools and skills. The former, at least, are now available to anyone with a Windows PC...



You can assemble an entire album's worth of completed stereo tracks in most modern multitrack audio applications for pre-mastering, although you'll usually still need a separate application to add CD track indices before burning a CD-R.

Martin Walker

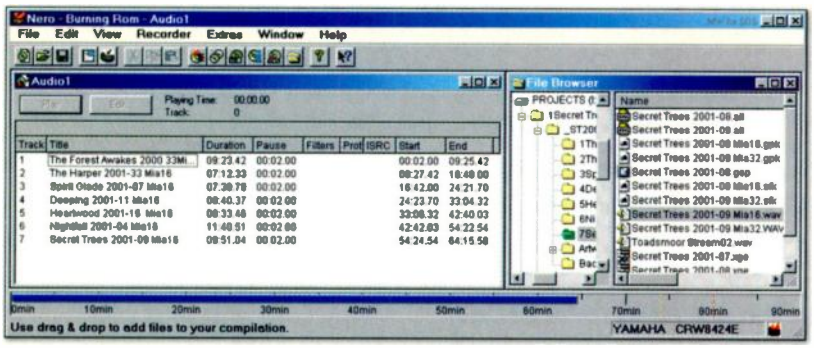
There are various ways to translate your rough PC audio mixes into finely honed versions ready to be burned onto a Red Book audio CD. If you have the budget (and it needn't be that expensive if you shop around) you can take advantage of the services of a mastering engineer. The combination of a fresh set of ears, a purpose-built studio with excellent acoustics, and a wide range of expensive equipment designed to get the best from your music should make your various tracks sit better in the context of an album, as well as adding some freshness and vitality. However, many PC musicians still prefer to adopt the DIY approach, pre-mastering their final mixes using PC plug-ins, and then burning their own CD-R that is then sent off to be glass-mastered and replicated.

Mastering Within A Sequencer

It's often possible to use your main PC multitrack sequencer to prepare your stereo masters for burning as a CD-R audio track. For simple projects, you could simply create a song containing only a single stereo audio track, like the Stereo Mastering Setup template in *Cubase SX*. This approach will work with simple projects where you can drag an entire

album's worth of completed stereo songs onto this single track, and it lets you hear all the songs one after the other, which will expose any differences in overall EQ, level, and so on. You're normally so used to hearing each one in isolation that it can be quite a revelation to hear them all together. You'll also be able to adjust the order of the songs and the length of the gaps between them, add non-destructive fades in and out using the automation functions, and in many cases drag songs across each other to create crossfades.

Where this approach falls down is where any plug-in treatments are required, since these generally apply to the entire track. The obvious way to bypass this is to create a separate stereo track for each song, so that you can apply a chain of unique plug-ins to each one. This will also help you adjust relative track levels more easily using a compressor or limiter plug-in — if you've got rock anthems and ballads on the same album, for instance, the ballads may require dropping in overall level to sound correct in context.



Once your individual tracks are tweaked to perfection, you can adjust the pauses between them and then burn a Red Book audio CD-R using a variety of low-cost PC applications like Ahead's *Nero*, which is shown here.

Budget Burning Applications

Where most PC multitrack applications need extra help is when it comes to creating the final product, since you still need to add suitable CD track index points and then burn the final CD-R. One honourable exception is Magix's *Samplitude* 7.1, which has integral Red Book CD-burning functions, and can even burn a CD on the fly from an arrangement, complete with any plug-ins and VST Instrument tracks, without creating an intermediate image file. However, users of applications such as *Cool Edit Pro*, *Cubase VST* and *SX*, *Cakewalk Pro Audio* and *Sonar* will all still have to abandon their PC MIDI + Audio sequencer for the next stage.

Red Book audio CD indexing features should take into account the fact that each track start, track end, or sub-index point must be exactly at a 'frame' boundary, where each frame consists of 588 stereo samples. If the software simply forces the start of each track to the nearest frame you can get unpleasant surprises, particularly when adding track markers during a continuous live set. *CDWave* (from www.cdwave.com) is one of the cheapest ways to avoid this, and exports a set of correctly split WAV files for you to import into your CD-burning application.

I discussed various CD-burning applications for the PC back in *SOS* January 2003, including Roxio's *Easy CD Creator* and *WinOnCD*, Ahead Software's *Nero* and *Feurio*, while reader Bill Blackledge also brought the budget Magix *Audio Cleaning Lab* 3 range to our attention in *SOS* April 2003.

Many musicians still rely on these simpler applications, even after using a stand-alone stereo editing package to compile their songs into an album, because they are cheap (and often bundled free with new CD-R/W drives), sometimes produce more reliable burns than more advanced music applications, and are so widely used around the world that they get regularly updated to support all the latest drives and their new features, which isn't always the case with more specialist music packages. You may also have more options if you want to create Mixed Mode or CD Extra-format CDs containing both audio and data, so that you can add band screensavers or video clips to provide extra value to your product.

Stereo Or Multitrack Editing?

One potentially serious problem with using a multitrack application for mastering purposes is that in general, enabled plug-ins are active whether audio is being passed through them or not, and continue consuming CPU power even if the track is muted. One of the few PC multitrack applications I've ever come across that avoids this is *Samplitude*,

which lets you apply a chain of plug-ins to an individual Object (part) in a track, so that they only take a CPU overhead while that part is playing. By contrast, if you load up plug-ins in *Cubase* or *Sonar*, their total processor overhead remains constant for the time the album is playing.

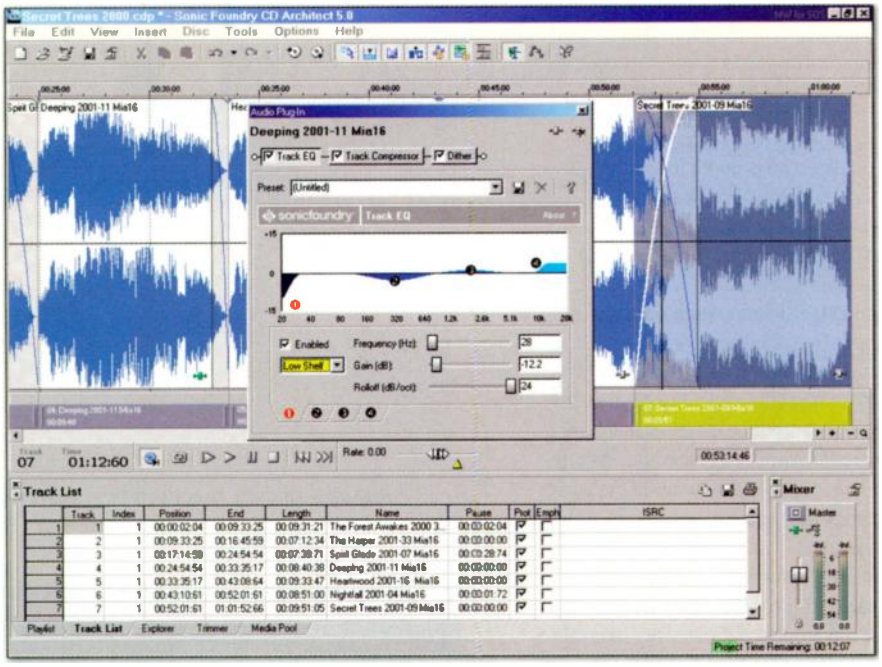
The reason this may prove troublesome is that, unlike plug-ins designed to be used at the mix, mastering plug-ins can be pretty CPU-intensive. For example, on my Pentium III 1GHz PC a typical EQ bundled with a MIDI + Audio sequencer application might take well under 1 percent CPU, whereas a specialised mastering plug-in like Waves' *Linear Phase EQ* takes around 14 percent. A suitable chain of plug-ins for mastering purposes can therefore use up the majority of your CPU power for a single track, which is why the developers of applications designed primarily for stereo work nearly always use the same approach as *Samplitude*, having plug-ins take CPU power only while they are 'active'. This is the case with the Montage function of Steinberg's *Wavelab*, and with Sonic Foundry's *CD Architect* 5, and it makes assembling a sequence of finished songs somewhat easier.

Final Formats

The most obvious thing to send to a CD mastering house is a 16-bit/44.1kHz Red Book audio CD-R, but there are various other options. Nearly all will still accept DAT tapes, while another option is to burn a CD-ROM containing stereo 24-bit WAV or AIFF files. One big advantage of this approach is that you can also send in your files at sample rates other than 44.1kHz, most popularly at 96kHz, so that the mastering engineer gets the best possible chance of retaining audio quality until the very last stage of the proceedings. You can now even send your WAV files over secure Internet links direct to some mastering houses.

Sample rates of up to 96kHz are also directly supported by DVD-Audio for surround purposes, which will interest those PC musicians whose multitrack applications already have surround-sound features. However, the only 'project-studio' priced DVD-Audio authoring package I've come across is Minnetonka's *Discwelder Steel* (reviewed in *SOS* March 2003), which only supports file formats up to 24-bit/48kHz for 5.1 surround tracks. DVD-A also supports stereo file formats up to 24-bit/192kHz, but I don't know of any PC authoring application that currently supports this.

So, while you may find 24-bit/96kHz recordings capture the last drop of detail, you're still likely to have to downsample in most cases to 44.1kHz before sending off your final product, in which case 88.2kHz might be a more appropriate starting point.



Dedicated pre-mastering and CD-burning applications like *CD Architect* 5.0 let you apply a different complex chain of plug-ins to each successive track, with the plug-ins only consuming CPU while that track is playing.

Specialist Editing Applications

Dedicated PC stereo audio applications tend to provide far more sophisticated editing functions than the majority of multitrack sequencers, and as mentioned previously, allow all your plug-in processing power to be devoted to each track in turn if necessary. They also provide comprehensive indexing functions that are aware of frame boundary restrictions, and tend to check the final result more thoroughly against the Red Book standard to see if it obeys all the rules, such as those concerning silent frames before tracks, and pauses at the beginning and end of the entire CD.

There are various PC-only applications that specialise in the pre-mastering and CD burning processes. *Wavelab* 4.0 has an extremely good reputation, while *CD Architect* 5.0 has plenty of dedicated followers, especially now it's been updated to include to support most modern CD-R/W drives, and is considerably cheaper. However, for those on a budget, *Wavelab Essential* provides most of the features of its sibling at a similar price point to *CD Architect*.

If you're anticipating using one of these applications to further treat your mixes after exporting them from a multitrack sequencer then you should always retain the highest available bit depth to avoid rounding errors. If you're using *Cubase VST* or *SX*, for instance, exporting in 32-bit format makes the most sense, even if the individual instrument recordings have been made at 16-bit, since once you mix them together more bits are generated. As for sample rate, this depends on your final format, and whether or not you can hear any improvements when using 96kHz or higher rates (see Final Formats box).

Multi-stage Mastering Plug-ins

Some software applications specifically designed for mastering purposes aim to emulate popular hardware 'finaliser' units from companies such as TC Electronic and Drawmer, but are still essentially a chain of plug-ins. Some, like IK Multimedia's *T-Racks* (originally reviewed in *SOS* February 2000) are available as stand-alone applications, so you can load in individual tracks, treat them, and then save the result for CD burning in another application. *T-Racks* includes four sections — an analogue modelled six-band EQ, tube modelled compressor with side-chain, multi-band mastering limiter plus a soft-clipping output stage — and is highly regarded by many users. The new *T-Racks* plug-in provides the same series of effects, but is designed to be used within any VST or DX-compatible host application, which means that you can launch one instance for each song, to optimise their relative sounds. The plug-ins can also be launched separately, which is handier for general-purpose use, and I'm impressed with their performance.

The same chained approach is used by Izotope's *Ozone* (reviewed in *SOS* April 2002), which is PC-only, and suitable for DX-compatible host applications. *Ozone* consists of six modules, starting with a paragraphic EQ, then a mastering reverb,

multi-band dynamics, multi-band harmonic enhancer and multi-band stereo imager, and is completed by a loudness maximiser.

If you've got a DSP card in your PC you may be able to run lots of pre-mastering plug-ins without loading your main processor. For instance, Creamware's *Optimaster* is included with their SCOPE systems and also runs on most of the other cards such as Pulsar and Luna, and combines a normaliser, multi-band expander, multi-band compressor, and multi-band limiter into one neat package, complete with a Wizard that analyses the dynamics of your songs and sets the controls automatically.

There are also various bundles of separate plug-ins that specialise in mastering functions, one of the best being Waves' *Masters Bundle* (reviewed in *SOS* August 2002), which includes *Linear Phase Equaliser*, the *Linear Phase Multi-band* compressor, and the *L2 Ultramaximiser*. Steinberg's *Mastering Edition* used to provide a good mix of specialised plug-ins, and since its *Multi-band Compressor*, *Spectralizer*, and *Phase Scope* are now effectively bundled with *Wavelab* 4.0 (see my *Wavelab* 4 review in *SOS* May 2002) and *Cubase SX* now includes *Free Filter*, users of both probably won't need to buy it — although I still find its *Spectrograph* sonogram display very useful for examining the spectral content of mixes.

Of course there's nothing to stop you putting together your own chain of plug-ins to achieve the same end, but for the novice in particular, buying a dedicated plug-in chain or mastering bundle can make the process a lot easier, since you have all the tools you need in one package, plus plenty of presets dedicated to mastering to provide some starting points for your own material. You may also get helpful manuals that further explain the various mastering processes. For instance, Izotope have also written two very useful PDF guides covering *Mastering With Ozone* and *Dithering*, which you can download free from www.izotope.com.

IK Multimedia's *T-Racks* plug-in provides nearly all the tools you'll need for mastering purposes in one neat chain which can be re-ordered if required.

Equalising, Enhancement & Compression

There's no fixed order set in stone for using PC plug-ins for mastering, but a good guideline is to start with any EQ that's needed (and only if it's needed — don't ever pass your final mixes through any plug-in unless you can hear an improvement), followed or replaced by any enhancement or other 'fairy dust' treatments. Then apply a little compression if necessary to pull the mix together, and finish with a limiter to raise overall levels in a transparent way, so that final peak levels are close to 0dBFS.

In general there are two plug-in EQ types available to PC users: surgical and sweetening. The first is primarily designed to alter frequency balance without adding any sound of its own, and includes the popular Waves *Q10 Paragraphic*, while the ultimate in this category must be the Waves *Linear Phase EQ* from the *Masters Bundle*. Pseudo-analogue 'sweetness' can be provided by plug-ins such as the analogue modelled *T-Racks* EQ and Waves *Renaissance EQ*, based on classic Pultec designs, while examples of EQs featuring valve 'warmth' include TL Audio's *EQ1* and the TC Works *Graphic* and *Parametric EQ*, both of which feature the optional Softsat algorithm.

You'll generally get cleaner and more transparent results using specialist mastering EQs than the plug-ins bundled with MIDI + Audio sequencers, particularly at the top end, since they tend to use more bits of precision for a less grainy sound, and often give less interaction between the various bands.

Some mastering engineers avoid enhancers, exciters, stereo imagers, and other 'fairy dust' plug-ins like the plague, but at the project level, this sort of plug-in can prove useful where the final mix lacks that certain something, or where deep bass or extended treble weren't present in the original recording but should have been. Recommended examples include Steinberg's *Spectralizer*, PSP's *Mixbass* and *Mixtreble*, the BBE *Sonic Maximiser*, Waves' *Maxx Bass* and their somewhat easier-to-use *Renaissance Bass*.

As an alternative to these, many compressor plug-ins offer the option to emulate the warm, fat, sound of tape saturation and tube circuitry, which may be more appropriate for overall treatment of your mixes. PSP have gained a great reputation in this area, firstly with the *Mix Saturator* and *Mixpressor* of their *Mix Pack* bundle, but most of all with their *Vintage Warmer*, a simulation of an analogue-style multi-band compressor. IK Multimedia's *T-Racks* also includes a tube compressor that allegedly emulates a Fairchild hardware device, while both the TC Powercore and Universal Audio UAD1 sport classic compressor designs that can go to town with DSP, and TC Works provide Softsat on the *Compressor/De-esser* in their *Native Bundle*. Perhaps the most widely used compressor plug-ins are still Waves', which include the warm-sounding *Renaissance Compressor* and the versatile single-band *C1*, while the more complex *C4 Multi-band* and *Linear Phase Multi-band* are more appropriate for transparent mastering.

As has been described in these pages on many occasions, a good starting point for a compressor when mastering is a compression ratio of between 1.1:1 and 1.2:1 and a

Which Dithering Algorithm?

Although dither noise is at an extremely low level, the various algorithms use different 'shapes' of dither noise. Dithering to 8-bit makes the differences obvious, but many mastering engineers maintain that you can still hear the differences even when dithering to 16-bit. There's even a web site dedicated to getting musician's opinions on this topic. 'The Great Dither Shootout' at www.24-96.net/dither has a variety of downloadable files dithered down from an original 24-bit/44.1kHz master recording to 16-bit/44.1kHz, using a variety of dither algorithms. You can either download the ones of your choice, or take part in a blind shootout poll by downloading a 15MB compilation and choosing the one that sounds best to you.

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To The Limit

Normally the final plug-in in the mastering chain will be some sort of limiter, to raise the overall level of each song in a fairly transparent manner. Once again there are plenty of suitable limiting plug-ins for PC users, the best known being Waves' *L1* and *L2 Ultramaximisers*, Steinberg's *Loudness Maximiser*, and TC Works' *Limiter*, while a new contender is Voxengo's mastering limiter, which is claimed to provide a transparent sound to rival these at a much lower price.

After you've assembled your collection of songs and placed them into the desired order, you're bound to find that one of them is louder than all the others. I find it easiest to get this track to the desired final level, generally by adjusting the limiter's threshold until the loudest peaks are just being limited, so that the majority of the track dynamics remain intact while the overall level is maximised. If you don't want to play back the entire track to find these peaks, just use *Wavelab*'s Global Analysis or *Sonic Foundry*'s Statistics tool to automatically find the peak level. If for instance the highest readings for the two stereo channels is -5.5dB, on most material you could set the threshold to about -10dB without unduly compromising dynamic range. Also, make sure you set any Out Ceiling control to a little under 0dBFS, to cope with the D-A converters on some CD players, which react badly to signals that peak at 0dBFS. I use a -0.3dB setting, but some mastering engineers drop as low as -3dB.

Once you've got this first track sounding how you want it you can then adjust the others to fit in with it, using your ears to adjust their relative levels to suit. If you want to give your ears a hand (so to speak), both *Sound Forge* and *Wavelab* let you measure the RMS average power of the entire track. Most *SOS* readers are probably more familiar with using this to measure the background noise levels of their soundcard, but it's also an ideal way to compare average track levels. Classical and jazz music will tend to have a greater dynamic range, and hence a lower RMS average power, with rock and dance at the other end of the range. If your average readings approach -15dB RMS your music will have little 'light and shade', and anything above -10dB RMS will probably be exhausting to listen to for any length of time.

To Dither Or Not?

Most of us working with 24-bit or 32-bit files will need to convert them to 16-bit/44.1kHz in preparation for burning a Red Book audio CD, and to get the best results you need to add some noise-shaped dither when doing so. I explained the basics of dither in my earlier PC Musician on mastering, as well as explaining a basic technique for hearing it in action on your own music. However, I've recently followed quite a few forum threads concerning the relative merits of various 'flavours' of dither offered by different developers, and this is especially relevant now that many of us have several dither algorithms in our collection.

Nearly all the major PC music applications are bundled with one or more dither algorithms, ranging from the internal ones offered with *Cool Edit Pro*, *Sound Forge* and *Wavelab*, to Apogee's UV22 and UV22HR bundled with *Cubase VST*, *SX* and *Wavelab* and the POW-r range that comes with *Logic Audio* and *Samplitude* 7.1. Many plug-ins also come with their own dither options, such as the IDR ones of the Waves *L1* and *L2 Ultramaximisers*.

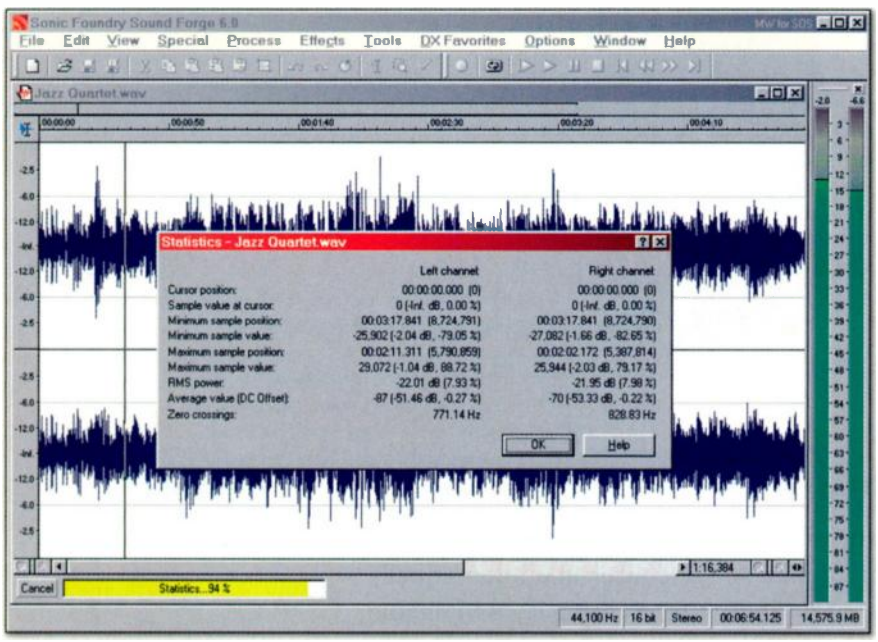
There are various rules to follow to get best out of the dithering process. The most important is always to dither when changing from a higher to a lower bit depth, to make the most of the available dynamic range of the original file — simply lopping off the bottom eight bits (truncation) when moving from 24-bit to 16-bit will leave your fades sounding very gritty at the bottom end. However, there's no point in adding dither when changing a file from 16-bit to 24-bit, since no information will exist in the extra bits.

Some soundcards provide various dither-related settings, and it's important to use these correctly. For instance, the Lynx range has a Record Dither option that should be enabled whenever you are recording 8-bit or 16-bit files through its 24-bit A-D converters, and whenever the Record volume fader is at any position other than full scale, and a Play Dither option that should likewise be enabled when the Play volume fader is not at full scale (though for best results you should in any case leave such digital level controls at maximum, to make the most of the available dynamic range). On professional cards like these it's handy to have such extra options, but thankfully most soundcard manufacturers try to choose the most appropriate dither settings for you automatically. For instance, drivers for the Echo range used to have an Dither Input option for their digital I/O, which had to be unticked when digitally transferring 16-bit DAT tapes to 16-bit WAV files, since the bit depth remained the same, but the latest drivers do this for you automatically.

Ideally, dithering should be added post-fader, which is the way *CD Architect* and *Wavelab* do it. If you want to choose a different option to those available by default you can add an extra plug-in in *CD Architect* in the Master FX chain, or in *Wavelab* by going into the Organise Master Section function in the Options menu, and ticking the PM (Post Master) column for the plug-in in question. Similarly, if you want to use the Waves *L1* or *L2* for raising overall levels in a transparent way, but abandon their IDR dither algorithms in favour of something else, just set the Waves dither options to 24-bit, None, and None respectively, and you can then run your choice of dither plug-in as a separate plug-in.

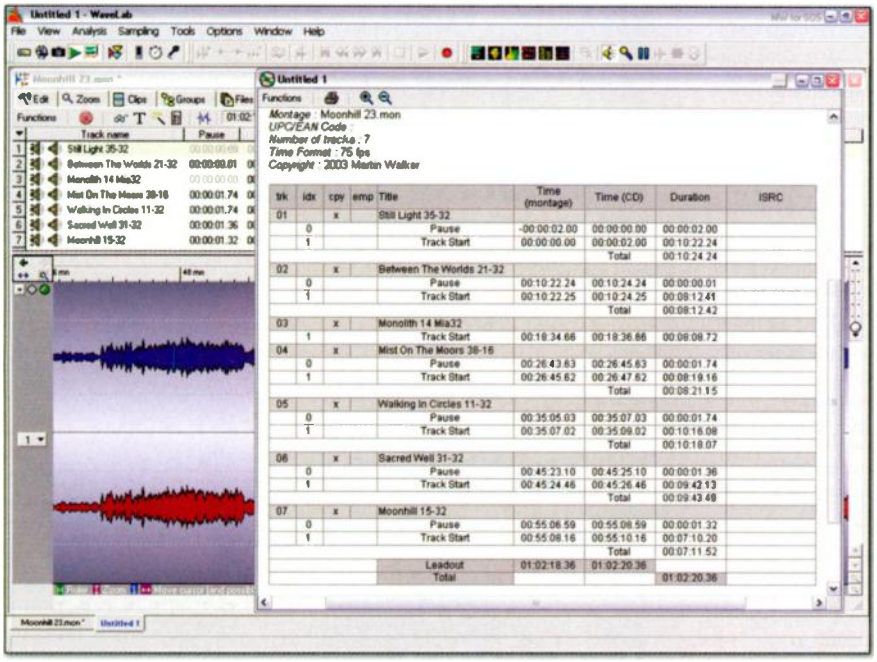
Burning Discs

Some experts recommend that you burn both



Examining the peak and RMS levels of your pre-mastered tracks can provide a good comparison to commercial material. Here, a well-recorded jazz quartet peaks at around -1dB, but has a power level of about -22dB RMS, which indicates a wide dynamic range and unfatiguing sound.

CD-ROMs containing 24-bit audio files and Red Book audio CD-Rs at 2x speed for best results. These days, however, it's getting very difficult to find a CD-R/W drive that can still burn at 1x or 2x speed. Some modern burners may even give more errors when burning at really slow speeds unless they have been specially optimised for this, so you should use a speed in the middle of the available range, ideally in CLV (Constant Linear Velocity) mode to avoid speed changes during the burn. Modern CD blanks tend to be optimised for higher burning speeds anyway, but remember that cheap unbranded blanks can give problems at any burn speed.



It's always sensible to accompany any Red Book audio CD-R with a report showing a detailed listing of all track times. Here's one generated by *Wavelab* 4.0.

Unfortunately, even the fact that your CD-R plays on your hi-fi and various other players doesn't guarantee that it will prove suitable for glass mastering, since audio players are generally designed to cope with lots of errors before they become audible. In the event of your mastering company finding TOC (Table Of Contents) errors on your CD-R, most PC burning applications including *CD Architect* and *Wavelab* will let you print out a PQ listing (aka Cue Sheet, Track List or CD Report) that you should send with the CD so they can check what you really intended and possibly build a new TOC. Some CD burners (notably those made by Plextor) also let you check for C2 errors (the second level of error correction) with a suitable software utility, which is reassuring before sending off a CD-R to be mastered. SOS

Boomedia *Studio Weapons*

Formats: PC Direct X

Boomedia's *Studio Weapons* bundle consists of no fewer than 11 Direct X plug-in instruments and five effect plug-ins, and is based around Jeff McClintock's *Synthedit* code, which is freely available from the Internet at www.synthedit.com.

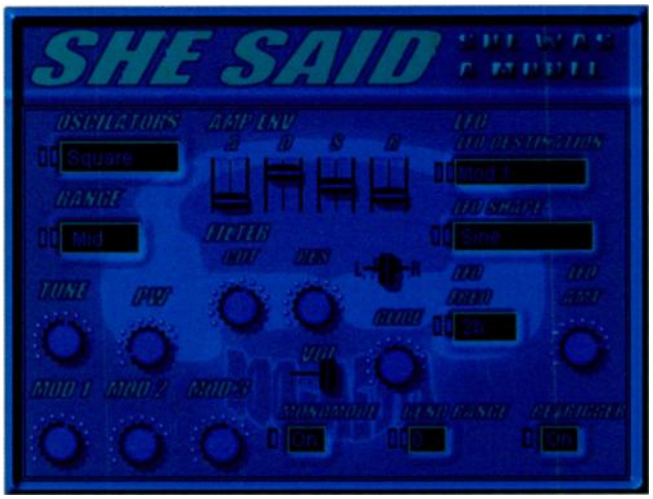
The first thing you notice when the plug-ins are loaded into your host sequencer is the visuals. Boomedia have approached this collection with some attitude, and their bright colour schemes make a refreshing change from the standard grey boxes. Unfortunately you can have too much of a good thing, however, and a couple of plug-ins are spoilt by some rather hit-and-miss graffiti-style controls that end up looking very cluttered, defeating the general minimalist feel of the controls and work surfaces.

The plug-ins themselves are arranged in six sub-folders: Analogues, Digitals, Drumboxes, Groovestations, Overlords and FX. The Analogue section contains three synths, beginning with *Cerebrum*, described as an analogue hard sync synth with assignable LFO, six wave shapes and six-note polyphony. This synth has a low CPU usage which is balanced by its simple and harsh-edged sounds. Alongside *Cerebrum* is *Jutoo*, a fatter-sounding Juno-style soft synth with more filters, a sub-oscillator and a stack of pretty good presets. The best of the 'analogue' bunch for me, though, is *Teepee*, a very simple bass synth featuring four-note polyphony, six wave shapes, a sub-bass oscillator and low-pass filter. The 32 presets are very good, ranging from some nice subs to the prerequisite acid squelch, and its uncomplicated controls (in a fetching red) make it a doddle to come up with some satisfying bass sounds.

Next up are the Digitals, which comprise two more synths: *Coolass* and *She Said*. *Coolass* is a six-note synth using four FM algorithms and three filter types, whilst *She Said* is described as a "digital-analogue hybrid" featuring an assignable LFO and three modelled resonators. Both synths sound good and feature a simple user interface, and are perfect for the 'knob fiddler' style of programmer like myself — which is good, as the included presets are a touch limited.

Time to try out the Drumboxes. *Sidekik* is a *Recycle*-like loop module which contains 87 preset (and chopped) breakbeats which can then be replayed into new patterns and/or sent through the unit's filters. The chopped loops are OK, but the inability to import your own loops means being stuck with what's here. *Boom Box* is a four-note analogue-style drum machine with a modelled kick and sampled snare, closed hat and open hat (two of each taken from a 808 and 909). Each hit has its own output and set of filters, but the resulting kits are disappointing. The snare in particular is a let-down, lacking bite especially in the woeful hip-hop preset kits. Last up for the Drumboxes is *Docta Beat*, a six-channel sample-based rhythm module featuring 320 preset drum hits (but no importing of new samples) split into the usual categories — kick, snare, hats, and so on. As with the rest of the plug-ins, each drum hit has its own channel and filter section and is very easy to use. The preset kits are patchy, ranging from very usable techno kits to quite weak hip-hop and drum & bass collections, but being able to mix and match between kits adds some much-needed user choice.

Described as the core of *Studio Weapons*, *Overlords* is a drum loop module based around 11 collections of loops grouped by tempo (from 80 to 180 bpm, in steps of 10). Each module can hold four preset rhythm loops taken from a bank of 36, which are different for each module and geared towards dance music, with each loop assigned to a separate output channel. The loops have been chopped in *Recycle* style, allowing changes in tempo, and each has its own 12dB/octave filter control



switchable between low-pass, high-pass, band-pass and band-reject, plus an assignable LFO. The pre-programmed loops are of a good quality and lots of fun can be had by layering the loops together, but without the ability to import loops I do wonder how useful this plug-in is for making actual tracks.

Last up in the instrument category are the two Groovestations, *Helix* and *Samurai*. *Helix* is a five-channel loop tool, where each channel contains a preset collection of dance-orientated samples (from a bank of 100 featuring both beats and synths) that can be played at normal, double and half speed. Each channel has volume and pan controls as well as an assignable output, and on the effects side there is both delay and reverb.

Samurai is a four-part module — each part assigned to a different MIDI channel — with

a bass tone generator, a basic drum machine, 10 chopped and *Recycle*d breakbeats and a bank of 77 loops. After a quick scan around the controls it's quite easy to get some quick grooves going, and the inclusion of the user-programmable drums and bass gives *Samurai* a little more flexibility than *Helix*. However, as with *Overlords*, I am slightly unsure of the Groovestations' value as real creative tools, as unlike stand-alone units that need nothing else to construct a track (like their hardware equivalents) both have to be run from within a host sequencer — where you can easily program your own patterns anyway.

Last but not least, we come to the FX section. This consists of five plug-ins including a host-sync'ed phaser/modulation effect, a delay with built-in LFO filter, filter bank and chorus/fattening module, all of which are simple to use and do their respective jobs very well.

Targeted towards the production of dance music in all its varied forms, *Studio Weapons* overall is a bit of a mixed bag. Although all the plug-ins are varied and refreshingly simple to use, some are much more useful that others, and the collection as a whole has a tendency to rely heavily on the included preset samples and loops. Having said that, £129 for 11 instruments and five effects isn't bad value for money — but be aware that there are other instruments of a similar nature based upon *Synthedit* out there for free (or as shareware) on the Internet if you take the time to look for them. *Oli Bell* SOS

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Readerzone

David Gledhill (front) with Slo-Mo: from left, Tracey Wilkinson, Liam Oliver and Kim Woodward.

Sam Inglis

Are computers changing the way we make music? If you're David Gledhill, the answer is an unequivocal 'yes'. Years of playing with guitar bands had left him disillusioned and on the point of giving up when he decided to experiment with recording on a PC. He quickly found himself adopting an entirely new approach to songwriting and production, and his first demo as Slo-Mo was soon attracting record company interest. Two years on, Gledhill has recruited a four-piece band for live outings, and his studio experiments have grown into an excellent debut album. *Slo-Mo* serves up his laconic vocals over an arresting blend of rocked-up guitars and sample-heavy beats.

"Not having to involve other musicians was the greatest thing for me," laughs David, "because I generally don't get on with many musicians. I hadn't been doing music for a couple of years, because I'd got very fed up with it. I'd been doing anything to avoid doing music, and then got a computer just to see if I was missing out on anything. I'd never done music in this way, and it was like a revolution overnight. Suddenly I was able to do everything myself — the bass guitars, the guitars, the keyboards, the drums, everything."

The Latin Quarter

One of the unusual features of songs like 'Death Of A Raver' and 'Girl From Alaska' is Gledhill's prominent use of Latin jazz samples alongside distorted guitars and beats; and it was actually the idea of sampling an Astrid Gilberto track that kick-started the entire Slo-Mo project. "It all started when 'Stan' by Eminem was out, which I think is one of the greatest pop records of the last 10 years," he says. "Then I was in the back of someone's car and they were playing a Latin jazz compilation. I used to be a really big fan of Latin jazz but hadn't listened to it for years, and the Astrid Gilberto track 'Agua De Beber' came on, and I thought 'I wonder if you could sample that?' I started with the sample, which is in double time, and I put it into half time. There was no real formula or plan, it was just doing that song, which has got a very particular sound to it, and then I got into sampling other Latin Jazz records — I used another sample on 'Girl From Alaska', which I think is from the Stan Getz version of 'Aguas De Marco', another Joabim song.

"With most of the songs I started with samples, but then I started to realise how expensive samples were! Some of the songs had samples on to help me start the songs, and then I took them off or naughtily

disguised them — I've become a bit of an expert at using samples but not having to pay for them. I'll chop them up into eighths or 16ths in *Fruity Loops* and swap the elements around, or reverse some of them. Then I'll play my track and the original sample to lots of people to see whether anyone can spot it."

Ghost Writing

The idea of using a sample as a starting point led to a radically different approach to songwriting. "Usually it would start with some kind of sample, then my whole approach to it is to record everything as fast as possible. On most of the tracks on the album, the actual parts — the guitars, the basses and so on — are ghost parts, because I found I would do the ghost parts very quickly and then could never recreate the feel. I have a system. I use *Fruity Loops* for doing most of my drum programming, I use *Acid* for messing around with samples, and I use *Cubase* to pull it all together. If you find a system that works I think you should stick to it.

"I would do a quick drum pattern, a quick bit of bass guitar, and a quick bit of guitar, and then it becomes really basic. I have a ghettoblaster with a tape in it on my desk, and I play the song on a loop, have an acoustic guitar, lots of sheets of words that I've pinched out of books — I'm really into books like *Fear And Loathing In Las Vegas*, crazy drug books — and then sing any old crap over the top of the song and record lots and lots of it. Then I'll go away for a week, not listen to any of it, come back a week later and play the tape, and I'll think 'That's a bit crazy, I'll use that.' I'll pick out the bits from the ghettoblaster that seem to work and write them down. The ghettoblaster is a very key thing.

"I'll pick out the bits that I think are good,

David Gledhill's studio measures about six by seven feet, and his main recording tool is an ageing 400MHz Pentium II PC.

and then set a mic up and start doing it on to the computer. I always think it must be like a painter doing a painting. I'll put bits on to the computer, and then most of the time is spent just editing in *Cubase*, moving the blocks, moving bits of singing. I tend to work on the premise that if it sounds good, I'll go with it, and that's why I end up keeping a lot of the ghost parts that I do. That means I have to spend a lot of time cleaning things up sometimes, because I've recorded things a bit quickly. Sometimes I've recorded guide guitar parts with an SM58, which makes everything a bit middly, and spent loads of time EQ'ing them. But I probably recorded 'Death Of A Raver' in 45 minutes; as soon as I get to the point where I'm spending a lot of time doing it, I tend to think it's probably not a very good idea in the first place. Some of the songs have probably got bum notes and out-of-tune guitars, but it's the feel that matters."

In case that all sounds too easy, Slo-Mo keyboardist and backing singer Tracey Wilkinson adds some words of caution: "A lot of people think that the computer will write the songs for you, that if you just stick in a few bits and bobs, the computer will piece it all together and you'll come up with a great song. But if you're not a songwriter and you're not a musician, you can't just do that. If you're a painter then you can do computer art, but that's because first of all you understand the principles of painting. If you understand the principles of putting a song together, then you can use the computer to your advantage, like a tool, but the computer doesn't write the songs for you."

"By the same token, a lot of the musicians we know in Sheffield will say to me 'I could do what you're doing with a computer,' and I say 'Well, do it!'" agrees David. "It actually doesn't work like that. The computer only does what you tell it to do, and it only plays back what you put into it, so even though it's the most key thing for me, if we couldn't do these songs acoustically I wouldn't be too happy. I think you should be able to play a good song on the bagpipes and have people understand it. It's not dance music we're doing, it's songwriting, but the thing I love about the computer is the fact that it allows you to change arrangements. The power it gives you is unbelievable."

Hardly Any Equipment

Gledhill's 400MHz Pentium II machine may be unbelievably powerful in a conceptual sense, but it's hardly at the cutting edge in computing terms. Nevertheless, he doesn't feel the lure of faster PCs or newer software versions: "I've just bought a really powerful laptop, but I can't seem to make the transition. It's like having an old blanket. There was a piece in *Micro Mart* where they were saying 'To do music on your computer you need at least a PII 500MHz,' and I'm sat here with a PII 400. That's just nonsense. Actually you need hardly any equipment. All you need is lots of imagination and a bit of equipment. The version of my album that will be in the shops I even mastered myself — it wasn't even mastered in a studio."

Main Equipment

- Pentium II 400MHz PC with Creative Labs Soundblaster Live soundcard.
- Steinberg *Cubase VST* v3.5 MIDI + Audio sequencer.
- Sonic Foundry *Acid* loop sequencer.
- IK Multimedia *T-Racks* mastering software.
- Joemeek VC3 input channel.
- Oktava MK219 and MK012 condenser mics, Oktava ML52 ribbon mic and Oktava MKL2500 valve mic.
- Cambridge Audio A1 power amp.
- Spirit Absolute 2 monitors.
- Roland Juno 106 synthesizer.

Miroslav Vitous Symphonic Orchestra Samples: Classical Choirs

GIGA/AKAI

The name Miroslav Vitous still has a glamourous ring, and rightly so — this is the man who created the world's first orchestral sample library, and played bass with the mighty Weather Report to boot. Since unleashing his original five-volume set of *Symphonic Orchestra Samples* in 1992, the Czech maestro has kept a relatively low profile, a lone acoustic piano title the only evidence of new sampling projects.

The intervening years have seen a crop of sampled choir releases from Best Service, Spectrasonics and Quantum Leap, so Miroslav's new *Classical Choirs* title (2.4GB in size, based on about 730MB of core samples) faces tough competition. For this project, sixteen anonymous singers of each sex were recorded in an unspecified location whose reverb tails suggest a church or cathedral. The men have a 2.5-octave range starting on a low D2; the female singers start in the alto range around G3 and ascend to A5.

The bulk of this library is dedicated to sustained vowel sounds which don't quite match their names — the men's programs labelled 'ahs' contain samples which sound like 'or', and what I hear as 'oohs' are described as 'uhs'. Perhaps it's just a spelling thing, but these vocalists avoid the natural vowel sounds of pop singers and adhere to the 'trained' enunciation of classical singing. Repeated exposure to this can cause irritable vowel syndrome, so it was a relief to discover the choir's resonant, vowel-free 'mmms' — these warm hums sound inviting and intimate, and blend very nicely with string pads.

Most of the long notes are a mere five or six seconds long, but Miroslav has sensibly provided looped versions of most of the sustains. While these looped programs are very handy for layering with other sounds, non-looped material such as the 'expressive ohs' are equally useful, their subtle volume swells adding much-needed dynamic movement.

In other respects, the library's handling of dynamics is somewhat limited. Though performed at three different dynamics, the men's 'ahs' and 'ohs' are presented separately, rather than in a combined velocity-split program, and the women's samples were recorded at one dynamic only.

Why do makers of choir libraries provide samples of pitched consonants? Is it in the feeble hope of combining them with sampled vowels to create 'words'? To me, this seems as pointless as asking Stephen Hawking to record a version of 'Bohemian Rhapsody', but Miroslav obviously has his own agenda. His classical singers perform a series of short notes based on a variant of the old 'tonic sol-fa' sounds ('doh', 'ray', 'mi', and so on) in staccato and two-second 'porto' (sic) styles, all gathered together in a 16-way keyswitchable program. Sixteen blokes singing 'doh!' could be amusing (the Homer Simpson choir?), but this crew blow it by failing to produce a hard 'd' sound. Though some of these short note performances are sonically engaging, I have a feeling most of them are destined to gather dust.

Miroslav's men and women never perform jointly, but 'combined' programs offer keyboard splits of low men and high women, while 'mixed' programs layer the two sexes, mostly in octaves. The Giga version contains no release triggers (a shame, as the reverb sounds rather splendid). There is a reasonable effects section in which the men cry, laugh, mutter and utter low rhythmic 'machine' noises, plus some nice glisses from both camps — these upward swoops end on a sustained target note, unfortunately not quite at concert pitch. A worse tuning issue affects the male 'eehs' and 'ehs' programs: some appallingly inept programming has rendered their samples a quartertone sharp, a tuning discrepancy almost on a par with this year's UK Eurovision disaster.

The documentation is scanty and not very good. We're given a vague warning that tunings of '440-443' are used, but with no indication of which tuning occurs where. Miroslav's English is imperfect, and some of his musical assertions (for example, that women's vocal timbre does not vary with volume, and that sung vowels invariably turn into diphthongs) are highly questionable. This rather sloppy presentation is at odds with the high quality of the recordings.

Although this library breaks very little new ground, it remains a well-performed, nicely recorded work which achieves its objectives. Classical choirs are a dramatic timbre which most composers will consider using at some point, and this one certainly deserves consideration — but, as with Miroslav's orchestral ROMs, the price will probably put many potential buyers off. *Dave Stewart*

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House Essentials

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AUDIO+WAV

Ueberschall get all dressed up and strut their funky stuff on the dance floor with this two-disc collection of house samples (one audio, the other WAV including 12 minutes of audio). Kicking the collection off (after a very disco-sounding demo track) are a whopping 645 drum loops spread over 28 tracks. Split into rough sub-genres including tribal, straight, deep, and groove, all the loops are set at a tempo of 130bpm and unsurprisingly feature predominantly driving four-to-the-floor patterns. Although this type of loop can get a touch tiring to sit through, good use of percussion, varied drum sets and, more importantly, top-quality programming keep the beats remarkably fresh sounding. I particularly liked the inclusion of hi-hat and percussion loops, which allow some simple but effective layering opportunities. ▶

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Moving right along we come to four tracks of bass with 90 single hits of a variety of styles from deep, subby monsters to clicky analogues. Each one is well recorded and very usable and, as with almost everything else included in this collection, the samples are tuned to the key of 'A'. This excludes any multisampled instruments, like the warm-sounding pick bass that rounds off the section.

The following 16 tracks contain a wealth of instruments, with multisamples, single hits and riffs. The highlights include some nice scratchy guitar riffs and a selection of stabs that manage to keep away from the tired old standards. I liked the nice range of single-hit lead synths, which range from strong, resonant leads to softer-sounding pulses. Although few of the samples here disappoint, I thought the multisampled piano and Rhodes where a touch weak, as were some of the more abrupt and badly edited string riffs. Also the inclusion of just two multisampled pads seems a bit stingy considering their importance in some of the more lush-sounding house sub-genres.

Vocals next, and we're treated to four vocalists, two male and two female. All the phrases are again recorded at 130bpm and contain a huge selection of lines and words (575 in total), in alphabetical order for each singer — a nice touch. All the vocals are recorded dry, and the quality of singing is very good, with each vocalist having their own distinctive style, ranging from full-on diva (the wonderful Vonda) to a smoother soul vibe (Fab). Some of the lines may be a little cheesy for the more discerning producer, but that comes with the territory and there are plenty more subtle phrases that would work well in all kinds of contexts.

Rounding off the audio we have seven tracks of effects that range from sweeps to sampled drum breaks and odd synth squiggles. Only the small, uninspired (and virtually unusable) section of scratches is a letdown, with the remainder handy for those odd touches that really bring a track to life.

If I really had to find something to moan about, a few variations in tempo throughout the drum loops might have been interesting, as would some extra pad sounds, but that is really being ultra-picky because, overall, *House Essentials* exudes quality and is a fantastic source to build whole tracks from (which quite rightly will take some work on your part) or just to dip into for inspiration. Credit must go to the producers, Risque and Doug Laurent, who have put together one of those rare sample CDs that actually simulates creativity rather than replacing it. If house music is your thing, you'll find plenty to keep you busy here. *Oli Bell*

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Public Enemy: Welcome To The Sampledome

EAST WEST AUDIO

Love it or hate it, hip-hop has transformed the sound of popular music over the last 15 years. Not bad for a genre dismissed by many as a fad. Arguably the most important (and at times controversial) group to win both critical and popular acclaim in the late '80s/early '90s was Public Enemy. Although currently in semi-retirement, Public Enemy still have a revered place in the hearts (and record collections) of many a hip-hop producer (this one included). You can imagine, then, my excitement when this sample CD from East West dropped through my letter box. With PE main man Chuck D (alongside Gary G-Wiz) on production, *Welcome to the Sampledome* features 49 original construction kits spread over two audio CDs.

Okay, you know the construction kit deal: each track gets a short four-bar burst of the whole groove followed by a breakdown of each of its component riffs. These include just the drum loop and individual drum hits, bass line, keys, guitar, synth riffs, and so on. Tempos range from 73bpm to 127bpm, but the majority of the kits seem to fall into the hip-hop-friendly 90-98bpm range.

Enough preamble, what's most important here are the samples themselves. So are they any good? Well, the content of the kits is, in a word, excellent. Style-wise the kits are quite unique, rather than emulating any trends, and the sound quality is top notch, as is the selection of samples and elements. All the drum loops have the required beef and bite and contain a mixture of played and programmed beats that works well. The rhythms themselves range in style from the standard 'boom-bap' to more complex patterns giving a varied palette of loops to choose from.

Drums aside, the other melodic (and sometimes not so melodic) elements that make up the kits are similarly well thought out. The bass tones in particular, a mixture of live and synthetic, sound great, as do the scatterings of real guitar and keyboard riffs. In true Public Enemy tradition, there are also plenty of quirky noises and samples that bring the kits to life and hark back to the group's earlier recordings.

Although I'm sure that most of the content here is played, there is still room for those all important little touches that sound like they were sampled from vinyl (some of which probably were), and these help to add some nice grit and grime to the proceedings. I was slightly disappointed by the lack of any real turntable work (still sadly missing from the majority of hip-hop collections), and some of the single drum hits end a touch abruptly, but that's all I can really find to moan about.

Although perhaps not as instantly relevant as a collection put together by Dre, Premier, or the Neptunes, this CD is still a bit of a coup for East West. Although hip-hop purists may be disappointed to find no content created by the Bomb Squad (Hank and Keith Shocklee, Carl Ryder and Eric Sadler), PE's production *tour de force* behind the most (in)famous LPs, the whole Public Enemy persona carries with it a respected musical pedigree. And it's this very legacy which has allowed Chuck D and G-Wiz the opportunity to tread their own paths rather than regurgitate the platinum sounds of their peers, like so many other hip-hop sample CDs. This freedom makes the content on offer here refreshingly different, yet totally authentic.

I'll put my hand up and admit that I'm not the most avid supporter of the construction-kit format, preferring to pick through individual loops to spark my imagination. But, having said that, the amount of quality material contained here means that it's easy to just dip in and pull out some inspiring sounds and loops. Can Public Enemy still bring the noise? You bet! *Oli Bell*

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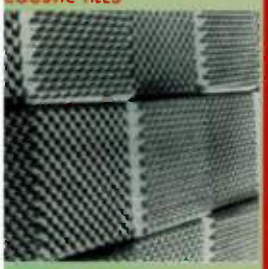

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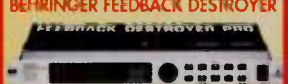

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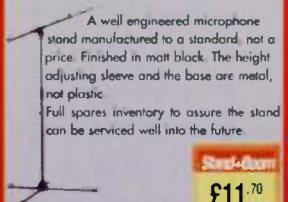

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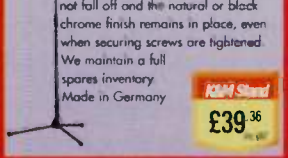

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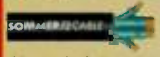

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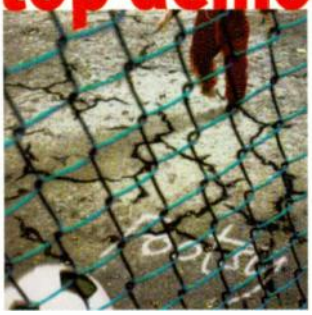
Resident specialist John Harris offers his demo diagnosis and prescribes an appropriate remedy.

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.

top demo



Footsy

Recording Equipment: PC running Steinberg *Cubase VST* v5.1, Joemeek MC3Q microphone preamp, Line 6 Pod, Rode NT1 mic, Behringer MX2642 mixer, Yamaha NS10M monitors.

Sean Boothe claims that he is more of a musician than an engineer, but with this three-track CD he demonstrates that having a good ear is the sure-fire route to producing a good demo. Certainly there are some technical problems — the mix on these tracks is overly bright as a result of excessive equalisation in the upper-mid and high-frequency areas. On the first song, the main casualty is the vocal which ends up sounding a little sibilant but, to be honest, no worse than some professional albums I've heard in the last couple of years. There is also a noticeable gap between the full sound of the bass and the lower frequencies of the six-string guitar. A keyboard part or a guitar sound with more bass could fill the hole and restore the warmth that's missing from the mix. As the owner of a Line 6 Pod who also records to a computer-based digital audio system, I can vouch for the fact that it can be difficult to make the guitar sounds from the Pod sit in the mix. The tactics I employ to address the probelm involve using valve outboard and analogue equalisation to add warmth, but these, I admit, are something of a luxury and not available to everyone. In Sean's case, it might be worth running the output of the Pod through the Joemeek MC3Q. The Pod has a variable output which can be turned down enough to suit the operating level of a microphone preamp.

However, as it stands, this demo still sounds very good. Examining the arrangement more carefully, it's easy to see why. There are many pleasing instrumental parts which are not immediately obvious on first listening. In particular, the use of countermelody throughout, mostly in the form of overdubbed electric guitar treated with effects, is excellent. For the benefit of anyone checking out the audio clips of Sean's demo on-line (www.sospubs.co.uk/sos/aug03/demodoc.htm), try turning off the left side of stereo where the main chordal work is happening and listening to the right where most of the countermelodies occur. In fact, this total separation of the guitars on the left and right stereo channels contributes to the non-homogenous sound of these mixes. I also liked the use of reversed guitar to drive the arrangement along, appearing before choruses to give a feeling of rushing into the next section of the arrangement. It's a classic production ploy, but nevertheless well executed in this case.

There are lots of positive points to this demo and it does a good job of illustrating Sean's skills as a songwriter and performer. Not only is the lead vocal sultry enough for a modern glum pop single by a guitar-led band, but the use of backing vocals is terrific. The end of the first track builds to a nice crescendo with two repeated backing vocals working in clever question and answer fashion; the main vocal in the choruses is layered with a falsetto vocal an octave above; a backwards effect runs into a harmony vocal section in the middle eight — what more do you need? ■

Skankt

Equipment: Mac G4 running Emagic *Logic Audio Platinum* v5.2, PC Running Steinberg *Wavelab*, Rode NT1, AKG D112, Shure SM58 and SM57 mics.

This album of contemporary ska punk was recorded at engineer Jeff Spencer's studio, which is based at an old Victorian gentleman's club in Gloucester.

Listening to track one, I was immediately impressed by the tight and lively sound of the band. Given that these tracks were built up with layers of overdubs (as opposed to being recorded live and then added to) they sound remarkably fresh and enthusiastic, and this is especially important for music of this genre. The mixes are very

busy and it's only in the more sparsely instrumented sections that you can hear the use Jeff has made of the 30 x 15-foot live room at his disposal in the old club. The room sound is especially obvious on the snare drum in these passages.

Turning to the overall balance of the mix, the brass and overdriven guitar sounds are fighting for the same frequency space, and although some panning is going on it's never quite enough to separate the two. The situation might be addressed in a number of ways. Firstly, EQ could be used to give the brass a little extra bite by boosting the upper-mid frequencies. However, it's likely that this would not be enough to differentiate the rasp of the brass instruments from the upper harmonics of the harshly distorted guitars. Alternatively, taking the subtractive approach, reining in the distortion on the guitar sound or opting for a more mellow overdriven tone would allow brass and guitar to interact more effectively. I understand that this would compromise the band's particular mix of metal, punk and ska, but, with some more careful arrangement, it can still work. A perfect example of this is the third track where the instrumentation is both a lot simpler and very effectively arranged and, as a result, the balance of the mix is much better.

Automated mixing and post-production editing have clearly come in handy on the more complex mixes on this CD. Jeff has certainly had his work cut out, as Skankt are fond of completely changing mood mid-song, moving from frantic to dreamy with clever changes in instrumentation. In particular, the juxtaposition of overdriven and clean echoed guitar sounds, underscored by some nifty bass grooves, works very well. The harmony vocals are also well arranged and performed but I occasionally found the lead vocal a little low in the mix and a touch over-compressed. However, this vocal sound, coupled with an overall EQ treatment which verges on the harsh side, give the album a very exciting and energetic quality — I'll bet the band are great live! ■

W www.skankt.com

Gear Limitations

I've noticed that quite a lot of demos arrive at *SOS* Towers accompanied by a letter that tentatively mentions the limitations in the equipment used to produce the CD. Such concerns are always relative. We all have them, and no matter how much equipment we own there's always one more bit of hardware or software out there that is guaranteed to give our demos that extra something, or, for the professional, a 'must have' bit of kit that's sure to get us more work. Strangely enough, some of the best recordings sent to Demo Doctor have been put together using setups that are more limited than most. When you've had to work that bit harder on the music and the sounds you're using, you gain a better understanding of your equipment and will often spend longer bouncing tracks and mixing to achieve the best result you possibly can. The quality control and musical discernment that using limited gear teaches are useful skills to carry into a (hopefully) more equipment-laden future.

QUICKIES

Cosmic Wandering

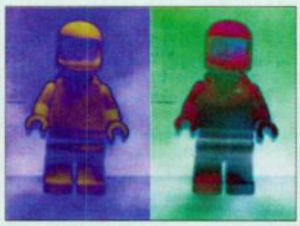
This chillout CD is not nearly as waffly as the title might suggest and has some fine musical moments. I especially liked the fluttering chordal pattern introducing the aptly titled 'Butterflies'. The loop, which is filtered and autopanned, immediately captures the interest of the listener, and continues to do so as the bass and drums come in and the loop's filter and envelope change to create a more percussive sound. A more traditional approach to instrumental arranging is demonstrated on the final mix, 'The Sultan's Lament'. This track is based around a solo piano part and features some heavily orchestrated sections. The mix is competently treated with concert hall ambiance using an Alesis Midiverb — who says you have to use plug-ins? ■

Back2Back

Firstly, I would suggest a change of band name! 'Back2Back' is suitably tacky for a covers band (which they otherwise are), but it could prove off-putting if they're trying to promote their original material. On the technical side, too much reverb has been used and, what's more, it's the wrong *kind* of reverb. The long decay time and pre-delay muddies the overall sound, when reverb with a shorter decay would be more suitable for these uptempo soul/disco numbers. The arrangements need some work too. The instrumentation needs to be built up for the choruses, not just with backing vocals, but also with countermelodies and extra keyboard textures. Having said that, the vocals are very good, with a touch of Madonna about them during softer passages. ■

Two Sweaty Men

In spite of the DH Lawrence imagery that flares up in my mind, I suspect that the title of this CD refers



instead to long hours spent in a rather small studio space in North London. The resulting mix is well balanced even if the tracks do tend to be a bit overlong and two-dimensional. A good start would be to create some variation in dynamics and shake up the (albeit accomplished) backing with a few aggressive changes in the drum loop, whether programmed or sampled. This could be easily accomplished in a club with a bit of nifty mixing on the decks, although it's surely desirable that a track should be able stand on its own two feet. ■

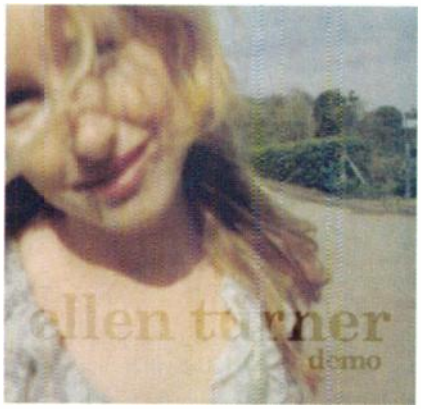
ArcZero

This demo's retro sound, influenced by the likes of Jarre, Foxx and Numan, could be improved with the merest hint of high-frequency boost on the first two tracks to add some more presence. The third mix is a lot brighter and this inconsistency needs to be addressed at the mix or post-production stage. The combination of simple bass lines and a solid bass drum is essential to this genre and the team have chosen their sounds so well that if you close your eyes, you could be back in the early '80s! Even so, some aggressive, modern, digitally filtered sounds are all that it would take to bring these tracks right up to date. It sounds like I'm willing them into the year 2003, but the lush string pads, soft filtering and slightly delayed loops on this demo are most enjoyable just as they are. ■

business end

The main demos featured this month can be heard in MP3 format at www.sound-on-sound.com/sos/aug03/demodoc.htm

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).



Ellen Turner

Dave Fowler (DF): "The first thing that needs to be said about this recording is that you can hear the digital reverb pinging off the Ts and Ss, giving it a very top-end kind of fizz which doesn't sound like part of the mix. It is a classic example of how not to use a digital reverb."

Matt Ward (MW): "It has a dreamy cover which is well suited to the music. The sleeve notes say it was recorded live in one take which is not the best technique for submitting a demo of this kind because it has left it with a very poor sound; there is the occasional duff note and the guitar sound is quite weak. On the plus side, playing live does demonstrate a talent and it is an advantage to be able to go to a label or publisher and play in front of them, but for a demo I think she needs someone to play the backing for her, and she should get it recorded properly.

"She has put a certain amount of emotion into these tracks but I still found the dynamics of the arrangements a little flat. This sort of folky music is probably not going to end up being presented in a three-minute radio-friendly pop format so I don't mean dynamics in that way, but if the song is telling a story then its musical structure should reflect that narrative. Basically, these songs aren't hooky or compelling enough."

Jon-Paul Harper (JP): "This demo starts well and the first song is really good. The theme of going under the knife for beauty is, I'm sure, a thing a lot of people can empathise with and certainly a large proportion of the female population. It's always a good thing if someone has got into writing music because they have something to say or have hang-ups to express. I liked the fact that she doesn't waste a line: line two isn't there just to rhyme with line one, for example.

"After the first verse I was expecting a band to come in. I know it's predictable but I think the contrast would be fantastic. The next two songs go out with a bit of a whimper. I don't think she is proficient enough to play the guitar herself and it doesn't help that it is a pretty horrible guitar sound — you can hear that it isn't a particularly nice piece of wood.

"Presentation wise, I like the cover which looks like a picture taken in the '70s. But overall it was pretty uninspiring and I think she should now think about getting a backing band."

DF: "Why is it that every female solo singer has at least one song about their dress size? If somebody asked me write a classic female singer/songwriter song then I would instantly pick a subject like that. However personal it is to her it has been done before and a lot better. She starts with the words 'I'm a size 10' and there is a Beautiful South song called 'Perfect 10', so having that as the first line is perhaps not a good idea.

"I've recorded a lot of female singers who have come into the studio either with a band or just an acoustic song and it has been very much the same sort of thing sung in a very similar way and I feel that it would be nice if someone took a different angle on it. There is something refreshing about what Kelly Osbourne has done by sticking two fingers up to it all through her lyrics. Having criticised Ellen Turner's lyrics, I realise that there is a lot more emphasis put on the lyrics of female artists. Oasis and Radiohead whine on and you often can't understand Thom Yorke's vocal, but the moment women sing everyone is listening to every word.

"I think she should get a band and continue singing and writing but have someone else playing the main guitar parts."

Sam Shemtob (SS): "The packaging looks very well finished and it is in a recognisable style — I feel as though I've seen the same cover before and it sounds just like it looks. I liked reading that the tracks were performed all live and uncut because that looks good on

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 principle engineer of Rogue Studios for five years. Jon-Paul now runs Rogue's rehearsal studios but continues working as a 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 Audio 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

paper but I'm not so sure if that approach works here. I liked the way she moved her voice to exploit her vocal range in the first song. Like Jon-Paul, the first few lines of the lyrics caught my interest but not in a particularly profound way. I preferred the third track which had more charisma and energy, and it was less predictable, so I felt that it challenged me a bit more."

Brooke Shelly

MW: "From reading her covering letter, I gather that these tracks are interpretations of traditional pieces, but she has added her own words. Mixing baroque or renaissance choral music of this type with contemporary beats is a very strong idea and I'd like to be enthusiastic about it but the idea has been done before by Enigma. She has a very good voice but the beats are very poor and weak and they just sound like a synth program. She says herself that the production is not that great but a lot more work needs to be done because at the moment it doesn't really work.

"I think the way forward would be to get a sympathetic producer behind her.

"On another point, I think that by sending in her entire CV she has given far too much information for a demo; it is like she is applying for a position in a local choir."

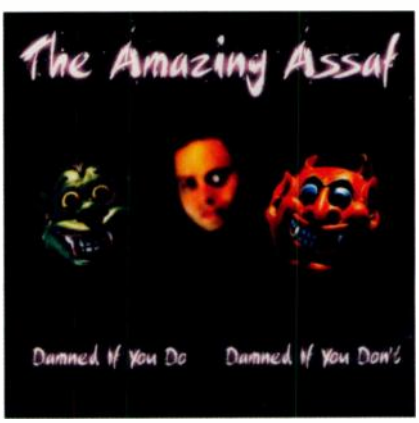
JP: "She says, in her letter, that she was trying to avoid the obvious thing of just putting a beat to classical choral arrangements, but unfortunately it sounds like she has done exactly what she was hoping to avoid. It is an interesting idea but it has been done before and I don't think there is a market for it at the moment. Having said that I was reminded of being in a department store where this sort of music is used in the background a lot.

"I have a problem with the principle of grabbing something that already exists and messing about with it instead of starting with an original melody, but I appreciate that she feels passionately about this sort of music. I think she should try to go for a live feel and get a band to play the parts."

DF: "She does say in her letter that she'd love to use proper musicians so she's heading in the right direction. I think this is an example of someone who is too trained, because there are no boundaries being crossed — she's trying to interpret something instead of putting any huge amount of imagination into it, and that way of working is partly a product of years and years of training. Obviously a certain amount of training is necessary to be able to sing or play but beyond that is a point where you actually stop asking questions because, if all your parameters have been set out, you know exactly what you are going to do before you even get there. She does have a good voice, but so have many other people who have been to music school and studied that number of years. I think a good vocal performance is all about character and this doesn't have a huge amount of character."

SS: "The first track didn't really grab me. The second track has a bit more of a singer/songwriter feel so it seemed to be a bit more developed. The third track goes in a different direction again but it sounds more dancey and I found it the most interesting. In fact, I think the third song is quite commercial. Maybe it is a little bit cheesy but some of the songs on Dido's album are quite similar, and not only do they work really well, but Dido's album was a huge success. Based on that reasoning I can see that there is potentially a big market for it.

"The cheesy part of me quite likes the beats that come in with her voice and I can imagine that a lot of people would feel the same, although we only listened to a couple of minutes of each track and I can imagine becoming tired of the idea if no other developments happen. So I think that if she can get the balance right between the choral elements and the modern dance parts then there is some potential for further exploration."



The Amazing Assaf

DF: "The quality of the production is good and I have no problem with that, but I'm not convinced by the musical content. I have heard a lot worse in this genre but I think he needs a couple of years to hone what he's trying to do. I think the presentation is misjudged: in the photo on the inside of the sleeve he looks like the kid at school you always wanted to hit! It's almost as if he's dressed as Harry Enfield's Kevin character but, to me, it comes across as though he thinks he's cool, not as a joke. If you've gone as far as producing glossy artwork then you don't want a photo like that."

MW: "He has done an awful lot of work on the packaging — too much, really. I liked the mix of styles he's trying to bring in, like the hip-hop beats, classical guitar and occasional electric rock solo. Mixing styles in this way is a nice method of giving recordings individuality, but the problem I have with it is that it comes across as being quite dated. His rap vocals have a certain amount of potential with that forward drawl thing, but a lot of the time he sounds like a boy-band doing rap, so it doesn't have that contemporary, cool feel to it. In the first track the vocals do get a little bit confused because the rapping is too fast for him to articulate the words clearly.

"Over all, even though the music combines various styles in an original way, it don't think it stands up next to a contemporary album release. It is reasonably well produced but I'm not sure quite what type of music it's supposed to be so it's hard to suggest ways in which he can progress."

JP: "If anything it looks dated rather than sounds dated. There is something intrinsically '80s about the cover and particularly the photograph of him sat on the bench. I do wonder if that is a wry smile, so I can't help feeling that from that picture he's not taking himself seriously.

"From a production point of view I think it sounds very good, so hats off to him for achieving that on his own. It's good that he's got a lot of energy, he's confident and he's having a go, but I don't think he's doing anything particularly new musically."

SS: "I actually think the photos are meant to be serious. A couple of people said they didn't like the rapping but I quite like it and I think that it bounces along nicely. Some of the tunes are very upbeat, which is great, because you don't often to hear rap or hip-hop used in that way. Having said that, I think the ideas need developing because overall the demo isn't challenging enough, or has enough of a musical direction." SOS

ILIO PRODUCERS FOCUS JULY 2003

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Laying your hands on these awesome riffs and licks, and relishing in how well they combine, is an experience you won't soon forget. Tempos range from a very greasy 75 to a blistering 160 BPM. By far the most ambitious in the Fingerstyles Series, this project includes a wide range of Funk and Fusion styles with influences from James Brown and Curtis Mayfield, P-Funk and Soul, to Reggae, New Jack Swing and edgy Rock/Funk Fusion a la Primus. Often hard driving, sometimes smooth and sexy, but always with a lot of phat and grease. Don't get caught without Phat Fingers!

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AUDIO - £59.95 (4 CDs)

NEW SAMPLE LIBRARIES

pc notes

We survey developments from the recent Windows Hardware Engineering Conference, which brought to light new information concerning the future of the forthcoming 'Longhorn' version of Windows.

Martin Walker

I'm sure readers of this column will be pleased to hear that it now reaches the eyes of Microsoft. Following my February 2003 column on the new Windows Longhorn operating system, I got an email from Martin Puryear, Development Manager of the Windows Audio/Video Platform, in which he reassured me that (contrary to rumours) Windows Longhorn will still be compatible with drivers written for previous versions of Windows, and will still support PCI expansion cards. Panic over!

Moreover, a lot more information was revealed at WinHEC (the Windows Hardware Engineering Conference) 2003, held in New Orleans in early May. Apparently Longhorn will not now be released even in Beta form until early 2004, with a likely manufacturing release date of sometime in 2005. It's unlikely that there will be any more interim Windows releases until then, although Windows XP will have new Media Center (sic) and Tablet PC Editions (see the 'PC Snippets' box for more).

Its wide-screen display may look strangely familiar to Mac users, but the prototype Athens PC shown at WinHEC 2003, and jointly developed by Microsoft and HP, contains quite a few new technologies.

Longhorn Audio

However, Longhorn will be of great interest to us musicians, since it has a new and rather more robust audio architecture that aims to eliminate audio glitches and reduce latency, while maintaining backward compatibility with older drivers, as mentioned earlier (although these won't benefit from the new features). It will have prioritised I/O for audio and video, various audio acceleration features, a finely adjustable playback rate that can be slaved to external video or audio clocks, and it will support timestamping.

On the surface, Microsoft are also aiming to to simplify AV device setup with centralised, easy-to-use Control Panels that replace the current and rather outmoded Volume Control. Underneath, their new UAA (Universal Audio Architecture) will run devices based on three specifications — USB, FireWire, or Azalia.

Azalia is the next generation PC audio specification from Intel that replaces the current AC97, and applies to integrated motherboard chipsets and expansion cards. The Azalia controller interface is designed to support one high-rate stream of eight channels of 24-bit/192kHz audio plus additional lower-rate streams for such things as modems and voice communications, while the proposed new 'Entertainment PC' spec also recommends an S/N ratio in excess of 110dB, which all sounds most promising. Longhorn will provide native support for all this, but Win XP and 2000 should also get a suitable update.

Longhorn Video & Control

While existing Windows desktop displays can already host multiple screen 'windows', each one is responsible for its own display area. In Longhorn, the desktop is re-rendered many times a second by combining the contents of each open window, each window having its own 'surface' and translucency level. This should enable us (for instance) to work in a mixer or synth editor window while our sequencer's arrange page is still partially visible beneath it. Even those who already work with dual-head setups to provide more screen 'real estate' should find this useful.

There are various other graphic and animation effects on offer in Longhorn, but they all use the features of existing 3D graphic cards, which currently remain largely unused except when running games and 3D graphic applications. IT staff may perhaps be a little cynical that Microsoft's vision for office PCs of the future includes expensive 3D graphic accelerators, but the good news is that these graphic features will be immediately available to any Windows application running under Longhorn, including existing ones. No re-compiling is required by software developers, and the new features will be optional if

PC Snippets

Microsoft distributed preview versions of their Windows XP 64-bit Edition and Windows Server 2003 Enterprise Edition for AMD processors during WinHEC 2003 (see main text). The XP 64-bit Edition will support AMD's new Opteron processor, and the Athlon 64 that's expected to ship later this year, while the Enterprise will also support the Opteron. This shows that Microsoft are now more committed to supporting AMD.

W www.microsoft.com

Sonic Foundry's desktop software assets, including *Sound Forge*, *CD Architect*, and the *ACID* and *Vegas* ranges, have been acquired by Sony Pictures Digital, following the recent release of Sony's *Screenblast Movie Studio* and *Screenblast Music Studio* applications, created in conjunction with the Sonic Foundry development team. This will allow Sonic Foundry to write off existing debts, as well as injecting plenty of capital, and should allow the same team to carry on developing, although they say they will concentrate on 'rich media' applications, following on from their web presentation software *Media Site Live*. What this means for for existing users of their other products isn't yet clear, but I'll keep you informed.

W www.sonicfoundry.com

The current Windows XP Media Center Edition has been available for some months, and is an entertainment version of Windows XP with an additional Media Center application that runs on a special 'PC TV'. This replaces a separate TV, VCR, jukebox, and stand-alone DVD player, letting you listen to music, watch TV and record programmes onto your hard drive, watch DVDs, store and view your digital pictures, and so on, all controlled from one handy remote, as well as being a fully-featured PC [*see Cutting Edge, p.34, for more.*]. It should eventually prove popular in family living rooms and to those with limited space if the price comes down — currently Media Center PCs cost about double what most people pay for a home PC. The forthcoming Media Center Edition announced during WinHEC 2003 will add better handwriting recognition for non-English languages and new Media Center Guide data for European television.

W www.microsoft.com

your PC doesn't have suitable hardware.

Longhorn will also feature a new control interface called Xeel, which has been described as a cluster of hardware components based on the success of the mouse scroll wheel. Details are still sketchy, but apparently Bill Gates has described it as "a ruler that can be pushed in or moved to the left or right", along with some additional vertically stacked buttons. Xeel aims to provide a consistent interface and navigation scheme across Windows powered smart displays and phones, as well as pocket and tablet PCs.

It's All Greek To Me

Also demonstrated at WinHEC 2003 was a prototype 'Athens' office PC, co-developed by Microsoft and HP, and designed to take advantage of Longhorn when it finally appears. It features 'next-generation' voice, video, and text messaging, and as you can see from the photograph on the left, has a a high-DPI (at least 120 dots per inch) flat-screen display with a horizontal 16:10 aspect ratio designed to make it easier to work with multiple documents (and, I suspect, with MIDI + Audio sequencer applications!). Microsoft predict that this 20-inch panel display should cost just $400 by next year, although many hardware experts seem highly sceptical about this.

Athens also has a wireless handset and headset on its left-hand side, using Bluetooth technology, and a video-conferencing camera on its right. Caller ID will let you know who's dialling in, using a pop-up screen, or you can mute the display, whereupon incoming calls will blink on the monitor bezel or keyboard. The new machine is designed to boot in under two seconds, power itself down when not in use, includes a rechargeable dock for tablet PCs, and has a battery powerful enough to enter hibernation mode or save any open files in the event of a power failure.

However, it's still got a small footprint, so it will be interesting to see what internal expansion possibilities there are. One interesting point for musicians is that Athens features "truly quiet" operation, which sounds encouraging, although this may simply mean low noise rather than complete silence. Even so, it's a sign that acoustics are now being taken a lot more seriously, because few people now want a noisy computer in the office or living room, let alone a music studio.

Hyperthreading Update

The newest Intel Pentium 4 processors feature hyperthreading technology, which lets the chip operate more like a dual processor that can run two applications simultaneously, or run a single application much faster than it would on a standard P4 processor. This technology first appeared in Intel's Xeon chips last year, and as you might expect it's not as powerful as a real dual-processor PC.

Older 533MHz FSB (Front Side Buss) P4s do have hyperthreading technology built-in (but disabled), and Intel officially specify a P4 3.06GHz or faster processor to support it. However, if you're thinking of splashing out on one of these, there are various things to bear in mind. First, you need a suitable motherboard with a hyperthreading-enabled chipset, and second, you can only run it under Linux 2.4x, Windows XP Home, or XP Professional. This is good news for users of Win XP Home, since only Professional users get true multiple processor support, but users of Win 98, 98SE, Me, 2000, and NT4 will need to disable the hyperthreading function in their BIOS setup to prevent problems.

Under XP, while you should see performance improvements when running several applications simultaneously, only one app at a time can access the FPU (Floating Point Unit), so it's difficult to generalise about how big these improvements might be. Individual applications won't improve until they have been rewritten to take advantage of hyperthreading, and here your choices narrow considerably. Steinberg's *Nuendo* 2 is one of the few music apps that currently supports hyperthreading, though others should gain support in coming months. As it stands, many applications won't show any benefit at all.

Moreover, there have been some teething troubles with existing music software, which is hardly surprising considering that most developers don't even have a hyperthreading-enabled PC. Anyone experiencing random CPU spikes, higher overheads, or clicks and pops should try temporarily disabling hyperthreading in the BIOS to see if the symptoms disappear. I've spotted forum users complaining of problems with *Reaktor* 4, Steinberg's *Virtual Guitarist*, the PowerCore DSP card, and *Cubase SX*. Steinberg have already promised hyperthreading support for *Cubase SX* in its next major update, due some time later this year. SOS

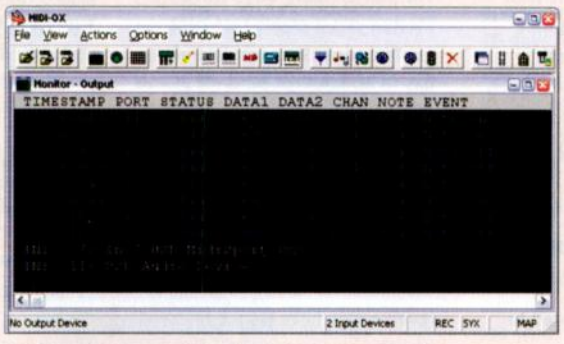
Direct USB MIDI Connections

Here's a quick update to my two-part PC Musician feature on real-world latency in *SOS* September and October 2002. As you may remember, I concluded from my measurements that, of the various PC MIDI interfaces, those found on PCI cards seemed to exhibit the lowest latency, followed by serial/parallel port devices, while USB generally gave the largest latencies, although all types offered similarly low levels of MIDI timing jitter.

However, having recently acquired an Evolution MK225C two-octave keyboard with integral MIDI controllers, to replace my trusty MK125, I've had the opportunity to test out its direct USB MIDI connection and compare it with its standard MIDI output routed through a variety of PC MIDI interfaces. This time, instead of using my modified MIDI lead, I was able to directly compare the arrival time of MIDI messages via both routes simultaneously, by using *MIDI-OX*, which provides a 'timestamp' counter with 0.1ms resolution that starts when you first launch the utility.

Connecting the USB lead from the MK225C to my PC, as well as a standard MIDI lead from the MK225C MIDI output to the input of the comparison PC MIDI interface, and then enabling both inputs simultaneously in *MIDI-OX*, meant that each time I pressed or released a key two identical MIDI signals arrived at slightly different times. *MIDI-OX* then displayed which arrived soonest, and by how much.

MIDI signals from the direct USB keyboard connection proved never to be more than a tiny 1ms later than those routed through my PCI MIDI interface, but up to 2ms earlier than my serial port-connected Midisport 8x8, and up to 3ms earlier than the latest Midisport 8x8 USB drivers (see screenshot). From these results I think we can assume that if your keyboard has a USB MIDI connection this will nearly always provide the lowest MIDI latency, unless you use your soundcard's MIDI input. However, a quick check with *MIDI-OX* will confirm this.



Direct USB-connected MIDI signals between a musical keyboard and your PC may arrive slightly earlier than via a separate USB MIDI interface, as you can see here, with up to 3ms difference between the two routes.

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Longhorn will also feature a new control interface called Xeel, which has been described as a cluster of hardware components based on the success of the mouse scroll wheel. Details are still sketchy, but apparently Bill Gates has described it as "a ruler that can be pushed in or moved to the left or right", along with some additional vertically stacked buttons. Xeel aims to provide a consistent interface and navigation scheme across Windows powered smart displays and phones, as well as pocket and tablet PCs.

It's All Greek To Me

Also demonstrated at WinHEC 2003 was a prototype 'Athens' office PC, co-developed by Microsoft and HP, and designed to take advantage of Longhorn when it finally appears. It features 'next-generation' voice, video, and text messaging, and as you can see from the photograph on the left, has a a high-DPI (at least 120 dots per inch) flat-screen display with a horizontal 16:10 aspect ratio designed to make it easier to work with multiple documents (and, I suspect, with MIDI + Audio sequencer applications!). Microsoft predict that this 20-inch panel display should cost just $400 by next year, although many hardware experts seem highly sceptical about this.

Athens also has a wireless handset and headset on its left-hand side, using Bluetooth technology, and a video-conferencing camera on its right. Caller ID will let you know who's dialling in, using a pop-up screen, or you can mute the display, whereupon incoming calls will blink on the monitor bezel or keyboard. The new machine is designed to boot in under two seconds, power itself down when not in use, includes a rechargeable dock for tablet PCs, and has a battery powerful enough to enter hibernation mode or save any open files in the event of a power failure.

However, it's still got a small footprint, so it will be interesting to see what internal expansion possibilities there are. One interesting point for musicians is that Athens features "truly quiet" operation, which sounds encouraging, although this may simply mean low noise rather than complete silence. Even so, it's a sign that acoustics are now being taken a lot more seriously, because few people now want a noisy computer in the office or living room, let alone a music studio.

Hyperthreading Update

The newest Intel Pentium 4 processors feature hyperthreading technology, which lets the chip operate more like a dual processor that can run two applications simultaneously, or run a single application much faster than it would on a standard P4 processor. This technology first appeared in Intel's Xeon chips last year, and as you might expect it's not as powerful as a real dual-processor PC.

Older 533MHz FSB (Front Side Buss) P4s do have hyperthreading technology built-in (but disabled), and Intel officially specify a P4 3.06GHz or faster processor to support it. However, if you're thinking of splashing out on one of these, there are various things to bear in mind. First, you need a suitable motherboard with a hyperthreading-enabled chipset, and second, you can only run it under Linux 2.4x, Windows XP Home, or XP Professional. This is good news for users of Win XP Home, since only Professional users get true multiple processor support, but users of Win 98, 98SE, Me, 2000, and NT4 will need to disable the hyperthreading function in their BIOS setup to prevent problems.

Under XP, while you should see performance improvements when running several applications simultaneously, only one app at a time can access the FPU (Floating Point Unit), so it's difficult to generalise about how big these improvements might be. Individual applications won't improve until they have been rewritten to take advantage of hyperthreading, and here your choices narrow considerably. Steinberg's *Nuendo* 2 is one of the few music apps that currently supports hyperthreading, though others should gain support in coming months. As it stands, many applications won't show any benefit at all.

Moreover, there have been some teething troubles with existing music software, which is hardly surprising considering that most developers don't even have a hyperthreading-enabled PC. Anyone experiencing random CPU spikes, higher overheads, or clicks and pops should try temporarily disabling hyperthreading in the BIOS to see if the symptoms disappear. I've spotted forum users complaining of problems with *Reaktor* 4, Steinberg's *Virtual Guitarist*, the PowerCore DSP card, and *Cubase SX*. Steinberg have already promised hyperthreading support for *Cubase SX* in its next major update, due some time later this year. SOS

Direct USB MIDI Connections

Here's a quick update to my two-part PC Musician feature on real-world latency in *SOS* September and October 2002. As you may remember, I concluded from my measurements that, of the various PC MIDI interfaces, those found on PCI cards seemed to exhibit the lowest latency, followed by serial/parallel port devices, while USB generally gave the largest latencies, although all types offered similarly low levels of MIDI timing jitter.

However, having recently acquired an Evolution MK225C two-octave keyboard with integral MIDI controllers, to replace my trusty MK125, I've had the opportunity to test out its direct USB MIDI connection and compare it with its standard MIDI output routed through a variety of PC MIDI interfaces. This time, instead of using my modified MIDI lead, I was able to directly compare the arrival time of MIDI messages via both routes simultaneously, by using *MIDI-OX*, which provides a 'timestamp' counter with 0.1ms resolution that starts when you first launch the utility.

Connecting the USB lead from the MK225C to my PC, as well as a standard MIDI lead from the MK225C MIDI output to the input of the comparison PC MIDI interface, and then enabling both inputs simultaneously in *MIDI-OX*, meant that each time I pressed or released a key two identical MIDI signals arrived at slightly different times. *MIDI-OX* then displayed which arrived soonest, and by how much.

MIDI signals from the direct USB keyboard connection proved never to be more than a tiny 1ms later than those routed through my PCI MIDI interface, but up to 2ms earlier than my serial port-connected Midisport 8x8, and up to 3ms earlier than the latest Midisport 8x8 USB drivers (see screenshot). From these results I think we can assume that if your keyboard has a USB MIDI connection this will nearly always provide the lowest MIDI latency, unless you use your soundcard's MIDI input. However, a quick check with *MIDI-OX* will confirm this.

Direct USB-connected MIDI signals between a musical keyboard and your PC may arrive slightly earlier than via a separate USB MIDI interface, as you can see here, with up to 3ms difference between the two routes.

apple notes

As the Apple Music Store online music experience is unleashed on an unsuspecting world, we speculate on the reasons for the recent reduction in Powerbook prices and take a look at how plug-ins are faring under OS X.

Mike Watkinson

Although Steinberg resolutely cling to the VST protocol and Emagic continue to champion Audio Units, the boundaries are becoming increasingly blurred. Two months is a long time in the heady world of plug-in development, and since Mark Wherry's look at FXpansion's VST wrapper for Audio Units hosts (available from www.fxpansion.com), there have been a number of significant software releases.

Native Instruments now have several virtual instruments that can work as VST plug-ins (in OS 9 and OS X) and as Audio Units plug-ins in OS X, as well as in stand-alone mode, while Waves, who make the *Native Power Pack* suite of industry-standard plug-ins, have a beta version of the Audio Unit WaveShell to add to the VST and DAE shells already available for OS X. For those who haven't used Waves plug-ins, the WaveShell is the item that is placed in the relevant plug-ins folder. The plug-ins themselves can be stored anywhere, since it is the WaveShell that acts as an intermediary between the host application and this location. Waves' plug-ins have been available for OS X for some time, while the various WaveShells required to allow each type of host to see the plug-ins have been developed at different speeds.

Comparing Audio Units With VST

This month, then, I decided to check out the relative performance and operation of the Audio Units and VST versions of *Reaktor* 4 from Native Instruments, as well as the Waves suite of plug-ins. Once I had downloaded the upgrade to version 4.0.1, *Reaktor* had no problems running as either an Audio Units plug-in in *Logic* 6.1 or a VST plug-in in *Cubase SX*, and CPU load appeared to be very similar (see screenshots). Functionality seems unaffected by the choice of platform — but still neither version allows the resizing of the plug-in edit window, something of an issue with a virtual instrument as potentially complex as *Reaktor*.

Although it is usually placed in the correct location by the install routine, I was obliged to manually install the Audio Units WaveShell (as it is currently not included in the Waves package). This was a reminder for me of how OS X looks after such things as plug-ins, no longer allowing them to reside in the Application folder. Audio Units plug-ins reside in the root-level Library (as opposed to the Library in the Home directory), in Library / Audio / Plug-ins/Components, and hence are available to all compatible applications.

OS X & *Logic* Ate My iBook

The Waves Audio Units WaveShell I tested was a pre-release beta numbered version 1.0b5, and it has to be said that I did experience some instability with it, but this is more than likely due to the relative unsuitability of the test system, an iBook 600MHz with 384MB of RAM. The iBook range is rumoured to be nearing the end of its current incarnation (even eMacs have G4 processors), and this machine with OS X loaded does not respond as snappily as it does in OS 9. However, the main issue appears to be lack of memory. Attempting to start *Logic* 6.1 with the WaveShell in place caused the application to quit on loading, at which point I contacted Emagic's technical support line at their UK distributor Sound Technology. Before I could mention the WaveShell, they identified lack of memory as the cause of the problem. I had not been expecting this, since *Reaktor* had not caused any such hassles.

Emagic's recommendation as a bare minimum for OS X and *Logic* is 512MB, with 1GB being more comfortable. The 384MB in my iBook was considered ample when the machine was purchased back in November 2001, but with this information and the increasing hunger for memory of all applications and plug-ins I may have to 'demote' it back to OS 9 (though buying more memory might grant a temporary stay of execution). Long may Emagic release parallel updates for both operating systems!

***Reaktor* running in *Logic* 6.1 and in *Cubase SX* — functionality and performance is almost identical.**

Waves Performance

Following the advice from the tech support line, I removed all components from the plug-in folder except that for the WaveShell, and this allowed *Logic* to load, lending some weight to the memory theory. Each new component increased the size of memory partition required by the application. It would appear, then, that the Waves WaveShell requires a lot more memory than most, perhaps due to the way in which it acts as an intermediate layer between the host applications and the plug-ins themselves. However, I got it to work, and the accompanying screenshot showing these industry-standard plug-ins open in an Audio Units host does represent quite a moment for me and those others

who have been following the development of this new format (note to self: get out more!).

Logic users will find that performance is very similar in OS X to what it is in OS 9. I was able to load four stereo Waves *RVerb*s (*RVerb* is a notorious CPU hog) before *Logic* gave up (as the fifth was loaded) on both platforms. *Cubase SX* would only load three of the VST version, whereupon it suffered from the 'crackling' that I have previously noted plagues CPU-hungry Waves plug-ins on this host. I would be prepared to accept that this might be the product of running such plug-ins on my lowly iBook (see above) but I have also experienced the same problem on some recent PowerMacs. It should be remembered that the WaveShell on test is still a beta version, and that this problem may be ironed out in the full release.

I should also note that *Cubase SX* had no problem loading with a full complement of components in place, but did not run smoothly, continuing the *Cubase* tradition which slows all operations when the processor is under stress, something that does not seem to affect *Logic* in the same way. (A time-limited demo version of the Waves plug-in suite, currently for VST and DAE hosts only, is available from www.waves.com).

iTunes & The iPod

The cut and thrust of development almost bit back as Apple announced *iTunes* 4 to coincide with the launch of the Apple Music Store in the US. The first version of *iTunes* 4 allowed file sharing across the Internet, and almost overnight sites such as iSuck (http://isuck.h3q.com/cgi-bin/isuck_search.pl) sprang up to create a Napster-like 'community' threatening to undermine the legitimacy of the Apple Music Store. Apple responded quickly with a minor update, to 4.0.1 that removed this feature, but be warned, without the update your machine may be at the mercy of surfers cruising the net for free music. This update also fixes the poor *iTunes* sound quality suffered by a small number of machines, so it's highly recommended.

The new iPod launched at the same time is slimmer and lighter than its predecessor, with capacities of 10GB, 15GB and 30GB available, and is certain to remain Apple's top seller. Having read the blurb at www.apple.com/uk/ipod/ and been suitably impressed when given a brief demo at the recent UK Press launch, I was keen to put one through its paces. I managed to get hold of a 15GB version, which, like its 30GB sibling, comes with the ultra-natty desktop dock that doubles as both a FireWire connector and a power supply. Fifteen and 30GB models also come with a carrying case and wired remote to tempt you to spend the extra cash.

The new iPods (and *iTunes* 4) support AAC (MPEG4) encoding, so I compared the time taken to convert an audio CD into this format with MP3 encoding. Both formats took around 10 minutes to convert the 42 minutes (430MB) of Joni Mitchell's *The Hissing of Summer Lawns*. The 39MB of compressed data (with both formats set to 128KB/s) transferred to the iPod in less than five seconds (equating to an approximate data transfer rate of around 10MB/s)! Comparing quality, however, revealed the AAC format to be clearly superior at equal bit rates.

The iPod is also able to function as a FireWire hard drive (which in essence is just what it is), with your music collection staying invisible to the Finder. This new iPod ran 37 tracks of continuous 16-bit, 44.1kHz audio in *Logic* 6.1 (with the Larger Disk Buffer option enabled) which is a small improvement on its predecessor's 32 tracks (on the same iBook 600).

This performance, together with the fact that you can install OS X and boot from the iPod, makes this device a unique hardware solution. Indeed, it seems I can't function without one! Now, is it to be 15 or 30GB? Well, the 30GB is slightly fatter (more platters on the drive) but that's a lot of space in your pocket...

The Apple Music Store

Apple are claiming a big success in the States for their Music Store, with one million songs downloaded in the first week of operation, and two million after 16 days, with a surprising proportion being whole album purchases. From a customer base of about 2.5 million Mac OS X users, not all of whom have broadband, these are quite some numbers, and Apple Europe have optimistically suggested we could have the store over here by late summer. Of course, that relies on licensing agreements from the big record labels. I'll be interested to see how quickly material from some of the esoteric 'independent' labels (also difficult to get hold of in high street record stores) will become available. SOS

Crash Logs & Preferences

Peering back in time to those sepia-tinted days when everyone used OS 9 (what do you mean, some still are?!), if a program began to misbehave, an easy solution was often to trash the preference file. These were easily found in the Preferences folder inside the System folder. *Logic*, especially, seemed to benefit from this process, and preference trashing became a routine housekeeping operation. However, during the early days of OS X, we were led to believe that it would become unnecessary, as the stability of OS X's UNIX core would make such drudgery a thing of the past.

Those of us who enjoy tinkering under the bonnet will be glad to hear that preferences are alive and well, and living in a more exotic location, the full path name for which is Your System Drive / Users / Your Username / Library / Preferences. This is more easily accessed by clicking on the Home icon at the top of any window (which takes you to the Home folder that bears your Username), then choosing Library / Preferences. *Logic*'s preferences are called 'info.emagic.logic', while the files for *Cubase SX* can be found within a folder bearing that name.

Crashing programs in OS X report the nature of the crash in a log file that can then be sent to the relevant developer for inspection. These get stored in the following location: Home Folder / Library / Logs / Crash Reporter. They will be named something like 'Logic.crash.log' (in the case of *Logic*).

Powerbook Price Reductions

Apple have reduced the price of four out the five models in the Powerbook range. The 1GHz Superdrive 15-inch TiBook is down £200 from £2199 to £1999, and the 867MHz DVD/CD-RW 15-inch TiBook is down £300 from £1899 to £1599. Cynics who witnessed a price reduction in the iBook range just before Christmas, followed shortly thereafter by a speed bump to the entire range, might see this as a sign that the TiBooks are about to be replaced by aluminium-cased versions, to match the newer models.

To counter this speculation, following their last speed bumps the 15-inch Titanium Powerbooks have remained competitive in most aspects with the 12-inch and 17-inch versions, the lack of AirPort Extreme and FireWire 800 being the only dips in an otherwise smooth progression through the range.

Moreover, Apple have also reduced the price of both 12-inch Powerbooks (867MHz DVD/CD-RW) and 867MHz SuperDrive) by £100, lending credence to their support for laptops as a viable alternative to desktops. A significant 42 percent of Apple sales last quarter were laptops, and this price reduction may just be part of a continued sales push now that 'early adopters' have purchased their machines.

It's not a drag to drag-and-drop, nor is it a drag to export your way to a truly universal backup solution.

Craig Anderton

This month I'm going to be looking at a variety of drag-and-drop clip options that *Sonar* supports. For example, in addition to drag-and-drop within a project, you can drag and drop clips among different projects that are open simultaneously. The rules are the same as for doing this within a single project: dragging the file moves it from the origin to the destination. If you want to drag-copy the clip, click on the clip, then hold the Ctrl key as you drag. Just remember to click on the clip itself, not on any automation envelopes or fades that may be riding 'on top' of it.

Note that if you've slip-edited the clip (for example, to shorten it), when you drag it you drag the entire clip. It still shows up at the destination as being slip-edited, but you can 'unroll' the clip to reveal the slip-edited part.

Also note *Sonar*'s 'drag and save' option. If you drag a clip off the project and onto the desktop or a folder (open or closed), it will remain at its origin, but will also be renamed and saved at the destination. A 'Copying WAV File' bargraph indicator keeps track of the copy progress. You can even select multiple clips and drag them simultaneously to a destination folder.

In Figure 1, several clips have been selected and dragged off to a folder for backup. The 'Copying WAV File' progress indicator shows the copy progress for each clip that's dragged over. In this case, five clips have been saved. Note that this procedure saves the raw files, without the effects of any automation or plug-ins.

The file is renamed with the following useful format: [name of project], [name of clip], and an ID number. This lets you see at a glance the project to which a file belongs. If you don't name the clip, the clip name will simply say 'Record' followed by a number.

All pretty straightforward — but there is something to be aware of. When you go to *Sonar* to select the clip(s) to drag-copy, the focus shifts away from the destination folder. So if you open up the folder then drag files over to it, after the copy process is complete you may not see the file names show up. Click anywhere in the destination folder or its title bar to return focus to it after copying, or keep the mouse button held down at the destination until the copy procedure is complete. When you release the mouse button, focus will shift to the destination folder, and you'll see the files with their new names.

If you drag the files to a closed folder, simply opening it should be enough to refresh the view. By the way, if you drag a groove clip (not just a WAV file) off to a folder for saving, it retains all its grooviness.

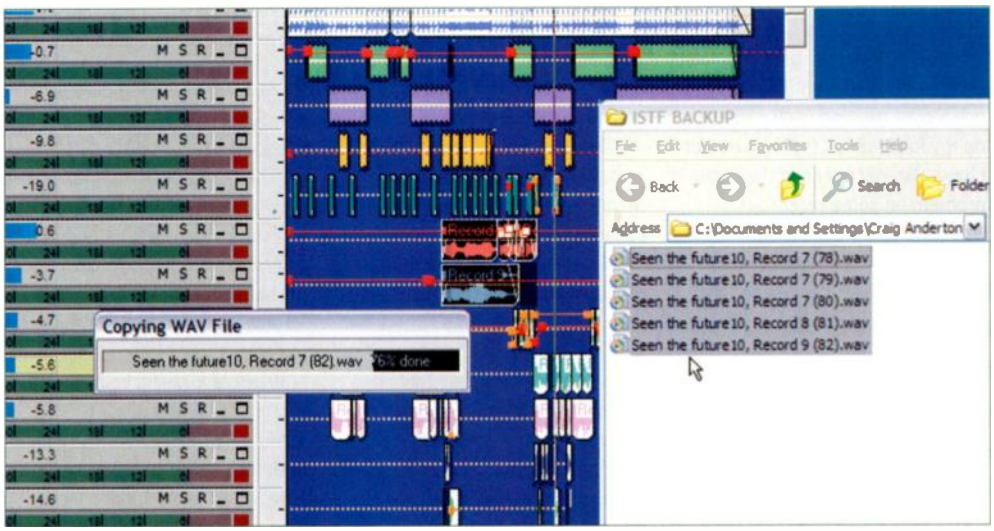


Figure 1: Drag and save in *Sonar*.

The Universal Backup

Consider this: you're conscientious about backing up, and when you finish a project you immediately save everything as a bundle file, or you back up the per-project folder to a medium like CDR, DVD+R or DVDR, tape drive, or removable hard drive. Your job is done, right?

Not necessarily. When you need to open your files five or 10 years from now because someone wants to do a remix or reissue, the media may be fine, *Sonar* may recognise the file, and all seems ready to go...until you find that several plug-ins won't load, because they're not compatible with Windows a few generations down the line, or you switched to a different computer and authorisation was tied to your original hard drive (worse yet, the company may have gone out of business, precluding re-authorisation).

Weird stuff can happen too. I tried to pull up a project in *Sonar* 2.2, but it said it couldn't load plug-ins that I knew were installed on my system — older files, using the same plug-ins, loaded without a hitch. Was there file corruption? Did I rename the plug-ins and not remember that I did? I'll never know. But this made me realise that simply backing up is not good enough.

The most universal backup format is to save each track as an individual WAV file — I think that even a decade from now, programs will be able to, at the very least, import WAV files. This also yields the greatest possible compatibility with other programs. The drag and save technique seems ideal for this concept: Select all tracks, drag them to a folder, back up the folder to multiple media, and voilà. But it's not quite that simple.

The upper track in the screen overleaf consists of a number of clips. The lower track is a clone of the upper track, but with all clips selected, then bounced to a single clip. The beginning has also been extended to the start of the song. Gaps between clips appear in the bounced clip as silence. ▶

Short Tips

- In the status line at the bottom of the screen, there are three slots to the left of the 'available Disk Space' indicator. These show if any mute, solo, or arm record buttons are selected. They also serve as master 'off' buttons for these functions — for example, if a slot says SOLO, clicking on it turns off all solo buttons.
- Drawing a 'marquee' around clips selects the entire clip. To select just a portion of a clip, hold the Alt key while click-dragging.
- Floating toolbars can be dragged anywhere on the screen — even over to a second monitor, if you want to free up space for the clips view and put all your 'control functions' elsewhere.
- If you dragged a toolbar from a 'docked' location, double-clicking on the toolbar's left side returns it to that location.

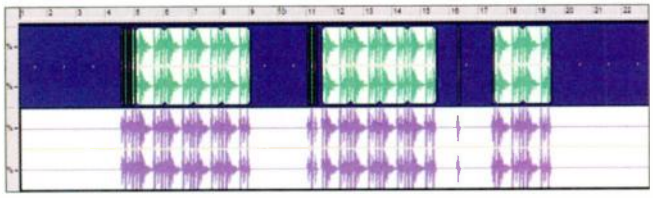


Figure 2: Backing up by bouncing all tracks to a single clip.

First, all the tracks need to have a common starting point, so you can time-align them when you import them into your DAW. Therefore, any track you save should extend from the song's beginning to the end of whatever's recorded on the track. You can do this by selecting all the clips in a track and going Edit / Bounce to Clip(s). This fuses them all into a single clip whose length extends from the leftmost clip to the rightmost (if there are gaps between clips, they are rendered as silence). Grab the leftmost edge of the composite clip, and drag it out to the beginning of the song. Then (important!) go Edit / Bounce to Clip(s) a second time so that this extra space becomes part of the clip as well.

If you don't bounce all a track's clips to a single clip, there are additional issues. If you select each clip, then drag and save, each will be saved as a separate file, with no obvious temporal relationship (Broadcast WAV file time-stamping should take care of this, but let's assume a worst-case scenario.) Furthermore, when you drag a slip-edited clip over, the entire clip gets saved — even any hidden parts. In many ways this is great, because you can go back and 'open up' the clip to reveal the edited part. But it doesn't help in terms of backing up individual tracks, only the clips that comprise them.

Also, automation moves, automation envelopes, clip envelopes, and the effects of any signal processing are not saved with a drag and save operation — only the raw clip data. While this is ideal for remixers, you may want the file to include some of these elements, which brings us to...

Exporting Audio

The best solution for a truly universal backup is to export each hard-disk track individually (we'll deal with MIDI tracks and virtual instruments in a bit). To do this, select only the track to export (I also solo it for added security), and select the range to be exported (ie. from the beginning of the song to the end of the track). The signal comes from the Source Buss being fed by the track, so to be absolutely safe play the track all the way through and make sure that both the track and bus meters don't indicate an excessively high or low level.

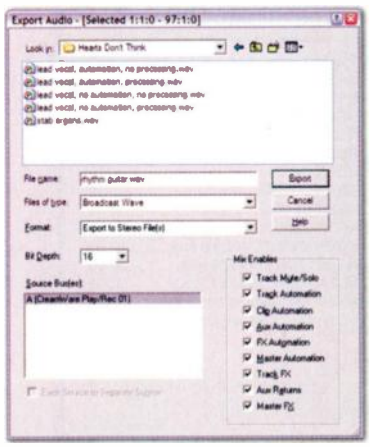


Figure 3: The Export Audio dialogue box.

If the levels are fine, double-check that you've selected the correct range, then go File / Export / Audio. You'll see a dialogue box that determines the exported track's characteristics.

The Export Audio dialogue box lets you choose a file format and type, along with bit depth and 'Mix Enables' options. These come in handy when you want to save multiple versions of the same track — one with automation, one without, one with processing, one with no plug-ins, and so on. For example, perhaps the reverb plug-in you used on the original vocal track sounds pretty cheesy compared to what a native reverb can do in 2008. In that case, you'll be glad you saved a version without reverb. Ditto automation: it's prudent to save a version of a file with automation moves and one without, in case you change your mind about levels.

Virtual Instruments

Render any virtual instrument outputs to an audio track, which can also be saved as a file. We've covered how to do this before, but the basic idea is to drag across the range you want to mix down, in the time line above the tracks. Then solo both the track containing the soft synth audio and the related MIDI track driving the soft synth. In the track view, control-click on both track numbers so that they're both selected, play the part and check the track and bus meters for overload, then export as described above.

MIDI

We're not done yet: Part of the backup should include any MIDI data that drives virtual instruments or provides controller data. Just use the File / Save As function to save the song, choose the file format (I recommend MIDI Format 1, as it saves each channel to its own track), then save. Open up the resulting file and make sure that the tracks are labelled in such a way that it's obvious which track drives which soft synth. In fact, document the entire tune in as much detail as humanly possible, and save this documentation in an ASCII text file with the rest of the files. This will be extremely valuable should you need to work with the song several years hence. SOS

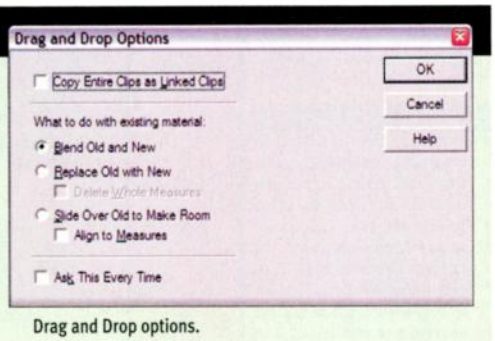
Traditional Drag And Drop Options

While we're in a drag-and-drop mood, let's look at some of the options *Sonar* allows when moving clips around.

The drag and drop options are powerful, but double-check where you click, because what you select becomes the default. Some users click on 'Replace Old with New' and then wonder why moving a clip deletes parts of older clips. Until you find the default that works best for you (I use 'Blend Old and New'), you have the option to tick the box that says 'Ask This Every Time' and choose the appropriate option.

Right-click in any empty space in the clips pane, and choose 'Drag & Drop Options'. Under 'What to do with existing material', you have several choices.

- **'Blend Old and New' means that if a clip overlaps another clip, both clips will play back during the overlap. If the Automatic Crossfades function is enabled, the two clips will crossfade instead of mixing.**
- **'Replace Old with New' indicates that moving a clip so that it overlaps an existing clip will delete the existing clip in the overlapped range.**
- **'Delete Whole Measures': if you tick this box, the existing clip will be deleted up to the beginning of the next measure that is not overlapped by the new clip.**
- **'Slide Over Old to Make Room': the main use for this is when inserting a clip at the junction of other clips, or in the middle of a clip. Everything to the right of the insert point moves further right to make room for the inserted clip.**
- **'Align to Measures': if this is ticked, the material slides over not just enough to make room for the inserted clip, but until it hits the next available measure line.**



Drag and Drop options.

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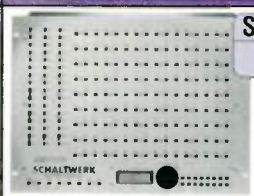

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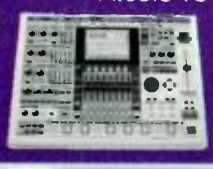
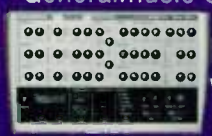


Roland MC909



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This month, we've got you thoroughly surrounded.

John Walden

SOS has always taken a strong interest in surround sound (see Hugh Robjohns' extended series on the subject starting in the August 2001 issue). Now the continued consumer success of the DVD format — and the consequent drop in prices of DVD writers — is encouraging many musicians to think about creating music for surround sound playback, whether in an audio-only context or with music-for-picture in mind. Add *Cubase SX* to a basic multiple-output audio card and budget 5.1 speaker set, and, for the purposes of experimentation at least, all the necessary equipment is in place.

Both *SX* and *Nuendo* offer plenty of scope for recording and mixing in surround sound formats. Unlike *Nuendo*, *SX* can only go up to 5.1 — but as that is the most popular format, this is not too much of a constraint. Both support 5.0 (3/2 — five main channels but no LFE channel) and the four-channel L, C, R, S configuration that formed the basis of the original film surround-sound format.

Figure 1: The VST Master Setup window allows a surround format to be selected.

Re. Formats

When you're creating a new project, the VST Master Setup window (from the Devices menu) allows the surround format to be selected (see Figure 1).

The '5.1 Surround' option (as selected in the screen shot) is the most commonly used. The alternative 5.1 formats simply specify the six channels in different orders, and it would obviously be important to check what is required in this respect if delivering a surround mix in a commercial context.

The final setup step requires opening the VST Outputs window (see Figure 2).

From here you can check that the required hardware outputs are assigned to the L/R, Ls/Rs and Centre/LFE channel pairs.

Down The Pan

One of the key advantages of surround-capable software is that it avoids the need for hardware surround panning controls. The software panning features of *SX* are well implemented. Clicking on the buss at the base of a mixer channel summons a pop-up (see Figure 3) and from that the audio track can be routed to either a single channel or to a surround panner. Selecting the latter changes the usual left-right pan control at the top left of the channel fader into a small surround panner. While this mini-panner can, of course, be used for panning, far more control is available if you double-click it to open the full Surround Panner window (Figure 4, opposite).

Figure 2: Hardware outputs are assigned in the VST Outputs window.

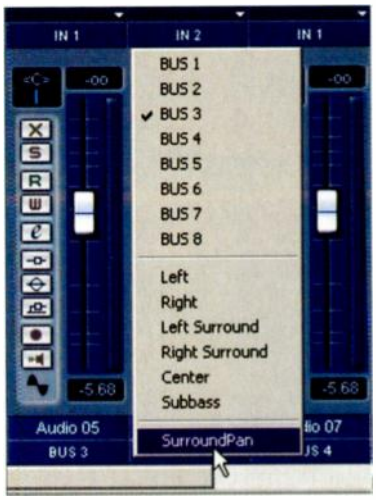

Figure 3: Individual audio channels can be routed to the Surround Panner via the pop-up in the Mixer.

Some of the controls here are relatively straightforward, while others require a little more explanation. On the simple side, holding down the Alt key and clicking on one of the speaker icons will toggle that particular speaker on/off. Also fairly straightforward is the LFE slider, which (as you'd expect) controls the level of the channel routed to the LFE channel, which will in turn appear at the sub-woofer speaker. Simple as this control is, however, some thought needs to be given to how it is used. The LFE channel is low-pass filtered and, in a film-audio context, is predominately used for the types of sound effects that make your teeth rattle. On the whole, music would be kept in the five main channels — all of which should have full range (20Hz–20kHz) speakers attached to them, so they should not be short of bass response. For music-only projects, there are no rules, however, so if your drum & bass track needs to get the furniture moving, feel free to experiment! The downside of using the LFE channel is that some of that bottom end may be lost when the mix is replayed on a system without an LFE channel.

Also simple in use is the Centre Level slider, which influences the stability of the spatial image across the front three speakers. A little experimentation soon reveals the noticeable difference between a 'phantom' centre image and a 'real' centre image. For example, if a stereo (in the 'two-channel' sense) track is spread mid-way between the L and R speakers and the Centre Level control is set to zero, the sound is replayed via only the L and R speakers and a 'phantom' centre image is created, exactly as in standard two-channel stereo playback. If the Centre Level slider is slowly pushed up, this 'phantom' centre is gradually replaced by a 'real' centre image, and sounds positioned in the centre (such as kick and snare drums) take on a slightly more solid feel. This effect is more noticeable as the listening position is changed off centre — 'real' centre images tend to be more stable and don't follow the listener towards one speaker or the other. With a mono sound source, the effect can be different again, with the 'phantom' centre often seeming a little more spread out compared to the 'real' centre derived from just the C channel.

Immediately beneath the panning area is the mono/stereo pop-up. With a mono track, this will default to 'Mono Mix' and a single panning ball will appear that can be dragged around between the various speakers. in the case of a stereo track, two panning balls appear and

Figure 4: The Surround Panner window.

a number of different options are available that influence how the balls are mirrored within the panner — but only one ball needs to be dragged and the other will move in a symmetrical fashion, either around the X (left-right) axis, Y (front-back) axis, or both axes (opposite quadrants in X-Y space). If Mono Mix is selected for a stereo track, the signal is summed to mono prior to panning.

Finally, the divergence controls alter the balance between the various speakers when panning. Some experimentation is needed to get to grips with these, but they tend to make panning moves sound somewhat less extreme.

Spin Me Right Round

As with other *Cubase* plug-ins, the parameters of the Surround Panner window can be automated. Activating the Write button for a particular channel means that any changes made within the Surround panner are recorded and will be reproduced during playback if the channel Read button is activated. This includes movements of the panning ball, Centre Level slider or LFE slider. However, if you're inclined to move sounds around within the surround field, editing the resulting automation data can require some patience.

As shown in Figure 5, the automation data generated by the panning ball motion is divided into two lanes — one for the front-rear balance and another for the left-right balance. If you wish to fine-tune the pan automation, both lanes of data need editing and this often means moving back and forth between lanes to get the right end result.

Mouse movements of the panning ball can be restricted to left–right only (Shift key), front–back only (Ctrl key) or diagonally (Alt or Ctrl Alt, depending upon which diagonal is required). Those who like the efficiency offered by Key Commands might want to consult the 'No Handy PanKey' box.

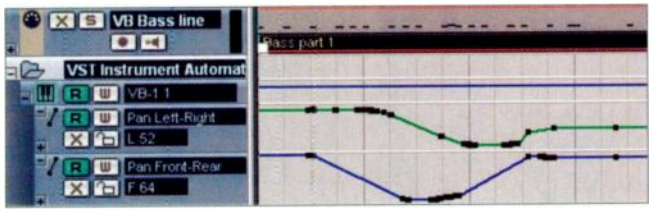

Figure 5: Automation data for surround panning.

Da Do Do Do (And Da Don't Don't Don't)

While *SX* is able to deal with surround-ready plug-ins, aside from the Mix6to2 (which simply provides a basic means of re-balancing the six channels down to a two-channel stereo pair), none are provided. However, stereo plug-ins can still be used for surround applications.

Figure 6 shows a common example: three Dynamics plug-ins have been added to the VST Master Effects window (one for each two-channel pair of the 5.1 configuration). In a surround project, each effects slot includes a six-channel routing box, allowing the stereo effect to be applied to a particular channel pair (L/R, Ls/Rs or C/LFE) in the 5.1 mix. If you're using a limiter or compressor in this way, some care is needed with the Centre/LFE pair, so that any special sub-bass effects don't cause the centre-channel levels (which often contain key elements such as vocals) to be over-compressed.

Another useful trick is setting up two reverb send effects and routing one to the Master Buss (which will therefore be sent to the L and R speakers) and one to Buss 2 (which will generally be the Ls and Rs speakers). Send levels for a particular audio track can then be used to place the reverb from that track either in front of or behind the listener, regardless of where the dry signal is panned. If the second of these reverbs is given a slightly different character, and perhaps a longer pre-delay time, this can add an extra sense of 'space' to the sounds.

There are, of course, also a few things to avoid doing with surround, and over-use of wild panning is certainly one. It's great for a special effect but it soon becomes simply distracting for the listener. Another no-no, for reasons briefly mentioned above, is over-dependence upon the LFE channel. Having said that, while surround mixing conventions are reasonably well established in film, for music-only mixing there are not yet that many rules set in stone.

Over & Out

SX allows either a split (six mono audio files) or a single interleaved file to be exported as the final mix. This is done via the 'File / Export / Audio Mixdown' option, as with two-channel stereo files. What *SX* will not do, however, is AC3-encode that six-channel mix so that it is suitable for inclusion, for example, as part of a video project on a DVD. AC3 encoders are not cheap. For example, the AC3 add-on for *Nuendo* costs around £650, a good chunk of which covers licensing costs from Dolby. Fingers crossed that, with time, as more users want to do their own AC3 encoding, these costs will come down. SOS

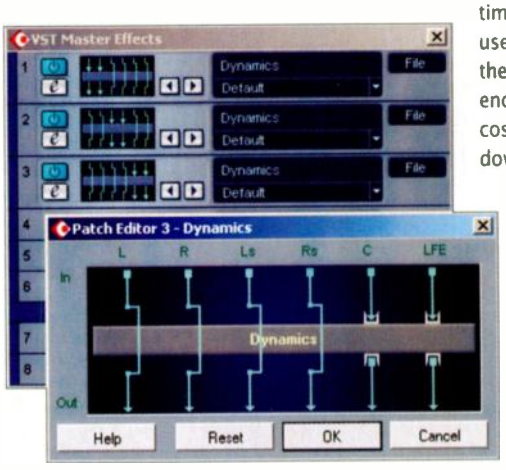

Figure 6: In a surround project, two-channel effects plug-ins can be applied to individual pairs of outputs via the VST Master Effects window.

No Handy PanKey

The Operation Manual for *SX* suggests that many of the controls in the Surround Panner can be controlled via Key Commands. Indeed, clicking on the Panner logo in the Surround Panner window and then clicking again brings up a list of these Key Commands. I'd be very grateful if someone tells me I'm missing something obvious here (please!), but in my PC version of *SX* (v. 1.0.5.58), I cannot get any of these to function.

Oddly, they do work as advertised in *Nuendo* (v. 1.6.1, because at the time of writing I'm still waiting delivery of my v.2 upgrade) where, in the Key Commands window, the Surround Panner options are listed under the Process Plug-in options. The Surround Panner does not have an entry in the same section of the *SX* Key Commands list.

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pro tools notes

Simon Price

The groundbreaking Beat Detective module in TDM Pro Tools systems offers some hugely powerful tools for manipulating the timing of recorded audio. This month we start by quantising audio material.

It's probably old-fashioned now to talk about how much Pro Tools and other non-linear systems have affected the music recording and production process. Recently, there's been lots of interest in the White Stripes' use of no-nonsense 'capture the performance' eight-track recording. However, the norm now is to see extensive use of multiple-take compiling, vocal tuning and drum editing, made viable even for low-budget productions by the speed of Pro Tools, *Logic*, and other DAWs. In particular, it's common to see the meticulous chopping of drum tracks into multiple slices so that the timing can be adjusted or corrected.

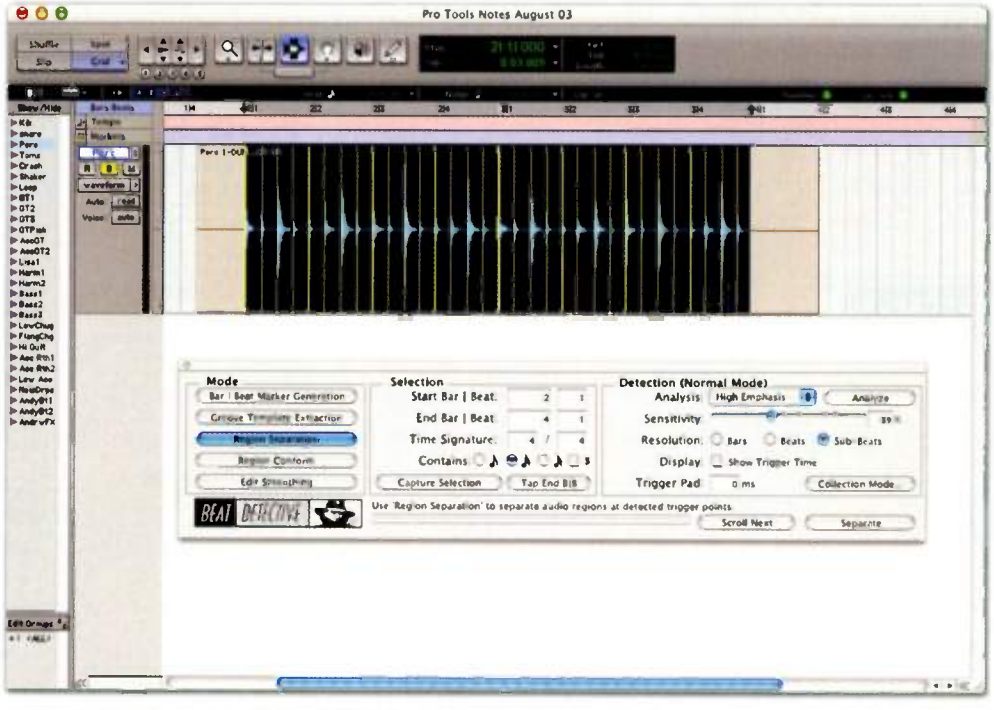
Pro Tools's TDM-only Beat Detective facility, accessed from the Windows menu, automates much of the drum editing process, thereby saving studio time and assistant engineers' sore backs. Beat Detective can automatically detect transients and cut up recordings accordingly, move the new slices around on the basis of various quantisation options to adjust the performance to a different feel or tempo, and automatically fill any gaps that appear afterwards. Another, almost inverse application of Beat Detective is to detect the timing and tempo of a recording, to use either as a groove template or the tempo map for a Session. This month we'll be looking at quantising audio to fix timing problems, and save some of the more complicated tempo and groove extraction functions for next time.

Quantising Drum Performances

Beat Detective is a actually a collection of several separate functions, listed on the left of the Beat Detective window as five 'mode' buttons in *PT6*, or four in *PT5*. To start at a simple point we're going to pass over the first two options (Bar/Beat Marker Generation and Groove Template Extraction), and jump straight in at automatically cutting up drum recordings and 'tightening' the timing. Once you've mastered this you should be able to perform several other tricks, such as using Beat Detective like Propellerhead's *Recycle* to replay drums at different tempos and match the feel of different loops.

In order to jump in at 'drum tightening' we need to look at the situation where the drums were recorded in accordance with the tempo and meter of your Pro Tools Session. This is because we are going to quantise the recording to the Bars and Beats grid in the Session (as you would with MIDI quantising). There's no problem here so long as the drums were recorded into Pro Tools with the drummer using a click; if not, you can use the Identify Beat command to match the Session's tempo and meter roughly to the recording.

The first step is to select across the area of drums that you wish to adjust. If you are just working with a single mono or stereo track, things are pretty simple. The important thing is to select from the point that represents the first beat of the first bar that you want up to the end of the passage, so you have an exact number of bars. Now open the Beat Detective window, and click the Capture Selection button in the central Selection section. This should then automatically fill in the start and end point fields by referencing the Session's bars grid. In the screen shot below I've done this with two bars of recorded percussion. The next step is to hit the Analyze button, whereupon Beat Detective will attempt to figure out where the transients, or hits, are located within the recording. You need to find a combination of the Sensitivity, Resolution and Contains settings that produces only the cuts you want to appear in the track. Use the Bars, Beats

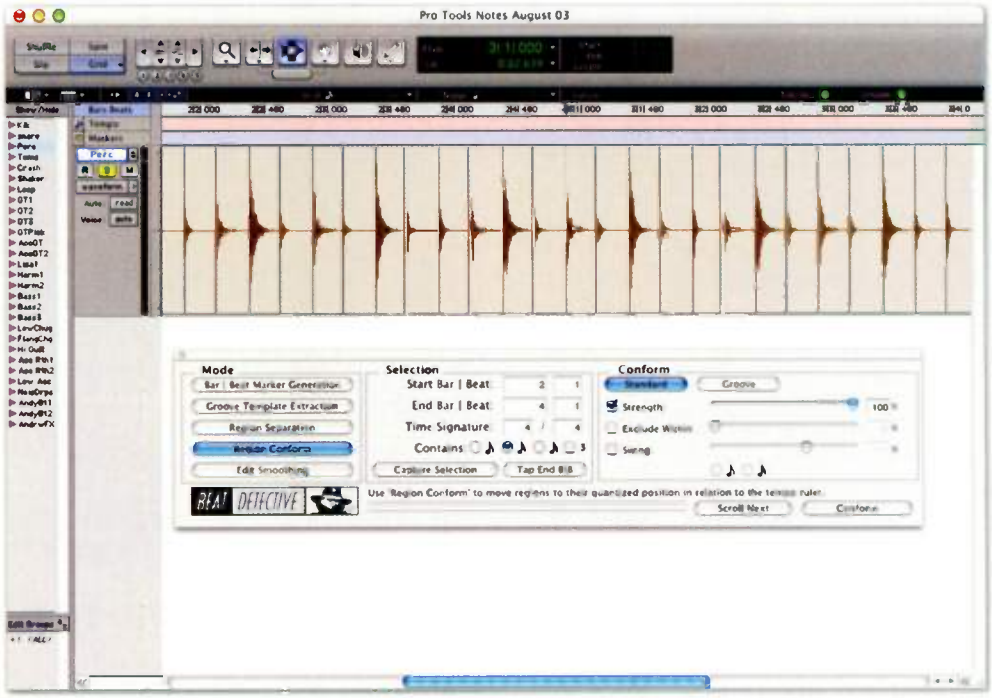


Using Beat Detective to analyse the transients in a two-bar drum loop.

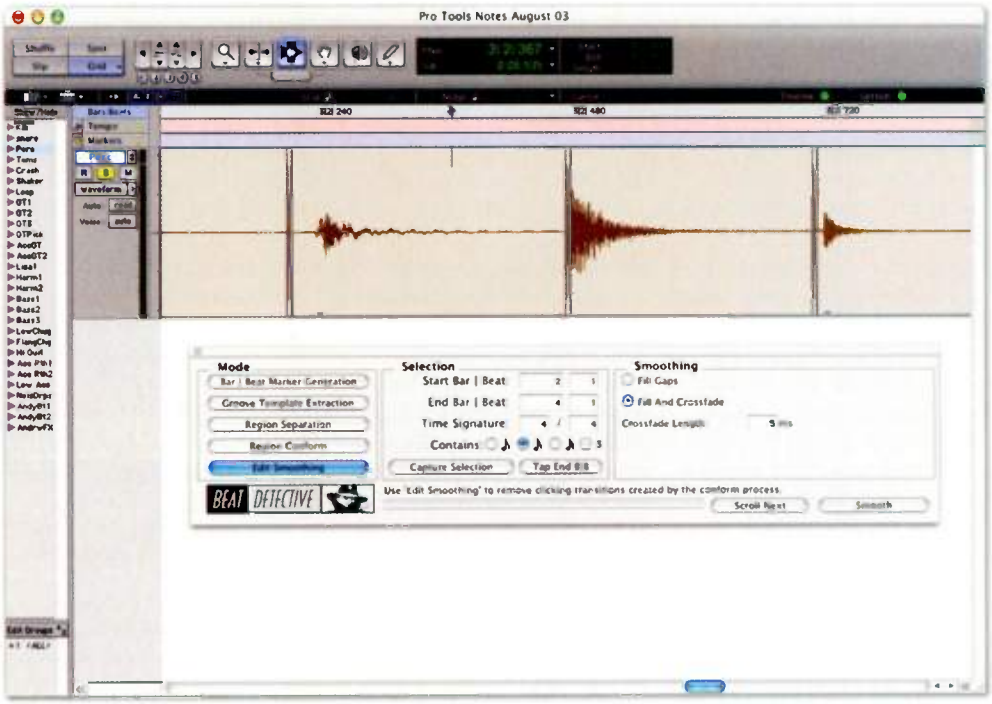
and Sub Beats settings to choose how finely you want to chop. As you adjust the Sensitivity upwards, Beat Detective will start to draw coloured lines over the waveform, starting with the most distinct hits, to show where cuts will fall. Notice that the cuts that *Pro Tools* assumes to be on the bar are thick, those on beats are medium, and inbetweens (sub-beats) are thin. The Sensitivity slider allows you to ignore quiet peaks that may just be background noise or spill from other mics. The Contains settings define how small a 'sub-beat' is. For example, in the screen shot, I needed to set this to 16ths for all the hits to be included. Just as in *Recycle*, you can add hits that aren't detected (by clicking with the Grabber), or delete spurious ones by Option-clicking on the Mac or Alt-clicking on a PC. Once you're happy with the settings, hit the Separate button and the selection will be cut into separate regions.

Clean & Tidy

Now that the section has been sliced, it's time to shift everything about to tighten up the timing. This is achieved by switching to Region Conform mode in Beat Detective. Over on the right you'll see a number of quantise settings. In Standard mode you set up the options manually, while in Groove mode you pick from your list of groove quantisation templates, just as with MIDI note quantising. The most basic option would be to use Standard mode with Strength set to 100 percent and the other options disabled. This will shift everything exactly into time and achieve a Krautrock-style machine-like performance. Using a lower Strength setting will tighten everything up while leaving some hint of the original timing variation or 'feel'. Additionally, the Exclude slider lets you leave stuff alone that was already pretty close, only moving hits that were noticably off. Finally, the Swing setting lets you introduce some new swing or shuffle to the performance by shifting the regions that were defined as sub-beats. Combining these gives you a number of options, such as using a straight 100 percent Conform first to remove any of the original feel (or just bad timing), then doing a subsequent Swing quantise to create feel from scratch. In fact the Groove mode has an option to do just this, by ticking the 'pre-process' box.



Conforming the drum loop with 100 percent strength moves every hit precisely onto the beat.



Edit Smoothing mode uses crossfades to mask any obvious gaps created by moving the slices around.

In the screen shot (top) my percussion track is now conformed with 100 percent strength (I like Krautrock), and you might be able to see that there are now obvious gaps between some of the regions. This can cause problems if you can hear obvious dropouts in the background room sound, and a good manual editor would sit and trim back the start of each region so that everything is joined up, possibly using fades to stop clicks or glitches. This is automated in Beat Detective in the Edit Smoothing mode. There's no great science to using this section: the next screen ▶

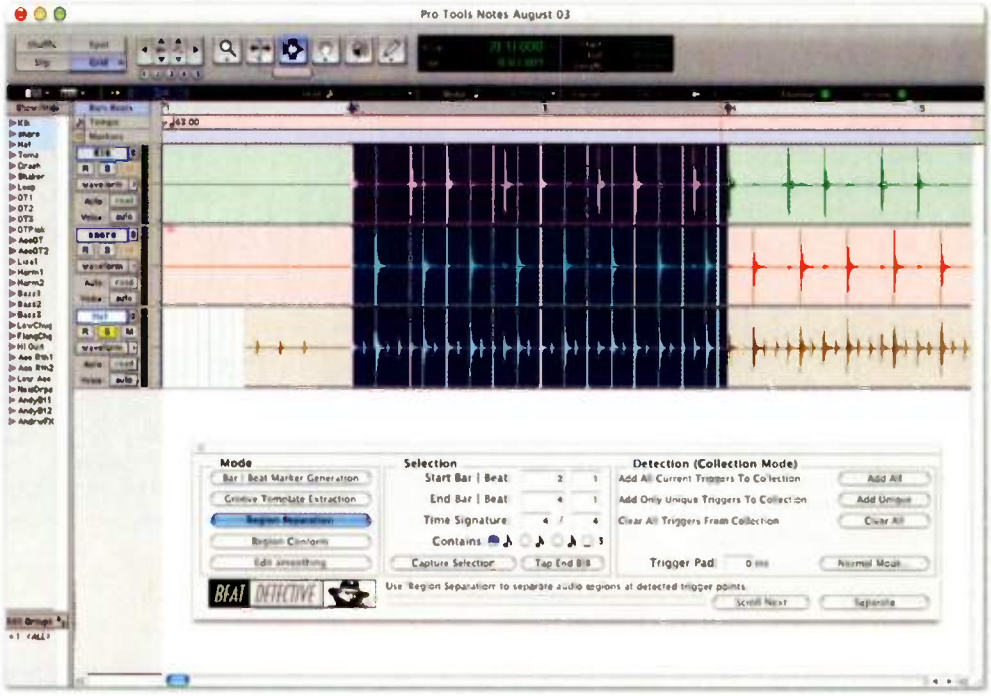
▶ (bottom of previous page) shows a close-up after I hit Smooth with 'Fill and Crossfade' selected. Ingeniously, this function thinks to add Sync Point arrows at the point of the original cut, so if you go back and change the quantising the hits will be referenced, rather than the starts of the newly trimmed regions.

Multitrack & Multi-miked Drums

Things get a little more complicated when you have recorded drums across a number of tracks. First off, it's important that you treat everything as one, because if you start moving tracks around with respect to one another you will introduce phasing or flamming between the spill on different mics. If you just select across a number of tracks and start playing with the hit detection, Beat Detective analyses all tracks at once, and then always applies all cuts across all tracks. This is probably not going to work, as you might get the same hits detected twice across different tracks due to delays between the mics. There are a couple of options here. The simplest is to just use one track to detect your transients, and then apply the results to all the other tracks. For example, you can select the kick drum track and set your sensitivity to just pick up the kicks, then extend your selection across the other tracks (by shift-clicking or using the selection cursors shortcuts) for separation. All tracks will now get quantised by the same amount, avoiding some possible problems.

However, if moving everything at the kick points is not enough to tidy up the overall performance, it's possible to do some fine-tuning. On a small selection it would be feasible to select across all the tracks, make sure everything you need is detected, then manually remove any cut markers that are doubled up before you Separate. It's important that you always keep only the earliest detection marker for any given hit (which will be on the closest mic) as this ensures the hit will get moved the same on all tracks without being cut in half on some tracks.

In fact Beat Detective has yet another automated process for performing something like this: the Collection Mode option. When using Collection mode, you analyse and detect each drum track one at a time, adjusting your detection settings each time. After each detection you add the cut markers to a pool which will later be applied to all tracks. To do this, select just one track at a time, switch Beat Detective's Separate page into Normal detection mode and make your detections. Then switch to Collection mode and choose Add Unique Triggers. Switch back to Normal mode, select just the next track and repeat for each drum channel. Finally, stay in Collection mode and select all the tracks concerned. You'll see all your cut markers across all tracks, colour-coded according to which track generated them (see screen shot above). Crucially, Beat Detective will discard cuts that are very close together, assuming they are caused by spill, keeping only the earliest one in each case. You can now hit Separate to slice up the whole performance in the most safe and optimal way. SOS



Collection mode allows you to amalgamate the transient information from several multitracked parts.

Current Versions

Mac OS X
- Digi 002: 6.0.2.
- Digi 001: 6.0.1cs1.
- Pro Tools HD, Mix, 24, M Box: 6.0.1.

Mac OS 9
- Pro Tools HD: 5.3.1r2.
- Pro Tools Mix, 24: 5.1.3.
- *LE* systems with Digistudio: 5.2.1.
- *LE* systems without Digistudio: 5.1.1 32T.

Windows XP
- Pro Tools HD, M Box: 5.3.3.
- Pro Tools Mix, 24, Digi 001: 5.3.1.

Quick Tips

If you're using *Logic* 6.1 with Digidesign hardware, you should download an updated DAE (Digidesign Audio Engine) file from www.digidesign.com/downloac/daedsi/. This fixes a couple of problems, including Audiosuite plug-in compatibility. The download is just the single DAE file, which you must manually drop in the right place, replacing the old version. The correct directory is Macintosh HD/Library/Application Support/Digidesign/.

Pro Tools TDM software has an 'auto-fades' feature, otherwise known as the 'lazy editing' option. This is activated in the Preferences (Operation pane) by specifying an auto-fade length of up to 10ms (0ms is 'Off'). *Pro Tools* will automatically fade in and out of regions during playback, hopefully eliminating any clicks or thumps that might exist after you've been hacking and moving stuff around. Be aware that this only occurs on playback, so if you Consolidate or Audiosuite something, or move to a system with auto-fades switched off, you might hear problems that weren't there before.

When arranging it's common to repeat and loop regions using the Command+D (Ctrl+D on Windows) Duplicate command. What you might not be aware of is that this doesn't only work on whole regions. For example if you have a particular short sound at the start of the bar, and you want to repeat it across several bars, switch to Grid mode, and drag a selection across the region and the blank space to the end of the bar. Duplicate will include the empty space when it loops your selection, rather than butting each copy of the region up to the original.

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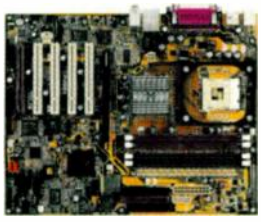

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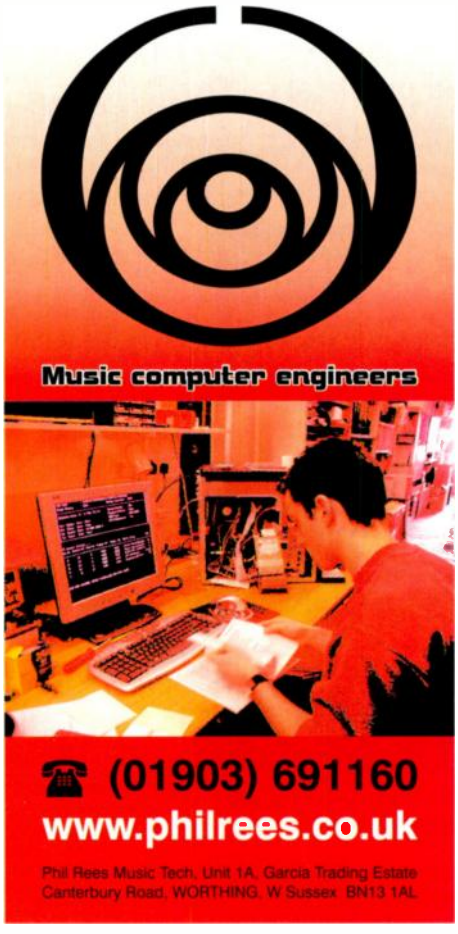

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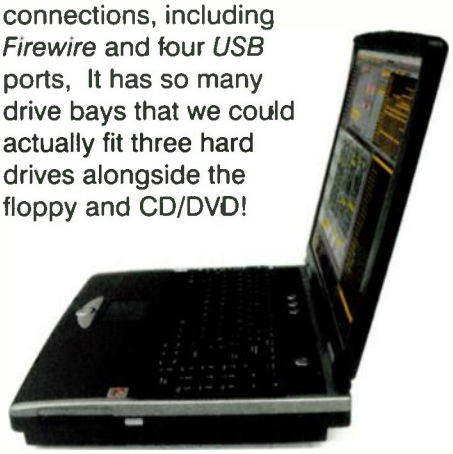

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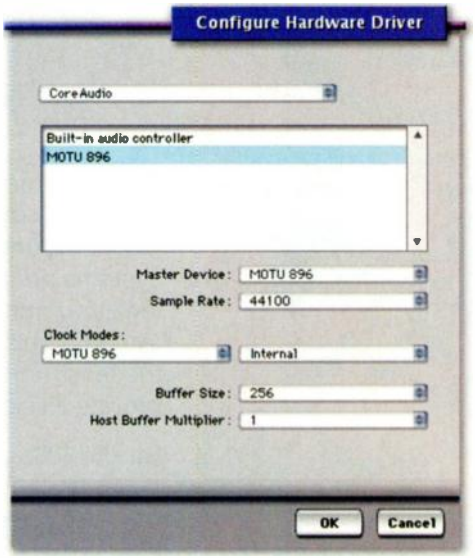
This month we take a look at using multiple audio interfaces with *DP3*, the new OS X patchlist format, and practical uses for the Waveform Editor for all *DP* users.

Robin Bigwood

One of the big advantages of running *DP* under OS X is its ability to use multiple audio interfaces simultaneously, such as a MOTU Firewire 896 with a PCI324-based 2408MkII. To accommodate this new flexibility, *DP4*'s Configure Hardware Driver window has been changed, and some new options have been added. Since virtually all interfaces designed to work with OS X have Core Audio drivers, the window's uppermost popup menu nearly always stays set on 'Core Audio'. Instead, interfaces available to *DP4* show up in the text field beneath, and selecting them for use is as easy as clicking on their names. If you're using more than one interface you need to specify a Master Device — the interface which *DP4* will use to determine the audio clock for the system. You can then configure clock options for each interface using the 'Clock Modes' menus.



DP3's revised Configure Hardware Driver window, with facilities for selecting multiple interfaces.

What isn't quite so obvious about this new arrangement — and you'd be quite forgiven for not twigging this immediately — is that *DP4* cannot by itself synchronise interfaces attached to it. To take the example above of an 896 and a 2408MkII, each has its own timing clock (although the 2408's is actually on the PCI324 card). *DP4* can address them simultaneously, but it has no facility for synchronising their two clocks, so left to its own devices a system like this would probably be plagued with clicks, pops and audio-timing problems, especially if you tried to route an input of one interface to an output of the other. Consequently you still need to synchronise the two interfaces manually, as it were, by taking a word clock output from the 896 to the word clock input of the 2408, for instance. You'd then need to designate the 896 as the Master Device in *DP4*'s Configure Hardware Driver window, and configure clock modes for each interface appropriately.

You also need to remember that some interfaces, including the Mac's own 'Built-in audio controller', have no facilities at all to send or receive clock, so any attempt to use them in conjunction with another interface is likely to be problematic, and could result in drifting timing or worse. So the moral of the story is that if you intend using more than one interface, make sure that the ones you choose for use with *DP4* can synchronise with each other — this is often not the case with cheaper USB units, for example.

Using multiple interfaces can sometimes scupper attempts to keep a *DP4* system running with low latency, as according to MOTU the number of interfaces (and hence drivers) you're using has to be reflected in the value of the Host Buffer Multiplier setting. So if you were using three interfaces and a Buffer Size of 256, you'd end up with the equivalent of a 768-sample buffer, and a tripling of the system latency. However, some interface combinations seem to work fine when the Host Buffer Multiplier is left on 1, so if you have multiple MOTU Firewire or PCI-based interfaces it's worth trying this out first, and raising it only if you suffer any audio problems. It's very much a case of 'suck it and see'.

OS X Patchlists

Now that FreeMIDI has been replaced by Core MIDI under OS X, the long-familiar FreeMIDI patchlists and ageing *Patchlist Manager* application have been consigned to history. It's to MOTU's credit that they released *DP4* together with virtually all their existing FreeMIDI patchlists converted into a format that would work with OS X, but as this new patchlist format is so different to the old one, and MOTU have so far not issued a replacement *Patchlist Manager*, it's not surprising that some users feel as if they've taken a step backwards. However, although a few things are still up in the air, getting to grips with the new arrangements is not all that difficult, and in the long run it should turn out to be an improvement.

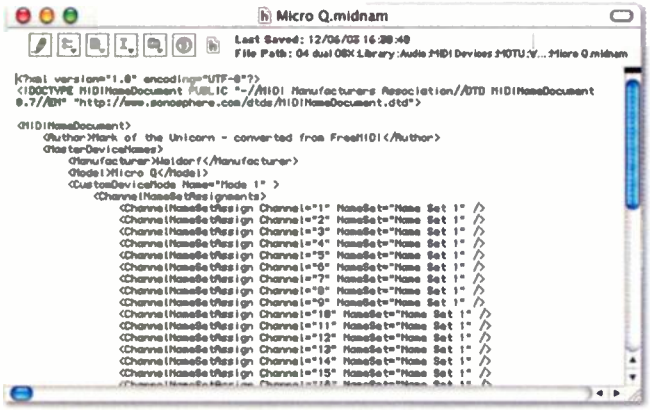
You'll find the OS X patchlists that come as part of a full *DP4* installation in ~/Library/Audio /MIDI Devices/MOTU. In this folder can be found two types of file you may not be familiar with, '.middev' and '.midnam', along with folders named after manufacturers, containing more '.middev' and '.midnam' files. Despite the slightly scary extensions, these files are nothing more than plain text, so you can open them in something like *BBEdit*, and I'd urge everybody who makes use of patchlists to do this straight away. What you'll find is an XML (Extensible Markup Language) document which is a structured system of tags and text not dissimilar to HTML. In this case, though, the document describes various attributes and characteristics relating to MIDI (see screenshot, above right). An

Waveform Editor Basics

Because of the sheer flexibility of *DP*'s non-destructive audio editing, it's possible to go for months without using the Waveform Editor window. But there are one or two things you can do there that can't be done elsewhere in *DP*.

First of all, normalisation. This process makes audio as loud as it can be in the digital domain without modifying its dynamic range, and can be simpler and more effective at boosting recordings made at too low a level than treating them with dynamics processors or the *Trim* plug-in. To apply Normalisation to a soundbite visible in the Tracks window or Sequence Editor, select it and then choose Edit in Waveform Editor from the Audio menu (in either *DP3* or *DP4*). A Waveform Editor dedicated to that soundbite's 'parent' audio file appears, with your soundbite 'active', though you may need to drag the close-up lens at the top of the window before you can see it. Double-click in the soundbite's title bar to select it, and then choose Normalise, again from the Audio menu.

The Waveform Editor also allows you to draw waveform data, so that you can repair a digital spike or click, for example. Open the waveform editor as if you were going to Normalise the soundbite, and then locate the click using the close-up lens and by zooming — the standard combination of the Apple/Command key with the left/right arrow keys works here too. When you're zoomed in to the point where you can see the detailed waveform shape, hold down the 'P' key to select the Pencil tool and draw directly over the click, ideally creating a smooth transition with the 'good' waveform either side. With any luck, and a touch of artistry, the offending click should be history.



A little bit of an OS X patchlist in XML, showing how some of the basic properties of the synth are defined.

interesting requirement of XML is that it should be easy to read and understand, so ploughing through a '.midnam' or '.middev' file is not at all difficult, even if you're not quite sure what each bit of it does. It doesn't take very long to realise that '.midnam' files are patchlists — they contain long lists of patch names (and sometimes note names for drum kits) together with basic MIDI information about a single synth or other device. Their counterparts, '.middev' files, are not patchlists but provide information about *types* of MIDI device made by a particular manufacturer. Consequently there's a '.middev' file for individual companies, containing information about the MIDI gear they make, and '.midnam' files for MIDI devices that need them. So although Akai get a '.middev', it doesn't get any '.midnam' files, reflecting the fact that there's no real point having pre-configured patchlists for samplers.

The '.middev' and '.midnam' formats aren't MOTU's invention, and so are not in a proprietary format like the old FreeMIDI patchlist. To find out more about who is responsible for them you need to follow the link at the top of all MOTU's .middev and '.midnam' files, and visit www.sonosphere.com, the web site of Doug Wyatt, who, as many will already know, was one of the main people behind OMS. You might also like to drop by the MIDI Manufacturer's Association at www.midi.org, as they're responsible for ratifying the new file types. What you soon learn is that the specification for XML-based MIDI files hasn't been finalised, so it turns out that MOTU really stuck their necks out by converting all their old patchlists. It also means, of course, that what we're using now could change at some point in the future, although if it does (and it looks like it might) the change should be only relatively slight.

There are various reasons why you might want to modify a '.midnam' file, such as altering patch names to reflect new sounds that you've programmed, or to add an entire bank to accommodate a synth expansion card, so how do you go about doing this? The most direct approach is editing the file manually in a text editor. This is nowhere near as worrying as it might sound. To give you an example, when I recently bought a Waldorf Micro Q, I instantly set about making some sounds, and saved one of them over a particularly boring factory preset in patch location C006, calling it 'Evil Noise rb' (well, it did sound evil!). To get that change to show up in the Micro Q's patchlist in *DP4*, I opened the Waldorf folder inside Library/Audio/MIDI Devices/MOTU, opened the 'microQ.midnam' file in my text editor of choice, *BBEdit Lite*, scrolled down to the line <PatchBank Name="Bank C">, located <Patch Number="6"....> just beneath, then changed "Up and Down Lead..." to "Evil Noise rb". After saving, the modified patch name then became visible in *DP* next time I started it up. Adding an entire bank is not much more difficult, though it might feel a bit nerdy if you've never written anything in XML or HTML before. Basically you need to insert a new bank tag such as <PatchBank Name="My New Bank"> between or at the end of the existing banks, follow it with information about the controller 0 and 32 numbers needed to select the bank, in the following format:

```
<MIDICommands>
<ControlChange Control="0"
Value="x"/>
<ControlChange Control="32"
Value="y"/>
</MIDICommands>
```

and then set about entering patch names in the following format:

```
<PatchNameList>
<Patch Number="001" Name="My
First Patch"
ProgramChange="0"/>
...
<Patch Number="128" Name="My
Last Patch"
ProgramChange="127"/>
</PatchNameList>
```

before adding a final

```
</PatchBank>
```

to round things off nicely.

What the more experienced patchlist tweakers amongst you may have realised already is that the XML patchlists MOTU have employed have a quite fundamental weakness — they can't describe, in a single bank, 'collections' of sounds drawn from several banks on the synth itself. That's because the bank change MIDI controllers 0 and 32 can only be specified once per list of 128 patches. Whilst only a slight change in the '.midnam' format is necessary to remedy this, we can only keep our fingers crossed that it occurs soon!

CherryPicker is Rob Martin's little freeware application for painlessly manipulating FreeMIDI and XML patchlists in OS X.

In the meantime, you might like to check out a great little freeware application, *CherryPicker*, that was written quite recently by Robert Martin, ex-bassist in the prog rock band Curved Air. *CherryPicker* can make the renaming of patches and the writing of new OS X patchlist banks almost painless, and (with the bank-select proviso above) convert OS 9 patchlists into OS X XML format and *vice versa*. You can download it from www.savagetranscendental.com/cherrypicker right now, and there'll be more about it (and the importance of '.middev' files) in next month's Performer Notes.

One final thought — it's probably worth making a safety copy of any '.midnam' files you intend to modify before letting loose with your text editor — that way normal service can be restored if the XML sprawl gets the better of you. SOS

Quick Tip

One of *DP3*'s greatest assets, its 'speech-bubble' help, has disappeared from *DP4*, and in its place is a more fully featured, searchable Help system, delivered in the manner of most other applications, and probably more useful in the long run. Hitting the Apple/Command key and '/' (forward slash) calls up help for whatever window you're currently using, whereas holding down the Shift key with Apple/Command and '/' displays a more general *Digital Performer* Help window. You can access these functions from the Help menu, too.

Current Versions

- MOTU *Digital Performer*: v4.01 (OS X).
- MOTU *Digital Performer*: v3.11 (OS 9).

The Project Manager is one of *Logic*'s most useful v6 features, and this month we show you how it can work in different ways to suit your needs.

Len Sasso

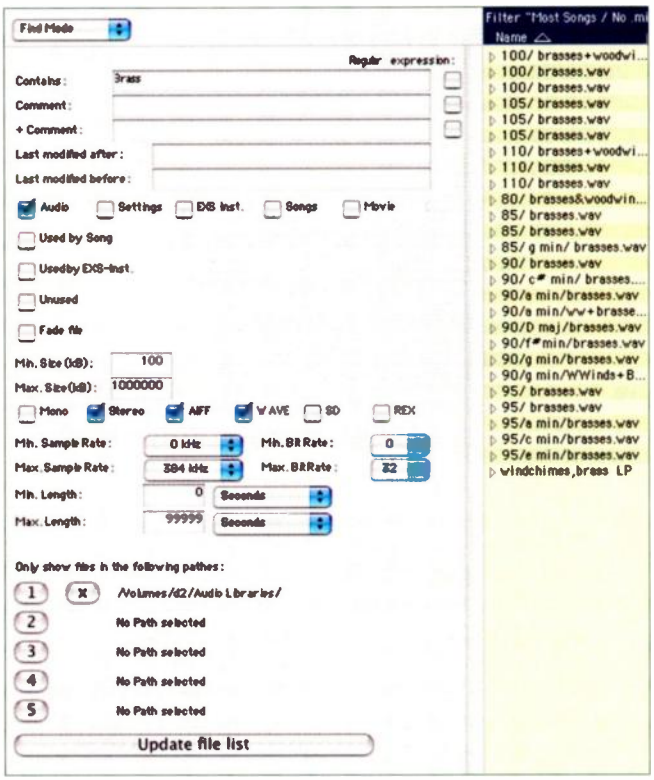
The new Project Manager in *Logic* is a tool for managing all data relevant to *Logic* on all media attached to your computer. But whether you choose to use it for complete data management (as Emagic recommend), use it occasionally as a window into your hard drives, or ignore it completely is a matter of personal preference. Although *Logic* is fully functional without the Project Manager, there are many ways in which it can save you time and effort in your daily use of *Logic*. On the other hand, those features come at a price, because, for the Project Manager to do its job fully, it must build and maintain a database of all relevant files on all your hard drives. This initial scanning process can take quite a while, and the database can quickly get out of sync if you subsequently move, copy, delete, or rename some of those files in the Finder or with another application. Let's first take a look at what the Project Manager can do for you, then examine your options in using it.

The Project Manager keeps five file types in its database: *Logic* Songs, audio files, *EXS24* Instruments and their samples (which are also audio files), Quicktime movies, and plug-in settings files. It displays those in a two-panel window in which you select the file type and location in the left panel and view file references in the right panel. The file references are displayed in hierarchical form, allowing you, for example to see all audio files used in a particular *Logic* Song or all *Logic* Songs in which a particular audio file is used. For *Logic* Song files, any reference to any file type catalogued by the Project Manager is displayed. For other file types, all *Logic* Songs that reference the file are shown, as well as all duplicates of the file. Double-clicking any of the cross-references takes you to that file's listing in the database, from which you can examine its dependencies. For example, you can select a Song then double-click an audio file referenced by that Song and find all other Songs that reference that file.

Browse & Find

The Project Manager has two viewing modes: Browse and Find. In Browse mode, a typical browser-style file tree is displayed in the left panel, whereas in Find mode, you enter criteria in the left panel that the Project Manager uses to select the references displayed in the right panel. Browse mode is useful for examining the contents of a specific Song or a specific location on your hard drive, whereas Find mode is useful for locating all files of a particular type. The Find mode criteria include: file type, text from the name and two comments fields, range of modification dates, and numerical data appropriate to the file type (for example, sample rate of audio files). You can select up to five specific destinations to include in the search, or select none in order to search the entire database. The two comments fields are a special feature of the Project Manager's database, allowing you to enter comments for individual items or all selected items at once, which is a great way to organise your Song and audio libraries if you want to spend the time.

One of the Project Manager's most useful features is that you can use it to audition, load, and even edit in *Logic*'s Sample Editor, any audio file within its database. Instead of rummaging around through stacks of folders in the Finder or in *Logic*'s Load Audio File dialog, you can simply navigate to locations in Browse mode or set up selection criteria in Find mode, then use the arrow keys to step through the individual files in the reference panel. You can assign a Key Command to the Project Manager's Start/Stop Preview function (preferably the same one that you assign to Play/Pause from the Arrange window) and use it to audition audio files as you select them. Once you've selected an audio file, you can reveal a Sample Editor-style overview directly in the Project Manager, open and edit it in



The Project Manager's Find mode allows you to specify various criteria for each supported file type and search for matching files in up to five locations (or in the entire database if no locations are specified). Here all audio files in a single path with the word 'Brass' in their file name are selected found and displayed.

Logic Tips

Holding the Option key while cutting a region with the Scissors tool causes the region to be cut into equal-sized slices. Dragging over the region (audio or MIDI) with the Scissors tool will scrub the region, allowing you to locate the cut point by ear. *Len Sasso*

You can save selections in the Sample Editor directly to your hard drive as new audio files using the Save Selection As option from the Audio File menu. That is available as a Key Command as well. *Len Sasso*

Have you ever tried to Merge audio regions into a single file in the Arrange window, only to have it do nothing at all? This will probably be because the track is muted, but may also be because the track instrument is not a suitable Audio object. *Mike Senior*

When you're jumping back and forth between Screensets with consecutive two-digit numbers, use the Key Commands for Next Screenset and Previous Screenset. That's much easier than recalling them using their two-digit numbers. *Len Sasso*

Current Versions

- Mac OS X: *Logic Audio Platinum* v6.1.0
- Mac OS 9: *Logic Audio Platinum* v6.1.0
- PC: *Logic Audio Platinum* v5.5.1

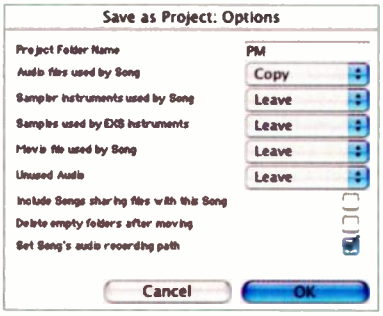
Logic's Sample Editor, or add it to the Audio or Arrange windows.

Song Consolidation

Another useful Project Manager function is Song consolidation. You can invoke that either from the global File menu or the Project Manager's Functions menu. Both ways involve the same steps, offer the same options, and produce the same results. Consolidating a Song amounts to collecting all the data referenced in the Song in a single location, which you might want to do for archiving or transporting the Song. If audio files used in the Song are not used by any other Song, you typically want to simply move them to the same location as the Song itself. If, on the other hand, the Song shares files with other Songs or other applications, you will want to copy rather than move the original, while changing the Song references to the copied versions. In either case, you can then burn a CD of the folder containing the Song and then delete the original or not as you see fit.

As mentioned at the outset, all this added functionality comes at the cost of creating and maintaining the Project Manager's database. If you have a lot of hard drive space, both processes can be time-consuming, but you can also adopt partial solutions. The full-bore approach is to start by having the Project Manager scan all your hard drives (do that when you plan to take a long break), ensure the Project Manager database is loaded each time you use *Logic* (there's a Global Preference to automate that), and use the Project Manager whenever you want to install new files relevant to *Logic* (for example from an audio sample CD). If you share audio and MIDI files with other audio software and that software can also create files, your hard drives will still get out of sync with the Project Manager, requiring a rescanning (which usually takes significantly less time than the original scan).

If it's not practical for you to keep the Project Manager totally up to date — for example, if you spend a significant amount of time using other audio software or working on projects created on other computers — you have the option of selectively scanning your hard drives and not worrying whether the Project Manager knows and shows everything. The Project Manager offers two ways to limit the data it scans: by allowing you to designate scan paths and by letting you scan individual folders. The Project Manager's sophisticated system of interleaving Include and Exclude paths allows you to set up virtually any subset of your hard drives' contents for scanning. Scanning individual folders allows you to take a 'scan as you go' approach to using the Project Manager. If you take a selective approach, you'll probably also want to disable automatic loading of the Project Manager database, as that takes time at each startup of *Logic*. Then, the database will be loaded only when you open the Project Manager window. Although the selective approach doesn't give you full Project Manager functionality, it will provide you most of its audio file auditioning and Song consolidation features at a fraction of the time-cost. SOS

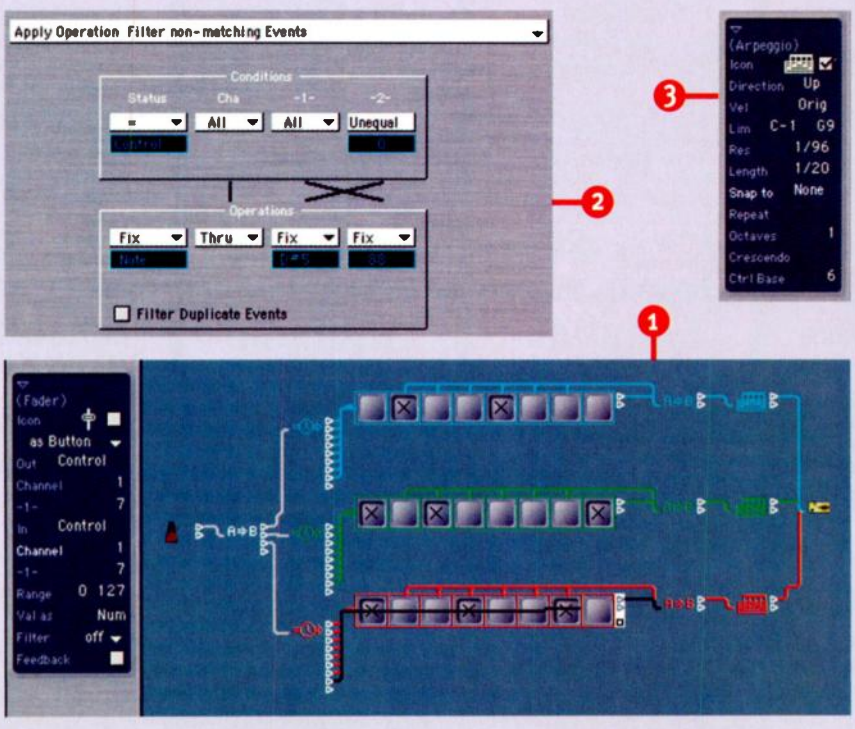


The Project Manager's Consolidate Files Of Selected Songs option allows you to move or copy some or all file types referenced in a Song to the same location as the Song file. That's useful for archiving or transporting a Song and all its files. The global File menu's Save Project As performs the same function on the current Song, and also uses the Project Manager database.

A Simpler Matrix Sequencer

It struck me while reading last month's *Logic* Notes that there might be a simpler way to create a matrix sequencer in the Environment, and after a while experimenting I came up with the three-line design shown in Screen 1 (the Song file is also downloadable from www.sound-on-sound.com) — it doesn't provide the same visual interest as Steve Knee's offering, but it's easier to put together. I've used the MIDI Metronome Click object just like Steve did, but I've converted the notes it produces to Bang messages (Meta message number 99) with a value of 63, as shown in Screen 2. These Bang messages are used to trigger buttons to send out controller messages, but first Delay Line objects are used to generate eight Bang messages per bar from the single Metronome pulse. Setting the Repeats field to seven and then cabling each output to a different button achieves this, as Delay Line objects automatically cycle their delays around all available outputs by default. The buttons in my example are set up as shown in the Parameters box at the left of the screenshot, so that they send out MIDI Continuous Controller number seven messages — these messages have a value of 127 if the button is down and a value of zero if it's up. Each line of buttons feeds a common Transformer object, which not only filters out zero-value controllers, but also converts 127-value controllers into the note messages of your choice — you can, of course, convert to controllers instead, if you want to set up sample and hold-style effects.

Steve also explained the difficulties of implementing note duration control, but there is a nice workaround for this by cabling each line's output Transformer object through an Arpeggiator object, which is set up as in Screen 3. You can use the Parameters Length field to adjust note durations, and its worth having an Arpeggiator per line so that you can adjust each line independently. *Mike Senior*



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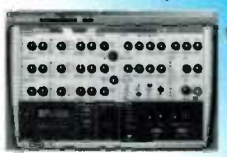

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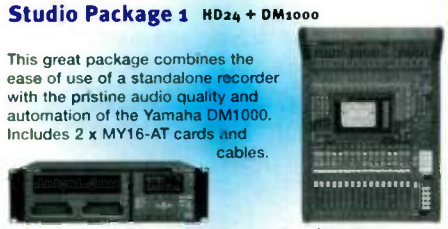

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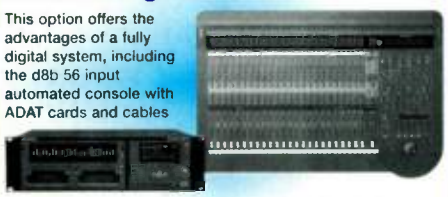

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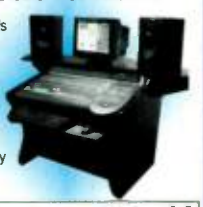

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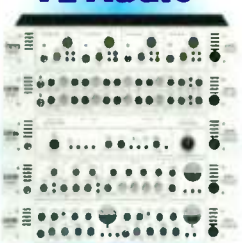

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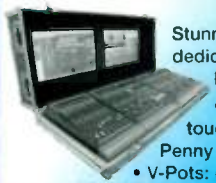

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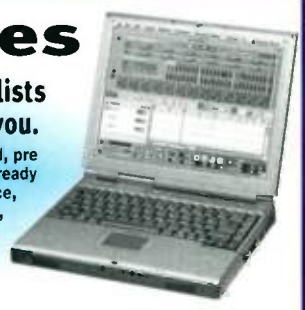

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DM2000

With nine times the processing power of the 02R and a feature set that outclasses desks at twice the price, the DM2000 is a formidable digital console. Features include:

- 96 channels
- 24 touch-sensitive faders
- 30 busses
- 96KHz operation and signal path throughout
- Dedicated DAW control section including transport control and track-arming for Digidesign Pro Tools, Steinberg Nuendo
- Studio Control software for Mac or PC

DM1000

Designed with film, video and post production in mind, the DM1000 offers many of the DM2000 features in a compact format

- 48 input channels
- 17x100mm faders
- 18 busses
- 96KHz audio
- Frame accurate automation
- Effects & processing on every channel
- Dedicated DAW control

01V96

With the exact same footprint as the 01V, the 01V96 will be familiar to 01V users, whilst also offering some nice surprises

- 40 channels
- 17x100mm faders
- 24 bit/96KHz audio
- Full automation
- Effects & processing
- Up to 99 presets
- 8 User defined keys
- DAW support
- Studio manager software

02R96

The 02R96 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.

- 56 channels
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Aphex Stompboxes

Aphex Systems have been making audio processors for more than 26 years. They are famed for their Aural Exciter technology which, in a nutshell, enhances the sound of a recording by synthesizing additional high-frequency harmonics to create the impression of presence and punch in a mix. More recently, Aphex have introduced their Optical Big Bottom processing concept, which enhances the bass in the same way that the Exciter affects the high end.

The latest products from Aphex are three stompboxes, each containing the essential functions of both the Aural Exciter and Big Bottom processors. The pedals, named the Bass Exciter, Acoustic Exciter and Guitar Exciter, have all been optimised to best suit the instrument they are named after.

UK distributors of the pedals Pure Distribution are kindly giving away three of each type of pedal, so that the three eventual winners of this competition will each get a Bass, Acoustic and Electric pedal. The retail price per pedal is £115, so we are talking about three prizes each worth £345.

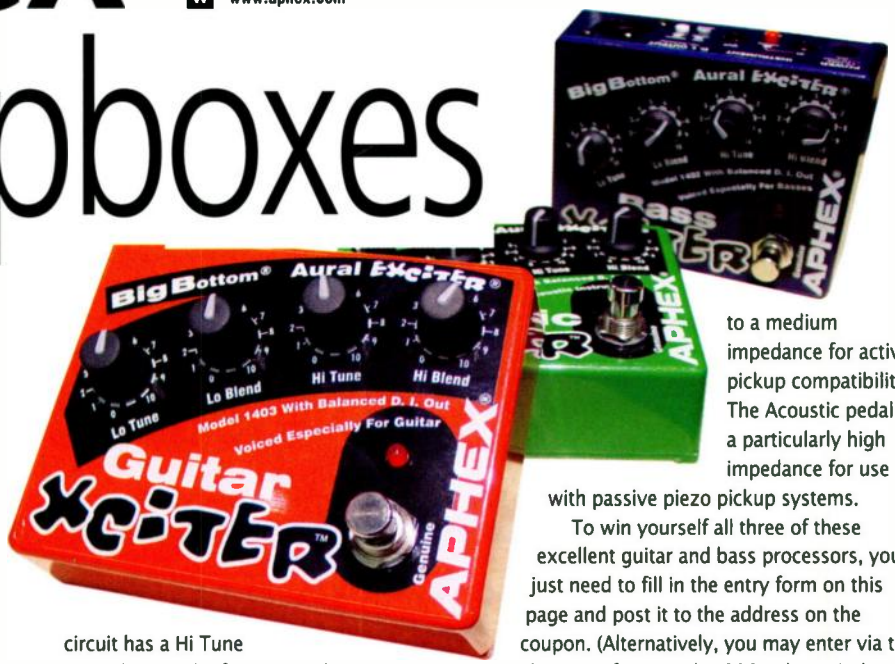
Pure are so keen to give these pedals away that our Editor In Chief, Paul White, has only just had time finish his review, which you can find elsewhere in this very issue. Before you flick to that page, though, here's a brief summary of the pedals' features...

Each stompbox has a robust stud switch for on/off selection, plus four main control knobs labelled Lo Tune, Lo Blend, Hi Tune and Hi Blend. Starting with the Big Bottom-derived controls, the Lo Tune sets the upper frequency limit for bass enhancement while Lo Blend determines how much of the effect is added. The Lo Tune range is 40 to 210 Hz for the Acoustic model, 30 to 210 Hz for the Bass model and 40 to 210 Hz for the Electric Guitar model.

The Aural Exciter part of the circuit has a Hi Tune control to set the frequency above which enhancement takes place, and a Hi Blend control to regulate the amount of harmonics added back in. The Hi Tune range is 300Hz to 3kHz for the Acoustic model and 500Hz to 5kHz for the Bass and Guitar models.

A single 9V battery should be enough to power one of the Exciter pedals for 150 hours of continuous operation, although an external power adaptor is available. The adaptor has been designed to work in any polarity, accepting both AC and DC power over the voltage range 5 to 12 Volts or 7 to 17 Volts respectively.

Audio output is available at instrument level from an unbalanced jack socket and via an XLR DI output with its own ground-lift switch. Usefully, the DI output has a Wet/Dry push button making it possible to select whether any effect is to be added or not. The instrument input can be switched to high impedance, for use with passive pickups, or to a medium impedance for active pickup compatibility. The Acoustic pedal has a particularly high impedance for use with passive piezo pickup systems.



To win yourself all three of these excellent guitar and bass processors, you just 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 **26th September 2003.** SOS

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questions

Which one of the following is not an Aphex pedal in the range?
- a. Acoustic ☐
- b. Electric ☐
- c. Bass ☐
- d. Synth ☐

Which of the following controls is not included on the pedals?
- a. Lo Tune ☐
- b. Lo Blend ☐
- c. Hi Time ☐
- d. Hi Blend ☐

The Aphex pedals can run on a 9 Volt battery for how long?
- a. 100 hours ☐
- b. 150 hours ☐
- c. 200 hours ☐
- d. 250 hours ☐

Aphex pedals tie-breaker

Enhancement tools like the Aphex pedals have to be used sparingly in most circumstances, but what popular recordings do you think would benefit from more excitement and a bigger bottom? Answers in 30 words or less please.

.....

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Would you like to receive more information on Aphex products? If yes, please tick or cross this box. ☐

Post your completed entry to: Aphex Pedals competition August 2003, *Sound On Sound*, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ, England.

WRH

the small print

1. Only one entry per person is permitted. 2. Employees of *SOS* Publications Ltd, Aphex, Pure Distribution 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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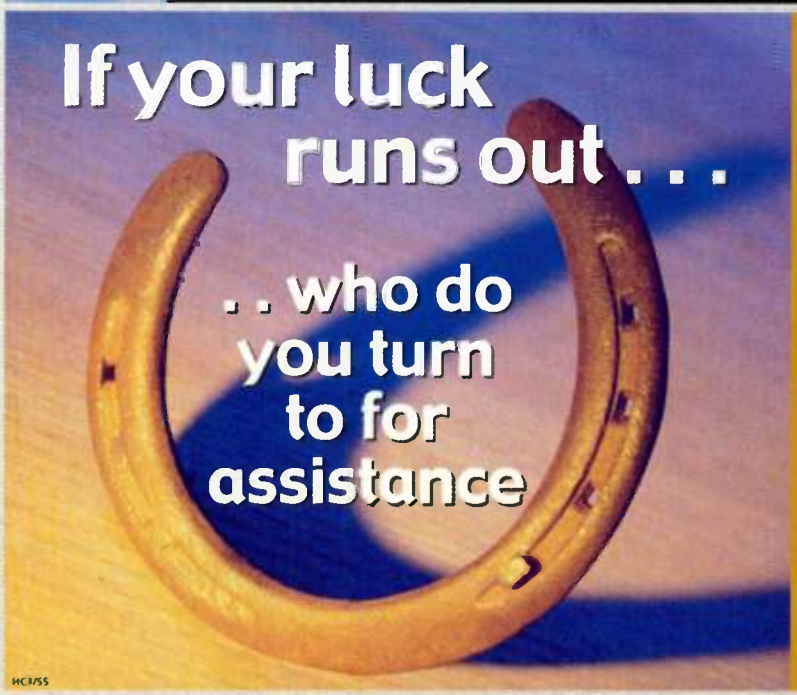

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FOSTEX D160 16-track hard disk recorder, analogue and ADAT ins and outs, 10GB drive, good condition, includes display extension cable, £550 ono. ☎ Peter 079 0163 0300 (Longdon, Staffordshire).

KENTON PROSOLO MIDI-to-CV convertor in mint condition, £40; Red Sound BPM FX Pro, top end studio version, syncs to BPM with separate outs and MIDI, £200. ☎ James 020 7207 7788 (London).

MACKIE 1604VLZ, immaculate, boxed as new, one owner, manuals, rack bits and more, £400. ☎ 01925 723301 (Warrington, Cheshire).

PIONEER DJM600 professional mixer, in perfect condition, boxed, contact me for full specification and details, £550. ☎ Paul 077 8992 1956 (Dunfermline, Fife).

REVOX PR99, £750; Studer A807, £950; B67VU, £750' A80VU, £950; A810, £800; 904 24:8:2, £5500; 902 10:2, £1200; Beyer M88, £70; Telefunken M15A, £700. ☎ 01246 275479 (Derbyshire).

RODE NT2 including case and shockmount, £175. ☎ Chris 01536 762305 (Kettering).

ROLAND VS840EX, £270 ono; M Audio Midisport 2x2, unregistered, £35; Roland PC180A MIDI controller keyboard, £50; Carillon AC1, as new, double hard drive, £950 ono. ☎ Luigi 079 5138 4906 (London).

ROLAND VS1680 digital multitrack recorder, expanded with two effects boards, hardly used, boxed, mint condition, £650 ono. ☎ 01375 370707 (Grays, Essex).

SONY MDM-X4 four-track Minidisc recorder, four data discs, manual, well used but in good working order, £250. ☎ Neil 079 4679 9001 (London).

SOUNDTRACS TOPAZ 72 channel mixer, 36 long-throw faders, eight buss, additional 36 rotary faders, includes meter bridge and seperate PSU, very good condition, £900. ☎ 077 6673 5261 (Herts).

SPIRIT FOLIO SX, as new, manuals, 20 inputs, sub mix, three auxes, £220. ☎ Craig 01273 621307 or email beedham18@yahoo.co.uk (Brighton).

SPIRIT FOLIO SX four buss mixer, 20 inputs, good condition, mains lead, manual, you must pay postage or collect, £150. ☎ Dave 079 5725 8914 (Herts).

TASCAM 488 Portastudio eight track cassette recorder, excellent condition, includes manual, £135. ☎ Mike 07801 350730 (Flaunden, Herts).

sequencers

ALESIS MMT8, good condition, you can view in Bedfordshire or Central London, £80. ☎ Sean 01525 406069 (Maulden, Bedfordshire).

BOSS SP505 sampling groovebox workstation, only six weeks old, complete with box, manual, PSU, excellent condition, bought in error, £350. ☎ Robert 077 9218 4986 (Blackburn, Lancashire).

ROLAND MC8 analogue sequencer, this is for sequencing all those analogue synths, stunning results, good condition, photocopied manual, £800. ☎ Gerald Vance 028 2568 5833 (Ballymena, Antrim).

ROLAND MC505, excellent live sequencer/groovebox, needs some repairs hence its low price of £250. ☎ 079 6734 9607 (London).

ROLAND MC505, excellent condition, manual, headphones, great sounding machine, £395. ☎ Ryan 078 1846 6098 (Harrogate, North Yorks).

ROLAND MC505, £400 ono, Korg Wavestation, £300 ono; A-frame keyboard stand, three-tier aluminium, £150. Rob 01787 474861 (Essex).

YAMAHA MDF2 MIDI data filer, two available, £85 each. ☎ Chris 01536 762305 (Kettering).

YAMAHA QY70, 16-track sequencer, 512 voices, 20 drum kits, effects, micro keyboard, £150. ☎ Gus 020 8372 3869 (London).

YAMAHA QY700 sequencer/sound module, £320. ☎ 020 8880 0520 (London).

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AKAI S3000XL, Iomega Zip drive included, 10 outs, excellent condition, no manual, £350. ☎ 079 4756 8936 (Harrow, Middlesex).

AKAI S3000XL, 32MB with effects and a second filter board, 250MB Zip drive and disks, excellent condition, box and manual, £350. ☎ Keelan 077 3308 8382 (Manchester, Lancs).

AKAI S3000XL, 32MB RAM EB16 FX card, SCSI Zip drive and discs, MESA software for PC, box and manual, mint, £475. ☎ 01795 533379 (Kent).

AKAI S5000 64 voices, effects card, 196MB RAM, CD-ROM, 4.2GB hard drive, sample library, V2.12, perfect condition, £575. ☎ Matthew 077 3968 8041 (Northampton).

AKAI S5000, mint condition, 256MB RAM, 128-voice polyphony, expanded to 16 outs, 9GB SCSI hard drive, external SCSI CD-ROM, manual and lead, buyer pays postage too, £600. ☎ Dave 079 5725 8914 (Herts).

AKAI S6000, great working order, latest software, comes with external Orb drive, £600. ☎ Dave 079 5725 8914 (Herts).

EMU E6400, 72MB, SCSI Zip drive and 15 Zip disks, needs repair to data wheel, £330. ☎ 079 6734 9607 (London).

EMULATOR II massive sample collection, late revision, manuals, flight case, perfect condition, fully serviced, interesting history, prefer to sell to enthusiast, £500. ☎ Matthew 077 3968 8041 (Northampton).

ROLAND S550 with colour monitor, home use only, no disks (apart from originals) but Roland Library in PC files, buyer collects, £165. ☎ Alan 020 7691 6843 (Walton-on-Thames, Surrey).

drum machines

ALESIS SR16, a recognised classic 16-bit drum machine, hardly used, still has sticky protective plastic on dial and display, £85. ☎ Paul 079 5840 9026 (London).

EMU SP12 Turbo, classic sampling drum machine with expanded memory, open to offers, Roland TR909 drum machine with the classic sound, good condition, open to offers for quick sale. ☎ Steve 077 3902 5912 (London).

ROLAND R8 drum machine with manual and power supply unit, £160. ☎ Ivan 0121 351 6150 (Sutton Coldfield, West Midlands).

ROLAND SPD20, eight pads, loads of drum and percussion sounds, in new condition, £395. ☎ 01273 581964 (Peacehaven, East Sussex).

personnel

BASS PLAYER required for band with studio and management, good gear, serious commitment essential, influences included Coldplay and Lenny Cravitz. ☎ Nik 077 3969 3885 or email info@nikkimurray.com (Buckingham).

COLLABORATION wanted by singer/songwriter, near working rhythm guitars to produce and market original material, styles reminiscent of Talking Heads, Blur, U2, Velvet Underground, must be serious and passionate. ☎ Nicholas 01932 844907 (Surrey).

COMPOSER wishes to meet lyric writer to work together, many already to choose from, bright happy feet and hand clapping types or ones from scratch. ☎ Fred 01935 873116 (Dorset).

SEEKING ENTHUSIASTIC vocalist or production partner to collaborate with on dance tracks for a possible release, I have a studio shared with good Alchamea-trained engineer. ☎ Imran 077 7164 0117 or email imrak@hotmail.com (London).

SYNTH/HAMMOND player required for a band with studio and management, good gear, serious commitment essential, influences included Coldplay and Lenny Cravitz. ☎ Nik 077 3969 3885 or email info@nikkimurray.com (Buckingham).

computers/software

APPLE G4 733MHz with 15-inch TFT studio display 896MB RAM, superdrive (DVD-R/CD-RW), 60GB hard drive, RME DIGI96 PCI audio card, Emagic *Logic Platinum* 4.8.1, soft synths, £1400. ☎ Brad 01633 791534/791590 (Cwmbran, Gwent).

APPLE MAC 7300/166, 160MB, Mitsubishi Diamond Pro 17-inch monitor, Korg 1212 I/O, Global Village 56K modem, Max scanner, Epsom 700 printer, manuals, all in excellent condition, offers. ☎ Renben 0114 236 0573 (Sheffield).

ATARI 520 ST, expanded to 2MB includes SM124 monitor and mouse, £45. ☎ Mike 078 0135 0730 (Flaunden, Herts).

ATARI C-Lab Unitor 2, two extra MIDI ins and outs, SMPTE I/O, EB Syncroniser MIDI expander for Atari ST series, £100. ☎ Joules 079 4912 1811 (London).

CREAMWARE PULSAR 1 card for Mac/PC, four Sharc DSPs, software synths, effects, boxed with software CDs, £300 ono. ☎ Pablo Cabello 020 8946588 (London).

CREATIVE SOUNDBLASTER LIVE drive soutfware, boxed, £50. ☎ Gus 020 8372 3869 (London).

EGOSYS WAMI-BOX, excellent little PCMCIA DSP card, MIDI and multiple I/O outs, boxed with all software, I just don't use it anymore, £150. ☎ Mike 078 1017 4250 (London).

M AUDIO AUDIOPHILE, S/PDIF I/O and MID I/O, rock solid card, runs on Mac or PC, £85. ☎ Chris 01536 762305 (Kettering).

M AUDIO DELTA 410, two inputs and eight outputs, S/PDIF, 24 bit/96KHz, software and drivers, in excellent condition, for Mac or PC, £150. ☎ 020 8983 4755 (London).

PROPELLERHEAD *REASON v2/2.5*, boxed, £100; Edirol UM2, boxed, £40; Live 2, boxed, £100. ☎ Lee 01559 363729 or email musicalee@btopenworld.com (Wales).

RME HAMMERFALL DSP and multiface For Mac/PC, includes PCI Card, I/O box, eight channels of analogue, eight channels of ADAT optical and S/PDIF, MIDI I/O, £500. ☎ Nick 077 8656 2917 (Brighton, East Sussex).

miscellaneous

KENTON CONTROL FREAK, Studio Edition, 16 sliders and buttons, fully programmable, four edit keys, data entry knob, backlit LCD, used to control sequencers/soft synths, never used, £145. ☎ 079 5630 3909 (London).

KENTON PRO CONTROL FREAK 16-channel controller, excellent condition, £100. ☎ 077 6673 5261 (Herts).

PHILIP REES V3 MIDI Thru boxes, two available, home use only, boxed with manuals, £11 each including 1st class postage in the UK. ☎ Louis 01869 245309 (Bicester, Oxfordshire).

wanted

AKAI MPC2000XL with eight outs and 32MB memory, I have money and transport, based in Bristol. ☎ 079 7030 5473/0117 927 3615 (Bristol, Avon).

ANY INFORMATION LEADING to a Roland SH101 modulation grip wanted. ☎ 079 1927 1770 or email xcepoo-m@ac.bpc (Dorset).

LEXICON PCM91 wanted in good working order. ☎ John Williams 020 8292 0549 (London).

MARSHALL JTM45, original valve guitar head wanted immediately, sound is more important than condition. ☎ David 078 8142 4947 (London).

ROLAND VS1824CD wanted, must be in perfect working order and in excellent cosmetic condition, I would prefer one with a manual, sensible prices please, cash waiting. ☎ Edward 078 1146 5943 or email pearlgarden53@hotmail.com (Hertfordshire).

WRH

If music be the food of love, why are there so many terrible cooks around these days...

Big George Webley

The revolution in home recording and CD burning is liberating more and more people every day. Never before in the history of recorded music have so many had the opportunity to record so much for so, um... few people to listen to.

The vast majority of what is being committed to disc for all eternity (or until the reflective coating wears off) is self-indulgent, half-baked, unlistenably bland rubbish. The single reason for this is not that most music-makers these days have no talent, or that they spend too much time quantising hi-hats and not enough time actually playing music for the sheer joy of it — although that doesn't help. It's that these days everyone thinks they have complete and total artistic vision and need no help at any stage of producing their work.

There are a few historic examples of the work of one person achieving critical and commercial success, but for every Brian Wilson there are a million Johnny No-chances churning out songs that make even their own mothers wince when they lie and say, 'It's very nice, dear'. Don't take my word for it, take a look at the Beatles, probably the most influential band ever. Prior to meeting George Martin, they were a below-average quartet for their time. If you haven't heard their Decca sessions, you haven't missed much, except an illustration of the importance of having a more experienced ear to guide raw talent.

An argument against what I'm saying could be that the current crop of boy and girl bands are all told what to sing, how to dance, when to talk and where to get off after a couple of singles, and they're all complete and utter crap. I'd agree with that, but I'm talking about *music*, not meaningless, mind-numbing corporate bilge, designed to lower our standards and expectations. (For all you Pop Idol executive types — and I know you read this magazine every month — go back to selling timeshare apartments and leave my industry alone.)

If you're in the process of recording some material in your home studio for release on your own label — stop! Is what you're doing just half an idea which took off when you used a cool sample or plug-in? If it is, I urge you to consider keeping it to yourself. Your music may well be its own reward, but it doesn't have to be everyone else's booby prize. Take a hard look at it. Is the music you're making really for the good of the listening public and the world, or is it just a waste of electricity and natural resources that will end up in your friends' CD racks, played (or fast-forwarded) once, never to leave its case again?

But wait — my Jedi mind powers are telling me that you don't think this column is about you! Maybe you *are* rarer than rocking horse poo and an exception to the rule. If you believe in your art, and I mean really believe in the music you're producing, take it to people who you respect (regardless of whether you know them or not). Ask them for their honest opinion, and if they say it's brilliant, ask them to invest some cash into it — nothing concentrates the mind as much as money. If they refuse, ask them if they are prepared to get involved in the development of the work. If they can't, for whatever reason, you have to seriously ask yourself why.

Nobody in their right mind would pass up the chance to work with the next U2, Sting or [insert your all time favourite band here]. Legend has it that George Martin was walking past an office when he heard the Beatles and put his (not insubstantial) reputation on the line to work with them. I myself get sent, on average, a dozen unsigned, unsolicited CDs every month. The vast majority have never been out of the bedroom where they were recorded, and all but a few sound, at best, half-finished, ill-conceived and directionless. (If you're one of those who has sent me a CD over the last couple of years, I assure you that yours was one of the very best I've ever heard and this article doesn't apply to you and your unique talent.)

Even if you think you have what it takes to make a great record without borrowing anyone else's expertise, how is anyone going to find out about it? Here's a little sum for you. Work out how much it cost to record and manufacture your CD (including your time at, say, £20 per hour), add 50 percent, and that's how much you should budget to promote it to the managers, publishers, record companies, radio and TV stations, the music press and anyone else who could smooth your path into the consciousness of the planet's music buyers. That's the ratio Hollywood uses to market their movies, and they continue to sell absolute crap to hundreds of millions of satisfied customers every week. So if they can, there's hope for us all. SOS

About The Author

Big George is currently recording a bunch of tracks that no-one wants to hear — available through his web site www.biggeorge.co.uk. He is also lobbying the head honcho of the BBC Proms, Nicholas Kenyon, to conduct a TV themes programme (UK vs USA) at the Proms 2004.

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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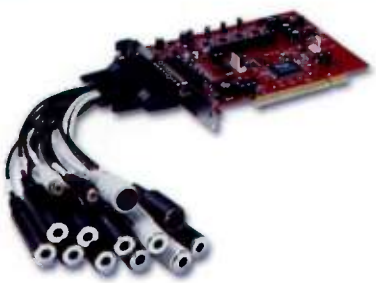

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