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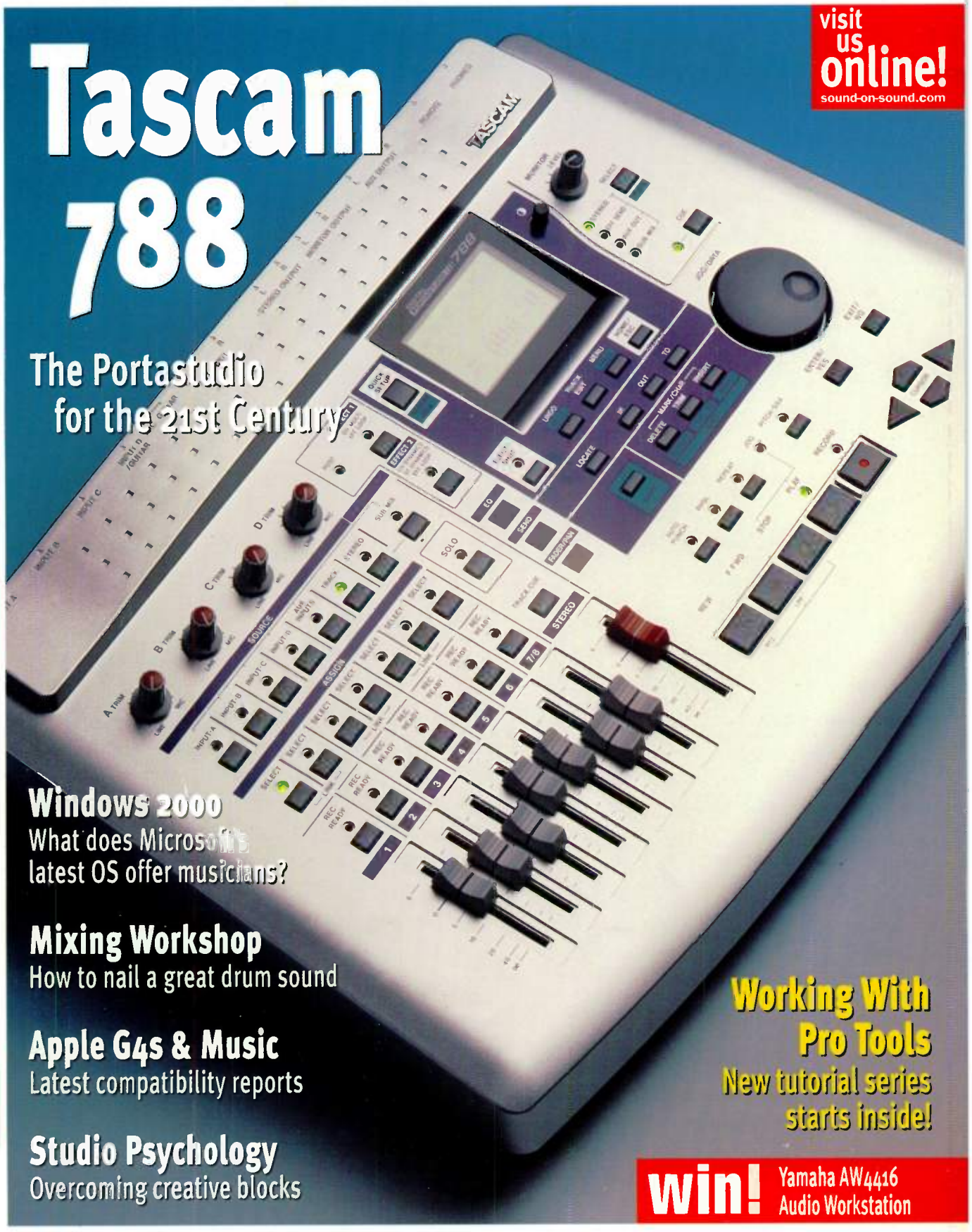

Windows 2000
What does Microsoft's latest OS offer musicians?

Mixing Workshop
How to nail a great drum sound

Apple G4s & Music
Latest compatibility reports

Studio Psychology
Overcoming creative blocks

Working With Pro Tools
New tutorial series starts inside!

win! Yamaha AW4416 Audio Workstation

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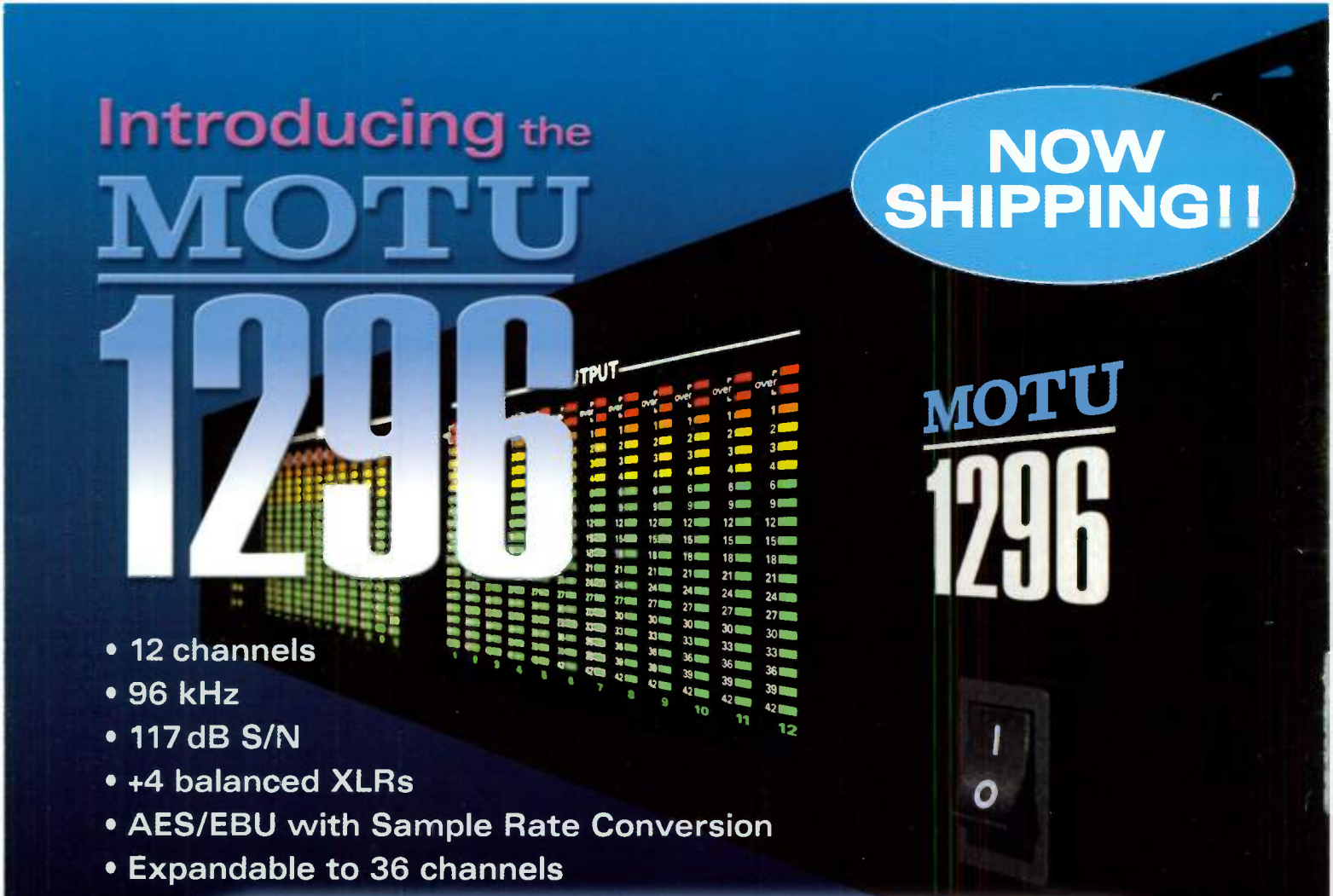

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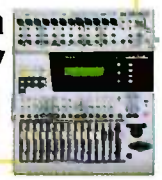

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don't push my button!

Here we are, well into the year 2001, and just as in the film of the same name, we now rely on computers for just about everything, from life support to entertainment. How *2001*'s HAL would have stacked up against a dual-processor G4 I don't know, but at least he had a voice interface that worked reliably — a definite advance over irritating windows with inadequate dialogue buttons.

The reason I say "irritating" is that my otherwise perfectly behaved Mac G4 has started making false accusations without providing me with any means of redress. What happens is this: I shut down the computer via the Shutdown command, just as I'm supposed to, and the computer turns itself off, just as it should. However, when I switch it on again, I get an accusatory message saying something like 'This computer was not shut down properly!', and as a penance, I have to click an 'OK' box rather than the 'Oh yes it bloody well was!' box which the Apple OS inexplicably fails to provide. To add insult to injury, I then have to sit and wait while the computer pretends to track down and fix disk errors caused by my alleged illegal shutdown.

Apparently, the release version of Mac OS 10 (or OSX?) will soon be available, and it's certain to be bristling with new features, all ready to turn against us as soon as the mood takes them. And I bet we still won't have the dialogue boxes that we actually need for stress-free co-existence with computers.

What's more, if we can plug little digital cameras, such as webcams, into our computers, why can't the OS designers utilise these to make our life easier? As an example, how about those annoying 'No printer found!' messages that show up when anyone with half an eye can see that the printer is plugged into the back of the computer, exactly where it should be? You should be able to grab the webcam off the top of the monitor, drag it round to the back of the box, point it at the offending printer cable and then tell the computer 'See for yourself — the bloody thing *is* plugged in. Just print the sodding document!' In the absence of a voice input you'd need a pretty big dialogue button to accommodate so much text, but I think I could live with that.

Then there are those cryptic messages that nobody, not even the programmers, can make any sense of. 'There is an unimplemented rectabular scrogue recyle inhibit problem type Z0493!' There wouldn't *be* any problem if we had a simple button to click that said 'So sort it. Who pays the electricity bills, after all?'.

There are already signs that the future will be based around web sites designed not for humans but for computers. When a problem occurs, the computer will simply log on and find the missing driver or update that it needs. If it has the misfortune to be a PC, it will track down the virtual equivalent of Martin Walker and ask for absolution. In theory, this should end all software support problems, but in reality it means that computers will be able to gang up to make our lives even more miserable, rather than doing it on a one-to-one basis, as they do currently.

I just hope we never get to the stage where computers learn to lip-read, like HAL. I shudder to think what my computer's response would be if it could understand all the muttered insults I hurl at it. Now, would you be so kind as to open the pod bay doors, HAL? HAL...?

Paul White ***Editor***

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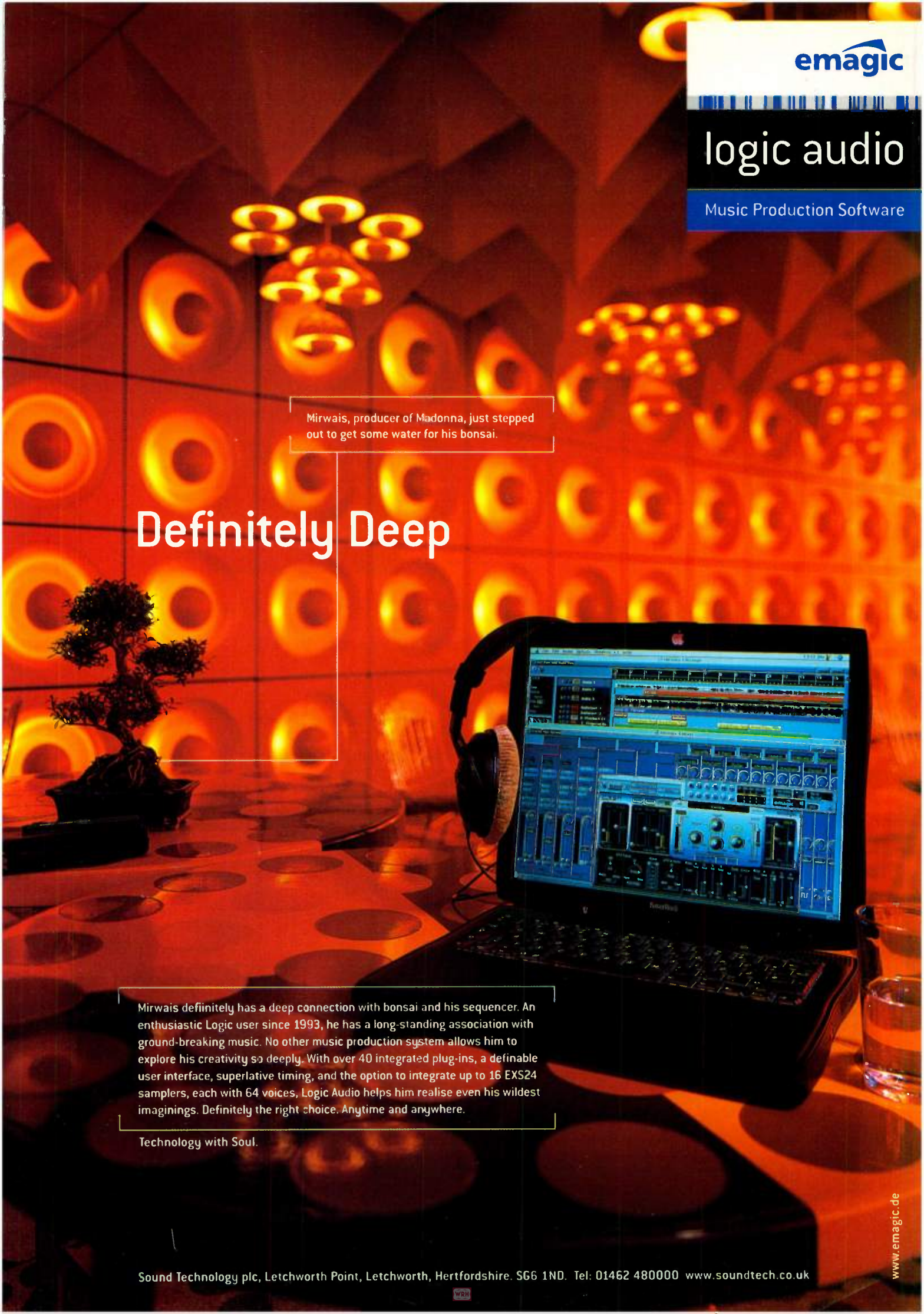
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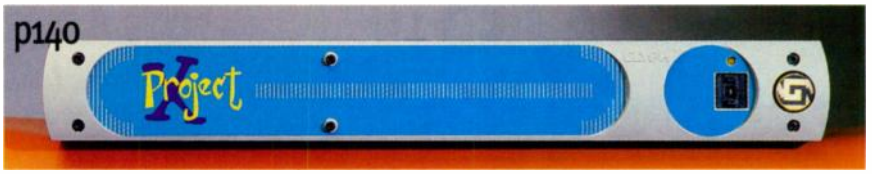

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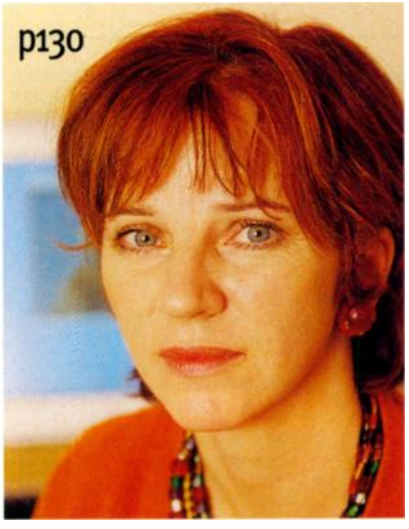

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Onboard effects might seem like a relatively recent synth innovation, but even old modular synths offered analogue effects. This month our synthesis history lesson reveals how the freely patchable nature of modular synths allowed these to be used to create convincing acoustic instrument sounds — thus effectively early physical modelling.

Elizabeth Parker 130
Elizabeth Parker is one of Britain's best-known composers of music for television, and is renowned in the business for her ability to complete projects to the tightest of deadlines. *SOS* visits her unique personal studio to find out how she does it.

PC Musician: Windows 2000 & Music 146
Microsoft's latest operating system, although primarily designed for business and network systems, seems to offer many features that are attractive to musicians, including greater stability and provision for dual-processor machines. But is there enough software support to make upgrading worthwhile?

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Wedding Present frontman David Gedge and engineer/producer Steve Albini are both associated with brutally loud guitar-based alternative music — so what happened when the two collaborated on an album influenced more by Serge Gainsbourg than The Stooges? *SOS* investigates.

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The first in a three-part series designed to demystify that staple of modern music production, Pro Tools, examines the various components that make up Digidesign's systems.

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Net Notes: ADSL 234
An ADSL telephone line can improve the speed and convenience of Internet access enormously — and it needn't cost the earth. Net Notes takes a hands-on look at the new technology.

Logic Notes & Cubase Notes 244 & 248
Logic users can discover how to use folders and screensets to their advantage, while devotees of *Cubase* check out *Cubase* Notes for an introduction to the useful Studio Module.

Retrozone: Korg PS3100, 3200 & 3300 262
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emu ensemble

Synth modules launched and enhanced

Emu's Proteus-derived series of synth modules continues to grow with the addition of the dance-directed Mo'Phatt (£649), which features a completely new set of hip-hop and 'urban' samples, 64 voices, 12th-order filters, two ROM expansion slots and two outputs. The

forthcoming Planet Earth (£649) completes Emu's current trio of dance modules, and is "the perfect complement to the XL1 [*reviewed* SOS *August 2000 — Ed*] and Mo'Phatt", according to Emu. Planet Earth features a similar technical spec to the other two modules, plus a new sound set of world instruments, ethnic sounds and percussion. Also due out now is the XL1 Turbo, an expanded version of the XL1 which ups that synth's facilities to six outputs, 128 voices and four ROM expansion slots, and costs £869.

In the Proteus Custom, Emu take their policy of open-endedness a step further by offering a Proteus 2000 chassis without even one sound ROM board fitted, for £649 (standard Proteus 2000 reviewed *SOS* March 1999). Purchasers can then choose to buy and have fitted any ROMs from the available range, or fit custom Flash RAM boards authored in an Emu Ultra-series sampler. Speaking of which, the Proteus v2.0 software, which allows the programming of presets on Ultra-authored Flash RAM boards is now available too, as is a 32Mb Flash RAM module (£353) for those who want to author their own boards in this way.

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get them while you can

Last run of Audiowerk8 PCI cards forms centre of dedicated surround package

Although Emagic's Audiowerk8 PCI digital audio card (reviewed *SOS* July 1997) and Audiowerk8 Home Studio Kit were recently discontinued, international demand has caused the German company to produce one final run. Emagic are also taking the opportunity to create a new bundle, under the title of Audiowerk8 Surround Kit, packaging the Audiowerk8 card with surround software for both Apple and Windows PCs, all at a price of just £349.

Logic Surround is at the software heart of the new bundle. This program is based on *MicroLogic AV* v4.5, but with surround capabilities borrowed from *Logic Audio Platinum*, and the ability to address all eight of the Audiowerk8's outputs independently. All current surround formats, including 5.1 and 7.1, are supported, and final mixes can be bounced internally to new stereo files for CD mastering, or bounced in surround format for surround mastering.

Logic Surround has an Arrange window, allowing easy recording, editing, and arranging of audio and MIDI tracks, and comes with a collection of plug-ins that includes reverbs, delays, chorus and flanger. In addition, each audio channel features an EQ section, and total recall audio mixing facilities are offered.

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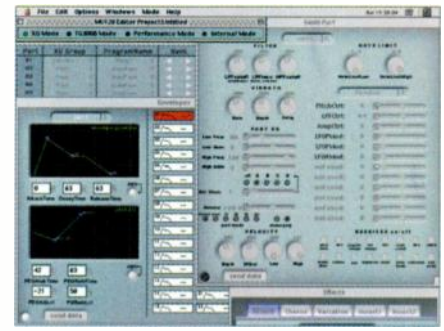
share & enjoy

Shareware treats for Apple users

Shareware General MIDI instrument editors running on the Mac platform are a comparative rarity compared to what's available for Windows PCs, so it's a pleasant surprise to hear of Mac developments at Robot Software, home of UK coder Paul Webb. *MU128 Editor* is described by Paul as a "new breed of XG editor" for Yamaha's GM/XG module and related products such as the SW1000XG, MU100, MU90 and so on. The software allows complete configuration of the synth's parameters via what Paul calls an "intuitive and simple" user interface, with the resulting data savable as Standard MIDI Files. A 30-day trial version of the software can be downloaded from the Robot Software web site; registering for a full version (on-line via secure server) costs US$39.99 (around £26), and includes free upgrades to the program.

The Robot Software site is worth a visit for some other unusual Mac software. *Random Music Machine* (US$25 shareware), *Cellular Grid Machine* (also US$25) and *Oscillator Music Machine* (US$20) are all algorithmic and semi-algorithmic music-generation tools that interface with the real world via *Midishare*, the freeware cross-platform MIDI operating system from French developers Grame (www.grame.fr/midishare). Luckily, the latest version is able to patch to OMS, if you need it, and talk via the USB interface of the latest Macs. However, *Midishare* also retains compatibility with the serial interfaces of older Macs.

W www.robotsoftware.co.uk



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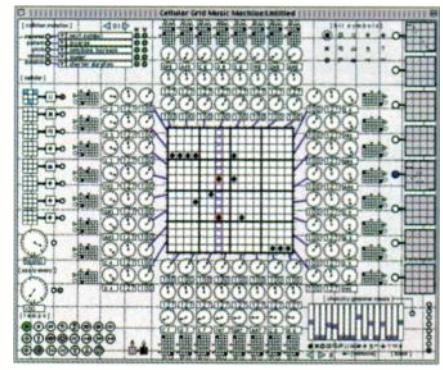

Cellular Grid Machine.

the scottish player...

SOS interviewee Ken Macbeth starts analogue synth business

Exactly a year ago, *SOS* ran a feature on one Ken Macbeth and his penchant for custom synth design. At the end of the interview, author Paul Nagle asked Ken about taking his skills and interests to "the next level", and that's just what Ken has done. *SOS* readers are now on the brink of being able to buy genuine analogue synths from Macbeth Studio Systems.

Ken's arranged the fabrication of PCBs and case metalwork, but the rest of the manufacturing process will involve hand-assembly. Yet he's managing to offer affordable pricing, starting at just £695 for the M3X (shown above). This will be a 4U, rackmounting, three-oscillator monosynth, with each oscillator able to cross-modulate the others *and* frequency-modulate the 24dB/octave resonant filter. The synth's filter is a 'Moog-style' transistor ladder type, and the two envelope generators follow the Minimoog model, while the analogue noise source is based on an ARP design. Interfacing includes CV in/out, S-trig in/out and an external input (for processing outside audio), and each oscillator's signal can also be sent out of the unit, pre-filter, for external treatment.

Also in the works is the larger (11U!) M5, a pre-patched 'semi-modular' synth with an approximate retail price of £1100 (subject to change). Once again, inspiration comes from classic instruments, such as the Minimoog, ARP 2600 and EMS Synthi A. The M5 will be operable without patchcords, as each basic source, mixer and modifier are interconnected, but the preset signal chain can be broken by inserting patch leads. The spec aims to feature three oscillators (each with two sub-oscillators, for a potential *nine* simultaneous oscillators), each offering positive and negative voltage control, standard voltage control, linear voltage control, pulse width and PWM.

Other provisional features include:

- Oscillator sync.
- A noise source offering white, pink and red output.
- The ability to process external audio.
- A multi-waveform LFO.
- A 24dB/octave filter (the same as that used by the M3X).
- A 12dB/octave state-variable filter (based on that used by the Oberheim 4-Voice).
- Three envelope generators.
- Graphic equalisation at the output stages.

The first run of M3X synths will be limited to 100 units, and orders will be taken shortly. A free demo CD is being prepared to show off the synth's capabilities, and anyone interested can ask for one. Telephone inquiries are welcome from 2pm-6pm UK time.

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new drives fired up

LaCie offer high-capacity, portable storage solutions with FireWire connectivity

LaCie, the well-known manufacturers of fixed and removable computer media, have announced the launch of a pair of FireWire drives. First up is a 75Gb model offering the FireWire advantages of hot-swappability and automatic mounting, plus the large capacity that's needed for digital audio or digital video recording and editing. LaCie say the 75Gb FireWire drive has been optimised to provide an access time of 9mS and a data throughput of up to 14Mb/second. The drive is expected to have a street price of around £700 including VAT. It comes with the necessary cables and LaCie's *Silver Lining Pro* drive utility software for Mac OS or *Silver Lining 98* for Windows 98SE.

LaCie's other new FireWire product is the palm-sized PocketDrive CD-RW drive, aimed at mobile computer users. In addition to its two FireWire ports (for daisy-chaining with other FireWire devices), the drive also features a USB connection. When used via FireWire connection, the drive offers 8x-write, 4x-rewrite, 24x-read performance (or 8x4x24x, as LaCie put it; this spec would allow you to burn a CD-ROM in 10 minutes). When used via USB, operation is at 4x4x6x.

The drive is encased in a grooved shock-absorber which not only protects it and acts as a cable tidy but also prevents sliding on work surfaces. PocketDrive measures just 158 x 152mm and should fit into any laptop carry-case

LaCie bundle PocketDrive with cables, a universal AC adaptor, one rewritable disc, one recordable disc, and various recording utilities (*Easy CD Creator* and *DirectCD* for Windows 95/98/NT, or *Toast* v3.8 and *DirectCD* for Mac OS). Two varieties will be available: a 4x4x24x drive for around £350, and an 8x4x24x drive costing just under £400.

T LaCie UK +44 (0)20 7872 8000.
F (0)20 7233 8338.
E info.uk@euro.lacie.com
W www.lacie.com

backing boon

All-in-one MIDI File playback from BCK

If you're in need of an all-in-one MIDI file player and General MIDI sound source, BCK's new Backtracker M88 might fit the bill. This £300 device also offers a mic input, with effects, and allows the user a certain amount of live interaction and control over MIDI Files without the need of computer software. Transposition, tempo changes and track volume (and mutes) can be altered on the fly, with changes savable to disk. A collection of MIDI Files can also be assembled and arranged to play without a break, which is handy for live sets.

T BCK Products +44 (0)1992 524442.
F +44 (0)1992 524004.
W www.bck.co.uk

visit the big apple

SOS readers invited to UK Apple HQ

SOS's Apple Notes contributor Paul Wiffen is planning an open presentation at Apple's UK HQ near Heathrow Airport in early February. Exciting new products and announcements concerning music, digital audio and Apple Macs are expected at the NAMM and MacWorld shows in California in January, and Paul's demo is intended to give UK-based *SOS* readers a first look at some of the new kit. Paul will be aided by worldwide Takamine guitar demonstrator Steve Fairclough, who will be showing off some new Mac-based guitar processing products.

The demo is planned to take place at 2pm on Friday 2nd February. For more details on how to reserve a place, surf to the web site of Learnthisway.com, who are sponsoring the event. *Matt Bell*

W www.learnthisway.com

bullets

Red Sound go it alone

Red Sound Systems, the British company behind a novel range of virtual synths and DJ products, and Yamaha-Kemble Music agreed to separate from their distribution agreement in the UK at the end of last year. Red Sound is apparently developing its own MI and synthesis products, and it was felt there would be a potential conflict of interest. The existing retail prices of Red Sound products will remain the same.

T +44 (0)1628 819191.
F +44 (0)1628 819111.
E red@redsound.com
W www.redsound.com

Heavenly move from MIDI to Media

Heavenly Music have long been known for the quality of their MIDI song and building block files, but have over the years branched into other areas, such as consultancy, PC systems supply, CD-ROMs, e-zines and more. They are now known as Heavenly Media Services, and have a new Internet identity to match (see below). Heavenly have also started their own Internet radio station, over which they'll be streaming a range of half- and one-hour programs. Have a listen at www.heavenlymediaservices.com/netradio.htm

T Heavenly Media Services +44 (0)1255 821039.
W www.heavenlymediaservices.com

All change for Virus Rack

News has reached us from Access in Germany that the forthcoming Virus Rack has changed colour at a late stage in its production. The Rack was originally planned to be released in silver livery, in contrast to the other Viruses in the range, which ship in appropriately infectious-looking red and black. The colour change brings the Rack into line with the rest of the range. Expect an *SOS* review of the Virus Rack soon — whatever colour it is! *Matt Bell*

W www.access-music.de

american classic

High-quality API channel strip is born in the USA

API, a noted American manufacturer of high-quality mixing desks, with a history going back to the '60s, have entered the dedicated 'channel strip' market. Their new 7600 channel strip takes up one unit of rack space and incorporates elements from several API products. The company's 200 Series Legacy mixing console is the source for the mic amp and the compressor, while the 500 Series is the source for the 3-band EQ, but in this case it's a 're-issue' of the classic 550A device, rather than the 4-band 550B that's currently available.

Unusually, the 7600 offers four buss sends and four aux sends, just as if it were a full channel strip on a mixer. In fact, multiple 7600s can be linked together to create a mini mixing desk, and API make this job easier with the help of the 7800 master module: it contains a summing section for the 7600's sends, busses and stereo mix, along with buss masters, solo and logic control, talkback, a simple control-room section for speakers/headphones and tape playback, master VU metering, and the facility to add a remote linear master fader.

Anyone wanting to build an API console one channel strip at a time using 7600 modules can take advantage of an alternate layout, as the 7600 is also available in a vertical configuration, allowing it to be mounted in a more traditional mixer-like fashion.

T Funky Junk +44 (0)20 7609 5479.
F +44 (0)20 609 5483.
W www.proaudioeurope.com
W www.apiaudio.com

SOS on the net
www.sospubs.co.uk (4.7 Million Hits)

french polish

Synthesis powers of Yamaha A-samplers highlighted by French CD-ROM

French sample developers GrooveStyle have entered the Yamaha A-series sampler market with a CD-ROM called *Powersound Series Volume 1*. This disk features 128 banks of instruments arranged into 32Mb chunks — this obviously presumes that you've upgraded the RAM of your A-series sampler! GrooveStyle claim to have packed a lot into each 32Mb by optimising sample lengths and using the full power of the A-series synthesis engine. In fact, part of the company's aim with their first disc was to show off the platform's synthesis capabilities.

Each sound bank contains a complete range of instruments, with the collection covering a wide range of musical styles. Sounds include drum kits, electric piano, atmospheric analogue effects, funky, electric, and sub bass, pads, and much more. *Powersound Series Volume 1* for Yamaha A-series is available now, priced at FF789.99 plus FF30 postage (that's about £80 in modern money). It's available direct from the GrooveStyle web site, where demos are also on offer. A second disc, *Volume 2: Brass Instruments*, is in preparation, and we'll bring you more details about that when we get them.

T GrooveStyle +33 4 90 77 16 13.
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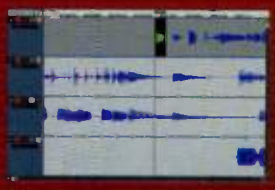
E groovestyle@groovestyle.com
W www.groovestyle.com

HDR24/96. MACKIE'S NEW 24 TRACK RECORDER. WORKS WITH ANY MIXER. NO EXTRA COMPUTER OR SOFTWARE NEEDED.



- **24 tracks...24-bits**
- **Built-in full-feature digital workstation editing**
- **Affordable pull-out media**
- **Built-in SVGA, mouse & keyboard ports**
- **Built-in 100BaseT Ethernet**

New hard disk recorders were all over the place at this fall's AES convention.

Our new HDR24/96 was the only recorder with built-in nondestructive graphic waveform editing. Just plug in a mouse, keyboard and SVGA monitor to view all recorder parameters on screen in real time. Enjoy complete editing control with unlimited levels of undo, drag-and-drop crossfades with 9 preset combinations plus fade/crossfade editor. And look forward to DSP time compression/expansion, pitch shift and lots more!

The HDR24/96 was the only recorder that uses pull out Ultra-DMA hard drives, so affordable that you can keep one for each project—over 90 minutes of 24-track recording time costs less than a reel of 2-inch tape!

Call or visit our website for preliminary info on the new HDR24/96. Shipping soon from Mackie Digital Systems.

HDR24/96 editing features include 8 takes per track with nondestructive comping, nondestructive cut/copy/paste of tracks, regions or super-regions, drag-and-drop fades & crossfades, 1x/2x/4x/8x/24x waveform views, true waveform editing with pencil tool, bidirectional cursor scrub and unlimited locators and loops... with unlimited undos — but without requiring an external computer! Coming soon: DSP time compression/expansion, invert, pitch shift, normalize and much, much more.

Use the HDR24/96 with any analog or digital mixer ...or link it up to our Digital 8 • Bus desk.

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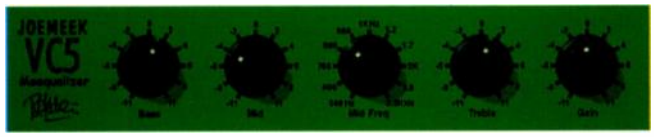
plug-in corner



Top hardware remade in software by Bomb Factory

Bomb Factory have carved a little niche for themselves by recreating the performance of noted hardware signal processors in virtual form, releasing the results as plug-ins for Digidesign Pro Tools TDM systems. Hardware that's received the Bomb Factory treatment so far includes Tech 21's SansAmp PSA1 guitar amp simulator, the Bob Moog-designed Moogerfooger low-pass Filter and Ring Modulator, Teletronix's LA2A levelling amp and Urei's 1176 classic compressor. Soon to be released are a range of software recreations of processors from the likes of Fairchild (the TM660 compressor), Pultec (the EQP1A equaliser), and Joemeek. Bomb Factory's SC2 photo-optical compressor and VC5 Meequalizer software (shown above) not only aim to digitally reproduce the distinctive Joemeek sonic signature, but also have an authentically green on-screen presence! Like all the plug-ins in the Bomb Factory range, the new Joemeek processors offer virtual representations of every knob, switch and meter, and every detail of their internal circuitry is modelled as closely as possible.

Bomb Factory plug-ins are already available in versions for TDM, AudioSuite and RTAS (Digi 001's Real-Time AudioSuite), and are about to be released in native form for Mark of the Unicorn's MOTU Audio System, or MAS.

T Rocky Road Distribution Ltd +44 (0)1494 535333.
W www.bombfactory.com

Affordable Creamware-format reverbs from DSPDev

A new series of reverb plug-ins for Creamware's Pulsar and SCOPE hardware/software synthesis and recording systems is under development by French software house DSPDev. Available for both Mac and PC computers, the DSPDev family will ultimately consist of five processors, ranging from a simple mono reverb to a full surround treatment.

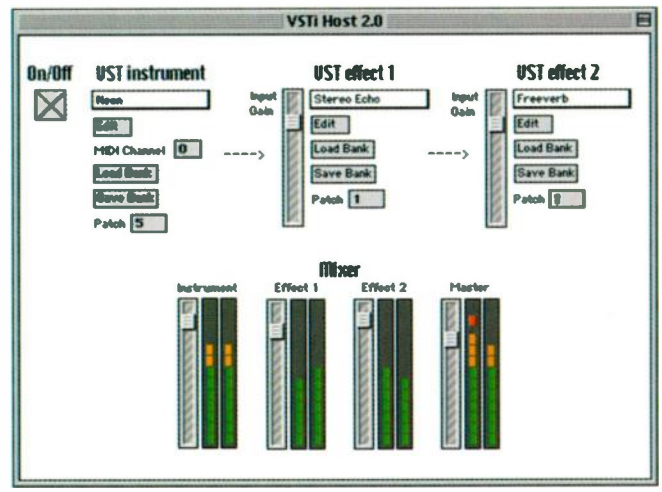
Verb Gold will be top of the range, using DSPDev's 'Spread Engine' technology to create binaural stereo treatments, while *Verb Pro* will aim to offer a quality stereo reverb without hijacking all the resources of the Scope or Pulsar cards. *Verb One Extended* is also a stereo reverb, but creates its effects using even less system overhead. The fourth member of the family is *Verb One*, a budget monophonic reverb, and the last is the completely free *Verb Free* — a mono reverb equivalent to *Verb One*, but with no controls aside from a reverb-time button.

DSPDev products can be purchased on-line. US$189 buys the *Verb Pro* package, which includes all the DSPDev reverbs except for *Verb Gold*. *Verb One Extended* alone costs US$99, *Verb One* costs US$69, and *Verb Gold* is expected to sell for US$359.

T DSPDev +33 (1) 56 32 32 22.
F +33 (1) 56 32 32 23.
W www.dspdev.com

VSTi Host runs VST plug-ins independently

Dan Nigrin, the programmer behind the *MC202 Hack* Roland microcomposer programming tool for Java, has come up with another useful utility. *VSTi Host* for Apple Mac, created with Cycling 74's *Max/MSP* MIDI programming language, provides a facility that many Mac users would appreciate: an environment in which to run VST instruments and effect plug-ins independently of any other



application. In this way, a spare Mac (and anyone who upgrades probably has one, since old Macs are notorious for their plummeting value) could be used as a stand-alone synth. And that's exactly the reason Dan developed the software!

VSTi Host also allows sequencers that don't offer native access to VST instruments the ability to use them, as long as they support OMS's Inter Application Communication buss. *VSTi Host* v2 can accommodate one VST instrument plus two effects, and they can be from any commercial, shareware or freeware source; a list of compatible plug-ins is maintained on Dan's web site. The *Host* itself costs a fairly measly US$14.99, and can be purchased securely on line via the PayPal or Kagi third-party payment services.

W www.defectiverecords.com/vstihost/

bullets

Native Instruments' *Pro 52*

Native Instruments have announced that their Prophet 5 VST Instrument simulation, previously known as *Pro-Five* and reviewed in *SOS* April 2000) has had a bit of a facelift, and a change of name to *Pro 52*. New features include parameter automation, audio input and delay effects. *Pro 52* can also be run as a stand alone program. It costs £149.95, including VAT, and *Pro 5* can be upgraded to *Pro 52* for £29.95.

T Arbiter Music Technology +44 (0)20 8970 1909.
W www.arbitergroup.com

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JANUARY 31ST 2001

Soundcraft

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be a winner

More readers bag studio loot in *SOS* competitions

We're pleased to announce some more *SOS* competition winners, from the June and July 2000 issues respectively. The June issue saw the Gateway School of Recording (+44 (0)20 8549 0014, www.gsr.org.uk) offer £700 of course time as a first prize, and £300 of time to a second-prize winner. The lucky readers were Andrew Theodoridi (right) of West Sussex, and Raj Dhamu (far right) from Warwickshire. Both started using up their free course time in November, on Gateway's Multitrack Recording course.

Andrew Theodoridi.

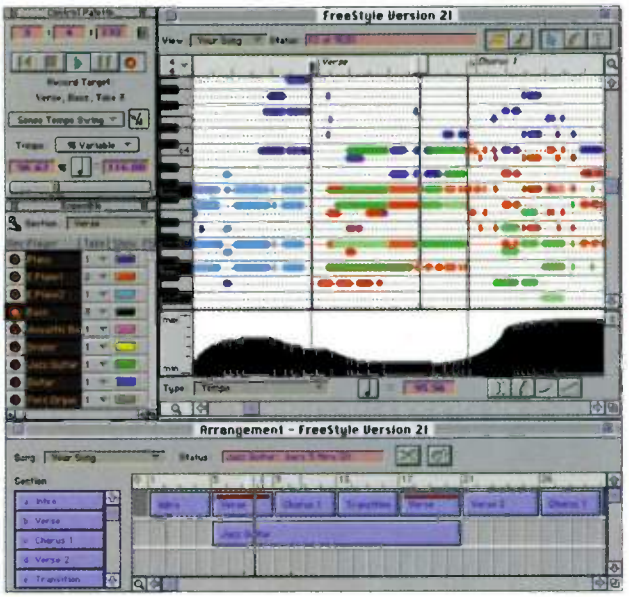
Raj Dhamu.

The following month, TL Audio (+44 (0)1462 680888, www.tlaudio.co.uk) generously offered us three Fatman Fat 1 stereo compressors to give away. The fortunate winners are Mike Cooling from Worcestershire, Simon Cappelli from Lancashire, and Alex Haynes of Dorset. Mike and Alex have already incorporated their Fatmen (Fatmans?) into their recording setups; Mike, in particular, praises the 'dial-in' mix settings for helping him to get the best from his album mixes and says it complements his existing TL Audio 5051 Ivory voice channel very nicely.

A big thanks to Gateway and TL Audio for the prizes, and congratulations to the winners. *Matt Bell*

Alex Haynes.

Mike Cooling.



freestylers unite!

FreeStyle 'trackless' sequencer updated

Mark of the Unicorn are shipping v2.31 of their bar-less, track-less sequencing package *FreeStyle* for Mac OS and Windows (last reviewed in *SOS* May 1998). This update makes *FreeStyle*'s latest feature-set identical across platforms, so users on any supported platform will be able to access new features such as event list editing, step record, System Exclusive recording and editing, support for over 275 MIDI instruments and sound modules, and more. That's not to mention the software's interesting approach to sequencing, which offers real-time notation transcription, 'trackless' sequencing, and MOTU's rubato 'Sense Tempo' recording feature, which means you don't have to play to a click if you feel it cramps your style.

There's a new event list display, showing MIDI data in numerical form, and a step-record option lets users insert notes and chords one at a time from either a computer keyboard or MIDI instrument. It's possible, using the 'Visual Step Record' feature, to see the actual notes or chords you're about to insert, in either piano-roll form or in dynamically transcribed musical notation, before they are step-entered.

MOTU's UK distributors Musictrack point out that *FreeStyle* v2.31 fully supports USB-equipped Apple Mac computers.

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

SOS on the net
www.sound-on-sound.com

noise is off

Red Submarine keep PCs quiet

Computer-generated mechanical noise is the bane of many of us working in home studios, so we're interested to hear of Red Submarine's latest launch, a "virtually silent stealth upgrade" to their home studio and professional series PCs. The shielded aluminium case they use is claimed to have a maximum noise level of less than 28dB, but this low noise level does not come at the expense of a higher operating temperature. Red Submarine achieve a quiet PC which also stays cool through a combination of six very low-noise cooling fans and specifically manufactured low-noise hard drives.

Complete recording systems start at £1799 including VAT, and are based on an 800MHz Pentium III processor, with six PCI slots, four 24-bit audio inputs, plus a control surface with eight faders and hardware transport control for *Cubase*.

W www.sub.co.uk

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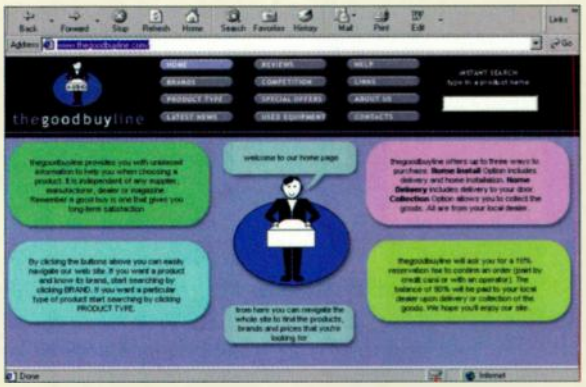

thegoodbuyline

A new way to buy music and studio equipment is being offered by a web site called thegoodbuyline. The site carries full information on a wide range of products, which can all be purchased through a partnership between it and the authorised dealer network for the manufacturer of each product on sale.

Prospective purchasers are presented with up to three prices for the product they're interested in, each carrying "a different level of service". A combination of the web site and a call centre is used to arrange the purchase of the required product on the customer's behalf, after which the dealer in question arranges delivery, installation if required, and after-sales backup. The web site will be active for purchases 24 hours a day, with a customer support line open 9am to 9pm, 365 days a year.

Other diversions available at www.thegoodbuyline.com include product news, competitions, a used equipment club, special promotions, and links.

T Buyline Ltd +44 (0)131 220 8218.
W www.thegoodbuyline.com

Raper & Wayman

Pro audio specialists Raper & Wayman have launched a new web site, and placed the latest edition of their catalogue on-line. The site is constantly being updated, and already features a colossal number of products for studio, broadcast and live applications. Visitors can browse the gear on offer, request on-line quotes, and also buy on-line if desired. By registering at the site you have a chance to win cash discounts off future on-line purchases.

W www.raperandwayman.com

HHB

HHB Communications' full range of recording media can now be ordered on-line, using the company's secure server. Blank CD-R, DAT, MD, MD Data, ADAT, DTRS, MO and DVD-RAM are all available, with quantity discounts available in some circumstances. Orders made before 3pm, Monday to Friday, are delivered on the next working day, with a guaranteed 10am delivery available for additional cost. Elsewhere on the site, the rest of HHB's catalogue can be browsed for information.

W www.hhb.co.uk

Zeta

Zeta, American manufacturers of MIDI electric violins, violas, cellos and basses, have opened an on-line store at their web site. For more info on the Zeta product range and how to buy on-line, surf to the address below.

W www.ZetaMusic.com/Store/

Fender UK

Arbiter have announced a facelift for the Fender UK web site. The site aims to bring all the latest information on new products and prices, authorised dealer locations, spare part information and UK clinic dates. Visitors can also ask any Fender-related question on-line.

W www.fender.co.uk

support your local synth

Free utility software disc for Yamaha synth owners

Yamaha have produced a new CD full of free software aimed squarely at owners of their current range of synths — the CS6x, CS6r, S30 and S80. The CD will be supplied free with the above-mentioned synthesizers in the UK and sent automatically to all currently registered owners (while stocks last). It contains a special version of Emagic's *SoundDiver* editor/librarian software, for both Mac and Windows PCs, plus FAQs, tools, utilities, and additional synth voices. If you've already got one of the supported instruments but haven't registered it, just give Yamaha a call, making sure you have the synth's serial number handy.

Yamaha are also urging new owners of the AW4416 digital recording workstation (reviewed *SOS* November 2000) to register their purchase. The AW4416 is upgradable, and by registering you'll ensure that updates — the new v1.10 software, for example — will be sent to you automatically in the post. The v1.10 upgrade can be obtained from Yamaha if you haven't registered, but you'll have to call up and have your AW's serial number handy.

T **Yamaha-Kemble 01908 369269.**
W **www.yamaha.co.uk**

small wonder

Knobby MIDI controller combines compactness and programmability

Yet another MIDI hardware control surface has made it onto the market in the shape of Encore Electronics' Knobby, which comes in a similar-sized package to the simple GMedia Phat Boy but offers some of the programmability of more sophisticated controllers from the likes of Kenton Electronics and Peavey.

Knobby is an affordable eight-knob controller that can control up to 120 parameters at any one time via switchable banks. SysEx data, MIDI controllers and NRPNs (Non Registered Parameter Numbers) can all be generated by Knobby's pots, for controlling hardware or software MIDI instruments, and the user has full control over these assignments courtesy of *Knobby ED*, a Windows editing package (a Mac editor is in the works). Those who don't like to roll their own will be interested to know that controller templates for a wide variety of synths are already available at the Encore web site.

Sadly, Encore don't yet have a UK distributor or any UK retail outlets. However, this US$199 device is available from a number of European vendors. At the time of writing, these include AEW Computer & Musik in Germany (www.a-e-w.de/), JAM in Sweden (www.jam.se/knobby.htm) and Pan Lydstudio in Norway (www.pan.no).

W **www.encoreelectronics.com**

cream of the crop

Creamware announce new software instruments and wave of updates

Creamware have announced a new software synth, and a round of updates to their existing DSP-based recording products. *Vectron*, the new soft synth, is a plug-in for Pulsar and SCOPE systems, and is designed to resemble the mid-'80s Sequential Prophet VS synth. It even incorporates the Prophet VS's original factory wavetable set.

Vectron produces its sounds using four wavetable oscillators per voice. Each oscillator plays back a static wavetable, and the combined output of the oscillators is passed through a filter, amplifier and pan control, followed by an integrated chorus and stereo delay. However, as on the original Prophet VS, the oscillator (and therefore the wavetable) mix can be varied dynamically via a two-dimensional 'vector' envelope, which results in sounds of "animated character and tonal complexity, suitable for animated pad sounds, punchy basses, and sparkling electric pianos", according to Creamware. *Vectron* has 127 built-in wavetables, but you can also create your own from WAV files, or even draw in your own using your mouse! Extensive real-time modulation control is also available over most of *Vectron*'s parameters, as with most other soft synths. The plug-in can be obtained via Creamware dealers or from the Creamware web site.

Creamware have also updated the software for their SCOPE SP, Pulsar II, PowerSampler, Elektra and Luna systems, providing bug fixes and new features. The PowerSampler sampling system, Elektra card-based synth and Luna recording card can now be used as expansion units for Pulsar or SCOPE SP systems. The v2.05 SCOPE SP update and the v2.04 updates for Pulsar, PowerSampler, Elektra and Luna are available from dealers on CD-ROM. Alternatively, the Pulsar, PowerSampler, Elektra and Luna updates can be downloaded free from the Creamware site. *Matt Bell*

T **SCV London +44 (0)20 7923 1892.**
F **+44 (0)20 7241 3644.**
W **www.scvlondon.co.uk**
W **www.creamware.de**

Roland's new VA3.

key words

Roland launch RD150 digital piano and VA3 arranger keyboard

New from Roland's Contemporary Keyboard division are the RD150 portable piano and VA3 Arranger Keyboard. The RD150 features a brand-new 88-key hammer-action keyboard and 16 sounds (each with eight variations) from the established FP9 digital piano. Other features include 64-note polyphony, a metronome, a two-track recorder, 'stretched' tuning (to improve the authenticity of the piano sound), seven temperaments, a transpose function, and slider controls for Volume, Brilliance and Upper/Lower Levels. A retail price of £799 should make the RD150 attractive to a wide range of stage and studio keyboardists looking for an 88-key controller keyboard with a basic set of piano timbres.

The VA3 (shown above) is a different kettle of fish entirely, squeezing great chunks of current Roland technology into a £999 home keyboard arranger-style package. The instrument boasts 3649 sounds (plus 128 user patch memories), 116 drumkits (taken from Roland V-Drums), hundreds of auto-accompaniment patterns, a 16-track sequencer, floppy-disk drive, D-beam infra-red proximity controller, and 64-note polyphony. Also featured is an interactive backlit touch screen, for easier access to the VA3's operating system.

T **Roland UK Brochure line +44 (0)1792 515020.**
F **+44 (0)1792 799644.**
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bullets

New player on the mLAN field

If you followed Paul Wiffen's popular series on the new FireWire-based MIDI and Audio protocol mLAN (see *SOS* August-November 2000), you may be interested to learn that professional audio gear manufacturers Otari have joined forces with Yamaha in an attempt to popularise the standard. The two companies are apparently working together on the second generation of mLAN chips in an attempt to meet the exacting requirements of the high-end pro audio market. Otari in particular plan to use the resulting chips in large-scale digital audio networking products. The chips are planned for release later in the Spring. Let's hope some mLAN audio products aren't far behind... *Matt Bell*

New Maplin catalogue integrates CD-ROM with web site

The latest CD-ROM edition of the Maplin catalogue has been developed with HTML, and thus has exactly the same appearance and functions as Maplin's own web site. This alsso means that you can browse the catalogue and prepare an order off-line, only connecting to the *real* site when you are ready to confirm the order. In addition, an 'order saving' facility puts items to one side for ordering at a later date, and a printable order form is available for those who'd like to post or fax their order. The CD-ROM catalogue costs just £1.99.

T **0870 264 6000.**
W **www.maplin.co.uk**

turnkey

If you want to look at equipment we'll send you some brochures...

If you'd prefer to listen and evaluate a wide range of products by strict A/B comparison there is currently only one option.

Turnkey houses what we believe to be the world's largest digital comparator systems for pro audio* and the only one's of their type in the U.K.

The Birthplace of Recording for Musicians

INDEX

2/3/4/5.....Computer 'ware
6/7.....Mixers & Recording
8/9.....Outboard
10.....Monitors/Amps
11.....Headphones & Mics

Also see our 8 page brochure in this magazine
1.....Samplers
2/3..Samplers & Accessories
4/5.....Sound Modules
6/7.....Keyboards
8.....Accessories

OPENING HOURS

Our doors are normally open from 10am to 6pm, Monday to Saturday (late until 'till 7pm on Thursdays), or you can catch us on the phone from 9am to 7pm, and often much later!

ZERO%

• PAY NOTHING for 6 MONTHS • CASHBACK

Wherever you see this sign, you can take delivery of your gear immediately, and pay absolutely nothing for 6 months[2], and even then you can spread your payments further! or forgo the credit and we'll give you the interest back in cash![3]

Extensive range of MIDI sound modules available for demonstration.

Over 70 effects processors are available for instantaneous A/B eliminating the repatching time which makes good comparisons so difficult. 16 pairs of monitors, 10 power amps, 16 mixing desks and around 30 sources and recorders (DATs, CDs, HDRs and Multitracks) are on the same matrix so you can instantly configure complete systems or A/B anything.

One side of the switcher-equipped recording room.

Recording consoles don't come cheap. We believe you're entitled to properly compare the various brands for EQ characteristics and noise.

Huge range across Mac, PC and Acorn platforms.

We've taken the same innovative approach to demonstrating all our products from studio mikes to analog synthesises. Our new Loopstation, for example, has been widely acclaimed as the world's premier resource for the sampling musician (see the flyer in this month's magazine).

Turnkey Loopstation: Samplers & Sample CDs, DJ/PA and Museum.

Most dealers will tell you which products best suit your needs. Only one can show you.

* The leading manufacturer of this equipment tells us that the Turnkey systems are the largest ever supplied worldwide.

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Fax: 020 7379 0093 114 Charing Cross Road London WC2H 0JR

GEM OF A DEAL!

SAVE UP TO £700!

Turnkey's dealmongers strike again! GEM's Equinox series seems to have been overlooked by most, but we've uncovered what are superb sounding and probably the most comprehensively specced workstation keyboards on the market. Even at the original prices, Sound on Sound said "it's hard to see where the competition lies without looking at considerably more expensive instruments", going on to call it "a very impressive instrument."

The specs detailed here represent just a fraction of these keyboards' capabilities, and we only have strictly limited stocks of this incredible exclusive deal.

Place your order early to avoid disappointment.

EQUINOX 61 SYNTH WORKSTATION

SAVE £600!

Fully featured 61 note synth with 64 voice polyphonic, 32 part multitimbral sound engine providing 2000 patch locations, plus integral sample playback, reading .WAV, AIFF, Akai and Kurzweil formats. There is 2MB of battery backed Flash RAM as standard (expandable to 8MB) and room for a further 32MB of standard RAM. A SCSI interface is also available. The eight control sliders can function as drawbars for the organ sounds, with 16 performance presets, and the piano sounds feature GEM's damper physical modelling technology. Onboard effects number 85 algorithm types, and with the addition of the optional interface board, can process any external audio, provide 4 part harmonisation and vocoding. The 16 track sequencer offers 192ppqn resolution and holds 250,000 notes with floppy disk backup, and there is a separate arpeggiator with 16 preset patterns. With it's and groove quantise facilities and 1000 built-in groove template patterns based on the "Twiddly Bits" series, the Equinox is a fantastic dance groovebox. As a MIDI master keyboard, it is extremely well equipped with split/layer setups and two assignable wheels, plus the 8 sliders and 8 function keys. The keyboard includes aftertouch, and there are three switch pedal inputs, along with a volume pedal socket, and there are 4 audio outs. Far too much more to mention here!

~~RRP £1399~~
£799.99
GEM-EQUINOX61

EQUINOX 76 SYNTH WORKSTATION

SAVE £650!

Featuring all the incredible spec of the Equinox 61, this keyboard is also available with a top quality 76 note semi-weighted synth action. It has the same 64 note polyphonic synth engine with over 2000 presets and built in sequencer, arpeggiator, drawbar organ and sampler. 2MB of flash RAM as standard, which is expandable to 8MB with room for a further 32MB via standard SIMMs. The synth will read WAV, AIFF, Akai and Kurzweil files.

~~RRP £1599~~
£949.99
GEM-EQUINOX76

EQUINOX 88 PRO SYNTH WORKSTATION

SAVE £700!

The 88 note piano weighted action version additionally has an internal 2GB hard drive loaded with the acclaimed Real Piano multisamples, as well as many others, and includes SCSI interface and 8MB Flash RAM as standard.

~~RRP £2199~~
£1499.99
GEM-EQUINOX88

EQUINOX UPGRADES

SCSI Board	£69.99	Vocoder / Harmoniser Board	£249.99
32MB RAM	£119.99	Pro Kit Upgrade (brings 61 or 76 version to 88 spec, as above)	£299.99
8MB Flash RAM	£79.99		

DRAWBAR PERFORMANCES

WAVEFORMS

SEQUENCER

MASTER CONTROLLER

WELL CONNECTED

RAM

PRO KIT

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SCSI INTERFACE BOARD

Service - Our No. 1 Priority

We realise that you the customer have a choice, and while we will never stop bringing you the industry's greatest deals, efficient and professional service in the process of doing this is our top priority.

Computerisation:

All quotes and orders are computer databased (please ask for a reference number) to enable speedy tracking of any subsequent queries. Our trained sales advisors have a huge range of information at their fingertips, from stock availability & pricing to technical details and prior purchase records.

IN STOCK & ON TIME

Delivery:

Our dedicated despatch department will package and process your order, normally the same day, for any orders taken before 4pm. We offer a variety of delivery services, with the recommended 24 hour insured courier service from just £9.99. For smaller purchases, we also offer a £3.99 postal service, but please allow 28 days for delivery in this case (items must be under £50 value & 1/2 kg).

Repair:

Our repair department currently numbers five fully qualified personnel, who will help you through any difficulties as smoothly and quickly as possible.

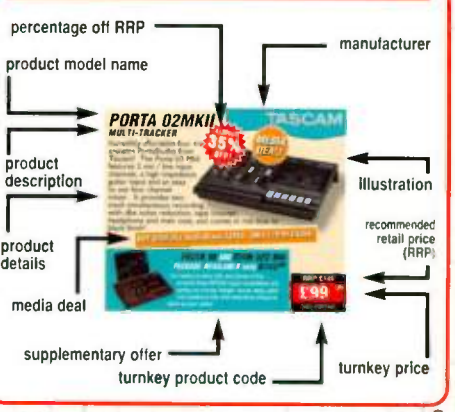
Stock Availability:

When you're ready to buy something, you don't want to wait for it! That's why we have the UK's largest stocks of MIDI and recording products under one roof, including a full range of accessories from expansion boards to cables and stands to media.

If at any stage you are unhappy with the service you are receiving, ask to speak to a manager - we aim to please!

Turnkey Deal Guide

YOUR KEY TO A BETTER BUY!



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Expiry date:
Issue No. (debit cards only)
Issuing Bank:

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Allow 12 days for cheque clearance (payable to Soho Soundhouse Ltd). All other payment methods immediate despatch. We accept Visa Mastercard, American Express, Switch, Delta, Solo, cash in registered envelope, bank building society draft, postal orders, and government purchase order.

Our P&P covers next working day delivery in mainland England and Wales and some parts of Scotland up to 8kg (£3.99 under £50 value & 1.2 kilo weight, allow 28 days).

Please call for details of other delivery times and prices for other areas.

We reserve the right to charge extra where insufficient carriage costs have been specified.

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We are giving away £10,000 worth of brand new equipment! Any order you make will automatically enter you into our prize draw, and the winner gets to select £10,000 worth of gear of their choice!

Pictured right is lucky *Year 2000 £10,000 Prize Winner* Brian Horsfield with his chosen studio equipment. This year, it could be you!

1 £10,000 of gear at RRP inc VAT. No purchase necessary. Entry to be held July2001. 2 Subject to status & acceptance. Written quotations available on request. 0% APR for 6 months, transaction fee 4.9%. 3 Calculated at the pre-vailing rate of Barclays Bank PLC. 4 See bottom of following pages for price guarantee. 5 Choice is subject to availability, please specify preference when ordering. Offer only applies to purchases made from this advertisement. Prices include 17.5% VAT and apply to current stocks only. UK mainland carriage from £9.99. Please allow 10 working days for cheque clearance. Errors & omissions excepted. In a small number of cases, some in store prices may vary as to those advertised for mail order on the internet or in press adverts such as this.

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digidesign UK's NO.1 MAC MUSIC DEALER

PROTOOLS 24 MIX PLUS

ProTools 24 is the industry standard professional hard disk recording system, and the Mix Plus system is the flagship of the range. As the UK's No. 1 ProTools dealer , we can offer not only the best price, but also first class support and advice in choosing your system, for example:

Digidesign ProTools 24 MixPlus, Apple G4/400 with 256MB RAM 20Gb internal drive, Apple Studio 17 inch monitor, DVD/CD Rom, Atto Dual Channel SCSI Accelerator card, Seagate Barracuda 18Gb fast and wide (SCSI3) drive & CDR in external 2U rack, 888/24 interface, this offer includes the following plug-ins free from Digidesign: Bruno / Reso, Line 6 Ampfarm, Focusrite D2/D3, Drawmer Dynamics, Digidesign's D-Verb, TC Master X.

RRP £15400
£12999
MIX PLUS BUNDLE

DIGIDESIGN 001

18 simultaneous inputs and outputs on dedicated external hardware, including two high quality mic pre-amps. Ships with Pro Tools 5.0 LE software offering 24 tracks of audio with real-time effects and up to 128 tracks of MIDI, mix external inputs in conjunction with your recorded audio.The ultimate studio bundle on a budget.
Apple G4/400 inc 192Meg, 10 Gb internal drive, DVD/CD ROM, Formac 17" Monitor, Digidesign 001 Including ProTools 5.0 LE

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001 BUNDLE

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Digidesign 8i8o 24 interface	£LOWEST
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Digidesign Mix Farm interface	£LOWEST
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Waves TDM Bundle	£LOWEST
Waves Gold Bundle	£LOWEST
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APPLE POWERBOOK

Apple Powerbook G3/400 running Cubase VST or Logic Gold with VX Pocket audio card and Sport 2X2 midi interface

FROM
£2899.99
POWERBOOK BUNDLE

MOTORMIX
MIDI CONTROLLER

IN STOCK NOW

Operating via MIDI, this device forms a universal control surface for any applications such as Pro Tools and Logic Audio where the mixing is being done by software, but the user wants hardware control with physical faders and pergots you can get your hands on. The Motormix has eight fully motorised faders which will dance for you when your computer sequencer plays back your sessions. There are also 8 assignable rotary knobs, and buttons which can be used as mute switches etc, and recorder transport controls. The MotorMix also has the significant price advantage over any of its main rivals!

RRP £799
£LOW
CMAU-MOTORMIX

AUDIOWERK 2
SOUNDCARD

emagic

Stereo I/O audio recording card with stereo analogue I/O and digital S/PDIF interfacing which comes bundled with Micro Logic for the Mac and Logic Audio SE for the PC. 16 track audio recording with effects and EQ. Also includes Zero Audio Packer compression software for the PC and CD burning software for the Mac. An excellent choice for anyone using any of Emagic's range of Logic Audio software.

RRP £199
£169
EMAG-AW2

POWER SAMPLER
PCI SAMPLER CARD

creamw@re

The Powersampler combines sophisticated sampling software with the raw power of three dedicated SHARC DSP chips. While virtually no load on the CPU the Powersampler software operates at only 1-2 ms of latency. The card itself sports 24bit 96kHz analogue in/out and a firewire socket for future expansion. Ships ready with ASIO 2, DirectSound and Gigasampler drivers. An excellent standalone sampler or upgrade to an existing Prism system.

£399

MIDISPORT 2x2
MIDI INTERFACE

midiman

The introduction of the Apple range of iMac and G3/G4 computers without standard serial ports has pushed forward the advances of USB (Universal Serial Bus) technology. One of the first companies to respond was Midiman with their 32 channel USB midi interface. Simple to install - just plug it in - and it works like a dream. But it's not only the Apple Mac that has benefitted, the Midisport ships with Windows drivers too.

£59

PULSAR 2
DSP RECORDING CARD

creamw@re

This new card from Creamware builds on the original Pulsar bringing you even more power to your music production environment. Sporting twin ADAT optical in/out along with stereo analogue and spdif all at 24bit 96kHz. 2 extra SHARC chips mean a total of 6 DSP's of processing power to run the stack of software synths, samplers, vocoders as well as the more usual mixing and effects processors, all updated for this new version.
PERMANENTLY ON DEMO IN STORE, HAS TO BE SEEN TO BE BELIEVED.
PULSAR 1 WALL MOUNTY STILL AVAILABLE only £699

£799

"The sales assistant could not be faulted"
M.J. (Kent)

DIGI 001
COMPUTER STUDIO

digidesign

Digidesign's Pro Tools systems have remained out of reach for most budget studios, but their stylish new 24bit interface box and software package offers 18 channel I/O with 8 analogue, ADAT and S/PDIF. This includes 2 phantom powered XLR mic inputs, monitor out, headphone socket and even a patch in/out thoroughout. This bundled software is the new Pro Tools 5 LE offering 24 track audio editing with new RealTime Audio Suite plug-ins and MIDI sequencing.

RRP £879
£799
DDES-DIGI001

24i + CORE
AUDIO INTERFACE

OVER 45% OFF!

As a Turnkey exclusive price, this computer's CORE setup brings you the M.O.T.U. PCI-324 card and Audiodesk software to interface with the proprietary Audio Wire format of the 24 rack unit. Operating at 44.1kHz or 48kHz sampling rate this professional multichannel converter is an ideal front end and gives you 24 record/play ins - 24 with main and headphone stereo outs and S/PDIF out (plus SMPTE in/out) I/O. Converters are 24 bit with 111dB dynamic range and use balanced jacks.

MOTU 2408 ALSO AVAILABLE only £899.99

£799

VX POCKET MkII
PCMCIA SOUNDCARD

Digigram

A PCMCIA soundcard to turn your laptop into a mobile recording studio, with a breakout board for balanced XLR mic/line ins and outs, and S/PDIF. Stereo analogue ins and outs, and S/PDIF channel which allows the card to support up to 24 bit file exchange. Includes ASIO drivers for Mac and Windows.

£449

SAC-2K
ASSIGNABLE CONTROLLER

A stand alone hardware interface with eight 102mm motorised touch sensitive faders, a large scrub wheel, transport controls and big 8 digit LED readouts for alphanumeric location points. Three banks of 2 line LCD displays can be used to name the rotary pots for the ultimate convenience. There are several built in templates for popular applications like Pro Tools, Logic and Cubase and a further 8 channel expansion is planned.

FACTORY DIRECT
£1169
RADI-SAC2K

ADAPTEC SCSI CARDS

- Adaptec are the industry leaders for reliable SCSI interfaces on PCI cards
- Range covers SCSI 2, 3, 50 pin, 68 pin sockets
- Includes EasyCD Creator software & CDR drivers

FROM
£49
RANGE AVAILABLE

ALTECH SERIAL MAC INTERFACE

- Easy to fit serial port interface
- 16 MIDI channels
- 1x1 MIDI in/out
- No psu required
- Flashing indicator LED's

FACTORY DIRECT
£59

ALTECH MIDIface EX

- Self powered Mac serial port MIDI interface
- 1 in / 3 parallel outs
- Serial Thru bypass switch
- Standard 1.0MHz clock

FACTORY DIRECT
£79

ALTECH MIDIface SX

- Ultra compact design

FACTORY DIRECT
£55

DIGIDESIGN SAMPLECELL 2

- Sample playback card
- 32MB on board RAM
- Powerful sample editing
- 32 voices
- Dynamic digital filters
- 8 outputs
- Full Pro Tools integration

RRP £909
£LOW
DDES-SCEL2PCI

EGO-SYS U2A

- Up to 24 bit 48kHz data rate for I/O connections
- S/PDIF optical & coaxial
- Simultaneous analogue and digital monitoring
- Includes 3m USB cable

£199

EMAGIC AUDIOWERK 8

- PCI audio recording card
- 2 in / 8 out analogue
- S/PDIF I/O
- Works with all major software

RRP £399
£249

KORG OASYS

- Korg's acoustic modelling synthesis on a PCI card
- Over 100 algorithms plus physical spaces + effects
- 24 bit analogue I/O
- ADAT or S/PDIF optical digital interfacing

£899

MIDIMAN MIDISPORT 1X1

- Single port MIDI interface for USB
- 1-in 1-out MIDI = 16 ch
- Self powered, no PSU
- Includes 6 ft USB cable
- Includes drivers for Mac OS 8.6 and Win 98

£55

MIDIMAN MIDISPORT 4X4

- 4 in 4 out MIDI interface (16 channels I/O)
- USB interface, ideal for newer iMacs
- Plug and play compatible with Windows
- MIDI Thru bypass function

£129
MAN-SPORT4X4

MIDIMAN MIDISPORT 8X8

- 8 in 8 out, 128 channel USB MIDI interface for Mac or PC
- 1U rackmount design
- Self-powered - requires no external power supply
- MIDI activity indicators for each port

£249

MOTU MTP AV USB

- Versatile USB MIDI patchbay interface
- Timecode synchronisation, MTC, SMPTE, ADAT
- Digital audio, video sync,

£569

MOTU MIDI EXPRESS XT USB

- 8x8 USB port MIDI interface
- 128 MIDI channels!
- SMPTE to MIDI sync
- Rugged 1U rack

£339

MOTU MICRO EXPRESS USB

OVER 35% OFF!

- Half-rack USB interface for Mac or Windows OS
- 1 MIDI in sockets + 8 ch
- 2 MIDI out sockets + 16 ch
- With SMPTE synchronisation

£244

ROLAND UA-30

- External USB audio interface for PC
- 2 ch analogue I/O on phonos with mic / line level switching
- 2ch digital I/O via S/PDIF optical or coaxial
- Hot swappable
- Built in headphone socket

RRP £199
£175

KENTON CONTROL FREAK 16

- Fantastic real-time MIDI controller
- 16 assignable sliders
- Special settings for Rebirth, GS and XG
- Works on any device with continuous controllers
- 8 Ch version also available only £199

£249

KEYFAX PHATBOY

- Fantastic real-time MIDI controller
- 13 assignable knobs
- Special settings for Rebirth, GS and XG
- Works on any device with continuous controllers

£135

PEAVEY PC 1600X

- Hardware realtime MIDI controller
- 16 faders, 16 buttons, 2 pedals, data wheel
- 128 scene memories, MIDI merge, I/O upgrade

£349

PHILLIP REES CF16

- Assignable hardware MIDI controller unit about VHS tape size!
- Sixteen 60mm sliders for any MIDI CC parameters
- 100 preset setups
- Built in mains PSU

£149

YAMAHA CRW-8824E

- Yamaha's fastest CDRW drive to date - 24x read
- 8x write, 8x rewrite
- 4MB buffer
- Wide SCSI-3 interface
- External case - IEC mains

RRP £299
£259
YAMA-CDRW8824E

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PRICES GUARANTEE*

NEW DIGI001 ON PC

Brenell CUSTOM STUDIO PCs

The computer is the heart of any studio setup, and so Turnkey road tested a huge selection of PCs for audio suitability, before settling on the superb new Brenell range as our recommendation of choice. Built with carefully selected components, they bring you a quality solution at an affordable price. We deliver a tested, working, integrated system, built from the ground up for life in the studio. Best of all, if you do have a problem, just call us - we promise not to send you round the houses.

Few applications are as demanding as digital audio recording. Criteria which are irrelevant to most PC shoppers (such as the level of radio frequency interference within the casing), become very important, and sound cards which are otherwise considered "best buy" in the press often lack the essential "*full duplex*" ability which permits monitoring of audio during recording. By supplying a pre-installed computer which we build from carefully selected components and run through 16 separate tests, we ensure that you get up and running immediately, you won't need to delve into DMA channels and P'n'P BIOS conflicts, and you won't get any nasty surprises like "insufficient system resources" warnings, when you try to run your software. The systems below represent our most popular configurations, we can build to virtually any spec - call us to discuss your requirements - ***your satisfaction is guaranteed!***

SOFT SYNTH STATION

Hardware
- Intel Pentium III933MHz
- 256 MB RAM
- 20GB ATA66 hard disk
- 17 inch SVGA display
- Win98 KBD & mouse
- Emagic MT4 USB midi I/f
- Sscape Mixtreme 2000 card

Software
- Steinberg Cubase VST
- Steinberg PRO52 (VST Synth)
- Arturia STORM (techno beats)
- Native B4 (organ model)
- Native Reaction(sound Design)
- ACID Style (LoopProduction)
- SoundForge XP (Sound edit)
- Surreal (Soundfont edit)
- Wave Mechanics Pinnerb
- Soundscape Audio Toolbox
- G'gasamplirLE + GigaPiano

RRP £4649 **£2899**

Extracts from a genuine Email found on Cubase newsgroup by satisfied customer R Blenkinsopp: *"With all the problems that people seem to be having with compatibility, I just thought I'd tell about a system that works fine. You can get the whole lot from Turnkey. Looking at the problems people have, I'm glad I did. If things do go wrong, there is only one contact point and there's no excuse for them not to help you... Turnkey supply a fully tested system... [mine] works fine with up to 20 tracks of digital audio, perfectly timed with MIDI tracks! PS - I don't work for Turnkey!"*

LOGIC RECORDING PACK
- Intel Pentium III 800MHz (opt 933,1GHz)
- 64 Mb RAM (option up to 512Mb)
- 30 Gb ATA66 HD (optional 20, 30Gb)
- 40x speed CD-ROM drive
- 15" SVGA display (optional 17", 19")
- Windows98 CD, keyboard & mouse
- Midiman DMAN PCI Audio card
- Top Quality Synth and sampler
- Logic Audio SE with 16 track audio

RRP £1649 **£1199**

CUBASE VST STARTER PACK
- Intel Pentium III 800MHz (opt 933,1GHz)
- 64 Mb RAM (option up to 512Mb)
- 20 Gb ATA66 HD (optional 20, 30Gb)
- 32x speed CD-ROM drive
- 15" SVGA display (optional 17", 19")
- Windows98 CD, keyboard & mouse
- Cubase VST PC I/O
- Midiman DMAN PCI Audio card
- Top Quality GM Synthesizer
- 1x1 MIDI interface adaptor

RRP £1799 **£1299**

EMU/VST SAMPLER STATION
- Intel Pentium III 800MHz (opt 933,1GHz)
- 128 Mb RAM (option up to 512Mb)
- 30 Gb ATA66HD (optional 20, 30Gb)
- 32x speed CD-ROM drive
- 15" SVGA display (optional 17", 19")
- Windows98 CD, keyboard & mouse
- Cubase VST V5
- EMU APS sampler card
- 32MB Sample RAM
- 1x1 MIDI interface

RRP £2212 **£1499**

DIGI 001 PRO TOOLS PACK
- Intel Pentium III 800MHz (opt 933,1GHz)
- 192 Mb RAM (option up to 512Mb)
- 20 Gb ATA66 HD (optional 20, 30GB)
- 32x speed CD-ROM drive
- 17" SVGA display (optional 19", 21")
- Windows98 CD, keyboard & mouse
- Digidesign Digi 001 Audio interface
- 18 in and 2 Mic Preamps
- Pro Tools LE version 5.01
- 24 track hard disk recording
- 1x1 MIDI interface

RRP £2412 **£1899**

- Add £79 for additional 64MB Computer RAM
- Add £169 for additional 128 MB Computer RAM
- Add £79 for 17" SVGA option
- Add £699 for LCD Flat Screen option
- Add £139 for extra 20 Gig HD
- Add £169 for extra 30 Gig HD

EXTRA 10% OFF

Available on fully guaranteed 'B'-Stock versions of many products examples below:

ALTECH MIDIdock 2X

- Self powered parallel port MIDI interface for PC
- 2 in / 2 out MIDI = 32 ch
- MIDI timecode generator
- Transparent printer pass through

FACTORY DIRECT **£59**

ALTE2XIPC

CREAMWARE LUNA

- 24 bit 96kHz PCI sound card with stereo analog & S/PDIF digital I/O
- Connects to main A/D A converter breakout box giving 8 channels I/O
- Modular expandability

RRP **£749**

EGO-SYS WAMI RACK 24

- 24bit audio & MIDI
- 4 in 8 out balanced analog with LED metering
- 4x4 MIDI interface with simple
- ASIO2, EASI and Gigasampler drivers

RRP £499 **£449**

EGO-SYS WAVE TERMINAL 2496

- PCI soundcard
- Full duplex operation
- 24 bit 96kHz converters
- TRS balanced jacks & S/PDIF coax + optical
- 4 channels I/O

RRP **£299**

EGOS-24/96

ECHO DARLA 24

- Multiple outputs on a budget
- 24 bit PCI audio card
- 2 inputs and 8 outputs!
- Easy to install and runs with all major audio programs

RRP £299 **£249**

ECHO MONA NEW

- New dazzling audio interface
- 4 mic/instrument preamps
- Super fast ASIO drivers
- 24 bit
- 4 channel LED monitoring

RRP £799 **£675**

ECHO GINA/24

- 24 bit PCI audio card
- 2 inputs 8 outputs
- Rugged breakout box with 1/4" jack connections
- ADAT and SPDIF in/out

RRP £399 **£369**

EGINT-GI

LYNX1

- The most cost effective serious PCI soundcard!
- 24 bit AD+DA converters
- 96kHz AES/EBU + S/PDIF
- Wordclock 6 ft breakout cable with bal XLRs
- 2x MIDI ports + 2 ft cable

RRP £599 **£499**

MIDIMAN AUDIOPHILE NEW

- A basic stereo in/out soundcard designed to give high quality audio performance
- Analogue with 24 bit 96kHz converters and S/PDIF coaxial I/O
- Breakout for MIDI ports
- ASIO2, GSIF, DirectX

RRP £179 **£179**

MIDMAN-AUDIOFILE

MIDIMAN DMAN PCI

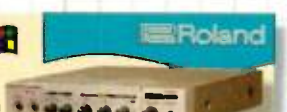
OVER 30% OFF!

- 20 bit DirectX PCI card
- Gold plated phono in/out
- On-board GM synth and MIDI in/out
- Ideal for soft synths and samplers

RRP £149 **£95**

MIDMAN-DMAN/PCI

UA-100G AUDIO CANVAS



The new UA100G is finished in gold. It does not include the built in Sound Canvas sounds (which you might not need or want to use anyway) but it does include the highly excellent Syntrillium Cool Edit LE audio editing application which gives you a wide range of effects and detailed waveform editing capabilities. There's a 32 channel MIDI interface, via USB in a compact half rack sized case with a guitar level line input, two mic inputs, and an S/PDIF digital output.

RRP £349 **£219**

ROLA-UA100G

MIDIMAN DELTA 1010

- 8 balanced analogue I/O
- S/PDIF coaxial I/O
- MIDI in and out (16 ch)
- Wordclock I/O on BNC
- 24 bit 96kHz supported
- PCI card + 1U breakout
- W98, ME, 2k, Mac & Linux

RRP £599 **£539**

MIDIMAN DELTA 44

- 24 bit 96 kHz full duplex PCI card + breakout box
- 4x balanced TRS jack I/O
- Includes driver software
- Up to 103dB S/N ratio
- W98, ME, 2k, Mac & Linux

RRP £249 **£199**

WAMI BOX PCMCIA AUDIO INTERFACE

The Wami Box is a PCMCIA card interface for any Laptop running Windows, complete with a breakout box for the audio connections. It provides 2 ch input and 4 ch output with mixer and effects - plus multiband parametric EQ. Digital I/O is in the form of S/PDIF optical and coaxial for the highest fidelity connection. The Wami Box is not just an audio interface - it also contains a 64 note polyphonic synth engine to realise sequence playback and has 16MB sample RAM onboard.

RRP **£399**

EGOS-WAMIBOX

US428 INTERFACE

Tascam's US428 helps you bridge the gap between ease of use and most software packages designed for multi channel recording and mixing. You get 8 faders, with passports and EQ pots and a master fader, plus a set of transport keys and a large data wheel. These can be freely assigned to your software parameters. Besides better control, the Tascam also gives you better audio interfacing with its 24 bit converters 2 x XLR mic inputs, 4 jack line inputs, S/PDIF and two MIDI ports. All of this audio and MIDI data is transferred easily via the single USB cable connection.

RRP £499 **£449**

TASC-US428

PASSPORT MUSICTIME DLXE & MK10

OVER 65% OFF!

- Up to 16 staves
- Fully MIDI compatible
- Part extraction and very easy to use
- Includes Evolution MK10 midi controller

RRP £179 **£59**

PACKAGE

RME HAMMERFALL LE

- Hammerfall Lite comes without the daughterboard but may be upgraded later
- PCI soundcard with ADAT optical x2 and S/PDIF x1
- 9 pin ADAT Sync socket
- S/PDIF coax breakout lead
- Ultra low latency
- Windows 98, Mac and Linux drivers

RRP £329 **£299**

RME-HAMMERLE

E- CARD PRO SOUND CARD

The EMU APS has set the standard for professional soundcard solutions. Now we can bring you a stunning new deal on this card by stripping away the extra drive bay preamp unit and offering the card on its own. But this still leaves you with a noise-less audio production card with 64 voices of sampling, multitrack hard disk recording and real-time DSP effects, all through balanced stereo mixer and EQ. A fantastic card for a fantastic price. Included: Steinberg Wavelab 1.6 & Cubase FREE!

RRP £399 **£269**

ALSO AVAILABLE with Expansion Bay only £369.99

UX256 MIDI INTERFACE

High speed USB MIDI interface from Yamaha, stacked full of MIDI ports for a remarkable price. You have a total of 128 MIDI channels to play with both into and out of the computer via MIDI sockets and two serial ports are provided for easy connections as well as a CD full of useful drivers and utilities.

RRP £199 **£179**

YAMA-UX256

ROCKTRON PC PREAMP

- The ONLY PC preamp for musicians
- Guitar & bass inputs
- Warm Spring reverb
- HUSH noise reduction
- Speaker simulator
- Stereo effects loop

FACTORY DIRECT **£69**

ROCK PCPREMIC

STEINBERG NUCARD

- PCI + daughterboard digital only soundcard with 3 ADAT optical I/O for 24 channels of 24 bit
- 9 pin breakout cable has ADAT sync socket and stereo S/PDIF coaxial I/O
- BNC wordclock in/out

RRP £499 **£429**

STEI-NUCARD

DELTA 66 MULTI IN/OUT AUDIO CARD

The Delta 66 is a high quality (24bit 96kHz) audio card sporting 4 analog inputs and outputs on balanced TRS jack sockets housed in a rugged steel breakout box. The inputs are configurable to either +4dB or -10dB via the useful software mixer and configuration utility. Digital S/PDIF brings the in-out to 6 in total. ASIO 2.0 and DirectSound drivers available for Windows 95, 98, ME, NT and 2K. ASIO 2.0 for the Mac and now Linux.

RRP £349 **£279**

DSP FACTORY PCI CARD

INC FREE AXIGAT ADAT I/FACE

PCI recording and mixing card from Yamaha - a single card with a row of DSPs. Yamaha have captured the mixing and effects processing of their 02R digital mixer to add professional audio routing capabilities to any PC studio. Multiple EQ and quality effects using 2 sr-built units based upon the popular REV500, along with 24 track mixing. Software support for all major audio sequencers.

RRP £599 **£475**

TERRATEC EWS88D

- 24 bit 10 channel I/O PCI soundcard
- 8 channel ADAT digital I/O plus 2 ch S/PDIF opt / coax
- Two independent MIDI ports for 32 channels
- Up to three cards can be cascaded with single sample accuracy

RRP £299 **£259**

TERRATEC EWS88MT

- Soundcard + external A/D and D/A converter box
- Handles up to 24bit 96kHz
- 8 analogue in/out
- S/PDIF coax i/o, + MIDI
- Includes ASIO2 and Win 95/98/NT drivers

RRP £349 **£319**

NEW U8 USB INTERFACE

A complete PC software based recording package including specially adapted versions of Cubase VST and Cakewalk Home Studio 9 to integrate with the USB hardware controller interface unit. The U8 itself provides 20 bit converters for 8 channels of inputs including XLR mic ins, as well as 2 channel S/PDIF digital I/O, and the convenient interface of 8 faders and a large data wheel, plus the handy transport buttons and more assignable rotary pots for things like EQ and filters etc. For those attracted to the powerful editing and flexible control of a computer desktop based approach, this system aims to provide almost everything you need to get started.

RRP £499 **£369**

ROLA-U8ST

SW1000XG SOUNDCARD

The ultimate soundcard that offers a complete solution for your home studio. It has the sounds from the celebrated MU100R tone module. It has 20 bit stereo analogue in/out and also a digital spdif output. An on-board DSP chip provides processor independant effects on 12 separate audio channels. MIDI in/out is also included. What else could you need? How about an FM, VL or harmoniser daughterboard? We've got those too!! Fully compatible with all audio/MIDI software. A blinding card at a fantastic price!!!!!

RRP £399 **£349**

YAMAHA SW1000XG DAUGHTERBOARDS

TWO new groundbreaking daughterboards bring the total up to FIVE cool ways to add a new sound dimension to your SW1000XG. They clip snuggly onto your existing card and are accesible immediately from the included software.

Choose from:
- PLG150-AN NEW Analogue Prophet 5 board
- PLG150-PF NEW Piano board
- PLG100-DX Gives you a bank of DX7 sounds
- PLG100-VL Virtual Acoustic Modelling
- PLG100-VH Vocal harmoniser.....and more

FROM **£99**

YAMA-PLGXXX

Prices include 17.5% VAT and apply to current stock only. UK mainland carriage from £5.00. Please allow 10 working days for cheque clearance. Errors & omissions excepted. In a small number of cases, some in-store prices may vary as to those advertised by mail order on the internet or in press. Items sold as new.

KORG ensoniq ALESIS Steinberg Technics Vestax NUREVIEW FATAR

EUROPE'S LOWEST

guillemot

MAXI-MUM VALUE!

NEW

MAXI ISIS
MULTICHANNEL SOUNDCARD

A stunning home studio solution for a staggering price. The Maxi Studio ISIS (Interactive Sound Integration System) is a full duplex card with external 20bit convertors offering 8 inputs 4 outputs and SPDIF coaxial and optical.

The external half rack box attaches to a control PCI card fitted inside the PC. The card comes with an on board GM synth with 4MB of high quality sounds with room for another 32MB with the addition of another SIMM. Fully compatible with all hard disk and MIDI software, not to mention games and multimedia and is fully DirectX compliant. Included in the box is a special version of Logic Audio offering 16 track audio, 4 effects buses and 3 EQ per track.

Everything you need in one package, and at this price who can argue with that!!!

- Complete Hardware/Software Solution
- 8 Independent Analogue Inputs, 4 Outs
- SPDIF Coaxial and Optical
- Logic Audio SE Included in the Box

RRP £249
£215.99
MAXI-ISIS

NEW **EVERPACK**

New from DUY, authors of such renowned VST plug-ins as Diffusor and Dist Valve, a plug-in bundle aimed at users of Mac native audio software. The Everpack provides an unrivalled package of FIVE plugins which can be used with any VST, MOTU MAS, Digi 001 or any program which supports the Audiosuite or Premiere platforms. These could will be invaluable for mixing or mastering within any of the above environments.

5 PLUG-INS FOR UNDER £300!

All five plugins in all or the above formats for an incredible £299 inc VAT VST, RTAS, Audiosuite, MAS, Premiere (not for 2 floats)

RRP £399
£299
DUY-EVERPACK

LOGIC SEQUENCER RANGE

emagic

Range sporting DirectX / VST plug-in compatibility

LOGIC PLATINUM - Up to 128 audio tracks, 31 included real-time DSP effects, support of multiple high-end hardware.
RRP £549 OUR PRICE £429.99! EMAG-LOGPL MA/PC

LOGIC GOLD - Up to 96 audio tracks, real-time DSP effects, supports Audiowerk 8 and Korg 1212
RRP £399 OUR PRICE £309.99! EMAG-LOGGL MA/PC

LOGIC SILVER - Up to 24 audio tracks, 3 effects busses.
RRP £199 OUR PRICE £159.99! EMAG-LOGSL MA/PC

VERSION 4.5 NOW WITH FULL SURROUND MIXING

FROM **£159**

MASTER TRACKS PRO
MIDI/AUDIO RECORDING STUDIO

PASSPORT

Crazy price crash on this fully featured MIDI and audio recording package. 64 track MIDI sequencing with Passports excellent scoring facilities for a professional printout. The audio side is handled by a special edition of the legendary S.A.W. (Software Audio Workshop) with 4 stereo tracks of rock solid digital recording, 99 mixing / EQ effects and editing. Works on any PC from a 486DX2 66 with 8MB RAM upwards.

RRP £299
£29
PASS-MTRAXPRO

MASTER TRACKS MIDI ALSO AVAILABLE only £19.99

"Nothing could have been better"
M.J. (Kent)

REAKTOR
SOUND GENERATION MACHINE

FREE DEMO CD NOW AVAILABLE!

Reaktor 3.0 is the latest version of the award winning milestone in synthesizer and sampling development. An amazing piece of software that transforms your PC or Mac into a professional fully featured synthesizer and sampler without the need for additional DSP hardware. For pure sound creation uniting synthesis, sampling and effects processing then Reaktor is unparalleled. Combining the power of both Generator and Transformator in a single dazzling package the potential of Reaktor is inexhaustible. Build synth engines powered by samples, cross formant filters with oscillators and modulators. *Must be seen to be believed!*

FACTORY DIRECT
£249
NATI-REAKTDU

DYNAMO EFFORTLESS REAKTOR-ING

Love the sound of Reaktor but don't want to dive into the depths of editing and creating your own synths? Then Dynamo is exactly what you need. Featuring a collection of 25 of Reaktor's most heralded instruments the Dynamo gives you a box of extraordinary sounds for an extraordinary price. This software synth is ideal for creating fat retro voices from scratch, or deconstructing and processing your existing sounds. Responds with very low latency, and Native Instruments have PC and Mac compatible versions.

FACTORY DIREC
£129
NATI-DYNAMPC

B4 SOFT ORGAN

Another superb software synth from Native Instruments, this time designed to mimic the famous Hammond B3 screwwheel organ, including its valve amplification and rotary speaker cabinet. The user has control over 9 drawbars for each manual keyboard and 6 for the two octave pedalboard. Parameters such as key click, percussion, harmonic foldback and loudness robbing add a realistic dimension to the simulation, and coupled with authentic player's chops from a MIDI keyboard, or very careful sequencer programming you can add uncannily authentic Hammond B3 organ parts to your tunes.

BUY DYNAMO + B4 TOGETHER FOR ONLY £199

FACTORY DIRECT
£129
NATI-B4

PRO 52
VST VIRTUAL INSTRUMENT

A genuine and authentic model of a Sequential Circuits Prophet 5 synthesizer, available from within Cubase or other supporting applications. Completely faithful to the real thing, and comes with almost a thousand amazing sounds, presets, and has full control over every parameter. Up to 49 notes of polyphony, and two operating modes of Analogue Warmth or Digital Accuracy.

RRP £149
£129
STEI-PRO52

NEW **SPEKTRAL DELAY** EFFECTS PLUG-IN

The first in a new series of "Spektral" plug-ins from Native Instruments based upon the division of an audio signal into 512 frequency bands by Fourier Transformation. The **Spektral Delay** allows you to delay each or any of the 512 frequency bands independantly which gives you the opportunity to create and transform sounds in a way never imagined before. Use as a standalone FX processor or as a VST plug-in for Mac or PC.

FACTORY DIRECT
£99
NATI-SPERDELA

EXS24
SOFTWARE SAMPLER

emagic

A software sampler which supports WAV, AIFF, SDII and Akai formats, up to 24 bit, and offers 32 voice polyphony. In fact, you could stack 16 of these together in Logic Audio. Sound design tools include multi-mode filters, taken from the ES1, envelope generators, LFOs for pitch, pan, volume and HPF sweep. Includes hands-on (with mouse-on) sliders and knobs, for adding effects like portamento.

RRP £259
£239
EMAG-EXS24

ANTARES AUTOTUNE

- Automatic intonation correction
- Retunes flat vocals
- The plug-in that makes the famous sound good
- Now available as a DirectX or VST plug-in
- RTAS also available

FROM **£89**

BIAS PEAK LE

- 2 track digital audio editor for preparing samples
- Supports import / export to most major samplers via SCSI
- Supports FX Plug-ins
- Playlist editing

RRP **£75**

CAKEWALK PRO AUDIO 9

- Best selling US sequencer
- Multiple MIDI & audio tracks running in sync
- Full range of DSP processing as standard
- Accepts third party software plug-ins
- Full DXP factory support

RRP £249
£189
TWEL-CAKAS

CAKEWALK PRO AUDIO DELUX V9

OVER 50% OFF!

- Massive software bundle! Includes the following:
- Pro Audio Delux V9
- NemeSys GigaSampler LE
- GigaPiano 2GB sample!
- Cakewalk Audio FX 1, 2, 3
- Musician's Toolbox III

RRP £499
£249

CYCLING '74 PLUGGO

- An ABSOLUTE BARGAIN!
- 74 interesting VST effects plug-ins for Mac
- Not boring old reverbs, flange, EQ, delay etc. but original DSP processes you won't find elsewhere
- eg. Swish, Swirl, Warbler, Stutterer, Durometer...

RRP
£59
CYCL-PLG

CODA FINALE 2000

- Top notation and score publication program
- Academic version available
- Even easier to use
- Stunning professional printout

RRP £499

DIGIDESIGN VIRUS TDM

- Access Virus synth in a TDM plug-in for ProTools
- 256 editable patches
- Can work as an effects processor for input
- Up to 80 note polyphonic
- Automate 150 parameters

RRP
£699

DUY SPIDER TDM

- 40 seperate modules that can be user customized into any routing for DSP
- 320 presets as standard
- Comp, reverb, EQ, de-ess, FX, synths, noise gates, 3D effects, de-esser etc.
- Read only Spider only £349.99!

RRP £799

DUY GLOBAL

- TDM plug-in bundle
- RedSlider: over 220 FX!!
- DeD Valve simulator.
- DeD Analog tape emulator
- DUY Shape: mastering 3 band waveshaper
- Max DUY: sound level normalizer.
- DUY Wide stereo imager

RRP
£999

EMAGIC SOUND DIVER

- Librarian synth editor
- Most modern and classic synths included
- Easy interface, can work within Logic or stand alone
- Mac or PC

RRP £249
£169
EMAG-WAVEMA

EMAGIC ES1

- Virtual synthesizer with up to 8 ES1 instruments within Logic application
- Up to 16 note poly each
- Integrated effect plug ins from Logic's inserts

RRP £99
£49
EMAG-ES1

EMAGIC WAVEBURNER

- CDR driver and mastering software for Mac
- Full PQ editing, real time sample rate conversion
- Track crossfades
- CDTEXT format support

RRP £149

FASTRACK RAVE E JAY

OVER 50% OFF!

- Become an Electronic DJ
- 8 tracks of Rave-tastic music making
- Over 100 included hits and loop

RRP £39
£19
FAST-RAJAYPC

KOBLO 9000

- 3 popular software synthesizers in one
- Three optimal over filters, LFO, modulators, gain, envelopes + modulation
- 32 bit DSP algorithms

RRP
£599
KOBL-STUDIMA

LEXICON LEXIVERB

- VST plug in for Pro Tools
- Based on Lexicon's world famous reverb algorithms
- Full parameter control and intuitive user interface
- Graphic displays of reflection density vs time

RRP
£645

NEMESYS GIGASAMPLER LE VERSION

- The Prince of Software Samplers!
- Pitches up to 4GB size!
- 48 note polyphonic
- 16 part multi timbral
- LE version now includes Akai format support

FACTORY DIRECT
£79
NEME-GIGAPCLE

NEMESYS GIGASAMPLER FULL VERSION

- Full version includes 1 GB grand piano multisample CD-ROM
- The King of Software Samplers
- Pitches up to 4GB size!
- 64 note polyphonic
- 16 part multitimbral

FACTORY DIRECT
£199
NEME-GIGAPC

NEMESYS GIGASTUDIO

- The god of software samplers!
- Pitches up to 4GB size!
- 128 note polyphonic
- 32 part multitimbral
- Built in studio effects and mixing
- Realism unparalleled
- 128 note polyphonic plus studio also available for only £499.99

FACTORY DIRECT
£269
NEME-GIGASPC

PG MUSIC BAND-IN-A-BOX

- World leading intelligent arrangement software
- Full backing band from entering chord letters
- Full GS/XG compatibility
- Can export MIDI files

RRP
£89

SONIC FOUNDRY ACID

- Fantastic loop production tool
- Unequalled time stretching and pitch shifting
- Paint loops right on the screen
- Comes with stacks of Loops on CDROM

RRP £349
£LOW
SFOR-ACID

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* Our guarantee is that we will match or beat any genuine quote, for identical goods, from a UK or European dealer at time of order.

PRICES GUARANTEE*

LOSE THOSE USB BLUES (...FIND THESE)

MT4 MIDI INTERFACE

NEW

The MT4 is a small, yet perfectly formed, MIDI interface from Emagic designed for any USB equipped laptop, Powerbook or desktop computer. Two independant inputs and 4 independant outputs, each with it's own activity LED's, provide 32 MIDI channels in and 64 MIDI channels out. Comes with patching software and is built using the same technology as the Unitor 8.

RRP £149 **£129** EMAG-MT4

UNITOR 8 Mk2 USB INTERFACE

NEW

The new Mk2 version of the Unitor 8 brings a classic interface right up to date with USB connectivity as well as via serial ports, making it suitable for users of both old and new Macs and PCs. There are eight MIDI ins and eight MIDI outs, plus full SMPTE to MIDI sync alowing easy hook-up with virtually any tape machine.

RRP £499 **£449** EMAG-UNITOR82

AMT-8 USB INTERFACE

NEW

You don't need to be an Emagic user to take advantage of their interfacing expertise, and it dates right back to Atari days! This latest incarnation gives Mac or PC users with USB ports 128 MIDI channels in both directions with rock solid timing, and if that's not enough, you can stack up to eight of them!

RRP £349 **£289** EMAG-AMT8

TASSMAN ACOUSTIC MODELLING

NEW

Applied Acoustics bring a breath of fresh air into the software synthesis market. Their scientific expertise has been harnessed to create a stunning collection of accurately modeled acoustic objects such as pianos, strings, beams, tubins, mallets and reeds, all of various sizes and materials. You have complete control over all aspects of the models and can build completely unknown instruments with intuitive ease. Comes packed with ready made instruments including Model's of analogue synths and is as well as real instruments. *This is the state of the art in physical modelling.*

FACTORY DIRECT **£269** AACO-TASSMAN

"Excellent service all round" I.C. (Kent)

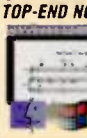
STORM VIRTUAL STUDIO

NEW

A completely modular virtual studio the likes of which you've never seen. Storm gives you a whole rack of professional composition tools including analogue synths, twin decks for mixing and scratching samples, samplers, beat boxes and with ready made modules downloadable all the seemingly possibilities are endless. Wrap it all up with real time effects and you have a fully configurable virtual studio. Use it as is or as a VST instrument in Cubase.

FACTORY DIRECT **£149** ARTU-STORMPC

SIBELIUS TOP-END NOTATION



The notation program choice of professionals and music academies. 64 stave, full orchestral scoring. Complete MIDI integration. Create anything from simple single stave pieces through to complex arrangements, fast and very easy. The program has a reputation second to none. We have it on permanent demonstration on the shop floor.

£595

SONIC WORX STUDIO 2

SonicWorx Studio 2 is a powerful tool designed for processing audio files in the digital domain. Besides a professional wave editor including all the functionality you expect from an up-to-date audio editing tool, including unlimited features such as multiple Undo/Redo, a graphic edit history for easy viewing, auditioning and restoring all edit steps and a snapshot function for easy storing and retrieving of preselection versions. Studio also offers advanced resizing and offline DSP capabilities not available elsewhere.

FACTORY DIRECT **£299** PROS-WSTUDIO

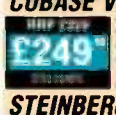
CUBASE VST V4.1

NOW MAC COMPATIBLE!

Pushing back the boundaries of hard disk recording power and integrated MIDI sequencing, Cubase VST leaps to version 4 proving that the Apple Mac is still ahead of the game. New Features include: 64 channels of CD quality audio, 8 aux sends and 8 global effects, extended tool bar with functions like time stretch direct in the arrange page, stylish graphical enhancements, MIDI panel mixer.

£249

CUBASE VST V5



Steinberg has produced a complete re-write of the PC Cubase MIDI/Audio engine bringing us a faster and smaller product for the 21st century. New effects and EQ emulations, additional VST instruments and Rocket Powered for on-line collaboration make this new version worthy of it's number one position in the studio software market.

£249 NEW VERSON 5

POWER BUNDLE

Plus a bundle containing SonicWorx Studio 2 (see above) and SonicWorx Artist, which gives over 60 effects, including reverb, noisegate, pitch / time, ring mod, chorus, distortion, maximizers, audio morphing, convolution, telephone simulator, formant shaper wow / flutter, and weird ones like Drumloop Simulator, Atmosphere Designer, Tubulator, Cellular Morphing and Turbulence.

FACTORY DIRECT **£399** PROS-POWERBUN

STEINBERG CUBASIS VST

Superb value entry level MIDI sequencing and 8 track hard disk recording software from market leaders Steinberg. Using the basics of the full Cubase program, Cubasis VST even offers support for VST plug-ins and instruments. Start as you mean to go on!

£89

PROFESSIONAL SCORE VERSIONS ALSO AVAILABLE only £399.99

ORANGE VOCODER VST PLUG-IN

With the Orange Vocoder Prosonig offers you an all-digital simulation of a classic analog Vocoder effect that is fully customizable and comes with an 8-voice classic analog synthesizer unit. Freeform EQ and Reverberation Reverb, all in one plug in. The use of advanced filter design technology and utmost efficient coding techniques make this powerful sound design tool lightning fast on your computer, while at the same time offering an unprecedented audio quality.

FACTORY DIRECT **£99** PRO-ORANGE

VST BUNDLE VST PLUG-IN PACK

Package of four VST plugins, including Ambisonic 3D placement panner for surround sound effects. Dynasone, a mastering mix normalizer and multiband compression plug-in. Roomulator an easy to use reverb with graphic control interface and VoxClon - a complete vocal channel strip with noise gate, equaliser, compressor, de-esser, exciter and valve saturation effect.

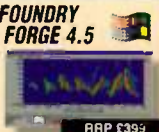
FACTORY DIRECT **£249** PROS-VSTBUN

DISCOVERING KEYBOARDS / MUSIC

Now only £29.99 each the Voyeurs 'Discovering' series are an ideal introduction to the world of music, keyboard theory, notation and harmony. In an entertaining interactive CD-ROM, packed with examples and excercises for you to try. The software will even analyse and help correct your work, acting as a virtual music tutor. Discovering Music introduces notation with planning, and lets you record with a 5 piece backing band. It also teaches music theory and history. Discovering Keyboards explains MIDI and synthesis, and includes a printed study guide to aid your keyboard skills. *Buy both for only £49.99!*

RRP £70 **£29** VOYE-DISCOVE

SONIC FOUNDRY SOUND FORGE 4.5



- Sound file editing, FX, loops, up to 50 files at once
- WAV, AIFF, Creative VOC, VOX & Sound Designer SDI

RRP £399 **£LOW** SFOR-SFORGE

SONIC FOUNDRY ACID MUSIC

- The music software hit of the year
- Fantastic loop based production tool
- Automatic tempo matching
- Easy to use
- 100's of loops included

RRP £99 **£LOW** SFOR-ACIDPHT

STEINBERG REBIRTH RB-338

- Two TB303s
- One TR808
- One TR909
- All on your Mac or PC!
- Edit on screen or via MIDI controllers

£125

STEINBERG GRM TOOLS

- Bundle pack of 4 unique plug-ins
- Shuffling
- Comb Filters
- Band Pass Filter
- PitchAccum - resposition

RRP **£129** STEI-GRMOU

STEINBERG CLEAN!

- Audio restoration and CD data extraction ripping
- Includes CDR burn drivers
- Realtime denoiser, wide stereo, declicker, exciter and gain normalizer
- Ideal for mastering CDR of your old tapes and vinyl

RRP **£99** STEI-CLE

STEINBERG PRODUCER PACK

- VST 32 plus lots more
- Includes Wavelab V2
- Includes FreeFilter and Waves Renaissance Compressor
- Complete music making and mastering solution

RRP £799 **£549**

STEINBERG MASTERING EDITION

- Set of Six great plug-ins
- FreeFilter - adaptive FIR 30 band graphic EQ/RTA
- Loudness Maximizer
- Multiband Compressor
- Spectralizer - exciter
- SpectroGraph - sonogram
- Phase Vectorscope - live goniometer & correlation

RRP **£349** STEI-MASTERDU

STEINBERG PPG

- synth VST instrument for Cubase
- Accurate model of PPG Wave 2.3
- 2 oscillators, 32 wavetables, 64 waveforms
- Hundreds of presets

£129

STEINBERG MODEL E

- Software synth VST Instrument for Cubase
- 64 voices polyphony
- 3 oscillators, 2 and 4 pole filters
- Numerous preset banks

£129 STEI-MODELE

STEINBERG WAVELAB V3

- 32 bit 96 kHz Windows Audio Editor
- Plug In Architecture for Direct X and VST
- New multitrack Audio Montage window
- 3D material analysis graphs and real signal generator

£299

STEINBERG RECYCLE

- Loop tool for samplers
- Cuts loops into component parts
- Supports all major samplers
- Sends/receives from samplers via SCSI/MIDI

£169

STEINBERG REASON

NEW

- The ultimate software synth
- Integrated Synthesis, sampling, FX & mixing
- Full MIDI control
- All the gear you'd ever need in a single plug-in

RRP **£299** STEI-REASON

STEINBERG CUBASE VST/32

- Brand new Version 5
- 128 Audio Channels
- Up to 32bit audio resolution
- Pro MIDI and notation editing
- Apogee UV22 dithering
- Rocket Powered for on-line collaboration

RRP £649 **£LOW** STEI-CUBAUOPC

STEINBERG LM4

- Brand new VST instrument for Cubase
- Full on software drum machine
- Tons of MIDI drum samples included
- Sounds fantastic

RRP £99 **£89** STEI-LM4

STEINBERG NUENDO

NEW

- Steinberg's new audio production system
- 128 track audio recording
- Surround sound mixing
- Win98/NT/2K and BeOS compatible

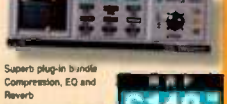
FROM **£999**

SYNTRILIUM COOL EDIT PRO

- Fantastic DAW editor recording software
- Up to 64 tracks of audio
- Sample accurate editing
- 30 effects modules
- Up to 32 bit 192 kHz
- Fingerprint denoising, convolution, FFT EQ etc

£269

TC ESSENTIALS



- Superb plug-in bundle
- Compression, EQ and Reverb
- Looks good and sounds fantastic
- Direct X PC compatible

RRP **£149**

TC WORKS SPARK

- 24 bit 96 kHz audio editing and mastering
- VST plug-in support
- SCSI transfer to Yamaha, Akai, Emu, Korg, E-mu & Roland samplers
- Reads WAV, SD2, AIFF and Quicktime formats

RRP **£299**

TC WORKS NATIVE BUNDLE

- Professional Mac class plug-in pack
- Combines reverb, EQ and compression
- Easy interface
- For any DirectX program

RRP **£299**

VOODOO SOFTWARE DRUM MACHINE

- Turns your computer into a programmable beatbox sampler
- Play drumloops, hits & MIDI file drum patterns
- Hundreds of free hits & samples included

£99

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EUROPE'S LOWEST

SPIRIT BY SOUNDCRAFT

GET IN THE MIX!

FOLIO NOTEPAD
10 INPUT UTILITY MIXER

For quality mixing on a budget, this has to be the neatest solution around. Typical Soundcraft quality has been further enhanced by the use of surface mount technology and custom designed rotary pots. 4 mono inputs are provided along with 2 stereo, which also feature RIAA preamps for record deck connection. 2 band EQ and an auxiliary send complete a highly flexible package.

RRP £149 **£109**

FOLIO F1
14 & 16 INPUT STEREO MIXERS

The most affordable small project studio mixer in the Spirit range for serious 8 track applications, available in two frame sizes offering a total of 14 or 16 inputs, with either 6 or 8 main mono channels with mic preamps, inserts and 3 band EQ with sweep mids. The remaining stereo channel pairs have 2 band EQ but all share the 3 aux sends and long throw 100mm faders. Both mixers may be rackmounted with the optional £19.99 rack ears, but they include Spirit's very handy built in handle for great portability.

RRP £279 **FROM £225**

FOLIO FX8/16
MIXERS WITH FX

A superb quality Lexicon multi-effects unit, with a fantastic Spirit by Soundcraft mixer thrown in free! The Lexicon DSP gives editable reverbs, delays and chorus, whilst the 16:4 channel mixer has XLR + jack inputs, inserts, direct outs, UltraMic preamps, 3 band sweep mid EQ, 4 aux sends, solo in place, and 100mm Alps faders. The FX8 is the smaller version with fewer inputs, but the same long throw faders and high quality circuitry, giving Spirit's warm dynamic sound.

FROM **£349**

SPIRIT FOLIO SX
16:4 PORTABLE MIXER

A great mixer which would suit both live sound applications and a small project studio for multitrack monitoring. 12 mono and 2 stereo inputs feeding both main and sub L+R outputs, giving you 2 stereo pairs or 4 mono busses depending how you pan and route your channels. 3 bands sweep mid EQ, HPF , inserts, direct outs, 3 auxes, 100mm faders & integral handle.

RRP £479 **£349**

MACKIE 24/8/2

- Hi spec professional 8 bus recording console
- Features Mackie's superior mic preamps and low noise circuitry
- 4 band EQ, 4 aux sends
- Full channel inserts and direct outs
- Optional meterbridge

RRP £2685 **£LOW** MACK-24/8

MACKIE 32/8/2

- Hi spec professional 8 bus recording console
- Features Mackie's superior mic preamps and low noise circuitry
- 4 band EQ, 4 aux sends
- Full channel inserts and direct outs
- Optional meterbridge

RRP £3523 **£LOW** MACK-32/8

MACKIE 1202VLZ PRO

- 12 inputs with 3 band EQ, HPF, 2 auxes, mute, PFL
- The highest quality small mixer available today!
- New improved XDR mic preamps with ultra low 0.0007% THD figure

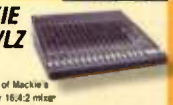
RRP £329 **£279**

MACKIE 1402VLZ PRO

- Compact very high quality
- 14 inputs (on 60mm faders)
- 3 band EQ with 75Hz HPF
- 2 aux sends, mute & solo
- Tape return, mix + monitor
- New XDR mic preamps

RRP £479 **£379**

MACKIE 1604VLZ PRO



- New version of Mackie's most popular 16:4:2 mixer
- 3 band sweep mid EQ
- 6 auxes, HPF, 4 busses
- New XDR extended dynamic range preamps
- Physically adjustable I/O accommodates racks

RRP £921 **£LOW** MACK-1604PRO

MACKIE 1642VLZ PRO

- Compact high quality 4 bus mixer in 16:4:2 size
- 8 mono channels with inserts and XDR preamps and 3 band sweep mid EQ
- 4 stereo line channels fully with 4 band EQ
- 4 aux sends, 8 direct outs
- Each bus has 2 outputs

RRP £899 **£649**

MACKIE CFX12

- 12 channel 4 bus live mixer
- Built in digital effects
- 9 band master graphic EQ
- 2 aux sends, 3 band EQ with sweepable midrange
- Extra mono Subwoofer out with 75Hz LPF
- 8 mic inputs with inserts

RRP £598 **£449**

MACKIE CFX16

- 16 channel 4 bus live mixer
- Built in digital effects
- 9 band master graphic EQ
- 2 aux sends, 3 band EQ with sweepable midrange
- Extra mono Subwoofer out with 75Hz LPF
- 12 mic inputs with inserts

RRP £799 **£599**

MACKIE CFX20

- 20 channel 4 bus live mixer
- Built in digital effects
- 9 band master graphic EQ
- 2 aux sends, 3 band EQ with sweepable midrange
- Extra mono Subwoofer out with 75Hz LPF
- 16 mic inputs with inserts

RRP £1149 **£839**

MACKIE D8B

- 56 ch digital console with integrated meterbridge
- 24 analogue + 24 digital line via expansion cards
- Dynamics, 4 band EQ, 12 aux sends, surround pan
- Full dynamic automation, LIVE2 encoding
- Optional effects plug-ins eg. Antares AutoTune

RRP £1899 **£LOW**

DPS12i
DIGITAL PERSONAL STUDIO

AKAI

Nonlinear hard disk recording and mixing in a box, with 12 tracks of uncompressed 16 bit audio onto an internal 10GB IDE hard drive - that's over two-and-a-half hours! Backup is possible via SCSI, via CDRW burning of your mixdowns. The new software includes crossfading, and improved graphic editing facilities. EB2M effects board option is also available.

RRP £995 **£799**

AKAI-DPS12i

01V DIGITAL MIXER

YAMAHA

Yamaha's fabulous new 01V replaces the ground breaking ProMix II and is basically a slightly cut down 03D for a lot less money! As well as a thrilling new silver paint job, the 01V also features 16 analogue inputs plus 8 digital ins and outs via optional cards in either ADAT, TDIF or AES/EBU format. There is 4 band fully parametric EQ for all the main inputs, 2 stereo multi effects processors, moving faders, dynamic MIDI automation, and of course, exemplary sound quality.

Initial stocks are very limited - get your order in now!

RRP £1399 **£LOW**

YAMA-01V

MACKIE SR24/4VLZ

- Cute compact 24 channel 4 bus recording console with Mackie's VLZ circuits and XDR mic preamps
- 3 band EQ with sweep mid and high pass filters
- 6 aux sends
- High headroom and exemplary sound quality

RRP £1341 **£LOW**

SCRA-GHOST24LE

SOUNDCRAFT GHOST 24LE

- 24 channel, 8 bus in-line recording mixer
- 8 aux sends + 4 band EQ with two parametric mids
- Optional meterbridge
- LE version does not have MIDI muting and hence is much less expensive!

RRP £3959 **£LOW**

SCRA-GHOST24LE

DPS16
DIGITAL PERSONAL STUDIO

INCLUDING FREE BEYER DT100'S (RRP £125!)

AKAI

ALMOST 30% OFF!

RRP £1699 **£1299**

AKAI-DPS16

03D DIGITAL MIXER

YAMAHA

Yamaha's fully-automated 24:4:2 digital mixing console with 26 inputs, 4 busses, 4 auxes, 18 separate outputs and two onboard stereo effects processors. It runs internally at 32 bit or greater DSP and handles full 24 bit digital mixes via AES/EBU in/out and has high quality 20 bit converters. The faders are motorised, there is an onboard automix sequencer and a serial mouse can be added for quick operation. Every channel and output has 4 band fully parametric 21Hz - 26kHz EQ and dynamics / expander section with assignable key inputs. User memories, 5.1 surround pan, and optional ADAT, AES/EBU or TDIF 8 ch I/O.

RRP £2999 **£1799**

YAMA-03D

SOUNDCRAFT GHOST 32LE

- 32 channel, 8 bus in-line recording mixer
- 8 aux sends + 4 band EQ with two parametric mids
- Optional meterbridge
- LE version does not have MIDI routing and hence is much less expensive!

RRP £4805 **£LOW**

SCRA-GHOST32LE

SPIRIT STUDIO 16

OVER 40% OFF!

- 16 mono faders, 40 inputs
- 8 bus, channel direct outs
- 4 band EQ, 2 sweep mids
- 6 aux sends, PFL buttons
- 32 chan version also available only £1499.99
- 24 chan version also available only £1299.99

RRP £1537 **£899**

SCRA-SPIRST16

BR8
PORTABLE 8 TRACK STUDIO

BOSS

Records 8 tracks of digital audio and up to 64 virtual tracks onto a built in 100MB Zip drive, with 3 recording modes at various degrees of data compression for more recording time. The highest quality MT2 mode uses over 20:1 data reduction to give 50 minutes of 8 track onto the Zip disk. Integral 8 channel mixer, guitar tuner, phrase sampler, COSM modelled effects, reverb, chorus, flange, EQ, pan, rhythmic beats / click track, 2 mic inputs, and S/PDIF digital output.

RRP £599 **£495**

BOSS-BR8

02R DIGITAL MIXER

YAMAHA

OVER 35% OFF!

Yamaha's pioneering digital mixer for the masses, and still the industry standard 32 bit 8 bus console with total dynamic automation, snapshot recall, motorized faders, 40 inputs, 16 mic inputs, 4 band parametric EQ and completely flexible dynamics for every channel. Also built in are 2 comprehensive on-board effects processors for reverbs, delays and most traditional FX. Optional interface cards allow full 32 channel digital I/O via TDIF or AES/EBU formats at 24 bit, or ADAT at 20 bit throughput. Yamaha also have analogue boards and a new M-LAN board for easy computer interfacing.

RRP £5499 **£3199**

YAMA-02R

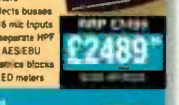
SPIRIT STUDIO 24

45% OFF!

- 24 mono faders, 40 inputs
- 8 bus, channel direct outs
- 4 band EQ, 2 sweep mids
- 6 aux sends, PFL buttons
- Ideal for live stage FOH mixing, or 24 track studio multitrack monitoring.

RRP £2199 **£1199**

SPIRIT DIGITAL 328



- 32 into 8 bus digital mixer
- 16 long throw motor faders
- 24 bit converters
- 2 Lexicon effects busses
- 3 band EQ, 16 mic inputs
- Global 48V, separate HPF
- ADAT, TDIF, AES/EBU
- 2 global dynamics blocks
- 16 channel LED meters

RRP £3499 **£2489**

D8
DIGITAL WORKSTATION

KORG

ALMOST 30% OFF!

For the last few years, Korg's high end SoundLink hard disk recording system has enjoyed considerable success in most production houses around the world. Now they've used all that expertise to bring you the amazing D8 - a complete digital recording studio in less than the size of a chest box! The D8 records up to 8 tracks onto its built in SCSI drive, has digi I/O and SCSI ports as standard, a whole range of built in digital FX, and even a guitar level input to do away with DI boxes. *In stock and on demo at Turnkey - call now for further details.*

RRP £849 **£599**

KORG-D8

EXTRA 10% OFF

Available on fully guaranteed 'B'-Stock versions of many products - examples below:

YAMA-CO848S	AES 8 Channel I/O card (SDR & 01V)	£199
YAMA-CO8RO	Analog 8 Channel I/O card (SDR)	£649
YAMA-CO8AE	AES 8 Channel I/O card (SDR)	£299
YAMA-CO8AT	ADAT 8 Channel I/O card (SDR & 01V)	£299
YAMA-CO8TD	TDIF 8 Channel I/O card (SDR & 01V)	£299
YAMA-CO8CSKH	Cascade Kit joins 2 expans (SDR & 01V)	£799
YAMA-02R2C	Main Board (02R)	£1199
YAMA-MY8AE	AES 8 Channel I/O card (01V)	£299
YAMA-MY8TD	TDIF 8 Channel I/O card (01V)	£299
YAMA-MY8AT	ADAT 8 Channel I/O card (01V)	£299
YAMA-MY8AD	Analog 8 Channel input card (01V)	SPDA
YAMA-MY8DA	Analog 8 Channel output card (01V)	SPDA
YAMA-RK-02R	19" Rackmount Kit (01V & SDR)	£29

D16
HARD DISK 16 TRACK

KORG

OVER 35% OFF!

16 tracks of 24 bit recording at 44.1kHz with non destructive, real time editing and 99 undo layers, and an integral 16 channel digital mixer, which is accompanied with EQ, fader and pan and built in 2 GB hard drive. There is a built in drum machine with 240 loops, which can serve as the foundation of your tracks, and up to eleven simultaneous effects, which include Korg's modelling algorithms eg guitar amp simulator etc and with which can be controlled by a foot expression pedal. Extra bonus features the a metronome, chromatic tuner and built in mic, and the touch screen! Your finished track recording can be mixed by the D16 to its stereo outputs, or exported as track parts via backup for example, via S/PDIF digital I/O or SCSI.

RRP £1499 **£949**

KORG-D16

VS-1880GX
HARD DISK MULTITRACKER

Roland

OVER 35% OFF!

We have secured a strictly limited supply of Roland's top of the range nonlinear hard disk recorder at an incredible price! The VS-1880GX has an integrated 28:2 digital mixer which can record 8 tracks simultaneously and playback up to 18. It can store up to 288 virtual tracks. The 12GB hard drive would store the equivalent of 135 minutes of uncompressed 18 track, but the Roland expands this yet further by its various degrees of data compression, offering longer times with higher modes of recording quality for its 24 bit converters. Digital I/O is two channel S/PDIF and the VS1880 includes EQ, effects and graphic editing facilities. *Buy NOW - before it's too late!!*

RRP £2199 **£1399**

ROLA-VS1880GX

ALESIS ADAT LX20

MEDIA DEAL!

- New 20 Bit ADAT Format for Superb Quality
- Ultra High Speed Transport
- Digital Dubbing Between Two Machines
- Get 10x 60min tapes for only £129.99 extra!

RRP £1699 **£899**

FOSTEX VF-16

- 16 track hard disk recorder with 8 virtual tracks
- 16 track simultaneous recording via ADAT optical
- 16 channel digital mixing with 3 band EQ, 2 auxes and 2 internal FX buses
- SCSI backup and WAV file import / export + MTC sync

RRP £1099 **£899**

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PRICES GUARANTEE*

marantz

CDR631
PROFESSIONAL RE-WRITABLE CD-R

RE-WRITES THE BOOK ON CDR!

Marantz have now released an improved version of their best-selling CDR630 rewritable CD recorder. The new CDR631, finished in white, is now more deserving of it's professional status with AES/EBU digital input and balanced XLR analogue inputs, as well as the basic phonos and S/PDIF digital I/O, and there is a new coaxial S/PDIF loop-out for daisy chaining digital sources connections. Besides the handling of pro or consumer, normal or rewritable discs, and shuttle search wheel, the new Marantz now features menu selectable SCMS data flags, a RAM buffer to prevent the beginning of tracks from getting cut off and track title display and editing in CD-TEXT format.

- *Professional 2U rack rewritable CDRW recorder*
- *AES/EBU input, S/PDIF optical input, XLR analog input*
- *S/PDIF coaxial and analogue phono in / out*
- *SCMS defeat, CD-TEXT track titling, memory buffer, etc.*

~~RRP £699~~ **WOW!** MARA-CDR631

TCD-D8
PORTABLE DAT MACHINE

SONY

Turnkey bring you the first stocks of Sony's brand new portable, the TCD-D8. Superbly built with a back-lit display, the unit features 48kHz and 44.1 kHz analog and digital recording. No other portable is available under £1000 - supplies are very limited, phone now to reserve yours!

MEDIA DEAL! ~~RRP £599~~ **£449**

BUY WITH 10 x QUANTEGY 90 min DATS - ONLY £39.99 EXTRA!

PORTA 02 MKII
MULTI-TRACKER

TASCAM

Incredibly affordable four track cassette Portastudio from Tascam! The Porta 02 MkII features 2 mic / line input channels, a high impedance guitar input and an easy to use four channel mixer. It provides two track simultaneous recording with dbx noise reduction, tape counter, headphone and main outs, and comes in red blue or black finish!

MEDIA DEAL! ~~RRP £145~~ **£99**

TASC-PORTA02

BUY WITH 20 x XLII'S 90 min TAPES - ONLY £29.99 EXTRA!

FOSTEX D5

MEDIA DEAL!

- Pro quality DAT machine
- Balanced line and outs
- S/PDIF optical I/o
- Superb build quality
- Get 10x 90 min DATs for only £49.99 extra!

~~RRP £719~~ **£599**

FOSTEX VR800

- MASSIVE COST SAVING! B-stock unit, boxed with guarantee
- 8 track recorder with either zip or fixed hard drive
- ADAT digital I/O + S/PDIF
- 16 virtual tracks
- Non destructive editing
- Wordclock, SCSI + MIDI
- Audio scrub, 9 locates

FROM **£249**

FOST-VR800

FOSTEX X-14

MEDIA DEAL!

- Entry level multitrack
- Built in microphone
- Simple to use
- 4 track pack only £10
- Get 20x 90 min XLII'S for only £29.99 extra!
- Now available in blue

~~RRP £149~~ **£129**

TOST-X14

HHB CDR 850

MEDIA DEAL!

- Use regular or rewritable dis cs (pro or consumer)
- Balanced analog I/O
- AES/EBU digital input
- Get 100x CDR74 for only £99.99 extra!

~~RRP £799~~ **£545**

MACKIE HDR24/96

- 24 track 24 bit hard disk recorder, 20GB UDMA66 drive
- Onboard CPU for graphic editing via any monitor, mouse and keyboard. FTP file export
- Has wordclock, MIDI, ethernet
- Expected by end of September!

~~RRP £4999~~ **£3999**

MARANTZ SD4050P

MEDIA DEAL!

- 3U rack twin cassette deck
- Dolby B,C noise reduction
- Pitch control +/-8% dual A
- Auto reverse, CD synchro
- Digital tape counter
- Optional remote control

~~RRP £249~~ **£199**

MARA-SD4050P

MARANTZ CD4000P

MEDIA DEAL!

- 2U rack CD player
- Plays CDRW discs
- S/PDIF coaxial output
- Digital volume control
- Infrared remote control

~~RRP £185~~ **£149**

MARA-CD4000P

PANASONIC SV3800

MEDIA DEAL!

- Industry standard mastering DAT machine
- Equivalent to 20bit
- AES/EBU and S/PDIF
- Jog/shuttle wheel
- Get 10x 90 min DATs for only £49.99 extra!

~~RRP £1099~~ **£799**

ROLAND VSR880

- Recordable hard disk recorder with nonlinear audio editing, 999 undos
- 8 tracks up to 24 bit with data compression mode
- 6GB internal hard drive with SCSI backup
- Optional effects board.

~~RRP £1299~~ **£699**

ROLAND VS890EX

- 8 track 16 bit HD recorder
- Up to 8 virtual tracks per track
- S/PDIF in and out + analog phones
- Non destructive editing
- 14 ch digital mixer, plus includes FX board & drive

~~RRP £1399~~ **£LOW**

ROLAVS890EX

ROLAND VS840GX

- 8 track non-linear HD recorder. 64 Virtual tracks
- Internal 250MB Zip drive
- 8 channel digital mixer
- S/PDIF digital I/O
- Effects bus with 26 types
- CDR burning software
- Optional SCSI interface

~~RRP £999~~ **£749**

SONY MZR-70

- Minidisc walkman
- Up to 17 hours use on alkaline batteries
- Analogue and S/PDIF digital recording inputs
- Sample rate converter
- 40 sec anti-shock buffer
- Mega Bass boost

~~RRP £349~~ **£199**

SONY-MZR70

SONY MZR-90

MEDIA DEAL!

- Portable MiniDisc recorder
- S/PDIF digital input
- Sample rate converter
- 40 second anti-shock buffer

~~RRP £299~~ **£249**

TASCAM DA302

MEDIA DEAL!

- Twin DAT recorder
- Omits video record impatibility, SCMS free
- AES/EBU and S/PDIF
- High speed dubbing

~~RRP £1099~~ **£799**

TASCAM DA78HR

- At long last, may be present!
- The first low cost tape based MDM multitrack with full 24 bit recording
- Replacing the DA38 and a huge 4mB more dynamic range!!!

~~RRP £1999~~ **£1849**

TASCAM MX-2424

- 24 track 24 bit HD recorder, 9GB SCSI drive fitted, accepts up to 18GB with current v1.50 MX-OS
- Optional 24 ch I/O digital & analog cards - can fit both!
- AES EBU S/PDIF Ethernet
- Transfer SDII or WAV files via ethernet to computer
- Up to 1000 virtual tracks

~~RRP £3440~~ **£LOW**

TASC-MX2424

TASCAM DA20 MKII

OVER 40% OFF!

- 3U rack DAT machine
- SCMS defeatable
- S/PDIF coaxial in out
- 32kHz, 44.1kHz, 48kHz
- Error counting and ID encoding adjustment

~~RRP £899~~ **£LOW**

TASC-DA20MK2

YAMAHA MD4S

MEDIA DEAL!

- MiniDisc 4 track
- 8 ch mixer, 2 mic inputs, 3 band EQ, 2 aux sends
- Cue from 32x to half speed
- 37 minutes of 4 track

~~RRP £599~~ **£LOW**

YAMA-MD4S

202MkIII TAPE DECK

TASCAM

MEDIA DEAL!

The 202 MkIII is a double deck which records on both decks. Make two duplicate copies simultaneously, or record from two separate mono sources. Also performs high speed copies.

~~RRP £349~~ **£269**

TASC-202MK3

BUY WITH 20 x XLII'S 90 min TAPES - ONLY £29.99 EXTRA!

MD301 MK2
PRO MINIDISC RECORDER

ALMOST 60% OFF!

TASCAM

The Tascam MD301 is a MiniDisc recorder in a professional 2u rackmount, and features phones and rotating S/PDIF quick way backup. The MiniDisc format runs at 44.1kHz and as such, the MD301 includes a built in sample rate convertor to accept 48kHz or 32kHz digital sources. There is an infrared remote control and front panel headphone socket.

Incredible reduction exclusive to Turnkey - order now while stocks last!

~~RRP £699~~ **£295**

TASC-MD301

414 MkII
CASSETTE PORTASTUDIO

OVER 40% OFF!

TASCAM

MEDIA DEAL!

The 414 records up to 4 tracks simultaneously and uses dbx noise reduction. Double speed recording for better bandwidth. 2 band EQ. 4 mic inputs and full L/D mastering make it great value for money. The cassette deck is optimised for chrome tapes but will give great results with metal tapes too, and you can even switch it to normal speed to play your regular tapes. The pitch bend gives you about 20% speed variation and for backwards recording, just turn the tape over. Includes free four track pack!

~~RRP £349~~ **£199**

TASC-414MK2

BUY WITH 20 x XLII'S 90 min TAPES - ONLY £29.99 EXTRA!

778 HD PORTASTUDIO

TASCAM

Tascam's new 8 track Hard Disk recorder with a 7.5GB drive offers either 16 or 24 bit recording and provides 3 band EQ with parametric mid, waveform display on the screen, 250 virtual tracks per song, 999 levels of undo, MMC/MTC sync and a huge range of onboard effects. There is a built in digital time-stretcher which allows you to audition tracks in slow motion playback at 50%, 65% or 85% normal speed, without changing pitch. SCSI backup to CDR is possible under the 778's control and the mixer includes S/PDIF and stereo I/O.

~~RRP £899~~ **£799**

TASC-778

CD-RW700 COMPACT DISC RECORDER

This newest CD recorder in town at the moment is Tascam's CDRW700. A bargain priced professional machine with a 2U rack base design, jog wheel, separate record level knobs. Digital Direct button to bypass sample rate convertor at 44.1kHz, synchro record, fader adjustable between 1- 24 seconds, digital volume control for digital input and a working clock in the LCD in standby mode. Writes pro and consumer discs and has SCMS defeat, and digital I/O on S/PDIF optical and coaxial. Includes infrared remote control.

~~RRP £499~~ **£399**

424 MKIII
MULTITRACK RECORDER

TASCAM

Tascam's newest upgrade to their range of PortaStudios is the 424 MK3 with its nice blue livery. It offers a six channel mixer with mic inputs, 3 band sweep mid EQ, two effects sends, and the transport runs at normal or double speed with dbx noise reduction and can record 4 tracks simultaneously.

~~RRP £329~~ **£265**

AW4416
HARD DISC RECORDER

YAMAHA

Integrated non-linear hard disk recorder and 26:8:2 digital mixer with EQ, dynamics, delay, effects, motorised faders, automation and S/PDIF I/O as standard. This recorder is up to 24 bit 48kHz linear with 16 track max simultaneous playback from 130 virtual tracks, and an optional internal hard drive up to 64GB may be fitted. Features include time stretch, pitch shift, 8 band simpler, 16 track sequencer, SCSI backup, serial mouse input and optional onboard CDRW.

~~RRP £2599~~ **£LOW**

YAMA-AW4416

YAMAHA MD8S

- Nonlinear 8 track MiniDisc recorder
- 8 channel mixer has 2 XLR mic inputs with insert points
- 3 band mid sweep EQ
- 2 aux sends per channel
- Jog / shuttle wheel

~~RRP £999~~ **£LOW**

YAMA-MD8S

YAMAHA MT400

MEDIA DEAL!

- Cassette 4-tracker
- 4 channel mixer
- 3 band EQ plus
- 2 auxes, 2 inserts, 2 st ins
- Double normal speed
- 4 track simultaneous rec
- 80dB S/N ratio with dbx
- This item is Yamaha B stock, but comes boxed with full guarantee

~~RRP £329~~ **£199**

YAMA-MT400

"Very helpful, attentive, great discounts and fast service"
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Other offers may not be available when price matching. We must be able to substantiate the quote and the goods must be available and in stock.

Soundcraft DRAWMER MACKIE Roland SONY TASCAM Fostex

EUROPE'S LOWEST

ZOOM IN!

RFX-1000 MULTI-EFFECTS RACK UNIT

OVER 30% OFF!

The RFX1000 is similar to the RFX2000 below, but with analogue connections only. It has a similar range of different effects types across 33 different algorithms, in three different banks - reverb, effects, and Mix + SFX. The reverb time and reverb character each have parameter control knobs, alongside the standard Input / Output levels and wet / dry mix. The vocal optimised effects found on the RFX300 are also here and there is a mic-input on the front panel to suit high impedance dynamic mics.

RRP £149
£99.99
ZOOM-RFX1000

RFX-2000 MULTI-EFFECTS RACK UNIT

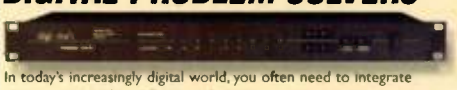
ALMOST 35% OFF!

The RFX-2000 is the top of the range in Zoom's new multieffects lineup, and perhaps defines what we should come to expect from a budget effects unit as we near the end of the 20th century - digital output as standard! Hooray! At last the clarity of those reverb algorithms and 24 bit internal DSP that are advertised, can be transferred intact to your recordings. Eight variations each of six different effects groups are presented, covering reverbs, delay, pitch-based effects like flange, chorus etc, and assorted special processes like a Vocoder (with mic input), Ring Modulator, Time Trip, Dimension, Isolator, Comb, Step Cry, Resonance and many others. There are pre-defined parameter control knobs, and the unit is MIDI addressable. The RFX2000 comes with a CD-ROM containing patch editing software for PC or Mac, which also includes an extra effects bank.

RRP £2~~99~~
£149.99
ZOOM-RFX2000

DIGITAL PROBLEM SOLVERS

FRIEND-CHIP



In today's increasingly digital world, you often need to integrate various pieces of pro digital equipment and semi-pro gear, and come up against problems like 48kHz sampling rates, wordclock conflicts, or various manufacturer's proprietary formats. Some have even retreated back to the analogue ins and outs just to get the job done, but Friend Chip's sensibly priced range can make your digital studio hassle-free! The DigiMax MIDI controllable digital patchbay (£299.99) supports AES/EBU, S/PDIF coaxial and optical, and offers 8 inputs and outputs. An XLR version (£499.99) is also available for greater AES/EBU reliability.

Also in the range:

OPTOPAK: optical to co-axial and vice versa	£89.99
PRO-COAX: SPDIF to AES/EBU and vice versa with SCMS stripping	£129.99
D-4-E COPY DOG: switcher with 1 optical & 3 co-ax ins, 3 co-ax outs and SCMS stripping	£119.99
SRA4.1: converts almost any incoming sample rate to 44.1kHz, ideal for ProTools and non-44.1 DATs	£149.99
SRC96: sample rate converter to 32, 44.1, 48kHz, with jack to external word clock	£249.99
Super Clock Driver: converts DigiDesign superclock to word clock and vice versa, 3 outputs	£129.99
Silent Audio Clock: converts Super Clock to word clock and vice versa with synchronous SPDIF signal	£129.99
ADAT Audio Clock: ADAT 9 Pin to word clock. Super Clock and SPDIF input converter	£129.99
ADAT Word Clock Synchroniser: ADAT 9 Pin to word clock and Super Clock converter, also sends MTC synchronise your sequencer with ADAT in sync	£199.99
ADAT SPDIF Synchroniser: as above but with converter only to SPDIF	£199.99
ADAT MIDI Machine Control: MIDI to ADAT 9 Pin converter with MIDI thru, used to either of the above for full remote ADAT control from your sequencer	£89.99
Rack Kit: holds up to three black boxes	£49.99

FROM **£49**

COMPOUNDER COMPRESSOR

Focusrite

The Compounder looks like a major contender in absolute terms against almost any other 1u rack compressor, excepting valve or high-res digital designs and outboard like the PL-8. Unlike the other Platinum models, it uses a VCA for gain reduction, operating in Class A mode giving a faster response and more assertive limiting action than the Opto electronic designs of the VoiceMaster and ToneFactory (which are designed for effect). Like dbx's 160A, the ratio setting can go past infinity to negative, and there is a "bass expander" which puts an inductor in circuit to fatten the low frequencies. There is a useful expander / gate and limiter, with metering via LEDs. The dual mono unit includes stereo linking, sidechain access and XLR and TRS sockets.

RRP £~~499~~
£385

NEW AIR FX REALTIME STEREO EFFECTS

ALESIS

There have been infra-red effects controllers before, some as stand alone units and others built into synths and grooveboxes. Roland's D-Beam for instance, is very popular - but it's just a single beam. Alesis however, have rethought the concept and developed a patent pending technology they call Axya™ which creates a 3D sphere of infrared light sensor response which can track your hand motion up / down, left / right and fowards / backwards giving you three axis of modulation control. The stereo digital effects are of exemplary Alesis quality with 50 types leaning towards the weird, wild and wacky!

RRP **£199**
ALES-AIRFX

266XL DUAL COMPRESSOR GATE

ALMOST 50% OFF!

dbx

Two channels of classic dbx compression with new Auto-Dynamic™ Attack and Release circuitry, program adaptive expander gates, balanced inputs, precision LED metering and sidechain insert. Front panel selection of stereo or dual mono operation, all in a standard 1U rack design and at an unbelievable price. Now with new auto setup mode!

Entire dbx range also on demo at Turnkey.

RRP £249
£129
DBX-266XL

MIXMASTER 3 BAND COMPRESSOR

Focusrite

A stereo-linked analogue processor with balanced ins and outs on TRS jacks and XLRs offering separately switchable expander / gate (with threshold & release controls), and a 3 band manual compressor (with adjustable crossover slope and relative balance). The 3 band sweepable EQ has fully parametric midrange, and there are balance, stereo width (M+S type stereo difference level) and a master fader controls plus an output limiter. All processes are well metered on LED bargraphs, and there's even a phase correlation meter and optional 24bit 96kHz stereo A/D converter upgrade.

RRP £~~795~~
£695

3630 COMPRESSOR / GATE

ALESIS

Even without the bargain discount of almost 45%, this dual channel, stereo linkable compressor would offer great value for money. It is based on VCA circuitry for gain reduction, and has fully manual controls. The characteristic compression behaviour may be switched between hard knee and soft knee, whilst the LED meters are switchable for peak or average (RMS) weighting. The additional noise gates have threshold and release controls. The unit provides external sidechain access and has operating headroom to +22dBu.

RRP £~~129~~
£109

FILTER QUEEN RESONANT FILTER EFFECTS

ELECTRIX

In a 1U high half-rack casing the Electrix Filter Queen provides a full gamut of filter effects under complete user control. The analogue circuitry is based around multi-mode stereo analogue resonant filters which may be switched to LPF, HPF, BPF or notch. Their sweeps can also be set to track the audio level of the input or an alternative key input, using the built in envelope follower, or to automatically sweep up and down from the control voltage of the LFO, which has sawtooth, square, triangle, random or inverse sawtooth patterns. With its true analogue nature you get completely smooth glitch free filter sweeps.

RRP £199
£175
ELEC-QUEEN

VOICEMASTER CHANNEL STRIP

Focusrite

The first model in the Platinum range is the VoiceMaster, an all in one recording channel for getting your signal to tape or disc in as clean and controlled a manner as possible. Both mic and line level inputs are given, followed by an expander/gate, saturation circuit for valve like tones, an opto-compressor, parametric EQ and opto de-esser. Focusrite have thrown in use opto-compression circuits to avoid having to use cut price VCAs at this price point, but have cunningly used an extra photo-resistor in the feedback stage to linearise the gain and avoid the colouration which is normally associated with opto-compressors. Sound on Sound's Paul White said "This must surely become the project studio in-theory standard."

RRP £~~399~~
£349

MOOGER FOOGER FILTER & RING MODULATOR

Big Briar

If you're a retro buff, then these pieces are authenticity with a capital A! Designed by the godfather of analogue, Bob Moog, the MoogerFooger Ring Modulator and Low-pass Filter use premium quality analogue components and circuitry throughout, to produce some of the fattest effects you've ever heard. The Ring Modulator divides the input signal into two for sounds ranging from tremolo and gong like tones to outer space effects, while the Low Pass Filter needs no introduction.

FACTORY DIRECT
£219
BIGB-RINGMOD

THC-00 RESINATOR

FAT

Freeform Analog Technology's Resinator joins their existing (and very popular) FreeBass synth and vocoder in their range of bargain priced 1u rack marvels, with front panel graphics sharper than a vinegar coated cactus. Three very resonant band pass filters process any mono signal (like some of the more wacky and groovy sounds you've ever heard in glorious auto panning stereo. Each filter has cutoff, which can be modulated by the built in LFO, the envelope follower or an external signal. Ideal for making loops interesting, or indeed any signal, for results ranging from the sublime to the extreme.

RRP £199
£149

VC3Q

JOEMEEK

Joemeek's latest revision of their bestselling VC3 unit is the new VC3Q which now features an equaliser instead of the excite. For most circumstances where a channel strip is needed, the EQ is far more useful, particularly with fine sources or DI instruments such as guitar or bass, or a radio mic receiver. The mic preamp input offers 48V phantom powering, and feeds through the opto compressor. This provides Joemeek's famous colourful squash to keep your signals proud in the mix. The VC3Q also has fully balanced inputs as well as outputs.

RRP £199
£149
JOEM-VC3Q2

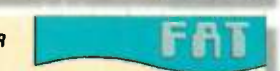
12 STAGE PHASER EFFECTS UNIT

The latest addition to the MoogerFooger family is the sensational 12 Stage Phaser. Of all Bob Moog's original effects units, the Phaser is by the most highly sought after, and the most highly valued - hardly surprising given its fantastic tones which range from a subtle shimmer to the very devil's fingernails screaming down the blackboard of life! The discrete analogue circuitry here gives 12 separate delay times for a smooth sweep effect, and control over the LFO cycle and modulation depth. Sublime.

FACTORY DIRECT
£299
BIGB-PHASER

PCP330 PROCODER

FAT



One question we've often heard is "Why doesn't anyone make an analog vocoder anymore?" Well here it is - with fantastic performance and a very down to earth price. The carrier is either the VCO or an external line input, whilst mic and line inputs are given for the modulator signal. Eleven filter bands each have their own level knob on the front panel giving true hands on control of your sound, and the sibilance (unvoiced) control also has an external input if required. The final output can contain any mix of modulator, carrier, vocoded signal and a special filtered version of the signal. Thousands of creative possibilities!

RRP £~~299~~
£249

KAOSS REALTIME EFFECTS

KORG

Stereo digital multitime effects processor ideal for DJs with 33 different effects algorithms, allowing 2 parameters assigned to the pressure sensitive pad which registers the horizontal and vertical position and motion. Includes sweepable filters with resonance and cutoff under pad control, and numerous others such as pitch-shifter, flanger, phaser, reverb, echo, distortion, auto-pan and even a ring modulator. A 5 sec phrase sampling features looping and speed control on the pad.

RRP £249
£LOW
KORG-KAOSS

ANALOGUE DELAY EFFECTS UNIT

Championing the cause of analogue electronics, the world's most famous electronic builder and synth pioneer, Bob Moog (it rhymes with Vogue, okay) has put his expertise into this subtly built effects pedal, as much at home in the studio, as on the floor in front of discriminating professional guitarists. Based on bucket brigade analogue delay technology, the MF-104 has a range from 40 to 800 milliseconds, giving everything from a slapback, to an Eighties echo, with adjustable feedback, lamp gain, mix level and drive. Analogue delay is an ideal alternative when you don't want to run through some grotty 12 bit digital delay pedal just to get a bit of echo, "cos it kills your sound!"

FACTORY DIRECT
£499
BIGB-DELAY

FOCUS EQ PARAMETRIC EQUALISER

OVER 60% OFF!

Focusrite

The Focus EQ also features a high quality mic preamp complete with phantom power and polarity switch, as well as line and instrument level inputs, making it an excellent recording channel, or even a top quality preamp for bass or acoustic guitar. In addition to the four parametric EQ bands, there are also variable high and low pass filters, and the EQ and filters each have their own bypass switches. Typical Focusrite build quality can be taken for granted, as can some of the best sounding EQ you've ever heard. Very limited quantities available for this exclusive deal - ***order now or regret forever!***

RRP £~~939~~
£349
FOCU-GREENEQ

EXTRA 10% OFF

Available on fully guaranteed 'B'-Stock versions of many products examples below:

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* Our guarantee is that we will match or beat any genuine quote, on identical goods, from a UK or European dealer at time of order.

PRICES GUARANTEE*

t.c. electronic

DUAL CHANNEL VERSION ALSO AVAILABLE ONLY £699.99

EASY AS 1,2,C!

The Triple-C is by far the most interesting and exciting new addition to TC Electronic, in the past few months. It follows suit from the M-One and D-Two, while furthering the range of high quality multiband compressors in the Danish company's famous lineup.

TC M-ONE

This multi-effects unit has 20 basic algorithms including reverb, delay, pitch-shift, chorus, flanger, tremolo, and even several dynamics algorithms. All effects are fully editable, and there are 128 user patches to store your favourites along with the 128 factory presets. The M1's dual engine architecture can run two simultaneous full stereo effects, eg. two reverbs, or chorus plus multitap delay. There is coaxial S/PDIF digital interfacing, or built in 24 bit converters with balanced TRS jack connections and a footswitch input for bypass, tap tempo or parameter control. TC's reputation was built on effects boxes like this.

RRP £459 **£369.99** TC-M1

TC D-TWO

TC Electronic are now almost daring to bring low cost effects units to the market, yet are not skimping on features - the D2 has fully balanced ins and outs with 24 bit converters, and coaxial S/PDIF. It's primarily a delay with 10 sec max time, tap-tempo setups including tapping in rhythmic motives (which can be quantized.) Five-way ping-pongs, spatial (phase inverted) delays, reverse echoes, dynamic level control of echo based on input signal amplitude and various delay-based effects like chorusing and flanging. Echo taps may be filtered to simulate natural HF rolloff or an analogue tape loop effect.

RRP £459 **£369.99** TC-D2

TRIPLE-C

Three distinct flavours of compression give this unit its name: Triple-C. Fair enough, although we're not sure about "Multi Spectral LCD Display" to describe the colour screen..? Take heed and learn - this is what the Triple-C does for your music! Hypes it up, stretches it, expands the dynamics or squeezes more volume into them, as a pronounced effect or a transparent DSP process with 24 bit I/O and S/PDIF digital interfacing. Three way multiband compression with lookahead delay, peak sensitive mode, adjustable crossover points, or full broadband mode. Plus a new envelope mode where attack and release gain can be hyped or squashed to radically change the character of a signal. Great for drumloops and basses, under MIDI control or realtime.

FROM **£459.99** TC-TRIPLEC

"How good you guys are, fine service, damn fine prices"

TR London

MPX 100
DIGITAL REVERB / MULTI FX

lexicon

The MPX100 also features a full MIDI specification with In Out and Thru, and even the ability to sync delay times to an incoming MIDI clock signal. The SPDIF output assures compatibility in an increasingly digital age, unique for a processor at this price point, and there's even a footswitch bypass facility for discerning guitarists and other live performers. Upgrade to Lexicon quality today!

RRP £249 **£LOW** LEXI-MPX100

MPX500
MULTI EFFECTS PROCESSOR

lexicon

Hmm, what have we here..? It looks like a high quality effects unit - it has balanced XLR & jacks ins and outs, plus S/PDIF coaxial digital I/O as standard, so it just might be a high quality effects unit. It has 240 presets, 30 user patches, 4 edit knobs, MIDI and a big LCD, and oh yes, it says LEXICON on the front, so it definately is a high quality effects unit!

RRP £499 **£385** LEXI-MPX500

MPX1
MULTI EFFECTS PROCESSOR

ALMOST 50% OFF!

lexicon

For those of us who need top quality reverb & multi FX but cannot stretch to the expense of the PCM80, Lexicon have released the MPX-1. Featuring the famous 'Ear' chip for reverb and separate DSP processor for multi FX, the MPX-1 brings you all that is good in signal processing for an incredibly low price. Up to 5 simultaneous effects are available including pristine quality stereo pitch shifting, and effects can be 'morphed' from one algorithm to another, as pioneered in the Vortex. *Megadeal only at Turnkey!*

RRP £1199 **£539** LEXI-MPX1

FINALIZER EXPRESS
24 BIT 3 BAND COMPRESSOR

40% OFF!

t.c. electronic

If you fancy yourself as a bit of a 'D.I.Y.' mastering engineer, but cannot afford the astronomic quantity of specialist reference equipment such professionals have at their disposal, you might find that TC Electronic's bargain Finalizer Express at just £799.99 could help empower you! In this easy-to-use 1u rack is an automatic look-ahead 3 band compressor, whose gain makeup also provides a 3 band EQ function. There's also a master fader, soft clipper, dither, MIDI, 24 bit conversion and comprehensive digital I/O formats.

RRP £1169 **£699** TC-FINALIZERX

SRV-3030/D
DUAL PROCESSOR 30 BIT REVERB & FX UNIT

Roland

OVER 65% OFF!

Turnkey exclusively bring you the effects bargain of the year! Roland's SRV3030 is probably the most overlooked effects unit on the market - it features dual independent processors, meaning you can have two completely separate premium quality stereo reverbs running simultaneously, each with their own (mono) input - the outputs of these are then mixed together internally. What's more, Roland's unique Dynamic Separation Algorithm means each of these can function as if they were several different units at once! How? The SRV can detect how loud an incoming signal is, what frequency area it is in, and what the density (speed) of notes is - and it can then modify the program accordingly in real-time, so that a kick drum can have a tight punchy reverb and a snare a beat later can have a long lush one. The reverb is no ordinary reverb either - it benefits from Roland's incredible patented RSS 3D spatial processing, giving a sound that completely envelops you. Other effects include an ultra rich chorus, flanger, phaser, and a unique 12 tap delay as part of the reverb algorithm which allows you to program the exact delay time (up to 2 seconds), level, pan and filter setting for each tap.

The user interface is a dream with front panel knobs for the most often used controls, 'EZ Edit' mode giving you control over multiple parameters simultaneously, in addition to fine detailed editing. The preview button allows you to audition programs from the front panel with a range of built in samples (more can be added via an optional SmartMedia card (£29.99), which also expands the 200 preset and user programs to 1000!). Technical specs include high quality 24 bit DA & AD converters, 30 bit internal processing, MIDI I/o, balanced XLR and jack connectors, footswitch & expression pedal inputs, and S/PDIF digital I/o (SRV3030D only - £249.99!).

We have very limited stocks only of these superb units, and at these prices, they won't last long - get your order in early to avoid disappointment!

RRP £539 **£199** ROLA SRV3030

4 POLE
FILTER

waldorf

The 4 Pole is the legendary Microwave / Wave 24 dB lowpass filter. You are free to apply this filter to any audio signal that you patch into the filter. So if your favourite sampler or sample player lacks that special quality, you can give it a sonic boost via the 4 Pole Filter. Full MIDI control, envelopes and panning etc make this a highly flexible studio tool.

FACTORY DIRECT **£269** WALD-4POLE

EFX-10
STUDIO MULTI-EFFECTS

viscount

Viscount's entry into the fully professional effects market features audiophile sound quality delivered by 24 bit processors with 128x over-sampling Delta / Sigma convertors. True stereo -20/+4 dB connections. Real-time MIDI control, large backlit display, huge range of effects including reverbs, delays, chorus, flanging, pitch-shift, wah, phasing, leslie simulations, etc. Unbelievable clearance price!

RRP £109 **£99** VISC-EFX10

ALESIS NANO COMP

- Stereo compressor for under £100!
- Hard or soft knee compression
- Peak or RMS detection
- Separate Attack, Threshold & Release controls

RRP £99 **£75**

ALESIS MIDIVERB IV

- 18 bit stereo digital FX - built tubular buttons!
- Up to three effects at once, 128 preset / user
- Automatic level sensing and set up utility
- On screen HELP pages describing each effect

RRP £199 **£174**

ANTARES ATR1

- Automatic digital pitch correction for your sloppy out-of-tune singing!
- Easy setup & LED meter
- Preset and user definable note scales, and ranges
- Almost transparent in use

RRP £699 **£599**

APHEX TYPE C²

OVER 50% OFF!

- From Aphex the inventors of the EXCITER™
- Blend in extra zingy treble harmonics
- Bass section compresses for more impact
- Balanced TRS jacks

RRP £299 **£139** APHE-104

BOSS VF1

- Digital multieffects unit with 24 bit A/D and D/A converters
- 200 factory presets and 200 user programs
- S/PDIF coaxial digital out
- COSM modelling effects based on Roland VG8

RRP £399 **£299**

DIGITECH VOCALIST PERFORMER

- Digital harmonizer with reverb
- XLR mic input. Adds 2 harmonies
- Major / minor chords assigned to key
- Programs allow A/B switchovers

RRP £349 **£269**

DIGITECH TALKER

- Mic or guitar input, footswitches
- Digitally mimics vowel sounds & FX
- Vocoder, Auto-wah, Dalek
- Drone pitch, Alien, Gated vocoder
- As used on Cher's vocal in the song 'Believe'

RRP £249 **£219**

DIGITECH VOCALIST WORKSTATION EX

- Digital harmonizer with FX
- Generates 4 extra harmony parts
- Corrects your out of tune singing!
- Follows MIDI note input

RRP £599 **£LOW** DTEO-VOICEX

DIGITECH STUDIO QUAD 4

- Discrete 4 channel effects
- Twin Stereo linkable
- 20 bit converters
- Auto input levelling
- Full MIDI implementation
- Reverb, delay, chorus, pitch, EQ + variations

RRP £299 **£255**

ELECTRIX FILTER FACTORY

- MIDI controllable stereo resonant filter with LFO
- HPF, LPF, BPF or notch
- 2nd order stereo or 4th order mono operation
- 'Buzz' distortion mode

RRP £299 **£289**

ELECTRIX WARP FACTORY

- MIDI controllable stereo vocoder with XLR mic in
- Switchable line or phono in with RIAA preamp for turntables, high & low EQ
- Formant freeze

RRP £349 **£289**

FOCUSRITE ISA-430

- Transformer balanced mono channel strip
- Mic preamp with line and high Z instrument input
- Manual / auto compressor
- 4 band EQ, noise gate
- Optional 24 bit 96kHz A/D

RRP £2345 **WOW!**

FOCUSRITE PLATINUM TONE FACTORY

- Mic, line, DI jack inputs
- Sweep HPF & LPF
- Opto compressor with 2 ratio settings
- 3 band EQ + 2 band semi-parametric
- Overdrive + bright switch, Noise gate

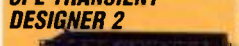
RRP £399 **£349**

LINE 6 POD II

- Recording preamp with digital effects and MIDI
- DSP emulations of 16 classic amp / speaker cab tones
- 36 presets and 8 knobs for gain, treble, mid, bass, reverb, dist effects etc
- Ideal for guitarists
- Boss Pod and rackmount versions also available!

RRP £299 **£249**

SPL TRANSIENT DESIGNER 2



- Two channel dynamics processor with sidechain driven from difference of two envelope followers
- Isolates different rates of level change rather than absolute level threshold
- Monitor Attack & Sustain

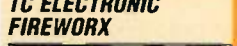
RRP £399 **£299**

SPL VITALIZER STEREO JACK

- Combined controls for stereo operation
- Multiband phase shifts based on programme dynamics & loudness EQ Soft/Tight bass auto compression
- Haas effect wide stereo expander

RRP £199 **£139**

TC ELECTRONIC FIREWORX



- 24 bit multiFX & AES, S/PDIF & ADAT I/O
- 8 simultaneous effects, real time control
- Digital cruncher, ring modulator, vocoder, formant molding & more...

RRP £1699 **£1585**

TC ELECTRONIC FINALIZER 96K

- New superior 96kHz no double fee! AES-EBU
- 3 band digital compressor, 5 band EQ
- De-esser, Enhancer, Limiter, Expander
- Levelling, sample rate conversion

RRP £1999 **£1769**

TLA FAT-1

- Stereo valve compressor with Balanced TRS Jacks
- 15 preset settings or fully manual control
- Hard / Soft knee switch
- VU meter for level and GR
- High Impedance DI input

RRP £349 **£299**

TLA IVORY 5021 COMP.

- Dual mono compressor with stereo link
- Valve output stage & retro VU meter
- Additional expander / gate
- High impedance guitar jack input

RRP £469 **£379**

Prices include VAT @ 17.5% and E&OE. Turnkey always try to be the lowest price for all items advertised. Should you find a cheaper price for an identical item, please let us know and we will endeavour to match it. Prices may vary as in those advertised for mail order on the Internet or in price adverts such as this.

Authorised Dealer | Soundcraft | DRAWMER | MACKIE | Roland | SONY | TASCAM | FOSTEX | digitech

EUROPE'S LOWEST

MACKIE. TRUTH HERTZ!

Mackie are back, not only with their VLZ Pro mixers and new hard disk recorder (available in July), but raising the standards again with this top quality nearfield design.

Getting low bass out of a small speaker cabinet is one of the biggest challenges for a speaker designer. Small domestic midi systems often have distortion or compression deliberately introduced to boost the perception of what little bass there is. Take a listen to the average 15 inch disco PA speaker - all boom around 60 - 90 Hz which sounds impressive for a while - a heavy throb when you turn the volume up - but where's the real low bass ?!! Completely missing, of course!

Most designs use vented ports to add tuned resonances, while other designs employ transmission lines or belt driven servomotors which are noisy. Mackie have utilised the silent passive radiator method, at the rear of the cabinet where it helps couple to the rear wall. This honeycomb membrane is a 12 inch x 6 inch elipse, whilst the main woofer is an 8.5 inch cone driven by a 150 watt amp using negative feedback to increase the damping factor. The cabinet is foam-lined 3/4 inch MDF with a 1 inch baffle. The waveguided alloy dome tweeter is driven by a seperate 100W amp, with a 24dB/oct active crossover. EQ trim switches are included, but we wouldn't touch them ourselves, because each HR824's electronics are hand-trimmed at the factory so its flat position gives an incredible ±1.5 dB frequency response between 39 - 22,000 Hz, and 30° off-axis behaviour is within 5dB to 16kHz. THD is under 1% (-40dB) and IMD is around 0.3% (-50dB), and the step response is very good, which should come as no suprise considering Mackie used laser vibrometry with an Ometron FFT analyser to fine tune the design.

A great pair of nearfields at a sensible price.

- *Excellent Bass Extension & On-Axis Linearity*
- *Bi-Amp Design: 200 W per Woofer + 100 W per Tweeter.*

RRP £1099 **£969** MACK-HR824

BEYER BLUEPRINT

ALMOST 45% OFF!

- 1U rack dual channel high quality power amp
- XLR Input, Speakon out
- 100 watts per ch into 8Ω
- 150 watts per ch into 4Ω
- LF Damping factor > 390
- VCA control link option

RRP £410 **£229** BEYE-A150

DYNAUDIO BM5

- Two way front ported nearfield
- 6.5 inch woofer
- 3 inch voice coil
- 25mm Tweeter
- Lightweight Al cone
- 100Wac, 88dBSPL per watt
- Nominal 4Ω, 50-20k Hz 23dB

RRP £408 **£LOW** DUAD-BM5

GENELEC 1030A

- Small two way active nearfield
- 80W amp drives 6.5 inch woofer
- 50W amp drives metal dome tweeter
- Front ported, max 99dBSPL

RRP £1099 **£949**

JBL LSR25P

- 2 way bi-amplified active nearfield monitor
- 5 inch front ported woofer with 80 watt amp
- 1 inch titanium tweeter with elliptical waveguide and 40 watt amp
- -3dB at 65Hz, switchable 80Hz HPF and volume
- Nice aluminium cabinet

RRP **£799** JBL-LSR25P

JBL CONTROL 1

ALMOST 50% OFF!

- Mini 1.8kg two way passive speaker
- 5 inch woofer, 2cm tweeter with grille
- 75 Watts max, 87dBSPL per Watt
- 4Ω nominal load, -10dB at 70Hz

RRP £199 **£89** JBL-CONT1

JBL CONTROL 5

ALMOST 45% OFF!

- Two way front ported speakers, 60W RMS 4Ω
- 6.5 inch woofer runs up to 3kHz crossover
- Metal dome tweeter
- 88dBSPL per Watt @ 1m

RRP £449 **£249** JBL-CONT5

HHB CIRCLE 3P

ALMOST 35% OFF!

- Magnetically shielded compact nearfield monitors
- 4.5 inch woofer, silk dome tweeter
- 8Ω nominal load
- Active version also available

RRP £349 **£225** HHB-CIRCLE3P

ROLAND DS90

OVER 40% OFF!

- Active nearfield monitors with extra S/PDIF input and internal D/A converter
- 6.5 inch woofer + 60W amp
- Soft dome tweeter + 25W
- -3dB at 45Hz, front ported
- Size: 37w 32 x 23 cm

RRP £849 **£499** ROLA-DS90

SPIRIT ABSOLUTE ZERO

- Small two way nearfields
- 6 inch woofer, soft dome tweeter
- Rear ported, 8Ω nominal load
- 95 Watts RMS, 89dBSPL per Watt

RRP £199 **£165** SCRA-AB0

YAMAHA MSP5

- Mini active speakers, front ported
- Bi-amped amps: 40W low, 27W high
- Metal dome tweeter
- 4" woofer -3dB at 80Hz
- Magnetically shielded
- Max 95dBSPL long term

RRP £449 **£265** YAMA-MSP5

MONITOR 2
MIDFIELD STUDIO MONITOR

50% OFF!

Having a great pair of speakers for your home studio setup often involves a compromise between sound quality, cost, bass performance and portability. Now you can have it all with our stunning deal on the Alesis Monitor 2's. Flat bass response down to 40Hz assisted by the substantial ported cabinets which come in a mirror image pair. The three way design with 10" woofer offers superior transparency with excellent quality reproduction across the whole frequency range. Power handling is up to 150w per speaker.

We cannot hold this offer forever - buy now before it's too late.

RRP £699 **£349** ALES-MON2

1029A
BI-AMPLIFIED MONITORS

ALMOST 35% OFF!

The sensationally compact 1029As are powerful nearfield monitors ideal for project, home studios, DAWs, and surround sound use. They have a rugged cast aluminium case and magnetic stray field shielding as default for every single unit. Includes active electronic crossover, overload protection circuitry and twin power amplifiers, one for each driver. They defy their size in out performing many much larger monitoring systems.

RRP £749 **£479** GENE-1029A

POINT 7
PASSIVE NEARFIELDS

ALMOST 40% OFF!

Following the success of its larger brothers, the Monitor Two and Monitor One, Alesis' Point Seven again represents unprecedented value for money in the budget nearfield market. The Point Seven is a two way front ported passive monitor with a 4 inch woofer and soft dome tweeter. It handles 25 watts RMS at 88dBSPL per watt sensitivity, giving it enough headroom at normal listening levels for the small project studio. Suitable amps should easily be able to deliver the 50W per channel program rating into the 4Ω load. The Point 7's deliver 7dB points of 85Hz - 22kHz, and are an affordable choice for rear duty in 5.1 surround. *Exclusive end of line deal, order now!*

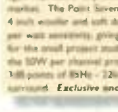
RRP £199 **£119** ALES-POINT7

ABSOLUTE TWO
PASSIVE NEARFIELDS

The Spirit Absolute Two monitors deserve special credit for being one of the few small two way nearfield designs rated to handle 100 watts RMS, which combined with their high 90dBSPL/W sensitivity gives them ample headroom for peaks at typical close field monitoring levels. The distinctive 8Ben comid 6.5 inch woofer is front ported and achieves a -3dB point of 45Hz. The tweeter is a soft dome model with a treated silk diaphragm. Nominal impedance is 8Ω and the enclosures have a slightly contoured front baffle and are very solidly built.

RRP £269 **£179** SCRA-AB2

CIRCLE 5
PASSIVE NEARFIELDS



This speaker has a relatively large cone area for its compact [illegible] which is heavily lined with damping foam inside, using as it does, an 8 inch woofer with a 1 inch voice coil - it even also looks a bit smarter in the HHB purple of the badged version rather than bright pink of Harbeth's original DPM3 model. The tweeter is an advanced design with back wave absorption, and sounds like the crossover is quite good. The 8Ω nominal load handles 60W RMS at 87dBSPL per watt sensitivity, average above 45Hz.

RRP £399 **£315** HHB-CIRCLE5P

ALSO AVAILABLE only [illegible]

REVEAL
PASSIVE NEARFIELDS

A magnetically shielded two way nearfield monitor with a concealed Kevlar baffle. The 6 inch woofer is rear ported in a 12 liter cabinet and achieves a -3dB point around 80Hz. The port is tuned to appose 40Hz. The design uses a soft dome tweeter and offers 50 watts power handling in a sensitivity estimately 87.6dB/1W/1m passband ripple around ±3dB above 80Hz. The drivers are crossed over at 3kHz with good timing coherence. The Reveal is also available in a blue coloured active version.

RRP £249 **£175** TANN-REVEAL

SERVO 170
TWO CHANNEL POWER AMP

A power amplifier for the budget conscious in a solid 2u rack housing. The amp has unbalanced jack inputs and push spring output terminals, and provides a low frequency damping factor of up to 1100. Power ratings are 55 watts per channel into 8Ω, 80 watts per channel into 4Ω or 170 watts into a single 8Ω load when both channels are bridged together.

RRP £209 **£129** SAMS-SERVO170

SERVO 260
TWO CHANNEL POWER AMP

A higher power version of the Servo 170 above, with the same connections and 2u rack frame. This 260 weighs just 6.5 kg yet offers 85 watts per channel into 8Ω, 130 watts per channel into 4Ω or up to 260 watts into a single 8Ω load with both channels bridged (home into some.)

RRP £299 **£179** SAMS-SERV0260

SERVO 550
TWO CHANNEL POWER AMP

At the top of Samson's range is the Servo 550 which has a larger 3u rack size. This would be a better choice for nearfields because of its ability to reach higher powers for transient peaks before clipping. Power is 180W per channel into 8Ω, 275W per channel into 4Ω or 550W bridged into 8Ω.

RRP £399 **£269** SAMS-SERV0550

YST-M8 & MSW10
MULTIMEDIA SPEAKERS

65% OFF!

Without doubt the best sounding set of active monitors we've ever heard for anything like this price - in fact this superb subwoofer and satellites combination puts many budget studio monitors to shame! The YST's feature Yamaha's active servo technology, are magnetically shielded and the combination is provided with 35W (genuine RMS) of perfectly matched amplification built in, together with a bass/treble control for tonal adjustment. Bass is handled by a ported 6.5 inch driver with its own crossover, whilst the top end is taken care of by a 2.5 inch cone, and there's even a headphone socket for those quieter moments. Our incredible end of line scoop purchase means there's nothing else on the market at anywhere near the price.

Order now to avoid disappointment!

RRP £199 **£69** PACKAGE

> **"Very pleased with the prices - will call again."**
> S. (Surrey)

F11 *ACTIVE NEARFIELDS*

Quested's most affordable self powered nearfields are the F11. A two way bass reflex enclosure with 6.5 inch woofer and active 24dB/oct crossover and bi-amped 100W - 50W power stages. The cabinet uses a polyester composite material more rigid and dense than conventional plywood or MDF, which helps to damp any nasty cabinet resonances. Amp noise is 10mV below rig with 0.03% THD (-70.5dB) System response offers high / low EQ tweaks and the "flat" setting is -3dB at 60Hz.

RRP **£1149** QUES-F11

VS2205 *ACTIVE MONITOR*

One of the most possible models in the Quested range, the VS2205 is designed as a highly accurate reference monitor, and its low profile and shielding made it ideal for a wide variety of uses. The built in amplifiers separately drive two 130 mm bass units and a 25mm ferrofluid damped soft dome tweeter. Switches are provided for input sensitivity and HF and LF equalisation, to compensate for room conditions and positioning.

RRP **£1699** QUES-VS2205

VS3208 *ACTIVE MONITORS*

A new model in the Quested lineup, offering a similar monitoring with a low-level XLR input and IEC mains connection. The cabinet is heavily built with slightly non-parallel edges, and two large forward firing bass ports very close to the tweeter. Each of the dual 8 inch woofers (which are side by side off-axis, rather than d'Appolito style) has it's own internal chamber, and the midrange is a sandwich unit. The back panel has EQ trim switches for each driver if you prefer non-flat voicings, along with gain trim.

RRP **£3699** QUES-VS3208

NS10M
PASSIVE NEARFIELDS

The Yamaha NS10M is a high-performance near-field monitor - the choice of recording professionals the world over. Its wide acceptance means that you can take your mix from studio to studio and always be sure of hearing it on a similar system. Using NS10M's also means you'll get a clear idea of what your mix will sound like on the average hi-fi system. Delivering 30 Watts RMS at 90dB SPL, this mirror image pair of nearfields feature a 7 inch woofer rated at a nominal 8Ω.

RRP **£239** YAMA-NS10M

Prices include VAT (UK) and apply to current stocks only. UK mainland carriage from £5.00. Please allow 10 working days for delivery. Subject to availability. E&OE. Some items in store prices may vary as to those advertised for mail order or the internet or in other adverts such as this.

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PRICES GUARANTEE*

beyerdynamic

HAVE YOU GOT THE DT's?

Long established microphone and headphone manufacturer BeyerDynamic celebrates its 75th anniversary this year, with a product range that's stronger than ever. We're concentrating on the headphones this month - check out the range:

DT100 CLOSED HEADPHONES

There are several industry standard headphones, depending on the priorities of the user - sound quality, sound leakage, robust built, durability, easy to replace parts, size and weight etc. Studio monitoring and location recording may aspire to the same ideals, but they face different contraints. Beyer's DT100 are perhaps the closest to pleasing everybody to some extent, and hence they have become a familiar sight in the vocal booth, control room and outside broadcast settings alike. ***Available impedances: 8Ω, 400Ω, 2kΩ - please specify when ordering.***

RRP £125 **£85.99** BEYE-DT100/4

DT75

- Lightweight open back circumaural dynamics.
- 1/4 inch plug adapter
- Single sided cable
- Adjustable headband

RRP £29 **£29**

DT231

- Closed back supra-aural dynamic headphones
- 32Ω nominal, 50mW max
- 95dBSPL/mW sensitivity
- -10dB at 20-18,000 Hz
- Stereo minijack & adapter
- Transiuscent blue backs

RRP £39 **£39**

DT250

- Closed back circumaural design
- 80Ω nominal, 100dBSPL/mW
- Response -10dB, 10-30,000 Hz
- 250Ω version available

RRP £109 **£85** BEYE-DT250/25

DT770 Pro

- Closed back circumaural design, 16dB isolation
- 600Ω nominal, 96dBSPL/mW
- Response -10dB, 5-35,000 Hz
- Single-sided cable

RRP £116 BEYE-DT770PRO

DT100 EAR PADS

- Replacement earpads to fit the DT100 above
- Large cushioned circumaural design
- Easy to install
- One size fits all

RRP £15 **£15**

DT100 CABLE

- Replacement headphone cable for Beyer DT series
- 3 metres long
- Standard 1/4 inch stereo jack plug
- High quality screened connection cable

RRP £24 **£24**

DT150

- Closed back circumaural design
- 250Ω nominal, 97dBSPL/mW
- Response -10dB, 5-30,000 Hz
- Extended bass response

RRP £149 **£119**

DT990 Pro

- Open back circumaural design
- 600Ω nominal, 96dBSPL/mW
- Response -10dB, 5-35,000 Hz
- Single-sided cable

RRP £139 **£139**

C1000S CONDENSER MIC

ALMOST 40% OFF!

A back electret condenser mic with battery or phantom power operation. The polar response is cardioid but the included PPC1000 adapter, if fitted over the mic capsule, will convert the response to hypercardioid. There is a steep bass rolloff tailored for vocals and AKG's famous treble zing, and the mic gives 6mV/Pa output sensitivity at 200Ω impedance. AKG's updated silver version also has a presence boost adapter for a treble peak centred around 6-7kHz. Unprecedented value price.

RRP £199 **£119**

C3000/B LARGE DIAPHRAGM MIC

INC FREE SHOCK MOUNT!!

Phantom powered large diaphragm back electret condenser mic with an unusual design, comprising one single 1 inch main diaphragm with a small mirror diaphragm behind it which superimpose their outputs to achieve either a cardioid or a hypercardioid polar pattern. Switchable gentle high pass filter and 10dB pad. The frequency response shows around 5dB ripple, and a slow bass rolloff below 120Hz, tailored for vocal use. The mic exhibits the typical bright treble presence of other AKG large diaphragm mics, like the C414, and is a popular entry level model.

RRP £330 **£185**

LIBERATOR RANGE 21L LAVALIER SYSTEM

audio-technica

INC FREE MIC STAND!

This lavalier system has the tie clip mic on a flying cable connected to the beltpack transmitter. The receiver is the dipole antenna type.

22 HANDHELD MIC

This system houses the transmitter inside the body of this dynamic, hypercardioid Audio-Technica stage mic. Features diversity antenna receiver.

RRP £199 **£119**

TLM 103 LARGE DIAPHRAGM MIC

Why buy a Neumann "wannabe" when you could afford the real thing ?! Currently one of the best selling models in their range, the TLM103 is a solid-state transformerless large diaphragm true condenser with a fixed cardioid pattern. It offers a low 50Ω source impedance, together with a high sensitivity of 21mV/Pa and very low self noise of 7dBA. This conspires to give you up to 75dB S/N ratio in practice. The ripple is +4dB and -8dB tailored for vocals, and the mic comes with a nice smart wooden case and stand clip supplied.

RRP £599 **£485**

ECM907 STEREO MICROPHONE

SONY

A bargain low cost stereo microphone, which includes an adjustable angled stand for tabletop mounting. The stand has a threaded hole so it can also be screwed onto a mic stand. The ECM907 is a back electret condenser and uses an internal battery rather than phantom power. There is a captive lead (not quite visible in our picture) which terminates in a 2.5mm right-angle stereo jack plug.

RRP £99 SONY-ECM907

NT1 LARGE DIAPHRAGM MIC

RØDE

OVER 55% OFF!

Rode, having quickly made a name for themselves with the pomular NT2, went from success to success with the NT1, one of the best selling budget condenser microphones we've ever witnessed. The gold plated large diaphragm capsule gives a sparkling response, and is great for all round use and particularly good on close miked lead vocals.

You could pay more than this for a dynamic - the NT1 has to be a bargain!!!

RRP £329 **£139** RODE-NT1

NT2 LARGE DIAPHRAGM MIC

ALMOST 40% OFF!

It's not often that a new company makes a big impact in the microphone market, but Rode have certainly established themselves with the NT2. Inspired by some of the all time classic vocal mics, the NT2 has a chunky silver coloured body and stylish look, with cardioid and omnidirectional polar patterns, as well as a 10dB pad. It's sound fares well in any comparison test with similarly priced mics and is smooth with some top end sizzle. The package includes aluminium flight case, windshield and shockmount.

RRP £429 **£275**

ECTV 58S RADIO MIC

SHURE

Shure's most affordable SM58 based system, using the same dynamic cardioid capsule as the legendary SM58 mic. The handheld transmitter gives up to 18 hours use from a 9V battery, and the single antenna receiver unit has unbalanced jack outputs and squelch compander circuitry to improve signal to noise ratio. Diversity receiver and lavalier / guitar/beltpack versions are also available.

RRP £249 **£199** SHUR-ECTV58S

SM58 INDUSTRY STANDARD DYNAMIC MIC

SHURE

OVER 30% OFF!

Shure's SM58 has been the industry standard microphone for as many years as we can remember, and even today it's still a great buy. Robust enough to withstand countless heavy metal gigs, versatile enough for a wide range of studio uses, the yard-stick by which all other mics are judged, now at an unrepeatable price.

RRP £109 **£75** SHUR-SM58LC

SM57 DYNAMIC MIC

SHURE

OVER 30% OFF!

Another extremely popular industry standard dynamic microphone from Shure, due to its general purpose versatility and very low cost. The SM57 has a slim profile without the round grill basket, and is generally used on stand for vocals or instruments such as drums, and a favourite for guitar cabinets, but is great for punchy handheld vocals. It has a cardioid response and an fairly extended bass pickup to 40Hz, and is supplied with a stand clip and case.

RRP £112 **£75** SHUR-SM57LC

DOD SR460H

- 6 way headphone distribution amp
- Balanced and unbalanced stereo line inputs
- Six individual volume knobs up to 1000mW per ch
- "AudioRamp" start-up overload protection

RRP £149 **£129** DOD-SR460H

SAMSON Q5

- Fire any headphone amplifier
- One stereo input using balanced jacks
- Individual volume controls for the five outputs
- Mono / stereo switch
- Up to 300mW per channel

RRP £149 **£119** SAMS-Q5

AKG K141M

ALMOST 50% OFF!

- Semi-open back
- 80Ω nominal, 98dBSPL/mW
- 1/4 inch plug adaptor
- 3 metre OFC cable
- 10dB, 20-20,000 Hz

RRP £99 **£49** AKG-K141M

AKG K301

- Open dynamic headphones
- Large circumaural ear pads
- Self-adjusting headband
- 10-25,000 Hz @ -10dB
- Stereo minijack plug with sliderdid 1/4 inch adapter

RRP £65 **£49** AKG-K301

SENNHEISER HD25

- Closed back dynamic headphones
- Padded double headband
- 70Ω nominal impedance
- Response -10dB, 18-22,000 Hz

RRP £139 **£129** SENN-HD25

SENNHEISER HD25SP

- Closed back padded supra-aural dynamic
- 200mW@ 60dBSPL mW
- Low 60Ω impedance
- Lightweight, and very popular especially for DJ monitoring in noisy club.

RRP £89 **£79** SENN-HD25SP

SENNHEISER HD470

- Low cost dynamic headphones
- Open back supra-aural design
- 32Ω nominal impedance
- Response -10dB 17-22,000 Hz

RRP £49 **£34** SENN-HD470

SENNHEISER HD495 SILVER

- Open back, padded supra-aural design
- 32Ω nominal
- Response -10dB, 17 - 22,000 Hz
- 3 metre detachable OFC cable

RRP £79 **£59** SENN-HD495

SENNHEISER HD570

- Mid range dynamic headphones
- Open back, circumaural design
- 64Ω nominal impedance
- Response -10dB, 18-22,000 Hz

RRP £89 **£89**

SONY MDR-V500DJ

- Supra aural dynamic headphones
- Designed for Dj/earth switching applications
- Closed back design

RRP £79 **£59** SONY-MDRV500DJ

AKG DRUM MIC SET

- AKG D112 is an industry standard kick drum mic with presence lift and high SPL handling.
- Four C418 mics are included for snare, hi hat, toms, cymbals.
- Hypercardioid condensers with gooseneck clip.
- + version also available only £499.99

RRP £599 **£499**

AKG C2000B

- Large diaphragm cardioid condenser mic with pad
- Switchable 500 Hz low-cut
- 20mV/Pa sensitivity
- 20dBA inherent noise
- 200Ω nominal impedance
- Includes stand adapter and elastic suspension

RRP £199 **£149**

AKG D112

- Industry standard bass drum mic
- Dynamic cardioid, takes high SPLs
- Presence lift for beater click
- Right-angle pickup from clip

RRP £219 **£149** AKG-D112

AKG SOLIDTUBE

- Bargain valve mic package
- Includes PSU, shockmount, cables
- Wimacoten and aluminium case
- Cardiac pattern, 100Hz HPF + pad
- Hybrid valve preamp, Output transformer

RRP £799 **£385** AKG-SOLIDTUBE

ALTAI PZM BOUNDARY MIC

- Boundary mic for placing on table, floor or tabletop etc, with 1.5m cable & minijack plug
- Hemispherical pickup pattern
- Battery phantom power
- 600Ω impedance
- 70Hz - 15kHz @-10dB

RRP £99 **£49**

AUDIO-TECHNICA AT4033AP

- Back electret large diaphragm mic
- Tight cardioid pattern
- 80Hz HPF, 10dB pad, smooth response
- 25mV Pa with +7dBA self noise
- Including shockmount & accessories

RRP £599 **£225** ATEC-AT4033AP

RØDE NT-3

- End fire small diaphragm condenser microphone
- Hypercardioid response
- 16 dBSPL self noise
- 11.2 mV/Pa sensitivity
- Battery or phantom power
- Includes carrying pouch, stand clip, thread adapter and foam windshield

RRP £199 **£129**

SHURE BG1.1

- Shure's entry level dynamic mic
- Cardioid pickup, low 150Ω impedance
- Integral on-off switch, neodymium magnet
- Includes stand clip and carrying pouch

RRP £99 **£49** SHUR-BG1.1

SHURE BETA 57A

- Shure's improved Beta version of their SM57
- Hypercardioid pattern
- Neodymium magnets are lighter and more efficient
- Transient performance is hence improved along with treble extension.
- Reduced handling noise via capsule suspension.

RRP £149 **£LOW**

SHURE ETHD

- WH20 headset mic, T11 bodypack radio transmitter and T1 receiver unit
- Cardioid dynamic mic has gooseneck adjustment and elastic headband
- Single antenna receiver has squelch control and jack output
- Diversity version available

RRP £399 **£319**

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cutting edge

THE FUTURE OF MUSIC TECHNOLOGY

There's new and compelling evidence that judges in Germany are bonkers. **Dave Shapton** explains.

I can hardly believe I'm writing this. The computer press reported on 24th November 2000 that Hewlett Packard has been told by a German court to pay an undisclosed sum for having manufactured CD writers which could be used to create pirate copies of audio CDs. The money is intended to compensate artists and authors whose CDs may have been copied.

Now, we've been through all this before in Cutting Edge. We've talked about how you really can't blame Ford for making Transit vans, a very small percentage of which are used in bank robberies. You also can't sue maternity hospitals for allowing future bank robbers to be born there. But in a world where you can blame Hewlett Packard for piracy, you must presumably blame everyone who at some point has failed to stop piracy from taking place. And that's... well, everyone.

It could be that the German judge is unaware that Hewlett Packard is, by anyone's standards, amongst the top manufacturers of computer backup devices — of which CD-ROM drives are an example. In which case, why is it only Hewlett Packard that is plagued by this ludicrous litigation? Surely if you were really intent on putting an end to CD Audio copiers you'd have a go first at a company whose products are specifically designed for copying audio CDs. Philips, for example. What on earth is going on here?

Well, I think there is a pattern to this chaos, and it all goes back to the start of copyright itself.

Copy Writes

Copyright theory is both complex and simple. Here's the simple bit. When you write a piece of music or the words to a song, you own the copyright. It really is that easy. You don't have to register it, or 'copyright' it in any way. You should, though, be able to prove that you created the work, and when you created it.

Forget about the word 'copy' in 'copyright' for a moment. Think about 'right' instead. Note, as well, that it's 'right' and not 'rights', and that PRS is the Performing Right Society. The right in question is the legal right to control the circumstances in which your work is performed. Quite simply, without recourse to any sort of legal procedure, you can specify absolutely any conditions that must be fulfilled before your musical work can be performed.

You could say, for example, that your song 'People think I've got a trifle on my head' can be performed in public if, and only if, the performer does indeed have a trifle on his or her head. Or it's just possible you might accept a fiver instead.

In the days before recording, or any kind of mass distribution of music, arrangements like this worked very well. That's because composers were either always aware of where and when their works were being performed, or they had no idea, in which case there was nothing they could do about it.

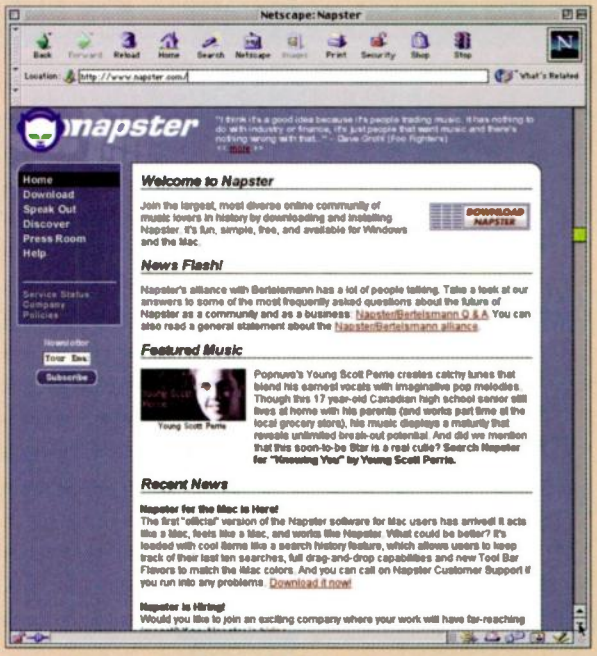
Now jump forward in time to the second two-thirds of the 20th century. What's different is that we have records, radio and TV. So if you want to play a record of copyright music on your pub jukebox, what do you do? Obviously, you've got to get permission. Chances are that you don't have the mobile phone number of the composer and copyright owner. So you either play the record illegally, or you don't play it at all.

Luckily, you don't have to face up to this dilemma. And that's because of the Performing Right Society. These days, if you're a composer, it's very much in your interest to give — or, more accurately, assign — the right to perform your music to the PRS. If enough people do this (and in practice they do), the PRS is in a position to say that it effectively controls all British copyright music. PRS has alliances and reciprocal agreements with similar organisations in the rest of the world. Which means that they can, by proxy, control the entire worldwide repertoire. So all you need to do when you want to perform music in public is get a ▶

PRS On Napster

Ironically, the PRS is the copyright organisation that has least to lose from the Internet. That's because what it actually licences is the right to perform a work. A performance, for the purposes of the PRS, is either a live presentation by a musician or band, or the act of making copyright music available to anyone outside your circle of family and friends by anything that drives a loudspeaker. (There are other rights, but these are the primary ones.) As far as I can see (and someone please correct me if I'm wrong on this), as long as you have a PRS licence it doesn't matter whether the music you play in your restaurant or pub has been obtained from Napster or not. (Although this so clearly contradicts the spirit of copyright in general that I very much doubt if the PRS would feel comfortable with it. Maybe they could put a clause in their licence-contracts to exclude this possibility.) PRS itself takes a realistic view on the organisations, like Napster and Gnutella, that facilitate Peer-to-Peer music sharing. This is from their website, www.prs.co.uk:

"PRS funds British Music Rights, the body that exists specifically to lobby government and discuss rights issues created by such software. Specifically, PRS would not license Napster and the like because in effect they are not the content providers. It would be very difficult for a collecting society like PRS to sue any software provider who is not actually presenting music to the public. We would, however, take action on sites that use PRS members' music, without obtaining a PRS licence.."



Music exchange web site Napster, one of the sites which has caused panic in a music industry fearing loss of control and revenue.

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Caught In The Net

Although it's a gross oversimplification of their history, PRS had to be invented to cope with a change in the way people had access to music. Without it the concept of copyright would have broken down completely.

Does that last statement have a ring of familiarity about it? If not, Welcome to this Planet. While you've been away, the entire music industry has worked itself into a state of apoplexy over the fact that you can type the name of any recorded work into almost any computer in the world, and within minutes be playing it from your hard disk. Then, when you've got several thousand downloaded tunes, together with your entire CD collection, occupying as much as 20Gb (that's a hard disk worth just over a hundred pounds), you can take it round to your mate's computer and copy the whole thing onto his disk in the time it takes to chill a can of lager.

What we're seeing now, as evidenced by this absurd German court case, is that the music industry, which has never understood the implications of new technology (not even Digital Audio Tape) is in an utter panic. It's blanket bombing what it perceives to be the enemy without a single thought for civilian casualties — who in this case are computer users that want to back up their data, and musicians who want to make CDs of their demo tracks to send to record companies (or possibly just their girlfriends).

We are, in fact, going through a change as big as the one that created the need for the PRS in the first place.

If any representative of a record company can present me with a coherent and viable account of how they are going to deal with the threat — no, the *actuality* — of uncontrolled copyright music swapping on the Internet, I'll report it here. Until then I'll continue to wonder, in public, why so few people and organisations in the music business seem to realise that the nature of the Internet is that it's open and uncontrolled. It's actually designed that way. And you can no more stop people swapping data than you can stop them saying 'Hello' to each other as they pass in the street.

At the time of writing, the Scour song-swapping site was under legal threat.

Don't Count On Digits

And don't forget that we're dealing with ones and noughts here. Yes, when these strings of digits are decoded they can reproduce music, but it doesn't take much ingenuity to disguise a piece of data as something else, or at least as something meaningless. Here's a method off the top of my head: take two songs of roughly the same length, and swap alternate bits in the data that make up the first song with the corresponding bit from the second song. Since they won't ever be exactly the same length, insert extra, random bits at the end of the shorter song.

Most programmers could write a very simple program to decode songs encoded in this way, and such a simple scheme isn't going to stop a cryptographer for very long, given access to both songs. But the important point is that data encrypted like this doesn't represent music. If anyone found an unauthorised copyright song encoded like this as a file on your PC, you couldn't be prosecuted for it, because it is meaningless by itself.

You can close down Napster and Scour (the latter is a song-swapping site that actually seems to work better than Napster). What you can't close down is the knowledge to recreate them. There are already alternatives, such as Gnutella, which seems to have a far less centralised structure than Napster. It's just 'Out There', and trying to close it down would be like trying to make a vacuum around a planet by putting some of its atmosphere in a Tupperware container.

The music industry, and to some extent the consumer electronics industry, seem to be taking the Secure Digital Music Initiative seriously. I would too, except that in the first place the 'watermarking' techniques being tried appear to be easily crackable (according to reports in the computer press), and, secondly (excuse me if I'm missing the point here big time), why do we need a watermark to tell us that David Bowie's 'Heroes' is copyright? Surely the best watermark of all is the music itself!

All of which means that watermarking actually fails to address the real issue: that since most ordinary people don't care whether stuff they download from the Net is copyright, they're not going to care if it's watermarked either.

There are, though, people who might care whether their music is watermarked. These are the people with good ears. I know the point is largely academic, but I find it hard to reconcile the emergence of the new 'Super Audio' formats with a watermarking technology that relies on altering (I'm trying to restrain myself from using the term 'corrupting') the audio data itself.

Of course, I really am missing the point here, to play devil's advocate, because the idea behind the SDMI is to prove whether or not a digital file representing a piece of music is an authorised (licensed, or paid for) version. But that's still not going to stop people disguising the data, or, much more likely, simply not caring where it came from at all.

Get The Balance Right

Meanwhile, as I write this, I find that www.scour.com is no more. They've voluntarily turned off their servers because of massive legal threats. There was a US legal case a few years ago in which a company in a small American town polluted the water supply with a carcinogenic form of chromium. (The case was the subject of the film *Erin Brockovich*.) Hundreds of people were affected and many lives were ruined. The judge awarded three hundred million dollars as punitive damages against the company. It was the biggest award in American corporate history.

Add up the damages being claimed by music industry representatives against the likes of Napster, Scour and MP3.com, and the figure comes to many times this. Where's the justice in that? SOS

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Q&A

Your technical questions and queries answered

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Q Who builds PCs especially for music?

I'm looking for details of any UK companies who build and pre-configure music PCs from scratch. I'm interested in possibly getting a new system geared primarily to the recording, production, mixing and remixing of different styles of dance music. While I have been a keyboard player for many years, I'm new to PC MIDI + Audio recording and editing. The PC I currently have is fairly basic — Pentium processor, 32Mb RAM, 2.4Gb HD, AWE32 soundcard, and a 16x CD-ROM drive — and was thrown together a few years back by an old work colleague using bits which I cadged off numerous friends. This time I guess I am looking for someone to hold my hand through the setting-up process, so I can get optimum performance from a system which has been purpose-built for audio recording.

Andy Walker
via email

Assistant Editor Sam Inglis replies: *There are many companies who now specialise in putting together PC systems for music, using combinations of motherboard, hard drive, graphics card and soundcard that they've tested and know to work with the relevant software. You'll probably end up paying a little more for such a system than you would if you went to PC World, but we always recommend that people use a music specialist, especially if they are just starting out in PC recording. The main advantages are that your system should work well straight out of the box, and that you will receive knowledgeable technical support on music-related issues (which I can guarantee you won't from a major box-shifter) and the sort of advice/tuition you're after. Check out the adverts in SOS from companies such as Red Submarine, Millennium, Carillon, Area 51 and Academy Of Sound. I can also recommend a book,* The Perfect Music PC, *available from the SOS mail-order bookshop (see the mail order pages in this issue).*

Millennium are one of the PC music specialists making PCs to order.

Q Should I re-patch every time I need to use phantom power?

I have been using a Yamaha Promix 01 mixer for some time now. Because inputs 1-8 are on XLR connectors only, I purchased an unbalanced loom to plug my sampler outputs into these channels. I also recently bought a Rode NT1 microphone which requires 48V phantom power to function. Unfortunately the Promix only has a global switch for its phantom power. Does this mean that I have to unplug my loom every time I want to use the microphone, to ensure I don't damage anything?

Oliver Smith
via email

Editor Paul White replies: *You shouldn't apply phantom power to a system that has unbalanced connections plugged into it, as you may damage the equipment on the other end of the loom. Also, depending on how the loom is wired, you may short out your phantom power source. This shouldn't hurt the mixer, but may prevent phantom-powered devices working properly. Your best solution would be to buy a separate mic preamp with phantom power (the Yamaha ProMix 01 preamps aren't great anyway) and leave the mixer phantom power switched off.*

Q What equipment will help me to become a producer?

I am currently doing my GCSEs at school and I know that I want to go into the music industry as a producer/recording engineer. Could you recommend me any software or equipment which will help me to become a producer/recording engineer?

Becky McGregor
via email

Assistant Editor Sam Inglis replies: *There is no software or equipment that will magically enable you to become a producer or recording engineer (which, by the way, are quite different things). If you want some good advice about these careers, I suggest you read David Mellor's two series, 'How To Become A Record Producer' and 'How To Become A Recording Engineer', which appeared in* Sound On Sound *in 1996 and 1999 respectively. You can read them in the online archives at our web site, www.sound-on-sound.com.*

Q How are remixes done?

I'm a subscriber and musician with a modest home recording setup. My question — which I'm sure could form a very interesting series of articles in *SOS* — is this: how do people do a remix? Sounds like a stupid question, but seriously, I can't imagine how I could remix a recent release without access to the multitracks! I hear about DJs remixing all the time, but surely they would be limited to stereo material which they could manipulate with EQ and sampling to extract parts or sections from a mix?

Mark Woods
via email

Senior Assistant Editor Matt Bell replies: *You have correctly worked your way to the only sensible conclusion — remixing (at least for commercial release) is only ever undertaken when the multitracks are available. There's simply no other reliable way of getting (for example) vocal tracks isolated for use with new backing.*

Of course, once you have access to the multitracks (or, more commonly, a DAT with the composite parts presented separately as stereo tracks), the process of remixing is relatively easy — just sample the bits of the track you want and drop them into a new backing track that you construct yourself. The exact methods vary, but they're all based on that underlying principle.

DJ remix compilations are slightly different, in that they usually just feature the stereo tracks crossfaded into one another, with a little bit of extra care and attention taken as to the order and tempo of the tracks, so that the rhythmic starts and ends crossfade well into one another. Of course, for those with studio experience this is fairly easy to achieve, with no access to the multitracks needed. Very occasionally, DJs do mixes which take sections they've EQ'd to extremes from a stereo track (without multitrack access) and drop them into their own backing, but these are usually only for white-label release. Sometimes, if the makers of these white labels have hits with the 'underground' remixes, they get asked to do a 'real' remix and the main record company gives them access to the multitracks, or a DAT with the parts on it.

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Q&A

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▶ *explains a little about the subject of obtaining management, accountants and contracts, and has many lists and contact details for managers and management companies.*

Q Can you help me reduce studio hum?

I have a problem with a new studio installation that I'm just getting to the point of completing. This is the third time over the past 12 years that I have relocated my studio (each time adding a bit more kit) and I have never had a problem with audio noise/hum like the one I have at the moment.

Knowing that ground loops can be a potential problem, I have the studio equipment powered from a distribution board, with all the grounds centred in one junction box. As far as possible, the audio leads are located away from the mains power leads. I've tried unplugging everything and carefully plugging in one lead at a time, checking for hums as I go, but this falls flat quite quickly, as nearly every bit of equipment, once plugged into the desk (which is nice and clean with nothing plugged into it!) creates a hum at around 50Hz. Strangely, two bits of equipment (the Korg DW6000 synth and an old digital delay unit) are perfect. They emit a bit of hiss, as you'd expect, but absolutely no hum. *Everything* else has hum.

Just to make things more odd, most of this equipment worked 100 percent hum-free in my last studio space. The only thing that has really changed is the location, and the power socket the power distribution board plugs into. The new studio space is in an industrial unit, near a main road. Any possiblity that there may be external interference getting into the cables?

Matt
via email

Editor Paul White replies: *It can be hard to pin down hum problems without actually being in the studio in question, but I think you may have a poor system earth, in which case getting a new earth spike banged into the ground and connected to your mains earth wiring might help. I've also found that connecting unbalanced equipment using pseudo-balanced leads helps a lot. I don't know if you've tried this permulation, but essentially you wire a balanced jack lead conventionally at the mixer end, then at the other end fit a mono jack wired hot to tip, cold to the bit where the screen usually goes, leaving the screen from the cable disconnected.*

I feel that the cause is unlikely to be interference, as the problem is hum rather than buzz, though apparently weird things can happen on industrial estates, due to unbalanced current draw from the original three-phase mains supply by companies using high-power equipment.

Take care with the audio connections between your mixer and monitor amp and try ground lifts if the connection is balanced.

Q Which budget compressor and mic should I buy?

Firstly, I'd just like to say a big thank you for writing the 'Advanced Compression' article that appeared in December's *SOS*. I knew of some of the things you mentioned, but you have hammered home each point and I have learnt a great deal.

Can I ask your advice on which good budget compression units currently available are most suited to modern dance/trance music? I may also use it for a little guitar and vocal work too, but mainly for synths. Also, could you advise me on mics (around the Rode NT1 price range, or less) which would be good for vocal work, as well as for recording instruments such as acoustic guitar and percussion. With the mic, would I be able to record directly to my SBLive Platinum card, or would it need the use of a preamp?

Tim Edwards
via email

Editor Paul White replies: *I'm glad you liked the compression article. For synths, all you really need is something to keep the filter sweeps under control without messing up the sound too much. As most synths are stereo, I'd recommend the £199 FMR RNC stereo compressor that we reviewed in the September 2000 issue of the magazine. Alternatively, you could check out the Drawmer MX series compressor (MX30 reviewed July '97), or one of the Joemeek models.*

As for mics, at the price the Rode NT1 is going for at the moment, you can't really better it — I use one for nearly everything, including acoustic guitar. It needs a phantom power mic preamp, so you can't plug it directly into a sound card. If you don't have a suitable preamp, a compressor with a mic preamp built in might be more cost effective, though be aware that most of these are only mono. If your budget allows, you could consider the RNC compressor plus a Joemeek VC3 voice channel (reviewed June '99), as you'll be able to use the VC3 to compress vocals and monosysnths, as well as for mic recording.

FMR's Really Nice Compressor lives up to its name and won't break the bank, at £199.

Q What's the best USB MIDI interface for my needs?

I'm having a bit of trouble choosing my MIDI interface for my new G4 Cube. I'm considering either a MOTU MIDI Express or a Emagic AMT8. I will be using *Logic Audio Silver* as sequencing software and my gear is rather limited at the moment (a JP8000, a Korg ER1, a Mackie CFX12 and soon a Yamaha A4000). My main concern is about the quality of these interfaces, using USB ports. I have heard the timing can be off and that the overall quality of sound is not up to scratch.

Dino Dalle Carbonare
via email

Assistant Editor Sam Inglis replies: *In your circumstances, and if you're planning to continue using* Logic Audio, *I'd recommend that you go for the AMT8. That way, you're using a combination of software and hardware from the same manufacturer and you'll know that they will have been tested together. You'll also know that if you do have problems requiring technical support, you won't get bounced back and forth between two different manufacturers, each blaming the other's products!*

You should also read Paul Wiffen's series on using the new Macs for music, which started in the November issue of Sound On Sound. *He has found that the AMT8 and Unitor8, working with* Logic, *form consistently stable USB MIDI systems. There's no obvious way in which the quality of a MIDI interface should be able to affect actual sound quality, since the sounds themselves are produced entirely by the sound modules.* SOS

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NEUMANN KMS105

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NEUMANN KMS105 VOCAL CONDENSER MICROPHONE

Hugh Robjohns auditions the latest addition to Neumann's renowned range of KM-series condenser mics.

There is no shortage of high-quality condenser microphones which excel at capturing the singing voice in the controlled environs of the recording studio. However, achieving similar levels of quality during a live performance on stage is a far greater challenge. Neumann's new KMS105 is their newest mic to address this challenge, and it shares many similarities with that old favourite the KM84, though the capsule design is actually derived from the K50 capsule employed in Neumann's KMS150, KM150 and KM185 microphones.

Hand Me Down

The KMS105 is supplied in an attractive turquoise padded pouch made of hard-wearing nylon, affording excellent protection to the enclosed microphone and stand adaptor. The complete package measures roughly 70 x 190mm, but the microphone within is a slim 48 x 180mm and weighs a comfortable 350g. The substantial metal body acts to reduce handling noise and it's not too long to be well-balanced. The grille, with its internal steel-gauze pop shield, can be unscrewed for cleaning.

The capsule is a typical Neumann high-quality unit with a diaphragm measuring roughly 18mm in diameter. It is configured to provide a very well-defined supercardioid polar response which varies little with frequency and has superb rear-rejection of over 15dB across the stated frequency response of 20Hz to 20kHz. This characteristic makes the KMS105 ideal for stage use, providing good resistance to feedback from stage monitors. The microphone has relatively low self noise, measuring 18dBA (DIN), and can accommodate peak sound pressure levels (for 0.5 percent distortion) of 150dB, at which point the output level will be bending back the desk meters with a whopping +12dBu!

The frequency response is tailored for close-miking applications, producing an almost ideally flat frequency response when used at around 5cm from the source. At greater distances the proximity effect is far less pronounced, with a smoothly falling low-frequency response below 200Hz. A high peak of around 5dB at 12kHz complements the clarity and presence of voices without emphasising sibilance.

The output level appears low at 4.5mV/Pa, but it must be remembered that this mic is intended for close-miking applications, therefore the actual output level achieved in practice will be comparable with any other decent condenser mic. Phantom power is obviously required, but the mic only draws around 3.5mA from a standard 48V supply. An internal DC converter circuit derives the necessary power rails for amplification and capsule polarisation, and it takes only a few seconds to stabilise.

Up Close & Personal

The KMS105 is a delightful microphone, both to use and to listen to. It is a comfortable size and shape for both large and small hands, and is relatively immune to handling noises. The polar response is extremely tight and well-defined, providing superb resistance to feedback from monitors and front-of-house PA. On axis, there is considerable sensitivity when used in a typical handheld, close-mic fashion, but this falls away very rapidly with increasing distance — this is ideal for capable performers with well-honed technique, though it could catch out inexperienced vocalists.

The frequency response of the mic is wide and clean, clearly balanced for close-mic applications and with a high-end brightness which works well on vocals. The microphone is sufficiently neutral in its characteristics to provide good service in a secondary role with a wide range of acoustic or amplified instruments. However, there are other models in the KM100 range which might provide more flexibility and therefore offer better results in these applications.

It would be wrong to think of the KMS105 as just a high-quality stage mic, because it works admirably in the studio too. A more distant placing results in considerably lower output level and a noticeable lack of low-frequency energy, but these points are easily addressed with low-noise mic preamplifiers and a little equalisation. The output quality is certainly of a high calibre — different to a traditional large-diaphragm mic, of course, but extremely good none the less. If you are looking for a top-notch vocal mic to use on stage as well as in the project studio, this should feature very high on your shortlist. SOS

NEUMANN KMS105
£400

pros
- Comfortable to use.
- Low handling noise.
- Excellent immunity to monitor feedback.
- Tailored frequency response.
- Easy to clean.
- Clever protection case.

cons
- As always, this sort of quality will cost you.

summary
An excellent vocal condenser mic intended for hand-held and close-miking use. Typical Neumann quality in sound and construction, and suitable for use both on the stage and in the studio.

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either mode. As an alternative to triggering the ADSR with your MIDI Note On messages, you can also get the filter to respond to the velocity and keyboard position of each note.

Although the WARP 9's filter is analogue, the control system is digital, programmed using the five knobs in the Modulation 1 section of the front panel together with a small switch that cycles them between three banks of functions. Corresponding LEDs let you know what bank you're in, though the physical position of the knobs may not correspond to the actual setting of the parameter being addressed, given that the controls are assignable.

A major advantage of the digital control system is that a number of front-panel settings, such as Cutoff and Resonance, can both send out and receive MIDI data in real time, allowing you to record a filtering 'performance' on the fly and then edit it from within your sequencer. Another advantage to this system is that is affords considerable modulation flexibility, providing some entertaining possibilities if you feel like delving into the manual. One interesting option is the possibility to modulate the ADSR release time from the LFO, and there are a number of innovative ADSR triggering modes available. There are also a few concealed options for sync'ing the LFO's operation with tempo, if that's what you're after.

The VCA section of the WARP 9 can be triggered via MIDI or from the input's envelope generator, though the way this occurs can be selected from a number of options. For example, the VCA can be programmed to act like a gate which opens whenever the signal is above the threshold set using the Trigger Level knob, or it can be programmed to stay permanently open regardless of the input signal level. In addition to any triggering, the VCA may also be modulated using the internal LFO and MIDI Continuous Controller 113.

Up to 32 user programs may be stored, and can be recalled under the control of MIDI Program Change messages. As there is no traditional display, the program numbers are shown as a binary sequence on five of the status LEDs — a similar binary counting system is used to select the MIDI channel.

Zwee-some Threesome

The RS3 doesn't lend itself to creating precise effects, but rather tends to go off and do its own thing based on the character of the input signal. It's easy to set up — even though I couldn't understand the text of the review unit's brief German manual, the included block diagram explained the operation pretty well. What's more you can make big differences to the sound by varying the overall brightness and filter release times, as well as by controlling the degree of LFO modulation. Even though there's no MIDI and the filters are band-pass with few adjustable parameters, somehow the results always manage to sound both interesting and musical. The pseudo-stereo effect is also a big plus, transforming a boring mono signal to a swirling stereo soundscape at the push of a bypass button. What more could you want?

As for the VF11, you have to be sure to set the input levels reasonably accurately, by getting the peak LEDs flashing briefly on peaks, if you're going to achieve a good result. Once this is done, you can create the textbook 'talking instrument' vocoder effect, using a voice and a rich synth pad, simply by setting the Unvoiced Level knob and all the individual band level knobs to the centre of their range. It can help to make the effect even clearer if you advance the Filter control until you can just hear an output without speaking into the mic, and then back it off just a fraction until the output is silent — this effectively achieves the optimum sensitivity setting for conventional vocoding. Being able to mix the unprocessed input with the vocoded output adds to the overall flexibility of the device but, for classic vocoding, only the vocoder level control should be turned up.

The VF11 performs its job effectively and is also not difficult to set up. There's lots of scope for creating new effects by using sounds other than speech at the Analysis input, but there's no way to cross-patch the different frequency bands as there is in some high-end models. Mangling drum loops and synth pads together can be both fun and productive, though it's difficult to think of many truly original ways of using the classic vocoder effect. Bottom line is that if you need an affordable vocoder, and you want to use hardware rather than a software plug-in, the VF11 does the business.

The Warp 9 is a much more sophisticated device than the RS3 and VF11, and has many features that are not obvious when you first start to play with it, so some experimentation is essential if you're to do more than create basic filter sweeps. Given the somewhat cryptic control setup, this will probably mean having a good look through the manual. Tonally, the filter is rich and interesting sounding, and I found it great for adding synth-style filtering to instruments without filters of their own, such as the original Emu Proteus range or the Kawai K1. However, the weakness of any filter like this is that its response to polyphonic inputs can never be the same as that of a real polysynth, as those instruments have separately triggerable filters for each voice. Used creatively, however, the Warp 9 provides a cost-effective way to add interest to synth sounds, samples and loops, and the comprehensive LFO options ought to provide lots of creative possibilities for exponents of electro-pop or dance music.

Given the extremely competitive pricing which Music And More have adopted, there is little in the way of direct competition for the RS3, VF11 and Warp 9, the closest rivals being the Electrix range, in particular the £199 Filter Queen and EQ Killer. These are stereo units and are much more sturdily built, but they can't really match the MAM units in terms of sheer features, particularly the Warp 9. As such, all three MAM units deserve to sell well to anyone who wants to throw filtering restraint to the winds, whilst remaining within a tight budget. SOS

"...all three MAM units deserve to sell well to anyone who wants to throw filtering restraint to the winds, whilst remaining within a tight budget."

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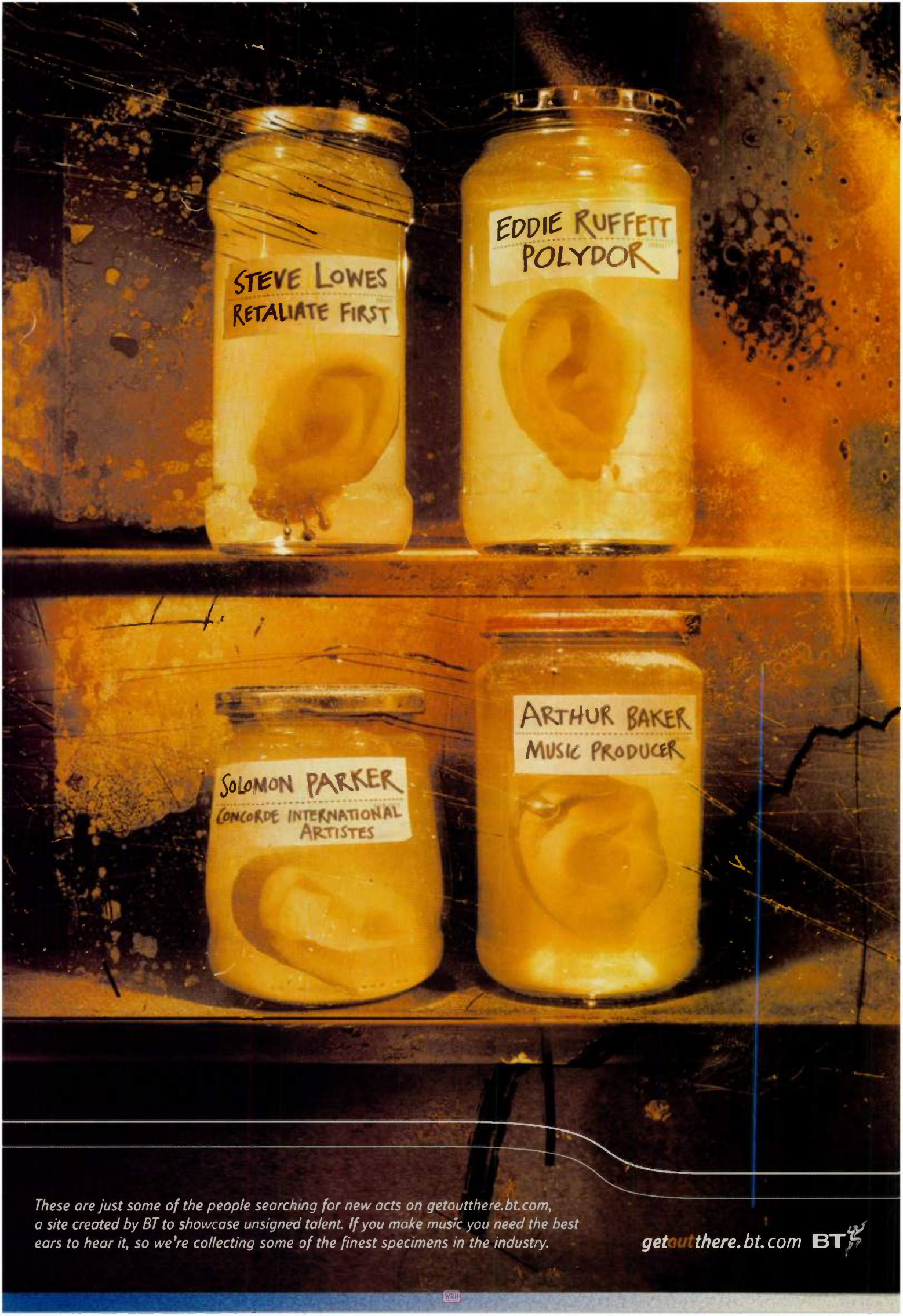

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high-end spill, as the gate is already cleaning this up. If your setup forces you to EQ pre-compressor, or even pre-gate, there's no need to worry — you should still be able to get a good sound, though you may need to alter the dynamics settings a little whenever you adjust the EQ.

If even these tools are unable to produce the sound you're after, then you might also want to experiment with one of the more specialised envelope-based dynamics processes, such as offered by the SPL Transient Designer or TC Electronic Triple•C. These units are able to totally transform the amplitude of drum sound envelopes, allowing you to easily add or subtract serious amounts of attack and sustain.

At this point, and before adjusting the sound any further, bring in the overhead mics and see how the kick drum sounds now. The overheads will change the sound to some extent and will also disguise the gating action, so your kick drum should sound much more natural now. At this point you can tweak the EQ again if you feel it needs it, but be aware that the subjective drum sound will be different again when you bring in the rest of the mix, so don't spend too much time on ultra-fine adjustments.

Snare Separation

Most commonly used snare mics tend to pick up boomy spill from the kick drum and toms, and may also pick up more hi-hat than is desirable. Once again, gating the sound is a good way to clean it up, and a frequency-conscious gate with some low end and some high end rolled off the side-chain input will help prevent false triggering from the kick, toms and hi-hat, if necessary. However, if you can't get rid of the hi-hat spill completely, don't worry too much, because the overheads should hide it quite effectively as long as you're careful to make sure that any spill breaks through in a consistent manner — the last thing you want is hi-hat spill on some beats, but not on others.

If you can't prevent the gate from triggering on some of the other drum sounds, bring in the overhead mics to see if this will hide the spill sufficiently. If not, then reducing the gate's Range setting will allow a little spill through between beats and may therefore help to produce a more natural result, even though this will be at the expense of separation. Even if your gate is operating cleanly on all the snare beats, it is still worth having a quick listen to it together with the overheads. Gating can really dry out the snare, and you may find that you'll want to add some reverb to get it to sit convincingly with the rest of the kit.

If the snare needs any extra crispness, then try a little high EQ at between 4 and 8kHz, or alternatively try one of the brands of psychoacoustic enhancer on the market — there are quite a number available, from manufacturers such as BBE, Aphex, SPL and Joemeek.

"In a situation where the toms have been submixed to a stereo pair at the recording stage, it's probably best to concentrate on getting the lower toms sounding beefy."

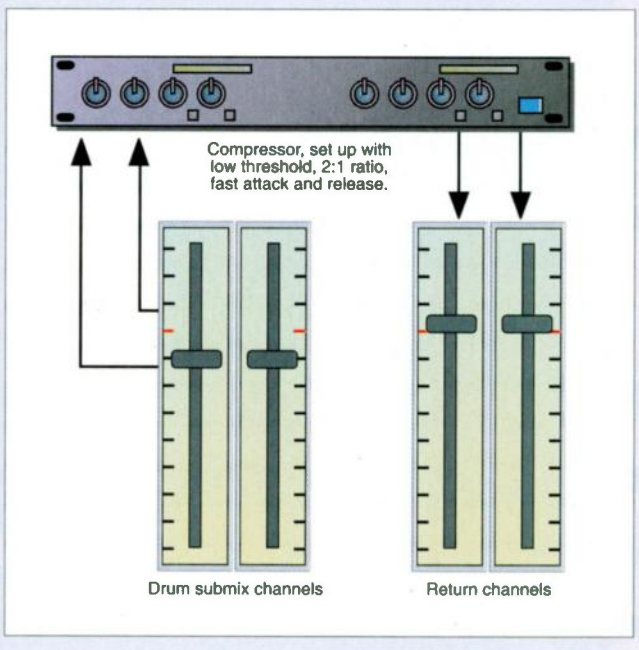
Invisible Compression

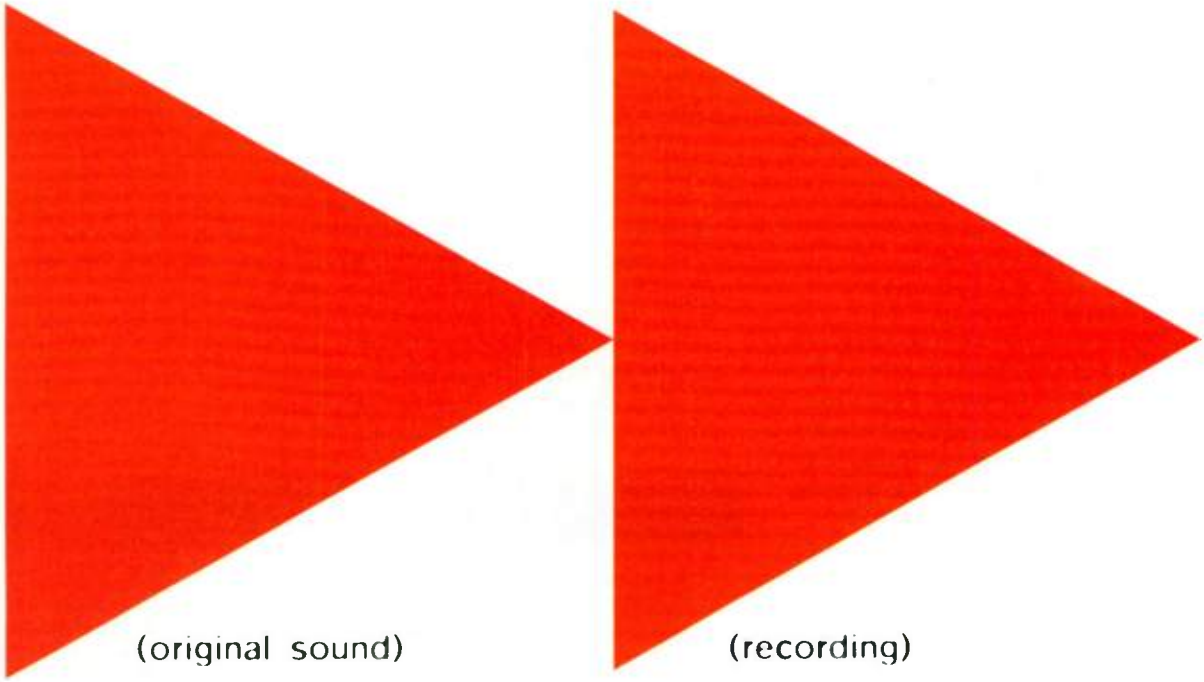
Compression has many uses when mixing drums, from managing levels to creating tonal changes and pumping artefacts. And possibly the first thing you'll have been told about using compressors is that they are designed to be used as an insert effect, patched directly into the signal path, rather than in an effects loop configuration. However, musicians being the contrary bunch they are, it was inevitable that someone would think 'well, why not?' And it turns out that there is, in fact, a good reason for using a compressor in a send/return effects loop rather than as an insert, particularly when you want to give drums extra weight and body without destroying the dynamics of a performance.

If you compress in the traditional way, it's the upper portion of the dynamic range that is squeezed in order to pull up the volume of the low-level detail. This tends to even out many of the most obvious nuances of the drummer's performance dynamics — namely the differences between beats which are hit fairly hard and ones which are hit bloody hard! While this 'ironing out' may be desirable in cases where the drumming is of questionable quality, it is much less desirable where the performance of a good drummer is being mixed.

Imagine, instead, that your compressor is being fed from the aux sends of the uncompressed drum submix channels, with its output then being fed back to the mix through an effects return. If the compression threshold is set low (say at -40dB below the peak level of the drums) with a 2:1 ratio and short attack and release times, such that the soloed compressor sounds like it's really working, you can then mix it in to provide more low-end detail. And the beauty of it is that it won't compromise performance dynamics nearly as audibly — hence the technique's nickname: 'invisible' compression.

One drawback with this approach is that it only works like this in the analogue domain — if you send to a compressor digitally, the processing delay incurred causes the compressor's output to phase with the unprocessed sound. Not that this stops you from pulling a fast one within your favourite MIDI + Audio sequencer in order to get around this — just bounce the compressor's output to disk and then use your audio editing facilities to line the compressed tracks up with the originals. If you feel you have to be able to tweak things in real time then a similar phasing-free alternative is available too: simply patch an ambience reverb plug-in (with as low a reverb time as you can get) directly before the compressor. Naturally, the side effect of this workaround will be a slight change in the space that the drums inhabit, though this change can be minimised by only returning the compressed ambience to the mix in mono. *Mike Senior*





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▶ Alternatively, you can add more body to the sound by applying a cautious amount of EQ boost at 100 to 150Hz. A little compression can also be handy to even out any level inconsistencies.

Isolating The Toms

Because toms tend to be played only during drum fills, you'll probably find that the tom mics just pick up spill most of the time. Again, out comes the gate, though if the tom mix is stereo, make sure you use a two-channel gate set to stereo link mode. Rolling off some low end from the gate's side-chain input will reduce the risk of false triggering from kick-drum spill. Adjust the gate release time to match that of the toms. As with the snare, if some false triggering still persists after you've done the best you can with the threshold control and side-chain filters, you can adjust the range control to allow a little more spill through, which will often help to disguise it.

A neater approach to solving triggering problems is to use mix automation, if you have it, to mute or turn down the tom tracks between drum fills. On a hard disk recorder, you can even erase the sections between fills, though it's wise to create a backup just in case you change your mind about it. Naturally, both of these tactics can also be used on the snare track if you have isolated triggering problems or a whole lot of spare studio time...

As with the other drums, compression may be used to even out the levels and to fatten up the sound, while EQ can be used to add weight and attack. The best frequency at which to equalise will depend on how large the toms are and how they're tuned — experiment with frequencies between 80Hz and 250Hz to try to pick out the resonance of each tom being used and as little boost as you can get away with while getting the job done. In a situation where the toms have been submixed to a stereo pair at the recording stage, it's probably best to concentrate on getting the lower toms sounding beefy — leave the high toms to look after themselves. As with the snare, a high-end boost between 4 and 8kHz can add definition to the attack of a sound, and a small amount of reverb can help to put back some 'liveness' that gating has taken out — just be sure to listen to the tom tracks together with the overheads in order to check that any processing is going to have the desired effect.

Hi-hat And Overheads

If a separate hi-hat mic has been used, the chances are that the hi-hat will be much louder than any spill on that track, so you shouldn't need to use a gate unless you have a very tough recording to deal with — in any event, many songs have hi-hat all the way through, so gating wouldn't bring about any real benefit. However, you can usually afford to filter off quite a lot of the low end, as this will reduce low-frequency spillage at least, and can also make the cymbals sound crisper by removing unwanted 'gongy' overtones — to set up the high-pass filter, move the cut-off point up the spectrum as far as you can without affecting the hi-hat sound unduly. If the hi-hat isn't crisp enough, you could give it a little 'air' EQ using either a high shelving equaliser or a bell equaliser set to a low Q (wide bandwidth) and centre it at around 15 to 16kHz.

The stereo overheads are a hugely important part of getting a good drum sound. These mics pick out the cymbals, they add to the definition of the individual drums and they help knit the whole kit sound together. For a rock drum sound, you'd probably start by getting a good close-mic balance, and then you'd bring in just enough of the overheads to get the cymbals sounding good. Alternatively, for jazz or indie material, using more overhead and less of the close mics is the norm.

One potential problem is that once you've turned up the overhead mics enough to get a good cymbal balance, the low end of the drums can lose focus. This can be a problem in any situation where multiple mics record the same source, and the first thing to try in such cases is always the phase-reverse switch. If phase reversing both overhead mics solves your problem, that's great, but if the low end still seems to sound worse when the overheads are brought in, simply roll off some of their low end to minimise the conflict.

The SPL Transient Designer can often help you get the drum sound you're after, even when traditional compression and equalisation techniques have failed.

If the drums were recorded in a good-sounding live room (or at a live gig), then the overheads shouldn't really need much, if any, artificial reverb, but if they were recorded in a small, dry studio, you'll need to simulate the environment of your choice. Plate settings are commonly used on drums, but short ambience settings will serve better if you're after a tighter sound.

For that vintage drum sound, you could also compress the overheads to get the crash and ride cymbals pumping slightly, but use this treatment with care and make sure it works with the rest of the track. Indeed, you'll need to listen to the whole drum submix in the context of the rest of the mix, particularly the bass instrument and any rhythm parts, to see if it's really working. At this point, you might opt to change the balance between the close and overhead mics or make some final EQ tweaks.

Unless the original drum recording was a total disaster, you should now be somewhere close to a good drum sound. But, before you forget about the drums, there's probably one final adjustment you'll need to make. Once the whole track is playing, the reverb you added earlier may be unsuitable, either because there's too much or too little, or because it's of the wrong type for the song you're mixing. Listen carefully to make sure the kit has a homogenous sound — it needs to convince you that the drums were all played together and not recorded as separate layers, unless you decide you deliberately want to create that disjointed effect. After which you can sit back and enjoy the rest of the mix, because the hardest part of the job will hopefully now be behind you! SOS

Down The Pan

If you're planning to mix your drums to stereo, then you'll need to decide whether to use your overhead mics as a stereo pair. Given that one hears very little in the way of stereo spread unless standing extremely close to a drummer in action, is it really important to have stereo drums on your record? And, if so, which way are you going to have the listener 'seeing' the kit: from the audience or from the drummer's point of view? Whichever approach you adopt, just be sure to make it consistent — listen to the overheads carefully, and then pan any individual drum tracks to match what you hear.

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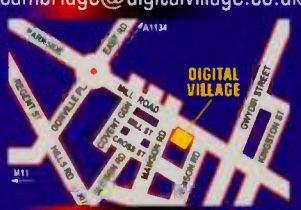

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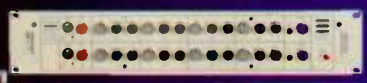
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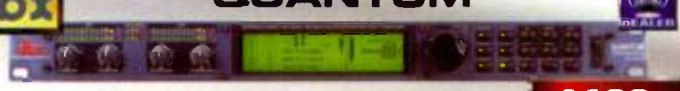

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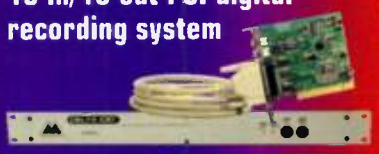

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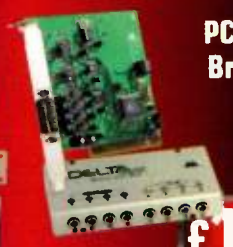

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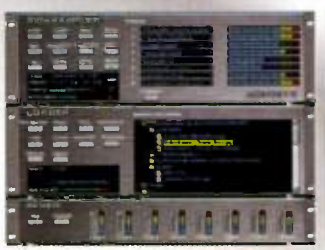

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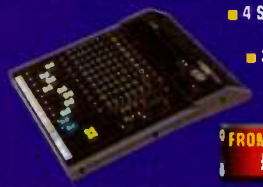

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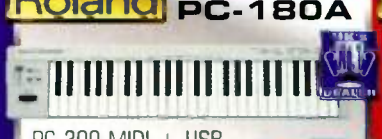
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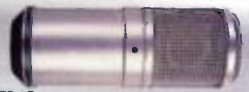

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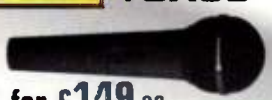

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ARCHITECHS •
RECORDING 'BODY GROOVE'

Photos: Curtis Benjamin

ARCHITECHS: RECORDING 'BODY GROOVE'

Architechs (left to right): City, Nana and Tré.

Sam Inglis meets the production crew behind one of the year's biggest garage tracks.

Tré and City, the production team collectively known as Architechs, are having trouble remembering the name of the keyboard which brought them their big break.

"He had a Korg N364," says Tré of his collaborator.

"No, it was a Korg X3."

"No, I had an N264, you had an N364."

"It's an X3!"

"It's not."

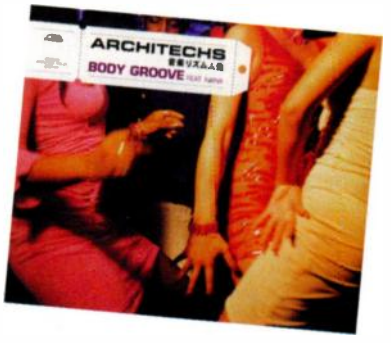
"It is a Korg X3. I've had it for years, man."

"I'm sure you had an N364. Check it."

"What do you mean, check it? I've had it since 1996. I know what I've got!"

City's workstation first reached the public ear in 1997, when the duo used it to create one of the first great underground hits of UK garage. They took an *a capella* mix of Brandy & Monica's R&B smash 'The Boy Is Mine', welded it to a two-step dance groove, and pressed up a couple of white labels to give to friendly DJs. The track immediately became a guaranteed floor-filler at clubs like Twice As Nice, and eventually shifted over 20,000 copies as a bootleg without receiving a legitimate release.

Three years later Tré and City went overground, signing a deal with Polydor subsidiary Go! Beat and, with the help of vocalist Nana (pronounced 'Nay-nay'), recorded their debut single proper, 'Body Groove'. The track was an instant hit with DJs, pirate radio stations and Radio 1's The Dreem Teem, and



City: "The hook just came out of me mucking around trying to emulate an MC, and I played it to my brother and he said 'That's a good idea, you should write something around that.'"

the growing buzz ensured that it entered the charts in October at number three. Even at the time of writing in Christmas week, 'Body Groove' has only just left the Top 40, and is still A-listed at Radio 1.

Underground Sound

Like their remix of 'The Boy Is Mine', 'Body Groove' was recorded using fairly basic equipment. The backing track was concocted at home, using City's trusty X3 (or was it an N364?), a Roland JV1080 sound module, and an Akai S3200XL sampler, sequenced from Emagic's *Logic Platinum* running on an Apple Mac G3. Vocals were added at The Dairy studio in Brixton, where the track was also mixed.

"We still use quite basic equipment," insists Tré. "It's no more than four or five things at a time. It's never like an elaborate thing where we've got tons of gear and hire stuff in, because our music — our own personal stuff, not the remixes — is based around songs, and they are always given room to breathe."

"It's quite akin to hip-hop," adds City. "A lot of underground hip-hop you hear now is not done in expensive studios either. Or if it is, they make it sound like it's not, it's quite dirty. It's the same sort of ethos for garage. It's done in studios like the Dairy, but it's made to sound like it's not, because garage has got a certain quality, and once it sounds too overproduced it loses the rawness. It's the same with jungle, you can't do jungle in a big studio."

Tré continues: "And not only that, it's that most people who are making that style of music haven't been trained in the sense of being engineers or being musicians, so their technical know-how is kind of limited. That's good to a certain extent because it brings out that raw element. If they had gone into a big studio with engineers and people who are really experienced, the sound would have been completely different, because people would have been EQing it from the aspect of 'No, the bass should sound like this, the hi-hat should sound like this, that snare should be like this.' Whereas the people who are doing this kind of music are making it more from how they feel it, from how they hear it, than the whole technical side. It's not expensive to get into it. It's not like doing band-based music, where you need someone to give you money to buy guitars, amps, and stuff like that. This is quite basic."

"When you listen to a lot of stuff, it's not panned, it's like just faders and that's it," agrees City. "No EQ, nothing. It's just raw like that, and that's where the sound comes from. But it's club-based music. All people want to hear is the drums and bass, and even if it was done in mono people wouldn't even be bothered."

Variety Club

City and Tré are keen to emphasise both the diversity of the garage scene, and the way in which their own music draws on a varied musical heritage. "A lot of people say 'I don't like garage, but I like your stuff,'" explains Tré. "And that, to me, sums up garage. I mean 'garage' is such a broad term, you can't really say who is doing garage — what is garage now? Garage used to mean US house, and now we use the same word to describe Architechs, Zed Bias, Wookie and MJ Cole, although the only thing they've got in common is the tempo. But the whole production values and everything are completely different, so you can get someone from R&B liking our stuff but not liking someone else's stuff because it's too jungle, or *vice versa*. And that's what we set out to do with 'The Boy Is Mine' initially. We were R&B producers, so we liked some of the garage stuff we heard, but only some of it, like Tina Moore and other tunes that were really soulful. We said 'Well, that's more like R&B, but at that sort of tempo,' and that's really what we set out to do. We weren't sure that it was going to work, because it is different, and people can be quite conservative when it comes to music, they don't like change. And it blew up."

"I used to work with Seb Fontaine back in the late '80s," recalls City. "This was when 'hip-house' was coming out, which was like rapping over house music. And all the majors were saying 'Right, great, you guys are good, but we want you to do this,' and I thought 'No, I'm not doing any hip-house!' Back then I was into the old-school rap which was credible underground, and hip-house was seen as pop stuff. So I thought 'I'm not doing it', and we turned our backs on the deals, and then we both went our separate ways. I went more into writing mode, and Seb carried on and became a house DJ — ▶

The Importance Of Sampling

Coming from a hip-hop background, Architechs see the sampler as central to the music-making process, and think of it very much as an instrument in its own right, rather than simply a device for playing back the sounds of other instruments. "You have to experiment, because that's what the sampler's there for," insists City. "It's an instrument for you to create new instruments, a magical little box. You have make up different things."

"The filters are the main thing really," continues Tré. "The Akai is good, because it's got its own unique sound. Obviously, the Emu's got different types of filters, and maybe even better ones, but the Akai's got a definite sound. That's what we used on the vocals for 'The Boy Is Mine', too. It's got a wicked sound to it."

"I'm a fanatic when it comes to sampling beats and kicks and snares and stuff," admits City. "All my production ideas have come from hip-hop, and they spend hours on getting kicks sounding right, and snares, and just building up libraries. So that's very important to us. We'll keep sampling different kicks and layering them, timestretching them, detuning them, transposing them, compressing them, all types of thing, just to try to make each snare sound completely different."

"The thing that sampling's really important for is for beats, for getting kicks and snares from old albums and so on," agrees Tré. "You can't get them out of drum machines. I don't think there's been any drum machine yet that does it properly, whereas you do get other gear that does other sounds OK. But for beats, you have to use a sampler. The hooks, the filters, and the fat beats are the three things that are always constant in our production. From 'The Boy Is Mine' on, the hip-hop beats and the filtering have always been in our productions, but other than that, our stuff is always different, with different sounds. We like to keep a certain vibe constant. You'll never hear a track from us and the beat's skinny, like it's taken straight out of some old drum machine. It'll always be a fat hip-hop beat that's been mixed to give it extra fatness."

"I get my samples from all over," continues City. "I live near Portobello market, so I'm always there every Saturday trying to find things, and I get stuff from junk shops, mates, cassette tapes, whatever. I listen to everything. I'm getting more samples and ideas from classical and pop stuff now, because the whole soul music angle has really been covered. There's only as far as you can go. But when you listen to classical and pop stuff, there's so many beautiful samples that you can take."

As Tré acknowledges, though, there are no obviously recognisable samples in most of Architechs' output: "We haven't actually used that many samples in our music as yet. The thing about sampling is that you get inspired to make things sound like a sample, like we did with the chords from 'Body Groove', rather than actually using a straight-up sample. If you can create your own sound and make it sound like a sample, it's completely unique — people can search all they want and they'll never find it, which is the great thing."

ARCHITECHS • RECORDING 'BODY GROOVE'

he's one of the biggest right now. So all our production skills and values have come over from hip-hop production, and with the Architechs we're doing a sound which uses hip-hop beats and R&B influence, but with more emphasis on the beats, so people who are hip-hop, who are not necessarily into two-step, can listen to it and think 'Mmm, I don't like the genre, but I like this.'

"I wrote the lyrics and the music to 'Body Groove'," continues City. "The ideas came about from trying to merge all the different influences of music like reggae, salsa, calypso, high-life African music, but with a modern feel. So like the chord structure is based on an old kind of Latin groove, and then the chorus has a reggae element to it, and it's got R&B in there as well.

"That song would never have been done if it hadn't been for one of my brothers. The hook just came out of me mucking around trying to emulate an MC, and I played it to my brother and he said 'That's a good idea, you should write something around that.' And I was like 'Whatever'. And he said 'No, really, you should write something around that.' So I thought of what could fit around this, and I thought 'Let me try to write a song about people who are working nine to five, and everyone's looking forward to the weekend because you've got your two days of freedom, so when you go out you want to party.' So whether that means you want to go down to the pub and get legless, or go to a club, it's that same thing, you're going to party."

"I think that the key is not to take it too seriously," agrees Tré. "Some people worry. They think they've got to sit down and seriously write a hit, but I think hits normally just come to you. They're usually ideas you have when you're being silly!"

X Marks The Spot

Compositionally, 'Body Groove' is fairly minimalist. Apart from the vocals, drum part, and bass line, the only major element is a synth-derived sound vaguely reminiscent of *pizzicato* strings, which is used to carry the song's chordal parts. Like all the other sounds, this was created by combining several different elements in the duo's Akai S3200XL sampler: "That's a mixture of Korg X3 and other sound sources as well," explains City. "They're all made-up sound patches. I can't even remember what went into them. There's a harp in there, timpani, and several other sounds, it's just all mixed up."

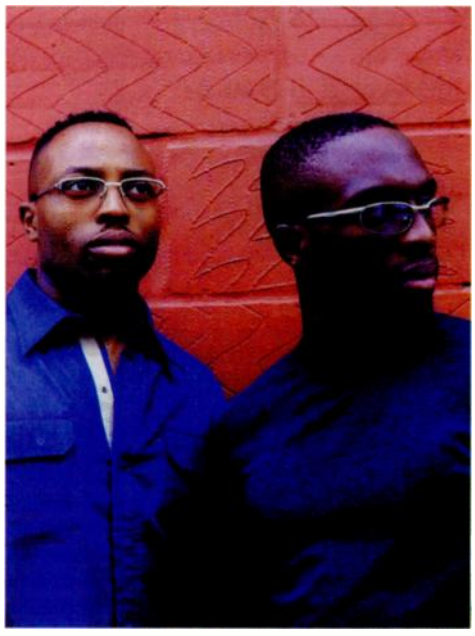
"We put it all into the Akai and make it into a keygroup and just play it from there," adds Tré.

"Everything was played in to the sampler and then programmed from *Logic Platinum*," says City. "I get a sound I like on the keyboard, sample it in, get another sound, sample it in, and just layer different sounds together. I sample it just to give it that old-school hip-hop feel, where you can tell that something's been sampled, so people will listen to it and think 'Oooh, they've sampled that from an old track.' People love that whole flavour, that whole crunchiness. I've found that the Korg X3 is nice, but it's very clean-sounding, and when you run it through the Akai and put the filters on, it gives it more of a bite."

"The bass is a mixture of layered, different basses," continues Tré. "Some are from the JV1080, mixed with Korg sounds and layered. We never like to use raw basses."

Like the keyboard parts, the drums were played into *Logic* from the X3, triggering layered samples in the Akai S3200XL. City is adamant that this is the only way to get the feel right in drum programming: "We'll do the drums live, we'd never draw them in."

The move up to *Logic* on the Mac is a relatively recent one, and allows City and Tré to combine audio recording and MIDI sequencing in one machine, but in general they still prefer other tools for drum programming. "Our first track was all done on an Atari ST," says City. "And people these days are still shocked when I say 'Yeah, sometimes we use the ST.' I've got a G4 at home now, and the G4 is good, but the timing on the ST is tighter. But anything that has MIDI is going to suffer time delay, because of the information being transferred and stuff, so most of the time we use an Akai MPC2000." (The internal sequencer on the MPC2000 doesn't use MIDI, and like many others, City feels that it gives tighter timing as a consequence.)



Architechs City and Tré.

As well as the obligatory crunchy snare, pounding kick, splashing cymbals and busy hi-hats, there are also some more unusual percussion sounds. These include backwards cymbals and, most noticeably, a curious springing sound in the chorus that sounds uncannily like someone bouncing up and down on a bed. "That's a weird sound that we made up in the sampler," explains City. "It's like shakers, but it's tweaked and crunched a bit in the sampler. There's also bells that come in, and there's a tambourine that comes in on 16ths."

Nana Sings

'Body Groove' boasts a number of vocal tracks. The most prominent is Nana's melody, on top of which she also sang several harmony lines in places. "The vocal arrangement and all the harmonies were down to Nana," says City. "When I was doing a lot of R&B in the past, I had put together this girl group, and she was one of the vocalists. We were doing tracks and stuff, and had a bit of interest, but nothing came of it, it just all fell apart. So I kept in touch with Nana, because she knew I was still doing writing, and she was still singing and doing a lot of backing sessions, and trying to make it as an artist."

In addition to the main vocal, Nana recorded lots of scat singing, which appears throughout the record, sometimes as it was recorded, and in other

"All the vocals were recorded directly into *Logic Audio* on the Mac... with the voices tracked using a Neumann U87 mic, plugged straight into the desk and lightly compressed at the recording stage with a TLA valve compressor."

places reversed and filtered in the Akai sampler. "All the vocal scats are hooks, because people remember them," explains City. "If you go back to hip-hop, when you had all those tracks sampling little James Brown 'oohs' and 'aahs', those were the little hooks that people always remembered. So when you're producing, you can build up a pattern where you're always using certain things as your hook, and as soon as people hear the track, and they hear that certain hook, they know 'Oh, yeah, that's the Architechs'."

On top of Nana's parts are the spoken male vocals which form the basis of the chorus and of the song's short rap section. The voice in question belongs to City. "I put down the vocals in the studio, but I'm not really an MC," he says. "I just put them down, and the others said it sounded all right. Originally, the whole song was built around that one hook, the 'Make the body groove, you got to let the body groove'. So when I first played the track to Tré and to other people, that was the main thing that they picked up on, and they said 'Your voice sounds all right on that.' I was going to get someone else, an MC, to come down and do the vocals, but we tried it with mine, and it kind of fitted. So we just sampled it to make it sound as if it was from an old reggae record or whatever; just ran it through filters a bit."

All the vocals were recorded directly into *Logic Audio* on the Mac. The sessions took place at The Dairy, with the voices tracked using a Neumann U87 mic plugged straight into the desk and lightly compressed at the recording stage with a TLA valve compressor.

Mixing & Mastering

Thanks to City and Tré's insistence on getting the right combinations of sounds into their Akai sampler in the first place, the mix of 'Body Groove' was straightforward. Reverb was added to the chordal pad from both the Akai's internal effects board and an outboard Digitech multi-effects unit, while the latter was also used to give the vocals a bit of space in the mix. The sampler's separate outputs allowed the drums to be processed individually, with compression added courtesy of the duo's Dbx 266 and Alesis 3630 dynamics processors, while the vocals were compressed futher using the TL Audio C5021. "The kick and the snare, because they're the two strongest elements, will get compressed together," says City. "It does make a difference what compressor you use, but as long as it gives it a punchy sound, that's all right. The TL Audio works slightly differently because it's a valve compressor. I think the Dbx is one of the best for that kind of punchy sound. The Alesis is alright, but the TL Audio's good for vocals as well. A nice soft, warm sound. It just depends what you're after.

"We had it mastered at Tape To Tape in Putney Bridge. They mastered a DAT of the mix, and then they used that to make a lacquer, and they used it for the CD as well. One of the guys who does the mastering down there did it, but always one of us sits in, because that's another stage where they can f**k it up. In the mastering and when they're making the lacquers, that's when the quality goes, or the bass boosts, or the vocals dip, or something goes wrong, so you have to monitor all the processes that happen once you've done your mix. Once you've left the studio, you're happy with the sound of it, so you want to be happy all the way through when you hear it on vinyl and CD."

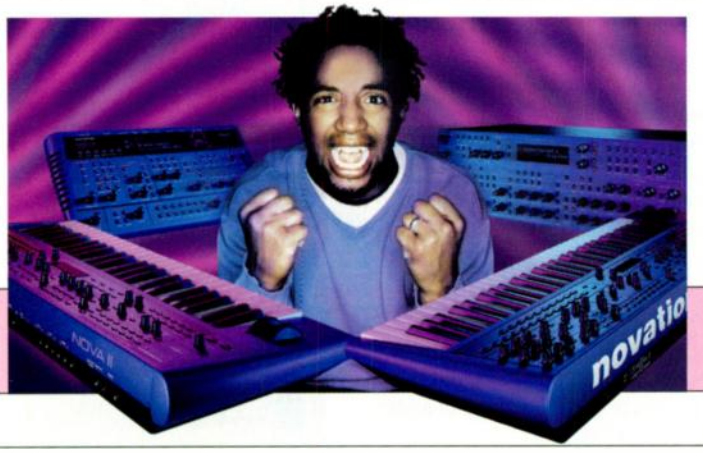
Beyond The Body Groove

Following the success of 'Body Groove', Architechs are in hot demand for their remixing skills, and a buzz is already growing around their next single, 'Show Me The Money', due out in March. They're also hoping to follow MJ Cole and Artful Dodger in pulling off the difficult trick of converting success in the dance singles arena into album sales. So what can we expect from their as-yet unfinished debut LP?

Tré: "It'll just be a mixture of R&B-type and two-steppy garage vibes, really. That's our sound and that's what we're going to keep to. We're not going to do any rock songs."

"You never know, though," laughs City. "We might do a rock fusion."

Tré pauses, then shakes his head. "I always thought you had an N364, you know..." SOS



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MARANTZ CDR631

white town

MARANTZ CDR631 CD RECORDER

Paul White tests the latest Marantz CD writer, which combines simplicity of operation with technical sophistication.

Unlike cheaper consumer machines that are forced to use more expensive blank media, the 2U CDR631 can use regular data blanks and will record to both CD-R and CD-RW discs. The CDR631 also has no truck with SCMS — the copy protection data is stripped from any incoming signals, but can be added back into the recording if desired — either to permit one generation of copying or to prohibit copying altogether. Sample rate conversion is also included to interface the machine digitally with 48kHz sources, though this is automatically bypassed for 44.1kHz inputs with an accuracy of better than 100ppm.

Both balanced and unbalanced analogue I/O is fitted, on XLRs and phonos respectively, switchable to either 0dBu or +22dBu. The one-bit delta-sigma input converters have a 20-bit resolution, while the output converters have a 24-bit resolution, but incoming analogue signals are truncated to 16-bit after conversion, rather than dithered, as far as I'm aware. Digital input is provided on both phono (S/PDIF) and XLR (AES-EBU) while the digital output is on S/PDIF phono and optical only. A further coaxial socket provides an S/PDIF Thru. An infrared remote controller is supplied as standard, though there's also the facility to use an optional hard-wired remote via the RC5 phono on the rear panel.

The large wheel located to the right of the front panel provides control over both analogue and digital input gain (with ranges of +0dB to -63dB and +6 to -63dB respectively). The user interface is particularly good, and marshals not only the recording functions, but also comprehensive replay features — programmable play order, random play, repeat play, music scan and all those other things that you find on virtually every consumer machine. It's worth noting, however, that a number of these functions are only accessible using the included remote control.

The CDR631 has four different recording modes, three automatic and one manual. Whichever mode you're in, a three-second input RAM buffer allows the CDR631 to avoid clipping the starts of tracks. In Record Track mode, recording starts following a Start ID and stops at the next one. In the case of analogue or AES-EBU sources, the level detection is used to identify track starts, though S/PDIF uses the track start IDs of the original source. Record Disk mode is much the same, but recording stops when the source stops or after a period of silence. The default auto-stop system used in the CDR631 stops recording after 20 seconds of silence (anything below -55dB relative to full scale). When using CD or Minidisc sources, the recorder stops within three frames of the source stopping — though if you're working from a DAT source then you'll still need to use the manual mode if you need to stop recording directly after the last DAT track.

A Make CD mode is optimised for copying complete CDs, transferring all track IDs and finalising the disk automatically upon completion. After recording in any of the other modes, the disc must be finalised manually. In the Manual record mode you can opt to increment tracks manually during recording, or you can set the CDR631 to detect track boundaries from the signal levels. While you can rely on the 20-second auto-stop function to terminate recording, if you wish, you do not need to, and this will be handy for recordings of classical music with extended quiet passages, or for 'trick' albums with long recorded pauses. You can also add CD text at the recording stage — for example, song titles.

Final Word

This really is a very simple machine to use, and the built-in buffer means you can abort a recording within the first three seconds without trashing your blank CD-R disk. When recording from an analogue source, the sound quality is excellent, while digital recordings are easy to do, given that no level adjustments usually need to be made — of course, if you're one of those people who think that lightly clipped audio sounds better, the digital input trim control will allow you to achieve this. This is a simple, virtually bomb-proof machine that does exactly what it's supposed to do. For those whose studios aren't based around a computer, the CDR631 could be the perfect unit for backing up rough and master mixes, as well as for creating small runs of audio CDs for demo purposes. SOS

MARANTZ CDR631
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pros
- Good interfacing facilities.
- Buffer prevents clipped song starts.
- Manual stop mode so long periods of silence can be recorded if necessary.
- Can record CD-Rs and CD-RWs.

cons
- Threshold and shut-off time for auto stop is not variable.

summary
A sensibly priced CD-R machine with professional interfacing options.

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HR824s are made by Mackoids in scenic Woodinville, WA USA.

Photo: Mike Cameron

OPTIMISING G-SERIES MACS, POWERBOOKS IMACS & IBOOKS: PART 4

using new macs for music

Paul Wiffen concludes his investigation into reliable means of audio interfacing on new-style Macintoshes when the traditional PCI card route is not available to you. This month, he tests two more USB audio-only interfaces, and reaches some more definitive conclusions about Tascam's US428 MIDI and audio interface.

Last month, having said in the previous issue that I would road-test various bits of USB hardware, I was only able to obtain two Mac-compatible devices: Edirol's UA30 audio-only interface, and Tascam's US428 control surface/MIDI and audio interface. My findings with the Tascam were then further compromised, as I was unable to get it to work correctly with *Cubase VST* v4.1 on the Mac (the then-current version of the software). This month, I had rather more luck. Not only did I successfully test two new audio-only interfaces, I also progressed with the US428 to the point where I feel I can now justifiably reach some reasonable conclusions about the Universal Serial Buss, MIDI, and audio.

Media Assistance USB One & Ego Sys U2A

The first audio-only interface, Media Assistance's 20-bit USB One, came from Germany and is now being distributed in the UK by Et Cetera. Drawing power from USB, this device gives stereo analogue in and out, plus co-axial and optical S/PDIF in, and worked first time without any drivers being installed when I plugged it in to a Mac OS 9.0.4-equipped PowerBook. An audio CD was playing on the internal drive when I did this, and just a few seconds passed before the system recognised the device and switched over to playing via the USB One. The Sound Control Panel now offered USB Audio as one of the available inputs and this also worked immediately on the stereo analogue input when selected. It did however reveal the biggest problem with Sound Manager USB audio; a latency well in excess of 100 milliseconds. There also seemed to be no way to get the digital inputs to work under Sound Manager, presumably because of the lack of a System Control Panel specific to the USB One.

However, the solution to both these problems was provided by downloading the USB ASIO driver from the Media Assistance web site — and it was no great surprise to discover that this was a customised version of the Propagamma USB ASIO driver mentioned last month. Rebooting with the extension in place makes the USB One available to ASIO-enabled applications. I used *Cubase VST* v4.1, and immediately found the driver in the ASIO driver list in the Audio System window. Selecting it halved the latency at a stroke from 30 milliseconds with the Sound Manager ASIO driver to 14mS with the Propagamma driver.

The USB One is well specified for its price (currently £139). It includes direct through-monitoring capabilities to help avoid

"I would like to see USB devices get to the stage where you don't have to swap back to Sound Manager operation to achieve reliable playback for mixdown, but at least these devices do provide audio I/O for PowerBooks and iMacs."

Ego Sys's U2A gives reliable stereo USB audio interfacing plus sample-rate conversion and co-axial-to-optical S/PDIF conversion facilities for £230.

latency problems, and a dither option for reduction from 20- to 16-bit without truncation errors. Recording with the USB One via ASIO was flawless, with the signal appearing in *Cubase VST*'s Audio Edit window as normal. However, as so often with USB audio devices, I found that playback was very patchy with unexpected interruptions to the signal. I assume this is because of the extra burden that the lower latency of ASIO puts on the CPU (although I was using a 500MHz G3). I guess the good news is that you can make recordings in confidence, even if the playback is somewhat unreliable. I did find that by switching off the Propagamma extension, rebooting and using the Sound Manager ASIO driver, I was able to achieve proper continuous audio playback from *Cubase* through the USB One, and whilst this is not the smoothest of working practices, I guess it does make for a usable system, provided you do not need digital outputs.

For almost £100 more, the Ego Sys U2A from Korea offers several more features, including 24-bit converters, a sample-rate converter and S/PDIF co-axial and optical connectors for output as well as inputs. I also liked the fact that there are LEDs to show when the unit is being powered. The Mac drivers, which I downloaded from Ego Sys's web site, come with a Mac Control Panel, so you can use all these features under Sound Manager.

The U2A also began receiving desktop audio within a few seconds of being plugged in and the Input became available in the Sound Control Panel. Once I had put the Control Panel in the System folder, I was able to access both the analogue and digital inputs simultaneously, as well as mix the audio from the computer with these without even rebooting. There is a switch to decide whether you are sending the analogue or digital input down the USB cable to the software on the computer, but the U2A can also mix the analogue and digital inputs it is receiving and add the audio signal coming back up the USB cable, then send different combinations to both its analogue and digital outputs. The direct signals therefore suffer from no latency (as they haven't made the journey through the CPU via USB) and can be used for direct monitoring. You could simultaneously use the analogue outputs to mix your direct analogue input with the output of the computer (say for the musician to listen to whilst recording) and the other as a 'digital through' to monitor what is coming in on from your optical co-axial source (CD player, DAT or Minidisc) on another digital device. As this could be on the co-axial digital output, the U2A effectively doubles as a co-axial-to-optical converter (which would cost you £50 on its own). Furthermore, because there is a parameter to change the Digital Out from Consumer to Professional format, you could even use it to hook S/PDIF-only gear to AES-EBU equipment. Add in the fact that if you set the U2A to its internal clock, it automatically acts as a sample-rate converter, and you have a damn useful little box.

An ASIO driver came as part of the Ego Sys download, and turned out once again to be the one from Propagamma (they seem to be the only game in town for third-party USB ASIO drivers on ▶

the Mac at the moment). As before, installing the driver reduced the latency to 14mS. On opening the Propagamma Control Panel, I was a little disappointed to find that only 16-bit resolution was available (all the others were greyed out). I imagine that 24-bit recording is not yet supported on the U2A (despite the presence of 24-bit converters). Mind you, it took Digigram eight months to get that working on the VXPocket under ASIO, and all the U2A control options available under Sound Manager can also all be used under ASIO.

Recording with the U2A gave the same glitch-free results as the USB One, but playback was subject to the same occasional interruptions. Once again, I had to go back to the ASIO Sound Manager to get uninterrupted playback all the time. At least with the U2A you don't lose any functionality when running under Sound Manager.

At £139, the USB One from Media Assistance is an even more budget-friendly USB audio interface than the Ego Sys U2A — but it does lack the U2A's sample-rate converter and digital outputs.

I would like to see USB devices get to the stage where you don't have to swap back to Sound Manager operation to achieve reliable playback for mixdown, but at least these devices do provide audio I/O for PowerBooks and iMacs.

MIDI, Audio & USB

As mentioned at the start of this month's article, I also managed to do some more testing with the Tascam US428 this month. The first major step forward was that I was able to get it to run as a control surface with MOTU's *Digital Performer* v2.7, thanks to the US428 *Performer* plug-in, which I downloaded from the Tascam web site. When I dropped it into *Performer*'s plug-in folder and ran FreeMIDI in OMS-emulation mode, the control surface of the US428 began operating *Performer*'s on-screen controls immediately. However, moving the EQ controls merely produced a string of error bleeps from the Mac. Maybe I didn't have everything assigned exactly right.

With *Performer*, you still need to use both the ASIO drivers for audio I/O and the OMS driver (albeit under FreeMIDI) to run the two external MIDI Ports on the US428, so I thought I would try this to see if the results were the same or better than I achieved with *Cubase VST* v4.1 last month. Once again, the audio was fine, but I didn't even get as far as a wandering MIDI click in *Performer*. Although I could get the OMS Studio Setup to acknowledge MIDI input on Ports 1 & 2 in the Test Studio mode, I could not get *Performer* to receive any MIDI input via the US428. However, I am not the most experienced *Performer*/FreeMIDI user, so I may have been missing something. I have heard of people both here in and in America who have apparently had the US428 working flawlessly with *Performer*, but I like to see (and hear) things working for myself before I recommend them wholeheartedly. In conclusion, I would say that if you want to use the US428 as an audio interface for *Digital Performer* v2.7 or *Cubase* v4.1, you should do fine with it, and the level of control surface response I got with *Performer* was certainly worth having. When I can get the EQ controls working with *Performer*, I will let you all know through the Apple Notes column.

While I was on the Tascam web site, I found a link to 'important notes on the use of Mac *Cubase VST* v4.1' with the 428. I eagerly read the lot, but was disappointed to find that it merely contained all the things I had tried last month to no avail. However, the site notes concluded with the observation that full support for the US428 would be implemented in *Cubase* v5.0 for the Mac — and at the time of writing, this was on the verge of being released. So the *SOS* production team moved heaven and earth to get hold of the final-release v5 in time for this issue, and a copy dropped through my letterbox just hours before the magazine's deadline. I hastily installed the software and US428 ASIO drivers on an early iMac running OS 9.0.4.

Once again, I was able to record four tracks of 16-bit audio simultaneously without any problems, proving it had not previously been a fluke on the G3 — and so many people had told me not to expect that level of ability from USB! *Cubase* v5 reported a reasonable latency of around 25 milliseconds.

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FIRST WE LISTEN

Unfortunately, when it came to MIDI operation, I initially ran into similar installation problems as last time; OMS immediately found Port 3, the US428 Control Port, but not Ports 1 and 2. Tascam are now aware of this problem, however, and advise opening a completely new OMS studio setup when incorporating the US428 into your system (I had originally been trying to update the existing one in the hope of retaining all the existing connections). I followed Tascam's advice, and discovered to my joy that OMS found not only all three ports for the US428 but also all the other OMS devices previously connected as well. I strongly advise that you likewise start from scratch if you plan to install the US428 yourself.

This done, I sat down to some serious testing. Firstly, I tried setting the MIDI click to a percussive sound, and listened to both that and the audio click together. Those of you who read last month's instalment of this series will remember that I found the MIDI click with *Cubase VST* v4.1 to be wandering so much that it was unusable. Not so any more — and this was on the old iMac, a much less powerful computer than the PowerBook I was using last month. The MIDI click and the audio click (both of which you can hear through the US428 if you feed your external MIDI devices through the Tascam's audio inputs) were rock-solid with v5, which gave me the courage I had previously been lacking to venture further. I then opened up some existing MIDI files with 16 channels of heavy MIDI controller usage, and these worked fine too. I had to go as far as filling up the second MIDI Port's 16 channels before I started to hear audible timing problems. In fairness to the US428, friends with other MIDI-only USB devices report the same problems with full use of a second 16 channels, so I am inclined to blame USB's bandwidth for this, not the 428's implementation.

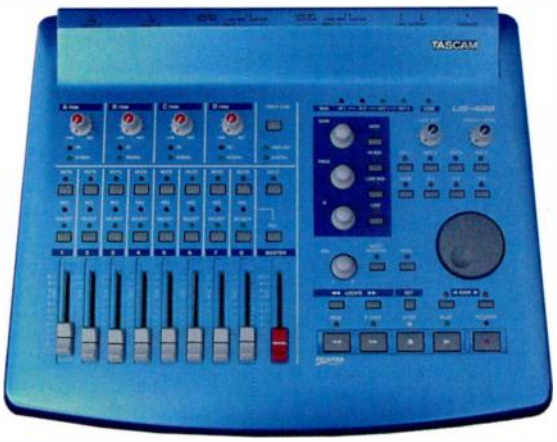
Simultaneous MIDI & Audio — The Big Test

However, the big test was still to come, the one which I had been planning since first receiving the US428. Could it deal with the four channels of audio *at the same time* as the MIDI? I unmuted the audio tracks I had recorded earlier, to try playing them back simultaneously with 16 busy MIDI tracks. Now there was no audio at all, not even in the meters on the VST Channel Mixer. I switched the ASIO driver back to Sound Manager and the audio reappeared. But when I switched it back to the US428 16-bit ASIO driver it vanished again. The same thing happened when I quit *Cubase* and relaunched it, and switching the US428 off and on didn't help either. Nothing short of restarting the Mac would bring the audio connection back. Now in fairness, I had been pushing MIDI to the point where it had clearly been butting up against the bandwidth limit of USB, so I assume that this side of things had monopolised the USB connection and squeezed the audio out.

However, once the audio connection was re-established, I found I could indeed play back all the audio tracks I had previously recorded side-by-side with a full 16 MIDI tracks without problems. I was even able to simultaneously record four tracks with this much MIDI going on. I only managed to 'break' the audio connection between *Cubase* and the 428 once in several hours of testing, and again this was following heavy MIDI usage on all 32 channels. When trying out the 428 on an iBook which a chance visitor made available for a couple of hours, I wasn't able to break the audio connection at all, even when MIDI excess started to tell in the timing (so a 450MHz processor may help avoid this, in contrast to the 233MHz version in the iMac I was using).

Suitably heartened, I felt ready to tackle the final area of the Tascam's potential; to try to get the control surface working. In *Cubase* v5, there is now an entry in the list of Remote protocols to select the US428 itself (this was not present in v4.1). When I selected this, I found that a new window popped up in VST offering me the opportunity to select which bank of eight channels in *Cubase VST*'s mixer would be controlled by the US428. I hurriedly opened the Channel Mixer in *Cubase* and waggled the 428's faders but to no avail. Pressing the 428's transport buttons was similarly futile. The LEDs above the buttons did not even light, let alone produce any response from Cubase. However, the LEDs *did* light when I operated the transport controls or switched banks from the *Cubase* end. Clearly some level of communication was going on from *Cubase* to the 428, if not *vice versa*. According to Tascam, one of the forthcoming *Cubase* updates will solve the remote problems with the US428. Until then, MOTU's *Digital Performer* leads the field in being able to drive the 428 as a control surface on the Mac.

"Last month, I found the MIDI click with *Cubase VST* v4.1 [via the US428] to be wandering so much that it was unusable. Not so any more... The MIDI click and the audio click were rock-solid with v5."



The Tascam US428 — now much improved as a result of better support in *Cubase VST* v5 and *Digital Performer* v2.7.

Conclusions

So, after all this testing, what do I feel about the suitability of the Universal Serial Buss as a replacement for other ways of getting MIDI and audio in and out of the new Macs? The answer to

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that still has to come in two parts, I'm afraid, one positive and one negative. For recording audio with an ASIO driver, USB can do the job. In stereo, it can clearly deliver better quality for recording than the Mac's built-in hardware, and the Tascam US428 pushes this up to four channels with no apparent problems. So where there is no other choice for expanding the audio side of your new Mac, you will be able to make excellent recordings in the field, whether you use the Tascam or one of the stereo devices which works with the Propagamma USB ASIO driver. If you are running software synths on your computer, I would go for the Propagamma-driven devices, as their ASIO driver gets the ASIO latency down to 14mS, as opposed to 25 on the US428 and 27 on Sound Manager. Monitoring at source on the Tascam gets you around latency during recording, but not when triggering software synths, unfortunately!

On the MIDI side, it does seem possible to run a certain number of MIDI channels reliably over USB. This means that for knocking out ideas with a portable PowerBook or iBook, the Tascam US428 should work as well as any other USB device via OMS. However, bandwidth limitations and the antique nature of OMS's core code may mean that you may start to notice timing problems as you approach 32 channels (or sooner, if you are heavy-handed with continuous controller data or like to send SysEx dumps in the middle of a song). Of course, on a blue-and-white G3 or on a G4, you may already have MIDI interfacing solved by one of the methods I recommended in the earlier instalments of this series (eg. the Stealth port, or MIDI via PCI cards). In this case, I can wholeheartedly recommend the US428 to handle the audio side alone, as it is the most reliable and (with four simultaneous inputs) the most capable USB audio interface I have so far encountered. However, I cannot put my hand on my heart and recommend it as a complete solution for a fuller level of MIDI operation — at least, not for Macs. PC owners seem to have had far fewer problems with the US428, not least because the interface ships with a free version of Steinberg *Cubasis* for PC which drives the US428 directly. Apparently Tascam hoped to do something similar for Mac users, but developing a Mac equivalent to the US428-specific *Cubase* is taking longer than they anticipated. I hear that their temporary solution is going to involve bundling a US428-specific version of BIAS's *Peak LE* software, but even this is not yet available at the time of writing. Maybe when it turns up, you will be able to fully exploit the 32 channels the 428 offers without hearing timing inconsistencies or squeezing the audio out of operation. Be sure that if I get to this stage with the US428, I will let you know in Apple Notes.

So far, the US428 is the only shipping USB combination MIDI and audio device which is recommended for use with the Mac, but other similar USB units are due for release any week now from Event and Yamaha. In the meantime, please keep your feedback coming in to applenotes@sospubs.co.uk, as it is in my regular Apple Notes column that I will be reporting back and commenting on your USB experiences from now on. In the meantime, I give a cautious thumbs-up for ASIO-driven USB audio, even if the OMS-driven MIDI side still seems limited on the Mac. SOS

The first of Paul Wiffen's Apple Notes column appears on page 252 of this month's issue.

Thanks to Martin Delaney and his colleague Helen for their help with the iMac and iBook while testing the Tascam US428.

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Echo Comparison Chart

Specification	Darla24	Gina24	Layla24	Mona	Mia
Digital connectors	0	RCA & Optical S/PDIF,ADAT	RCA & Optical S/PDIF,ADAT	RCA & Optical S/PDIF,ADAT	S/PDIF
Analog outputs	8	8	8	6	2
Digital outputs	0	2 or 8	2 or 8	2 or 8	2 (8 virtual)
Analog inputs	2	2	8	4	2
Digital inputs	0	2 or 8	2 or 8	2 or 8	2
Nominal output levels	yes	yes	yes	yes*	yes
Nominal input levels	yes	yes	yes	no*	yes
Default nominal level	+4	+4	+4	See below	+4
Analog input gain	no	no	no	yes*	no
Analog input auto level	no	no	no	no	no
Input clocks	Esync	S/PDIF,ADAT, Esync	S/PDIF,ADAT, Word	S/PDIF,ADAT, Word	S/PDIF
Output Clocks	Esync	Esync	Word, Esync	Word, Esync	Esync
Midi	no	no	Yes	no	no
Sample rates	8,11,16,22,32, 44,48,88,96	8,11,16,22,32, 4,48,88,96	8,11,16,22,32, 44,48,88,96	8,11,16,22,32, 44,48,88,96	8,11,16,22,32, 44,48,88,96
Other		headphone output	headphone output	4 built in Mic pre-amps with Phantom Power	Multiple client support On-board DSP

All cards have output levels for analog outputs and monitors that can route from any input to any output.

All cards support internal input clock

*Mona handles nominal levels differently from the other cards. For analog outputs, the XLR connectors are +4 and the RCA connectors are for -10, so there's no software switch to change between the two. The analog inputs are controlled by knobs on the front panel, not in software by the console. Mona can handle +4 and -10 just by turning the knob on the box. There is no software switch for analog input nominal levels.

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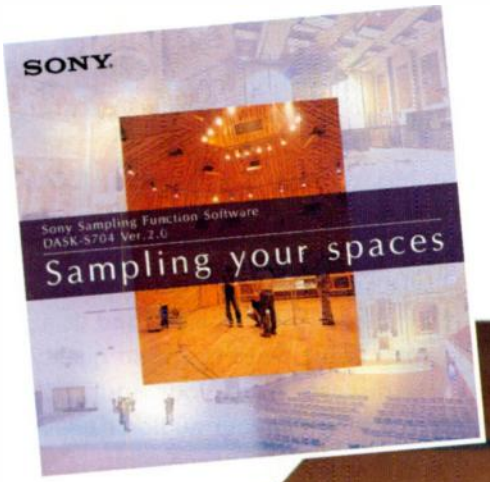

With Sony's flagship sampling reverb processor you can now sample the acoustic signature of any space you want. **Hugh Robjohns** puts it to the test by sampling the unique acoustics of an award-winning concert hall.

Photo: Mark Ewing

reality bytes

SONY DRE S777 SAMPLING DIGITAL REVERB V2

At the time of my review in *SOS* December 1999, the Sony DRE S777 was running version 1.0 software and offered only a single CD-ROM of sampled acoustics. However, since then Sony have continued developing it and have since updated the operating software to version 2.0, as well as releasing three further CD-ROMs (see 'Real Spaces' box, page 78). The most powerful feature of the new software is that you can now sample acoustic spaces in true stereo, a feature which is likely to appeal to a diverse cross section of the audio industry. For example, recording studios could acquire samples of their various rooms for use when overdubbing in different venues, and post-production studios could sample the ambience of a filming location in order to be able to reapply it to added dialogue tracks.

Sampling Real Venues

In order to use this new facility, you need not only the DASK S704 self-sampling software (supplied on a CD-ROM with a 64Mb memory stick to store the results), but also a pair of decent microphones, a dual-channel mic preamp, and a full-range dual-channel PA system. The DRE S777's analogue inputs need to be connected to the amplified mic signals, while its outputs feed the PA system. The PA rig doesn't need to be anything excessive; it only needs to have a reasonably wide bandwidth and be able to output a sound pressure level of around 100dBA — roughly the equivalent of a loud instrument, sufficient to energise the room and its characteristic reverberation. However, the higher the quality of both the PA and the mics, the better the end results. I witnessed a sampling session in a theatre near Sony's headquarters in Basingstoke, where a pair of Schoeps CCM3s and a compact two-way Sony 'suitcase' system with subwoofer performed admirably! (See 'Sampling In Action' box for further details of the demonstration.)

The Sony system analyses the reverberation pattern caused by a time-stretched pulse (TSP) — this is essentially a rapid sine-wave frequency sweep lasting a couple of seconds. The reverb generated from this frequency sweep is captured and stored on the memory stick, but requires further internal processing, or 'compiling', before it can become a usable reverb program. Typically, when sampling an acoustic space, the DRE S777

SONY DRE S777 £5869

pros
- Sampling acoustic spaces is comparatively fast and easy.
- Excellent, accurate and very usable results.
- Good range of pre-sampled acoustics available.

cons
- At over £10,000 with all the CD-ROMs, you've got to be prepared to pay for such high quality.

summary
The ability to sample your own favourite acoustic spaces and apply their characteristic reverbs to other recordings is revolutionary. I'm sure that the Sony DRE S777 will quickly gather a fanatical user base in a wide range of recording environments.

SOUND ON SOUND

> **"The direct comparison between the real environment and its sampled recreation was enough to convince me of the merit of the convolution technique and of Sony's implementation of this technology in particular."**

will need to generate a number of TSPs, because background noise will need to be averaged out in order to make a usable program. This averaging process becomes progressively more effective the more TSPs are used, with a maximum increase in signal-to-noise of 18dB being possible when 64 TSPs are used.

When sampling a space, the speakers should be set up where the sound source would normally be, and the microphones placed in a good listening position. There are three possible sampling modes: standard rate (44.1 or 48kHz) sampling for either 5.5 or 11 seconds; or double rate (88.2 or 96kHz) for 5.5 seconds — however, the 11-second standard and 5.5-second double rate sampling modes require an optional DABK S703 DSP expansion board for ▶

Sampling In Action

I was able to attend a demonstration of the DRE S777's sampling abilities at the Anvil in Basingstoke, an award-winning concert hall whose acoustics are among the best in Europe — Deutsche Grammophon's acclaimed 1998 recording of Berlioz's *The Damnation of Faust* was recorded there, for example. A pair of Schoeps microphones were first sampled in positions roughly a third of the way back in the hall, and around four metres apart. Then they were moved four metres further back and sampled again. In both cases 16-sweep sampling passes were used, and versions were sampled with both omnidirectional and cardioid mic capsules employed. When compiled, these samples provided a degree of flexibility in the finished programs, allowing the choice of two distances and two polar patterns, as well as various four-channel surround modes.

The demonstration worked perfectly first time, and the whole procedure seemed remarkably quick and easy, but the key question is how accurate was its recreation? The empty hall has a fairly generous and smooth reverberation, but with pronounced slapback from the rear wall. Using the S777 to apply the sampled acoustic to a variety of close-miked instruments and voice recordings, I found the results to be convincing in stereo, portraying a realistic impression of size and emptiness and with the recognisable sonic character of the theatre. Using the S777 in four-channel mode (making use of all four sampled mic placements to provide two stereo pairs) and with the outputs routed to a 5.1 speaker arrangement, the distinctive slapback from the rear wall was recreated to perfection. Listening in a relatively dead monitoring environment, the result was uncannily accurate and the illusion of space that was created was incredibly lifelike. The direct comparison between the real environment and its sampled recreation was enough to convince me of the merit of the convolution technique and of Sony's implementation of this technology in particular.

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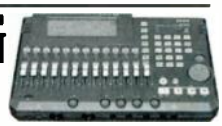

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sufficient computational power. The reverb samples are stored on a supplied 64Mb memory stick inserted into the front of the S777. Given that a 5.5-second standard-rate sample requires around 2Mb of storage, and that the corresponding compiled reverb program comes out at roughly 25 percent smaller than this, the memory stick ought to accommodate about 40 standard-rate programs.

The compiling operation is almost trivial — select the relevant samples and start the process. Mid-way though the procedure, the machine provides the option to delete any data which arrived prior to the direct sound — pre-echoes. With most natural reverberation, pre-echoes are irrelevant and should be removed, but if you were sampling plate reverb, for example, pre-echoes might well be an integral part of the reverberant sound. The software next displays information about the reverb samples, including the level of noise — this should be below -60dB, otherwise the sampling process ought to be repeated with more TSPs. However, if everything is satisfactory the compiling process will then produce the final reverb program.

The DRE S777's new operating software also allows you to import reverberation impulse responses by saving them to the memory stick. This data can then also be compiled as described above to produce a new DRE S777 reverb program. It is Sony's intention to create a web site where users may post and download impulse responses and programs for the S777.

Prices

- DRE S777, £5869.13.
- DABK S701 two-channel A-D converter board, £922.38.
- DABK S702 two-channel D-A converter board, £634.50.
- DABK S703 DSP upgrade board, £1874.13.
- DASK S701 *European Halls and Churches* CD-ROM, £699.13.
- DASK S702 *American Acoustic Spaces* CD-ROM, £699.13.
- DASK S703 *Japanese Acoustic Spaces* CD-ROM, £581.63.
- DASK S704 sampling software, £646.25.

All prices include VAT.

Room For Improvement?

The self-sampling software for the S777 really opens up the potential of this innovative machine. The whole sampling process is very fast and easy to perform, needing little in the way of equipment and no particular expertise. But, most importantly, the results can be impressively accurate and very usable. Although a specialised machine, once any studio acquires one, they'll almost certainly wonder how they ever coped without it! SOS

information

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Real Spaces: The Sample CD Collection

The standard CD-ROM shipped with the S777 is entitled *Halls, Churches, Studios and Plates*. This is a collection of general purpose anonymous acoustic spaces, and includes two halls, two churches, three studio live rooms, two plates, and a drum room. All are provided with a variety of source and microphone positions, providing subtle alternative reverbs, and all portray the almost uncanny realism which is the hallmark of the machine.

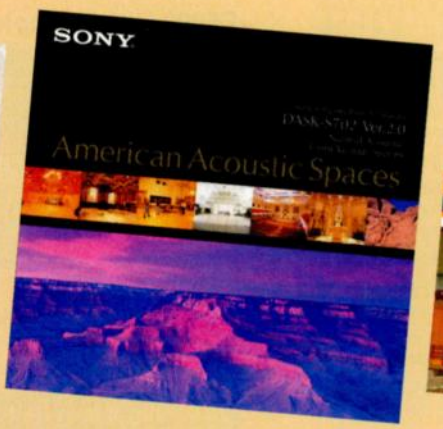
The three new disks are entitled: *European Halls and Churches*, *American Acoustic Spaces*, and *Japanese Acoustic Spaces*. These all carry version 2.0 software and offer a greater variety of mic positions and types than the original generic disk. There is also considerable technical information about microphone positions, the structure of the halls and the nature of the recorded reverberation.

The halls section of the European disk includes samples of the Amsterdam Concertgebouw, the Vienna Grosser Musikvereinssaal, and the Concerthaus in Berlin. There are also three churches: Westerkerk in Amsterdam, Jesus-Christus-Kirche in Berlin; and St. Vincent de Cardona in Spain.

The American disk provides four studios (Avatar Studio A, Ocean Way Studio B, Enterprise Studio E2 and Giandomenico Studio), the Mechanics Hall, the Cathedral of St. John the Divine, and a boxed canyon in the Grand Canyon — the latter a fantastically open ambient acoustic.

The Japanese disk starts off with the Sedic Audio Studio in Tokyo, providing seven variations of the main studio, plus samples from the vocal booth, the control room, a tea room and a telephone box! The one hall is the Yokohama Nohgakudou, while the more unusual spaces include the Tamanoyu Bathhouse, the Ohyaishi quarry, the Kamaishi mine, the Goto Planetarium dome, and the Hotaka mountain range!

The combination of the four disks provides a vast and impressively usable collection of acoustic spaces and reverberation characteristics, and provides something for pretty much any occasion.



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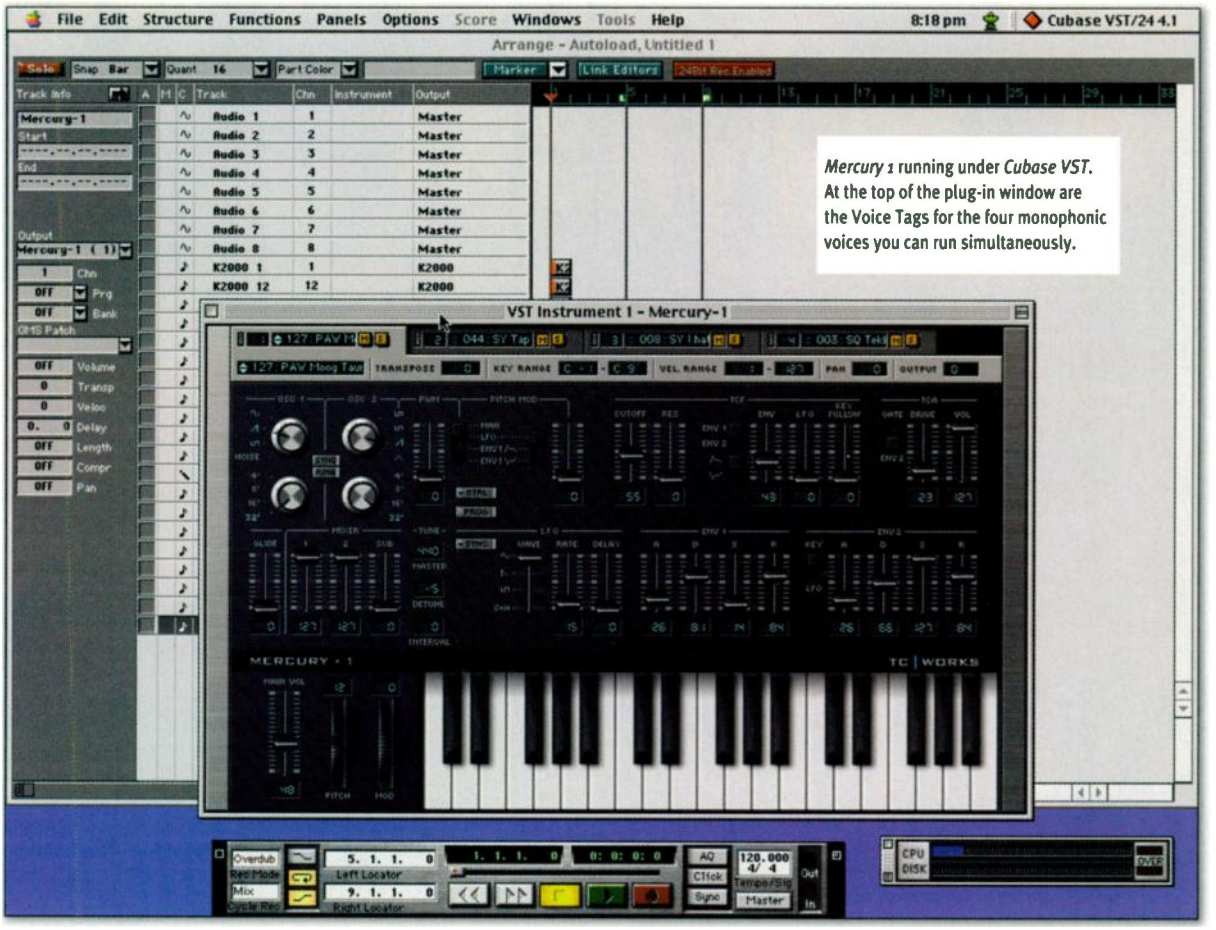
mercurial tendencies?

TC WORKS *MERCURY 1* MONOPHONIC SOFTWARE SYNTH



Mercury 1 running under *Cubase VST*. At the top of the plug-in window are the Voice Tags for the four monophonic voices you can run simultaneously.

Hardly a week seems to go by without the announcement of another VST instrument, and virtual analogue software synths have been particularly common of late. But when a company like TC Works gets involved, it's worth taking notice. **Paul Ward** plugs in...

Mercury 1 is a VST-compatible monophonic dual-oscillator (plus sub-oscillator) virtual synth. It is conceived very much along 'classic' analogue lines, with a smattering of standard waveforms and a 24dB/octave filter. Each loaded instance of *Mercury 1* actually consists of four monosynths, with four-way splitting and multitimbral capabilities.

Installation is relatively straightforward, if registration is not. *Mercury 1* uses a hard-disk installation based on a challenge/response mechanism. When you try to access *Mercury 1* for the first time it offers a seemingly random list of short words. This string of words, along with your serial number, can then be entered into the registration page at the manufacturer's web site, or sent as an email. They then usually respond within two days, sending you another list of words with which to respond to the authorisation challenge. Once you type these words in, your hard drive is authorised to run *Mercury 1*; in the meantime you have 21 days' use of *Mercury 1* in its unauthorised form. I have to say that this was all a bit of a palaver, and is reliant on the buyer having convenient Internet access, which I know is not

TC WORKS *MERCURY 1*
£99

pros
- 'Authentic', rich analogue sound.
- Lots of easily accessed MIDI modulation options.
- Song sync-able LFO.
- Velocity and key-splitting available.

cons
- Four pairs of stereo outputs.
- Needs a fast processor for practical multitimbral use.
- User interface could do with a few tweaks.
- Monophonic only.

summary

Mercury 1 is a little demanding on processor power, and its layout and implementation are occasionally irritating, but it is capable of some truly inspirational sounds. Make sure you try before you buy to see if your computer is up to the task.

SOUND ON SOUND

always the case. To be fair, though, I did receive my registration details within 24 hours.

Loading *Mercury 1* into your host application is just as for any other VST Instrument; I ran it with both *Cubase VST* and *Logic* with no apparent problems. The manual also gives details of how to load *Mercury 1* into TC Works' very own (Mac-based) *Spark* editor, but not having this piece of software, I can't comment on how well this works. Once you've loaded *Mercury 1*, you can then access its editing window, which is where all the fun is to be had.

I'd say that *Mercury 1*'s editing panel is very reminiscent of an old Roland SH-series synth, even down to the chunky silver knobs for oscillator waveform and footage. An improvement over such old hardware, however, are the small blue 'LEDs' under each control that display a digital reading of the control's position. These are of a '1-127' nature, and personally I would prefer to read dB, Hz and milliseconds, but they are very welcome all the same.

The Plug-in Window

The accompanying documentation refers to each of the *Mercury 1*'s four monophonic, dual-oscillator synths as a 'Voice'. Oscillator 1 presents a palette of sine, sawtooth, square and noise waveforms, whilst

Mercury 1 — Key Features

- Four-part multitimbral monophonic virtual analogue synthesizer.
- Two oscillators plus sub-oscillator.
- Sine, sawtooth, triangle, square, pulse (with PWM) and noise oscillator waveforms.
- Oscillator sync and ring modulation.
- Resonant 24dB/octave low-pass filter.
- Two envelope generators.
- MIDI modulation capabilities.
- LFO synchronisable over MIDI.
- Sine, sawtooth, square and sample & hold LFO waveforms.
- TC SoftSat drive for analogue-like distortion possibilities.

Oscillator 2 has a choice of square, pulse, sawtooth and triangle waveforms. Additionally, a square-wave sub-oscillator is tied an octave below Oscillator 1's pitch. When using Oscillator 2's pulse waveform the pulse width can be modulated, either by a static amount, by the LFO, by Envelope 1, or an inverted version of Envelope 1's control value. However, there's no way to mix varying amounts of each of these modulation sources. Similarly, oscillator pitch may be modulated by one of LFO, Envelope 1, or inverted Envelope 1. Footage for each of the oscillators is selectable over a range from 32 to four feet. Oscillator 2 can be interval tuned in semitone ▶

TC WORKS *MERCURY 1*

steps over +/-1 octave and detuned by +/-50 cents to thicken dual-oscillator patches. Oscillator sync and ring modulation are provided — and can both be used at the same time if required.

Glide is a simple fixed-time implementation with a single rate control; a fixed time/fixed rate option would have been nice. There is no option to produce legato-fingered glide for TB303-style switched portamento. Neither did *Mercury 1* seem to respond to portamento on/off MIDI messages.

A simple mixer allows for the volume of both oscillators and the sub-oscillator to be balanced before passing into the filter.

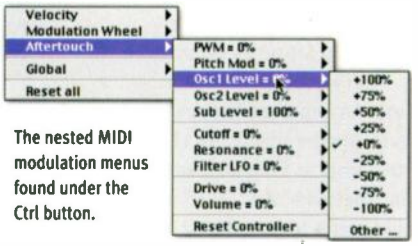
Mercury 1's filter is a 24dB/octave low-pass type, which is pretty much the standard for classic synth emulation, although an option to switch in 12dB and 18dB variants would have been nice, allowing for more accurate emulation of typical Oberheim and TB303 filter characteristics. Resonance goes right up into self-oscillation — and very authentic it sounds too. Cutoff frequency may be modulated by either of the two envelope generators, the LFO and key-tracking in simultaneously variable amounts. Whichever envelope generator is chosen as a modulation source can be used in its normal or inverted state.

The envelope generators are simple ADSR types. Envelope 2 is selectively triggered from key presses, or from the LFO for 'pulsed' sounds. Attack, decay and release are fully variable over a 1 millisecond to 10 second range. It's a small point, but the scaling of the envelope controls felt very natural to me, which is not something I usually find to be the case with virtual instruments.

In typical Roland monosynth style, the Amplifier section offers you the choice of a gate or envelope to open the amp. When you are stuck with a single envelope generator, applying the gate to the amplifier can be very useful (I use this trick often on my SH09), but since *Mercury 1* offers two envelopes anyway I wonder how often I'd turn to it. A Drive control pushes *Mercury 1*'s output to create a pseudo-distortion effect, using TC Works' proprietary SoftSat analogue emulation. And quite well it works too, although high settings have the habit of being a little unpleasant on the ears. A Volume control at the right of the Amplifier section sets the overall level for the patch.

The LFO is supplied with control sliders for rate and delay. Sine, sawtooth, square and sample and hold waveforms are available. Rate can be set to a free-running speed or be synchronised to the MIDI Clock supplied by the host application. When in MIDI sync the rate slider controls the timebase (ie. whole, half, and quarter notes), and the results are effortlessly inspiring. The LFO can also be set to return to the start of its waveform cycle on receipt of MIDI note events.

In the centre of the control panel is a drop-down menu labelled 'Ctrl'. Behind here are a series of nested menu options (see below) that open up a host of MIDI modulation features accessible to velocity, mod wheel and aftertouch. Modulation amounts are shown in percentages, which can be specified as any amount to two decimal places, although +/-25 percent stepped values are instantly accessible from the menus without having to do any typing.



The nested MIDI modulation menus found under the Ctrl button.

Mercury 1's keyboard, pitch and mod wheel may be accessed via your mouse, which is handy for checking settings away from your physical keyboard. Maximum pitch-bend amount is set in the LED above the virtual pitch wheel here. There is no option to hide the keyboard away, which would be useful when screen space starts to get cramped.

Looking at the top of *Mercury 1*'s Edit window, you notice a set of four 'voice tabs', one for each of the four assignable synths. By clicking on one of the tabs you

System Requirements

MAC OS:
- Power Mac G3/G4.
- 64Mb of RAM (128Mb from Mac OS 9).
- Mac OS 8.6 or higher.
- VST Instrument-compatible sequencer such as *Logic Audio* or *Cubase VST*.

WINDOWS:
- Pentium II or better.
- 64Mb of RAM.
- Windows 95, 98, 2000 or NT 4.0.
- VST Instrument-compatible sequencer such as *Logic Audio* or *Cubase VST*.

REVIEW MACHINE:
- Power Mac G3 300MHz with 256Mb of RAM.
- Mac OS 9.0.4.
- Korg 1212 soundcard.
- Steinberg *Cubase VST* v4.1 rev2.
- Emagic *Logic Audio* v4.61.

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get to see the current control panel settings for that particular Voice. Each Voice may be muted (this frees up processing power) or soloed for closer checking during edit sessions and a MIDI indicator lights to show activity on each Voice. MIDI channel is selectable, or can be set to 'A' for 'All'. Each Voice has a definable transpose, key and velocity range, which makes for a very flexible set of options for key and velocity switching. Pan position is set here, as is the pair of outputs for each Voice to use. *Mercury 1* offers four pairs of stereo outputs, which will appear in your host program's mixer, just like any other audio channel.

Presets

Named presets are selected in the tab area. The currently chosen preset name for the other three Voices can be seen at the top of the window, even when they are not the actively chosen Voice — this is a very well-thought out aid to editing. You can scroll through presets using a pair of up/down arrows to the left of the current preset name. It would be a useful feature to be able to click and hold the preset name to see a list of presets, because clicking through the names one by one becomes a bit of a chore — and quite why the preset names are duplicated both on the tab *and* on the line below the tab, I don't know. Nor do I understand why you can no longer move to a new preset by using the up/down arrows once a preset is edited, because the arrows disappear! Help is at hand, because presets can also be chosen within the Program Browser (see right). The Browser is accessed from a (strangely placed) button in the centre of the main control panel. In here you can page through preset names, load, save, copy, paste and rename presets to your heart's content. I feel it would have been better to open this browser from a double-click of the preset name, or at least place the button in the same vicinity.

Mercury 1 transmits MIDI data from its control panel and these changes may be recorded into your sequencer for playback, whereupon your ministrations will be faithfully replayed. The manual provides a list of MIDI controller number assignments which will help anyone wanting to use a hardware controller to edit *Mercury 1* on the fly.

I did find *Mercury 1* to be fairly processor-hungry. I ran a simple four-part sequence within *Cubase VST* and assigned the four parts to each of *Mercury 1*'s voices. This used up around half of my Mac's processing power. I found that my computer 'choked' every so often, even when soloing a single *Mercury 1* patch, and I then had to stop and restart the sequencer to get things moving again.

I can't finish this review without mentioning the manual, which is OK for anyone familiar with analogue synthesis, but doesn't seem to offer much help for newcomers. Many of the explanatory notes for individual controls are no more than a single sentence; I would really have expected a little more in the way of examples and guidance. I'd suggest that one of the main reasons for buying a plug-in synth such as this is because, for one reason or another, you do not have access to a hardware equivalent. Surely, you are therefore less likely to be familiar with the architecture and terminology of analogue synthesizers?

Problems With Emagic *Logic Audio*

The following known problems occur when using *Mercury 1* within Emagic's *Logic Audio* sequencer:

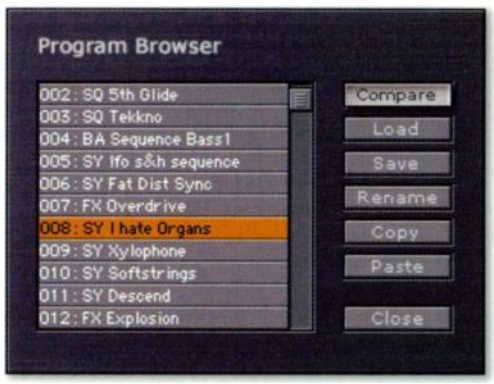
- **Only one MIDI channel can be used per instance of the *Mercury 1* plug-in.**
- ***Logic Audio* does not currently support MIDI sync, so LFO sync will not work.**
- **If more than one *Mercury 1* synth is assigned the same MIDI channel, they must share the same audio output.**
- **Edited presets are not automatically saved with a song.**

Conclusion

Mercury 1 certainly sounds good — very classy, in fact. There's plenty of warmth there and I found some superb results in the bass registers. I usually find it a good test to attempt to emulate the sound of my Moog Taurus bass pedals — and in this instance I got pretty close! The envelopes seem very responsive and at minimum values produce sharp, clear transients, and the filter is exemplary. I'd say that the overall sound lies somewhere between a Sequential Pro One and a Korg Mono/Poly — and that's not bad company to keep. Furthermore, there is a wealth of MIDI modulation options hiding under the control menu, and the voice velocity/key splitting will be of great use to many.

"...the overall sound lies somewhere between a Sequential Pro One and a Korg Mono/Poly — and that's not bad company to keep.."

But the amount of processor load does seem disproportionate to the sophistication of the control surface. This may be indicative of the calculations required to produce such an undoubtedly rich sound — that's certainly TC Works' justification — but we are only dealing with a monophonic synth emulation here. I tried loading up four instances of Native Instruments' *Pro-Five* and found that I could seemingly run these polyphonically for the same processor load as *Mercury 1*'s four monosynths.



The Program Browser gives easy access to all preset sounds.

The placing of some of the controls is also odd, in my opinion. Why, for example, are the controls for Oscillator 2's Interval and Detune down alongside the mixer? Why does the Program menu live in the middle of the control panel? Why do I have to go to the Program Browser to move away from an edited version of a preset? These are minor niggles, admittedly, but I just don't get the same sense of immediacy and ease of use that I experienced with the likes of Steinberg's *Model E*, or Waldorf's *Wave 2.V* PPG emulation, for example.

If your primary concern is sound, then *Mercury 1* is a worthy contender, and I wouldn't hesitate to recommend it on that basis — but you need to make sure your computer is up to the task before you part with your cash. Try downloading the demo version from www.tcworks.de and see how it fares in your setup. SOS

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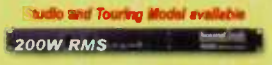

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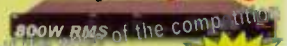

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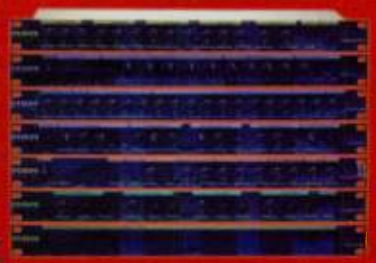

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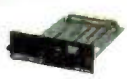

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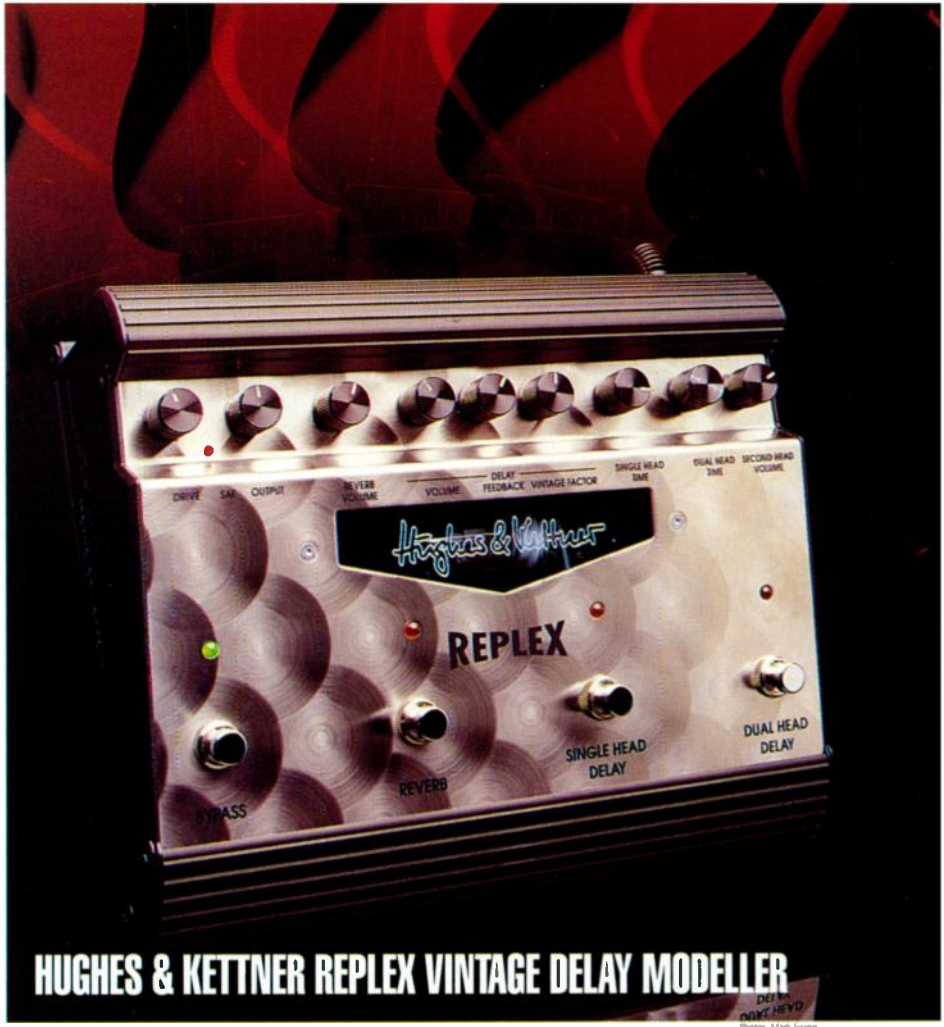

HUGHES & KETTNER REPLEX VINTAGE DELAY MODELLER

Photos: Mark Ewing

The Hughes & Kettner Replex is a delay unit that combines digital processing and valve analogue circuitry in order to emulate the sound of a vintage echo unit, without having to change tapes or clean heads. It offers a choice of three basic effect types: reverb, single-tap delay and dual-tap delay. Powered by an external mains adaptor, the Replex is a very solidly built pedal with a metal case, traditional-style recessed rotary controls and four momentary-action footswitches. The leftmost switch acts as a Bypass, while the other three switches engage the three different effect modes — only one process can be used at a time. Audio connections to the unit are simple, given that this is a mono unit, with Input and Output jacks, the former having a high impedance for use with electric guitar.

In addition to the main Output level control, there are knobs for Reverb Volume, Delay Volume and Second Head Volume, which allow the user to tweak the exact mix between dry, delayed and reverberant sounds reaching the output. Two controls set the delay times for the two heads: Single Head Time sets the delay time for the single-head tape-echo effect and Dual Head Time sets the time for the dual-head effect, though the relative spacing between the two 'virtual' tape heads is preset in this mode at a proportion of the overall delay time. The maximum delay time seems to be around three quarters of a second, which should suit most conventional applications. The number of repeats is set using the Delay Feedback knob. The Drive control can be used to add a little valve overdrive at the input, if you want to dirty things up a little.

A final control in the Delay section is called 'Vintage', and affects the signal that's fed back to create regenerating echoes. Turning it clockwise introduces subtle modulations, distortions and high-frequency filtering effects, to simulate the non-linearities of a tape-based system. On the whole, it does this rather well — although I think there's still a way to go before modelled delay boxes sound exactly like their tape-loop counterparts, the Replex gets pretty close, with individual repeats getting successively more distant and more grungy, making it easy to approximate those old '60s guitar sounds. As for the reverb, that sounds very much like the spring from a typical guitar combo, but without the 'sproing' when you knock it, of course...

In many ways, the Replex is no more complicated than the vintage boxes is seeks to emulate — given that so many vintage effects units had three or even four replay heads, I'm a little surprised that Hughes & Kettner didn't provide this option too. It's also disappointing that you can't use both reverb and delay at once. However, the overall sound quality is good and generally convincing, though the small knobs are rather too coarse for making precise settings — a tap tempo switch would have been useful for setting delay times because of this.

Ultimately, the Replex is a bit of a one-trick box, but it does that trick better than most — both the reverb and delay are creditably close to their vintage forebears. In addition, it's more reliable, more affordable, and built to last. SOS

H&K REPLEX £339

pros

- Convincing emulation of vintage tape-delay and reverb effects.
- Sturdily built.

cons

- You can't use delay and reverb simultaneously.
- A tap tempo button would have been very useful, given the comparatively coarse control provided by the small knobs.

summary

A well-built unit which can provide convincing vintage-style effects both live and in the studio.

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Review from Studio Sound, June Issue by Zenon Schoepe

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ZOOM PS02

Do you write your song ideas on the back of a fag packet? Well, now that Zoom have made a studio the same size as a pack of 20, you can give up smoking! **John Walden** gets addicted to the PS02 Palm Studio.

Photos: Mark Ewing

cross my palm with silver

ZOOM PS02 PALM STUDIO

The portable studio concept has come a long way in the 20 years since the introduction of the original Teac 144 cassette-based four-track Portastudio, a revolutionary product for the home and mobile recording/songwriting community. The concept has clearly been a successful one, in both analogue and digital domains, and the competitiveness of the market means that the basic models are now within the financial reach of almost anyone.

For some, size really does matter and even a Portastudio is, well... simply not portable enough. Enter Zoom's solution to this portability problem: the PS02 Palm Studio. Aimed squarely at the guitarist or songwriter who likes to be *really* mobile, Palm Studio is a perfectly accurate description — the PS02 is approximately three inches (yes, inches) square. Despite this, it has a feature set that owners of the original Teac 144 would have sold a close member of their family for. So just how much 'studio' can you cram into something the size of a fag packet?

Tardis Time

Reading the features list for the PS02 (see 'Features In Brief' box) leaves you wondering if the Zoom design team were also involved in the production of Dr Who's Tardis. Fitting drum and bass backing facilities, three digital audio tracks and a digital effects unit into a box this small is quite a design accomplishment. The rather smart silver plastic case feels reasonably robust, and its front panel is equipped with a small LCD screen, three sliders, a selection of buttons and a four-way circular cursor button. The main function of each control is clearly labelled, although in operation, as might be expected, some buttons actually do a number of different jobs. Despite their fairly small size, the controls have been laid out in a sensible fashion and only the most ham-fisted are likely to have any difficulty navigating the PS02 environment.

The single, mono quarter-inch input jack can accept a range of guitar, synth or microphone inputs (although there is, of course, no phantom power for the latter). A built-in microphone is also provided for those moments of inspiration when a standard mic is not available. A stereo mini-jack Aux In is also provided. Output is via a stereo quarter-inch jack, though a 3.5mm mini-jack output is included for headphone use. The unit can be powered using batteries — four AAA batteries providing about four hours of use — or from the supplied mains adaptor.

The PS02 provides a rhythm unit that comprises a stereo drum track, which can be built from 200 preset rhythm patterns, plus a mono bass track which is based on a user-defined chord

ZOOM PS02 £299

pros
- Brilliant songwriting tool.
- Extremely portable.
- Damn good fun!

cons
- No loop function for audio tracks.
- SmartMedia still a little expensive.
- So small you might lose it down the back of the sofa!

summary
A paradigm shift in terms of mobile recording for the songwriter. Small on size, big on features and a whole lot of fun besides.

SOUND ON SOUND

Spec Check

- 20-bit, 64x-oversampling A-D conversion.
- 20-bit, 8x-oversampling D-A conversion.
- 24-bit internal DSP processing.
- Sampling frequency: 31.25kHz.
- 100-song memory.
- 211 rhythm patterns.
- 120 effects patches (60 preset, 60 user).
- Built-in microphone: omnidirectional electret.
- Input: quarter-inch mono jack at -10dBm to -50dBm (adjustable).
- Output: stereo quarter-inch jack rated at -10dBm.
- Headphone output: stereo mini-jack.
- Aux In: stereo mini-jack.

sequence. The PCM drum and bass sounds use the same technology as the Zoom RhythmTrak drum machine. Three digital audio tracks can be added to this rhythm section (more if you use the digital bounce facility). The audio input can be fed through the PS02's digital effects processor, which offers algorithms for guitar, bass and acoustic sources. Finally, the finished mix can be output, and a little global reverb and EQ applied if required.

Data is stored to SmartMedia cards. These are now widely available, due to their use in some digital cameras, and prices, while still quite expensive at present, are coming down. The 8Mb card included with the PS02 provides a modest 3 minutes of total audio track time in 'Hi-fi' mode (at 31.25kHz sampling rate), while a 'Long' mode doubles this. However, 32Mb cards are around £60 at the moment, for example, so the facility is there to extend this recording time considerably if you wish. The SmartMedia card is integral to the operation of the PS02 as it is used to store the system, sound, song, and effects-patch files. A format routine is provided that will initialise a new card and copy the necessary files to it. The manual indicates that Zoom will provide updates for the PS02 (in the form of new sounds and drum patterns) via the web. You would, of course, need a SmartMedia reader (at current prices these are around £40) for your computer in order to transfer these updates to the PS02.

The Rhythm Method

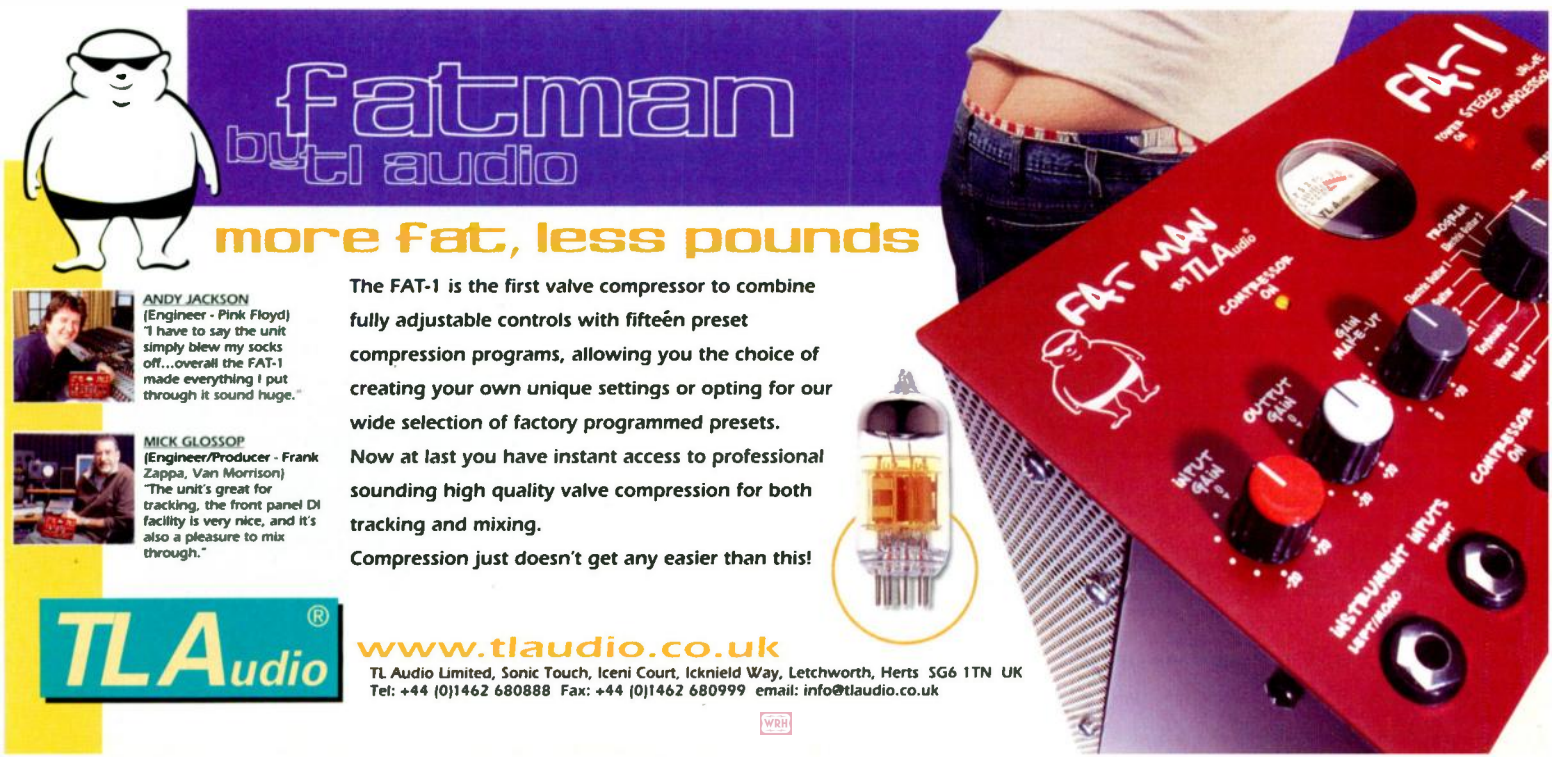
Creating a new song with the PS02 starts with the rhythm track. From the Song menu it is possible to scroll through the 100 song locations. The song number and name are displayed on the LCD as you move through the song list. By default, songs 1 to 50 hold demonstration patterns to show off the various drum and bass styles. Only song 1 has any audio associated with it and, even if you do not like the song itself, it is difficult not to be impressed by the sound quality.

With an empty song location selected, moving to the Rhythm menu allows a new song to be started. Pressing the Rec key puts the PS02 into Rhythm Record mode and automatically gives an empty song a two-bar rhythm track. Pressing Ins/Del then allows the slider controls to be used to specify how many additional bars you wish to insert into the song — as elsewhere in the song creation process, the LCD provides very clear visual feedback. Pressing Store adds the specified number of bars to the song.

The next step is to specify the drum pattern associated with each bar. The preset drum patterns are divided into sections, styles and variations. The section defines the basic rhythm: there are sections for quarter, eighth and 16th-note patterns provided, as well as sections of fills, intros, and endings. Within each section, various styles are available, and these cover a wide range of genres including pop, rock, country, R&B, latin, blues, techno, hip-hop, funk and jazz. For each of these styles there are then a number of variations.

The three sliders allow selection of the drum pattern section, style and variation for each bar. If no drum pattern is specified for a bar then the pattern from the previous bar is used. Usefully, if you press the Play button then the patterns can be auditioned during the selection process. Each drum pattern has an associated bass part. The timing of the bass notes is fixed for each pattern but, as described below, the pitch of the individual notes within the bass part varies depending upon the chord specified for each bar.

While in Rhythm Record mode, you can toggle between drum pattern editing and chord editing by pressing the up and down arrows on the cursor wheel. In chord editing, slider 1 specifies the root ▶



note of the chord and slider 2 specifies the chord type, with plenty of choice being provided — see the 'Pick A Chord' box. Chord changes can be specified with quarter-bar resolution and, as with drum patterns, the current chord is played until a change is specified.

From the Rhythm menu, a number of other settings can be changed. Tempo can be adjusted and a selection of drum and bass sounds are provided to suit different musical styles. The six kits offered are Standard, Rock, Jazz, Analog, Power and Funk, whereas the five bass sounds are Finger, Pick, Slap, Acoustic and Synth. The quality of the sounds is remarkable given the size of the unit and I particularly liked the Jazz and Funk kits.

Overall, creation of rhythm tracks is very simple and the manual does a reasonable job of explaining the steps involved. It does not take very long for the whole process to become second nature and basic sequences can be created in just a few minutes. Very usefully, when a song is playing, pressing View switches on a chord display on the LCD so it is easy to follow the chord sequence if playing along to a PS02 backing track.

Strumming Along

So far, so good, but the key facility of the PS02 is obviously it's audio capability. Once you've connected a signal to one of the PS02's inputs, the next step in setting up for audio recording is to tweak the sound itself. From the Effect menu, the 'Effect Patch' cursor keys can be used to step through the 60 preset and 60 user effect patches.

The Zoom PSo2's incredibly small size is possible in part because it records to diminutive SmartMedia memory cards.

Many of these are designed for electric guitar, but there is also a good selection suitable for acoustic or bass guitars, vocals, keyboards and for final mixdown. The LCD displays the patch's name and number. A small microphone icon lights up for those patches designed for vocal recording and, for these patches, pressing the Mic button disables the main jack input and uses the built-in microphone instead — the quality of this is good enough for capturing basic acoustic instrument or vocal performances.

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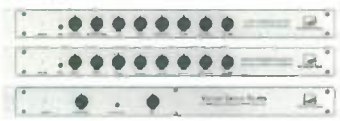

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The DSP chain consists of a number of effects modules (Drive, Cabinet, Noise Reduction, EQ, Modulation, Reverb and Total) each of which can be switched in as required. The guitar preamp and cabinet modelling is based on the same VAMS system developed for the GFX8, reviewed in *SOS* September 2000, and a range of sounds from clean country through to thrash metal are available. The quality and editing flexibility of the effects is not as great as would be found on a dedicated multi-effects unit, but all are very useable, including the reverbs — the 'Effects Highlights' box gives a taste of what the presets offer.

With an appropriate effects patch chosen and the Audio menu selected, pressing the Rec key allows one of the three audio tracks to be selected for recording. Pressing the Play button, which by this stage is flashing, activates the recording. A pre-roll can be defined, as can punch-in and punch-out points, and there is also a function to display the remaining audio capacity of the SmartMedia card at this stage. Each track can have up to 10 alternate takes recorded, storage capacity permitted, and the best of these takes can then be selected for playback when mixing.

If three audio tracks is not enough, then a bounce facility is available and all three tracks can be bounced either to stereo or mono. With a stereo bounce, the original pan positions of the audio tracks are retained, and you can even bounce to a new take on the destination tracks, retaining your original tracks for re-bouncing if needed. The one limitation is that only whole tracks can be bounced, not just a range of bars.

Stereo recording is not possible and, while this is perhaps not surprising, it is a shame because some of the digital effects are available in stereo. One feature of the audio side of the PS02 is, however, more frustrating. The rhythm track has a 'repeat' function that can be switched on for a particular song, for looping a 12-bar blues sequence for example. Unfortunately, any audio parts recorded for a song do not get repeated; they play the first time through the song, but then the rhythm parts just repeat on their own. Given that much of the operating software for the PS02 is held on the SmartMedia card, this may be something that Zoom could address in future updates.

Effects Highlights

Within the six main effect modules that make up the processing chain (Drive, Cabinet, Noise Reduction, EQ, Modulation and Reverb), a total of 50 effects types are available. For example, these include 24 Drive, 14 Modulation and 9 Reverb types respectively. There is more than enough editing control available given the likely uses to which the PS02 will be put. Some of the more notable preset patches are:

- 7 BLACK: American stack emulation with lots of gain (party on, dude!).
- 18 B-FINGER: Nice clean patch for finger-style bass.
- 20 VO-ECH: An OTT reverb and delay to disguise any dodgy vocals!
- 25 AG-CHO: Chorus for a clean acoustic, which also works well with electric.
- 41 SNAKE: Overdriven guitar sound, but with plenty of bottom end.
- 49 FUNKCT: Clean and funky with a touch of auto-wah.
- 50 FD-CLN: Clean channel on a Fender Twin. Very nice for picked chords.
- 53 ELEACO: Acoustic guitar simulation from an electric. Surprisingly useable.
- 54 PITSFT: Pitch-shifted harmonies. Basic but, again, effective.
- 58 SL-ATK: Slow attack volume swell.
- 60 ZAKWAH: Rock solo with auto wah — hmmm... nice...

Mixing is a fairly basic affair. Once the recording process in complete, one of the special mixdown effect patches can be selected, though this mutes all the PS02's inputs. The mixdown effect patch uses a dedicated configuration in the Drive module, allowing some tone shaping of the upper and lower frequencies, and adds global reverb. Mixing while playback is in progress is then just a case of flipping between the Song menu (where the sliders control the drum and bass levels) and the Audio menu (where the sliders control the three audio track levels). The whole mix can be output to an external monitor system or recording device to produce a stereo mix.

Conclusions

Despite the one or two minor criticisms mentioned above, the PS02 has a huge list of positive features. For the musician/songwriter on the move, Zoom have just redefined what 'portable' means in terms of a recording sketchpad. Considering both its size and price, the feature-set of the PS02 is hugely impressive and the quality of what can be achieved is, quite simply, remarkable. The PS02 is innovative, easy to use and a whole lot of fun; it will be very interesting to see if or how other manufacturers respond. With the PS02 as a mobile songwriting tool, it is definitely time to throw out the dictaphone and abandon the back of the fag packet. Brilliant... I want one! SOS

Pick A Chord...

The PS02 provides the following excellent selection of chord types for song construction:

- NON: No transformation
- MM7: Minor Major 7th
- MA9: Major 9th
- MI9: Minor 9th
- MA6: Major 6th
- MI6: Minor 6th
- M75: Minor 7th (flat 5th)
- SU4: Suspended 4th
- 7S4: 7th suspended 4th
- DIM: Diminished
- AUG: Augmented
- MA7: Major 7th
- MI7: Minor 7th
- 7TH: Dominant 7th
- MIN: Minor triad
- No display: Major triad

The mono, quarter-inch jack input can accept a range of guitar, synth or mic inputs. Output is via a stereo quarter-inch jack, though a 3.5mm mini-jack output is included for headphone use. A stereo mini-jack Aux In is also provided.

The PS02 runs for approximately four hours on four AAA batteries, though it may also be powered from the supplied 9V DC external power supply.

information

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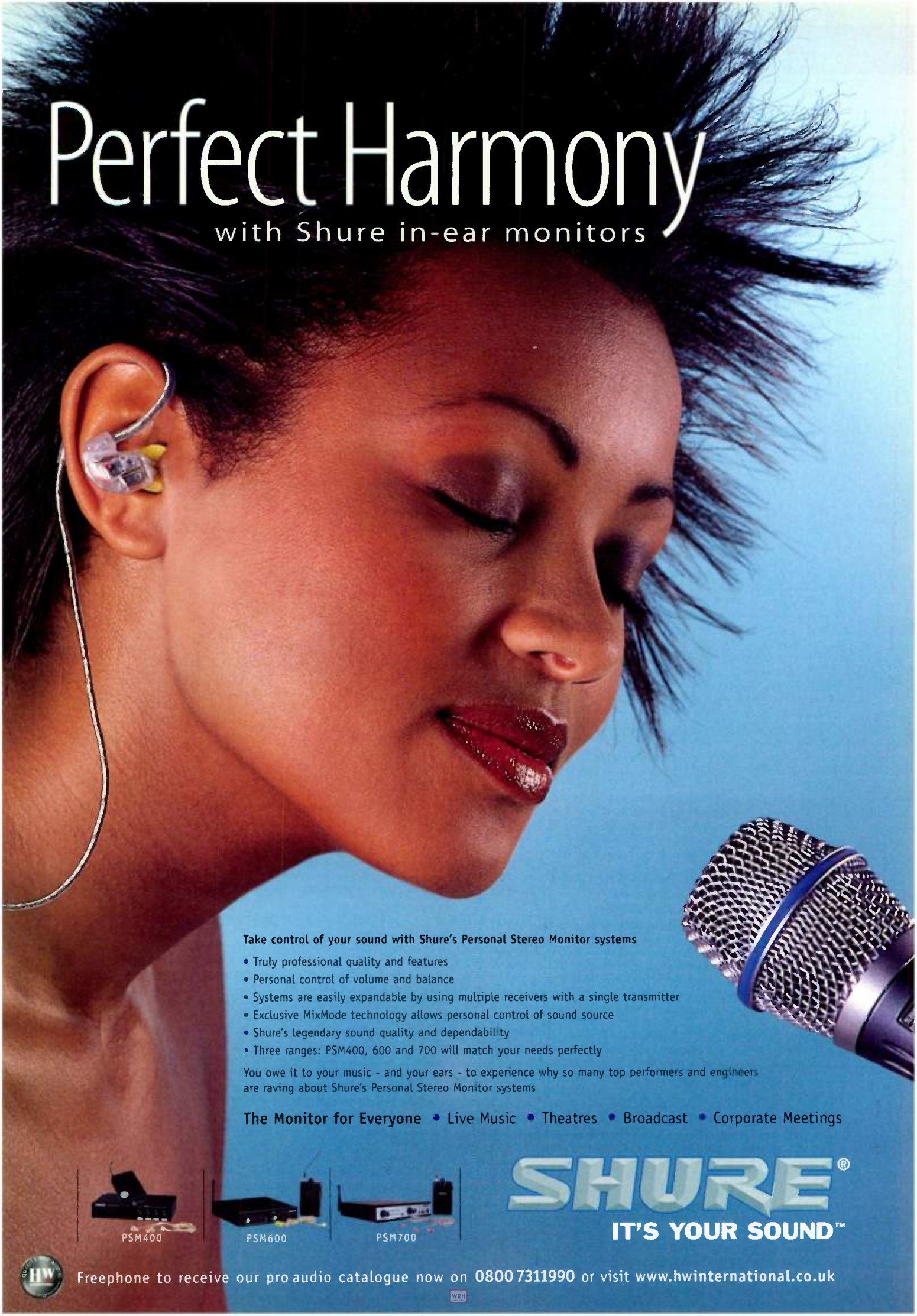
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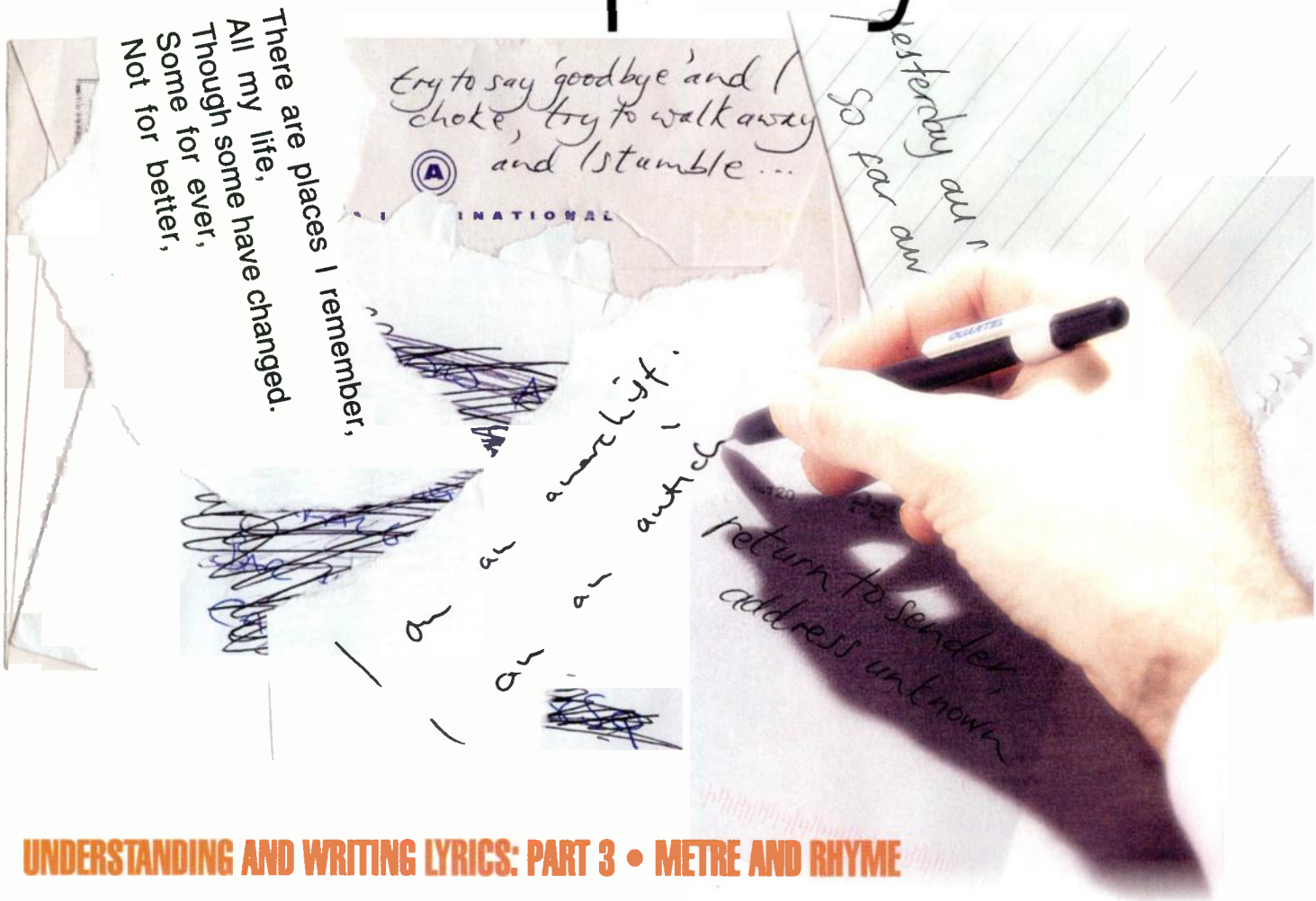


UNDERSTANDING AND WRITING LYRICS: PART 3 • METRE AND RHYME

In this month's installment, **Sam Inglis** looks at how you can use the sounds and rhythms of words to make your song lyrics more memorable.

A good pop record is made by its hooks, and there are several different kinds of hook. First of all, there's the melody itself, especially in the chorus. Secondly, there are prominent features of the arrangement — neat bass lines, guitar riffs, keyboard licks, and so on. Thirdly, there are what we might call 'production hooks': interesting and distinctive effects that help to make a record stand out, not because of any musical content, but simply because of the way it sounds. In the first part of this series, I pointed out that the lyrics to pop songs can and should be hooks in their own right. However, this month I'll be considering in detail what makes a line or phrase into a lyrical hook. I'm going to focus on the basic structural building blocks of verse: words, their arrangement into sentences, and the arrangement of sentences into sections such as verses and choruses. What makes one string of words a good, catchy, memorable, moving pop lyric, and another string of words clumsy, contrived, or banal?

There are two basic issues to consider when it comes to arranging words to form verse: how the resulting phrases sound when spoken or sung, and what they mean. As we saw last month, the fact that they mean anything at all implies that they are being delivered by a narrator, whether that person is the singer or songwriter, or another real or fictional person, or even an animal or an inanimate object. We also explored the differences you can make to the meaning of songs through your choice of narrator and mode of narration. In future, I'll be returning to the issue of meaning on a smaller scale, to look at how you can choose the most effective words to say what you want to say. For

the time being, however, I'm going to ignore questions of meaning to concentrate on the sound of words — the sequence of noises that can be created by putting words together in the right order, and their importance in creating hooks and setting the mood of a song.

Metre

One of the most basic things that separates most poetry and song lyrics from prose is that they have a rhythmical structure. English words are made up of individual sonic units called syllables. When those words are spoken or sung, the syllables fall naturally into patterns where some are accented or stressed and some are not. The word 'punnet', for example, contains two syllables, of which the first is accented in normal speech and the second is not.

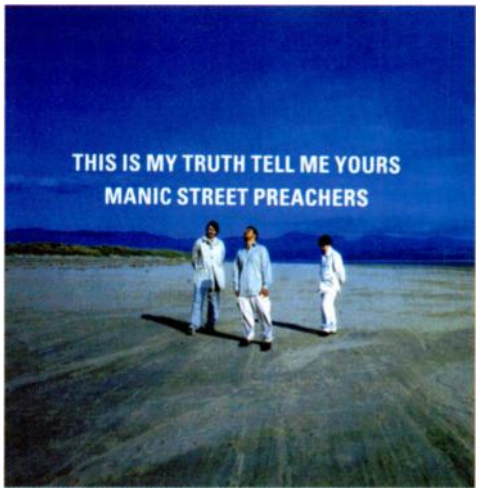
The changing metric structure between the verses and choruses of The Beatles' 'Lucy In The Sky With Diamonds' is one of the song's many hooks.

Metre is the arrangement of syllables into a rhythmic pattern of stressed and unstressed syllables. Usually, some or all of the lines in a song will share a similar pattern, which will itself be made up through the repetition of more basic patterns known as 'feet'. These are the smallest 'building blocks' or units of rhythm within a line. The line 'Desmond has a barrow in the marketplace' from The Beatles's 'Ob-La-Di, Ob-La-Da', for instance, employs a kind of foot consisting of a single stressed syllable ('Des-', 'has', bar-') followed by a single unstressed one ('-mond', 'a', '-row'). The verses of their 'Lucy In The Sky With Diamonds', by contrast, have a foot consisting of one stressed followed by two unstressed syllables: '*Pic*ture your*self* on a *boat* on a *riv*er...'

Feet are arranged into the lines of a song or verse, usually in a repeating structure. The above-mentioned line from 'Ob-La-Di, Ob-La-Da', for example, contains five two-syllable feet plus an additional stressed syllable (the word 'place'); more complex lines might contain two or more different types of foot. The arrangement of feet into lines is partly responsible for the feel of a song. Continuous unvarying repetition of a simple foot, as in 'Ob-La-Di, Ob-La-Da' and 'Lucy In The Sky With Diamonds', is straightforward and direct, and can help to give a kind of singalong feel, but it can also sound facile and childish if overdone. More complex verbal rhythms can add interest and be diverting, but it can also be harder to find meaningful words that actually fit the structure without appearing contrived.

Rhythm Versus Stress

In verse designed to be sung or spoken, including pop lyrics, the 'natural' pattern of stresses within sentences is often over-ridden to some extent by ▶



The Manic Street Preachers often have lyrics with natural stress patterns which bear no relation to the rhythms of their music.

a pattern imposed by the rhythm of the song or speech. There is, in this case, a sort of overarching metre, and some of the lines will fit this more straightforwardly than others. The pattern may, for instance, be set up by the first line, which sets a template that other lines are moulded to fit around.

It is often the case that as long as the stressed syllables of a line can be made to fall into the right pattern, different numbers of unstressed syllables between them can be made to sound equally good. Consider, for instance, Elvis Presley's 'Jailhouse Rock': sometimes three unstressed syllables are squeezed inbetween stresses, as in 'The *pri*son band was *there* and they be*gan*', and sometimes only one, as in '...*knocked* out *jail* birds *sing*'. The only strict pattern is that the stressed syllables fall on the beat: both lines fit the metre of the song, and the variety helps to make the vocal rhythm a bit more interesting.

Conversely, many sentences are sufficiently flexible that they can be spoken or sung with two or more different patterns of stressed syllables, to fit different metres, and will still sound reasonably natural. Consider, for instance, the first four words of 'Do Right Woman', 'Take me to heart'. In that song, the word 'heart' is stretched out to form two syllables, the first of which is stressed along with the word 'take': '*Take* me to *hea*-rt'. This fits well with the tune and its six/eight time signature, but one could fit the same line equally well to several different patterns of stresses. With the right tune it could, for instance, be sung as '*Take* me *to* heart,' or 'Take *me* to *heart*'. (Note that the changed stresses in the last version suggest a slightly different meaning, as in 'take *me* to heart, not her!')

The craft of writing lyrics involves matching the natural patterns of stresses within sentences to the patterns imposed by the rhythm of a tune. Interesting and sometimes effective results *can* be obtained by writing words with a natural pattern of stresses that bears no relation to the rhythm of the music — listen to almost anything by the Manic Street Preachers, for example — but more often than not a poor fit will just sound clumsy.

At the other extreme, however, it's important not to construct clumsy or unnatural sentences simply in order to create a sequence of words with the appropriate number of syllables or the correct stress pattern to suit a tune. A personal bugbear is lines that are padded out to the required length by having the word 'it' spuriously inserted to add an extra unstressed syllable, as in 'The clock it was ticking'. Similar pitfalls include reversing the order of parts of a sentence to fit a metre, even though no-one would actually ever use the words in that order, as in 'To the bottle I've been turning', and adding entire clauses to a sentence in order to pad it out, even though they are completely unnecessary. The Rolling Stones' 'As Tears Go By', for instance, includes the line 'It is the evening of the day' — but what else would it be the evening of? The most notorious example of spurious lyrical padding has to be Paul McCartney's 'Live And Let Die', with its oft-quoted line 'In this ever-changing world in which we live in' (though McCartney apologists argue that he meant to sing the marginally better '...in which we're living').

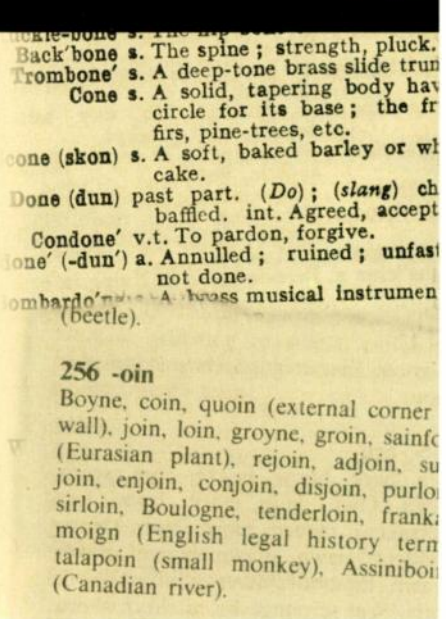
Stanzas

Lines themselves are arranged into groups known in poetry as stanzas. In pop lyrics, stanzas are usually individual sections such as verses, choruses, middle eights, and bridges. The range of structures used in pop songs is generally narrower than that available to poets. Indeed, much modern poetry is written as so-called 'free verse' which, although it usually has rhythmic elements, does not have a consistent repeating structure at all. Pop songs, however, tend to have relatively simple melodies in which two or three metric structures

"If a rhyme isn't natural enough to come to mind without the help of a dictionary, it's probably going to sound a little artificial in the context of a song."

Rhyming Dictionaries

Opinions differ about the value of rhyming dictionaries in lyric writing. Some see them as an indispensable aid for producing new and original rhymes, while others feel that they foster laziness and contrivance. Personally, I tend towards the latter view: if a rhyme isn't natural enough to come to mind without the help of a dictionary, it's probably going to sound a little artificial in the context of a song. It would certainly be a mistake to try to use rhyming dictionaries to generate all your rhymes as a matter of course, if only because they tend to be quite cumbersome and slow to use, and invariably come up with lots of words you can't imagine using in any song. Where many people feel that rhyming dictionaries come into their own is when you have a great line, but are completely stuck for anything to rhyme it with. The idea of looking up all the possible rhymes in a book certainly appeals, and it can't do any harm to find out the options that are available; but it's by no means an infallible solution. If you can't think of a suitable perfect rhyme yourself, the chances are that's because there just isn't one. And you may be better off either considering different end words to rhyme with, or settling for a half-rhyme, than making do with whatever your dictionary comes up with. There are actually two types of rhyming dictionary. The oldest, such as Walker's Rhyming Dictionary, simply list words in reverse alphabetical order. These often do rhyme, as in 'node' and 'mode', but of course having a similarly spelt ending is no guarantee — consider 'cough' and 'bough'. Nor do all rhyming words necessarily have similarly spelt endings, so such rhymes as 'cake' and 'ache' won't show up. Modern rhyming dictionaries usually consist of two parts: an alphabetical list of words, and a list of words grouped according to their rhyming properties. Looking up a word in the alphabetical list directs you to groups of similar-sounding words. This type of rhyming dictionary is a lot more comprehensive than Walker's, but can be more confusing to use, and still doesn't include multi-word rhymes ('gannet' with 'plan it', for example).


Back'bone s. The spine; strength, pluck.
Trombone' s. A deep-tone brass slide trun
Cone s. A solid, tapering body hav circle for its base; the fr firs, pine-trees, etc.
one (skon) s. A soft, baked barley or wh cake.
Done (dun) past part. (*Do*); (*slang*) ch baffled. int. Agreed, accept
Condone' v.t. To pardon, forgive.
one' (-dun') a. Annulled; ruined; unfast not done.
ombardo' A brass musical instrumen (beetle).

256 -oin
Boyne, coin, quoin (external corner wall), join, loin, groyne, groin, sainfo (Eurasian plant), rejoin, adjoin, su join, enjoin, conjoin, disjoin, purlo sirloin, Boulogne, tenderloin, frank moign (English legal history tern talapoin (small monkey), Assiniboi (Canadian river).

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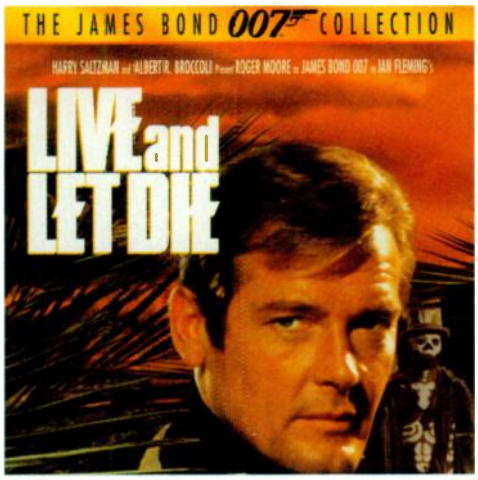

Paul McCartney's title song for the film *Live And Let Die* becomes nonsensical because of all the spurious words added merely for the sake of the metric structure.

are repeated. Often, some or all of the lines within a stanza will have similar metric structures — ie. the same number and pattern of feet. To return to 'Ob-La-Di, Ob-La-Da', for example, the third line, 'Desmond says to Molly, "Girl I like your face"', has the same number of syllables, with the same stresses, as the first. (Incidentally, I'm not using this song as an example because it has good lyrics, just because everyone knows it...)

Contrasts and similarities between the metric structure of the different stanzas can make a big difference to the feel of a song. For instance, if the verses, bridges and choruses of a song all have the same metre, or if there are only verses and no other stanzas (as in Tom Hall's 'Harper Valley PTA'), it will be harder to create any sense of development through the song. Perhaps for this reason, this sort of very basic structure often works best in songs with a strong message or story, where progression through the song is provided by the meaning of the words rather than by changes in their rhythmic pattern.

By contrast, a sudden or complete change in the pattern of syllables or structure of lines can delineate a particular section of a song very sharply. To take 'Lucy In The Sky With Diamonds' again, the relaxed stress pattern of the verse (one stressed syllable followed by two unstressed) gives way to a more forceful pattern (one stressed, one unstressed) in the chorus, corresponding with a switch from three/four to four/four time. And where the pattern in the verses is continuous and repetitive, creating a lulling, hypnotic feeling, the pattern in the chorus is more disjointed: the repetition established on 'Lucy In The Sk-y' is broken by the next few syllables, which have a completely different pattern of stresses. All of this makes the chorus stand out from the rest of the song, a difference which is reinforced by the musical arrangement. A lot of pop songs use this sort of contrast in metrical structures — where verses have longer lines with less pronounced or fewer stresses, and choruses have snappier or more forceful structures to make them sound 'big' and catchy.

Rhyme

Over the twentieth century, the use of rhyme in poetry became the exception rather than the rule. However, it's an unusual pop song, even now, that doesn't have a firm rhyming scheme. Rhyme could be defined as the deliberate placement of similar sounds within a verse to create a pleasing sonic effect.

Strictly speaking, a rhyme occurs when the last stressed vowels of two words or phrases, and any unstressed syllables that follow them, sound the same, but they are preceded in each case by different consonant sounds. Thus, 'cat' and 'mat' rhyme, as do 'matting' and 'batting'. However, 'batting' does not rhyme with itself (because the consonant before the common vowel is the same), and nor does 'matting' rhyme with 'baton' (because, although the last stressed vowel is the same, the following unstressed vowel is different). Where no unstressed syllables follow the stressed vowel, as in 'cat' and 'mat', a rhyme is called 'masculine'; 'matting' and 'batting', by contrast, are 'feminine' rhymes.

"The concept of rhyme encompasses a number of other effects besides so-called 'perfect' rhymes. These are often ignored by pop lyricists, but can be just as effective in creating 'hooky' lyrics."

These kinds of rhymes are called 'perfect', and are sometimes thought to be the be-all and end-all of rhyme. However, the concept of rhyme also encompasses a number of other effects besides so-called 'perfect' rhymes. These are often ignored by pop lyricists, but can be just as effective in creating 'hooky' lyrics.

One such effect is 'near' or 'half' rhyme. This is similar to perfect rhyme, except that it uses similar rather than identical vowel sounds, as in 'home' and 'room', or 'cover' and 'mover'. Half-rhyme is

Setting The Tone

In both poetry and song lyrics, the types of rhyme that are used usually depend on the tone of the verse. The greater the degree of obvious contrivance, the harder it is to sound as though you're being serious, and comic verse is often more effective if it wears its cleverness (or lack of it!) on its sleeve. Multisyllabic feminine rhymes, therefore, tend to be used for comic effect. 'Serious' and moving verses, on the other hand, generally work only if the rhymes are fairly transparent and natural-sounding. This is also true of internal rhyme: obvious and contrived alliteration or assonance fits better with comic moods, and while internal rhyme is also a vital component of more serious verse, it needs to be handled more subtly.

The same principle generally applies to rhyming schemes: complex, tortured patterns involving lots of rhymes in quick succession, or large numbers of lines that all rhyme with each other, tend to reinforce a comic feel, whereas a serious feel is best suited by a more natural, understated rhyme scheme. Compare, for instance, Ian Dury's comic 'Billericay Dickie', which employs feminine rhymes throughout, and in which each verse contains seven increasingly contrived rhymes for the same girl's name, with the sad and immensely moving song about his father, 'My Old Man', which precedes it on *New Boots And Panties*. Or, to take another example, consider The Beatles' 'Maxwell's Silver Hammer': taken at face value, this could be a rather disturbing story about a serial killer, but its complex rhyme scheme, tortured multisyllabic rhymes ('Edison' with 'medicine', and so forth) and jaunty tune give it more the air of a music-hall comedy or child's nursery rhyme.

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rarely used in pop songs, but it can have a powerful effect. Half-rhymes are disconcerting and stand out in pop music, because perfect rhymes are so prevalent that the listener unconsciously expects to hear them. The best example of half-rhyme I know of is the jarring first couplet of the Sex Pistols' 'Anarchy In The UK', 'I am an antichrist / I am an anarchist'. In this sneering punk rant, the use of a deliberate half-rhyme suggests contempt for the lyrical conventions of 'nice' pop music.

Another rhyme effect is assonance or 'vowel rhyme' — the use of similar vowel sounds but different end consonants, as in 'make' and 'fate'. This is often used in pop songs as a next-best solution where the songwriter has clearly got stuck at some point in a song that otherwise uses perfect rhymes throughout (for instance, the juxtaposition of 'last' and 'grass' in the first verse of The Beatles' 'Get Back'), but can also be used as a deliberate lyrical device in its own right. There are some contexts, particularly in very sad or personal songs, where perfect rhymes can seem overstated, trite or contrived, and subtle assonances work rather better.

Rhyming Schemes

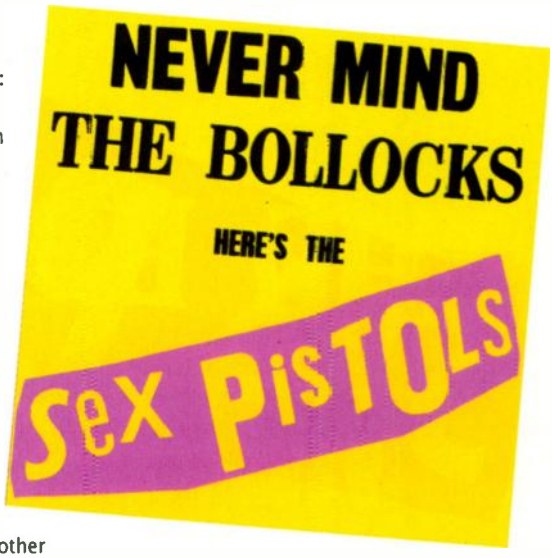
A rhyming scheme is the systematic organisation of rhymes within the stanzas of a poem or song. Rhymes usually, though not always, occur at the ends of lines, so we can say in general that two lines of a verse either rhyme with each other or they don't. Rhyme schemes are standardly described by assigning letters of the alphabet, starting with 'a', to individual pairs or groups of rhyming lines, and using the letters 'x' and 'y' to indicate lines that have no rhyming counterpart. So, for instance, the first verse of 'Ob-La-Di, Ob-La-Da' has a rhyme scheme of abab, indicating that the first line and the third line rhyme, as do the second and fourth.

Pop songs almost always follow one of a few fairly simple rhyme schemes, most often with the lines arranged into groups of four: probably the most popular are abab, aabb, and xaxa. However, there is no reason why this has to be the case, and more unusual arrangements of rhymes can be very memorable (see below). Paul McCartney's gift for employing unconventional rhyming schemes, often juxtaposing long and short lines in clever ways, is evident in songs like 'When I'm Sixty-Four' and 'Yesterday', and helps to make both the lyrics and the melody memorable.

Internal Rhyme

So far, I've considered only the obvious rhymes that link the ends of different lines in a verse. Where techniques such as assonance and half-rhyme come into their own, however, is in setting up sympathetic patterns of sound which don't refer to other patterns in other lines, but work *within* a line. Internal rhymes are usually much more subtle than conventional rhymes and are just as important, even though they are often neglected — at least at a conscious level.

A lot of the 'hookiness' of a lyrical phrase — the feeling that a particular line just sounds right — is down to the pattern of sounds within that phrase, and how they connect to each other. Two sentences can have the same natural pattern of stressed and unstressed syllables, and yet one can sound infinitely better: and this is usually a result of internal rhyme. For instance, in the title phrase of Ian Dury's classic 'Hit Me With Your Rhythm Stick', every stressed vowel sound is a short 'i', creating a strong pattern of assonances even within quite a short line. This goes a long way towards making the line memorable and pleasing to the ear. To see just how important this is, compare it with the sound of a similar line which replaces the 'i' sounds with an assortment of other vowels, such as 'hot me with your fathom stuck' (well, it's nearly as meaningful as the actual line!).



One of the best examples of half rhyme occurs at the very beginning of The Sex Pistol's 'Anarchy In The UK' — 'I am an antichrist / I am an anarchist'.

As well as perfect rhyme, half-rhyme and assonance, internal rhyme can involve a fourth element: alliteration. Alliteration is the counterpart of assonance with respect to consonants. It is the repetition of a stressed consonant sound, as in 'take a taxi to the town', and can be a subtle and very effective way to reinforce a melody. Again, Ian Dury often used this to good effect. Listen, for instance, to the pattern of 'n' sounds (alliteration) and 'a' sounds (assonance) in this line from his 'Clevor Trever': 'Just 'cos I ain't never 'ad no nothing worth 'aving never 'ave and never ever.'

A more subtle example comes from Joni Mitchell's 'Big Yellow Taxi', which contains the memorable alliterative line 'They paved paradise, put up a parking lot'. (Pop shields to maximum, Captain...) The melody to which this line is sung is used, more or less, for most of the other lines in the song — but this one stands out as the hook because of its strong internal rhyme. And, of course, there's Craig David's recent hit, the chorus of which goes 'I met this girl on Monday / Took her for a drink on Tuesday / We made love by Wednesday'.

Working With Rhyme & Metre: A Few Ideas

A point I've stressed in this series is that there's no advantage in setting out to write bland, generic lyrics. Sometimes, you have to rein in your *musical* imagination, because musical arrangements or compositions can put listeners off by being too different or 'difficult'; but you can only gain by making your lyrics stand out from the crowd. Last month, we saw how making the right choice of narrative voice and lyrical mode could help you to achieve this. Sometimes, as we saw, you can make

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your song stand out by narrating it from an unusual point of view, or constructing it as a dramatic address — but only sometimes. The more conventional and familiar voices and modes are familiar for a reason, which is that they are often the best or the only choice for dealing with a given subject. Whether or not your song is set up in an unusual mode and narrative voice, however, you can always ensure that it stands out by distinctive use of rhyme and metre.

Let's consider for a minute what would *not* be a memorable use of rhyme and metre. This 'lowest common denominator' would be a song or verse in which all the lines were the same length, and had the same number and arrangement of feet. On the rhyme front, it would be a song which used only perfect rhymes, which conformed to a very basic rhyme scheme such as xaxa, and in which no thought was paid to internal rhyme, alliteration or assonance.

If you want to create a lyric that is memorable for its metrical structure and use of rhyme, then, you could start by trying to get away from this template. Let's suppose that you've come up with a hook line for your chorus or for the beginning of your song. When you're writing the next or the previous line, why not deliberately try to write one that is half as long, or twice as long? If you can come up with a structure based around lines of different lengths, you'll almost inevitably end up doing things differently in other areas too. Since the lyrical metre will be much less repetitive than that of our 'lowest common denominator' song, it'll be easier to come up with a non-repetitive and therefore distinctive melody. Because the lines are of such different lengths, you may well find that the most natural rhyme scheme is one that juxtaposes a word at the end of a short line with one in the middle of a long line (for instance, 'You know something I *don't* / You do something I *won't* forget for a while'), rather than simply rhyming the last word in each line. And if you choose to incorporate one or more long lines, you'll have more scope for internal rhyme within them.

Choosing to use a less straightforward arrangement of stressed and unstressed syllables (feet) can also have similar benefits. Why not use different patterns in consecutive lines, or a varying foot within each line? Opting for a more complex, compound pattern of stresses may well suggest different note patterns for the melody of your song, as well as adding interest in its own right.

Alternatively, you could deliberately write to an unusual rhyme scheme. Try using a scheme where some lines rhyme within individual verses and some rhyme across verses, such as aaab/cccb. Try using a rhyme scheme that includes more or fewer than four lines, such as aabba (the rhyme scheme limericks have), abccab, or aab/ccb. You could even write so-called 'blank' verse, which is verse that has the same sort of structure as rhyming verse in which stressed syllables are correlated across lines, but simply doesn't rhyme (for instance, 'I ran through the *valley* / I climbed up the *hill* / I swam through the *river* / I walked in the *woods*'). Again, it's often the case that working with an unusual rhyming scheme or number of lines has positive effects on other aspects of the songwriting process, forcing you to come up with a distinctive melody and song structure. If you want to reinforce a difference between two sections of a song, say a verse and a chorus, why not try giving them strikingly different metres and rhyming schemes?

Joni Mitchell's 'Big Yellow Taxi', from *Ladies Of The Canyon*, features a good example of alliteration.

Think about the possibilities for incorporating internal rhymes into your lyrics, too. Identify the 'key' words in each line, and identify the consonants and vowels that will be stressed when the lines are sung. Are these repeated in other words in the same lines? If not, can you replace those words with others that do contain these letters? If so, can the alliteration or assonance be extended by changing other words? Let's take the line 'She went away on Tuesday' as an example. There's already an alliteration on the letter 'w' in 'went' and 'away', so we might think about a way to extend this to the end of the line. In this case, it's easy: we can simply replace 'Tuesday' with 'Wednesday', and the result sounds considerably better.

From Rhyme To Reason

Having explored the struture of verse and some of the theory which explains why some words sound good together and others don't, it's time to turn to the actual meaning of song lyrics. Supposing you've decided on the subject of your song, and what point you want to convey about that subject: what techniques are there for converting ideas into words and phrases that get your point across elegantly and effectively? In the fourth and fifth parts of this series, I'll be exploring some of the different ways in which you can choose the best words to say what you want to say. SOS

"Opting for a more complex, compound pattern of syllable stresses may well suggest different note patterns for the melody of your song, as well as adding interest in its own right."

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RED SUBMARINE LAPTOP PC FOR MUSIC

Although there is a lot of interest in the idea of portable, silent PC-based recording, only one company has taken up the challenge of supplying and supporting laptop systems that are guaranteed to work well for music recording. **Martin Walker** tries one out.

The Red Submarine music laptop running Steinberg's *Wavelab*.

In last month's PC Musician, I outlined the many pitfalls facing the PC laptop owner who wants to make music on the move. In compiling the article, I got feedback not only from readers, other musicians, and music tech support staff, but from various specialist music retailers. However, I could only find one company, Red Submarine, who actually sell laptop PCs optimised for music recording. Given the current level of interest in portable computer recording systems, and the problems many people have been having, I was keen to try out one of their machines for myself — and having now been using this laptop for the last few weeks I can say that it does, indeed, escape these problems. I have been able to record and play back dozens of audio and MIDI tracks using a very portable PC system without compromising on audio quality. In fact, this model seems currently to be the only laptop that is guaranteed to work well with MIDI + Audio software.

Specification

Red Submarine currently source their laptops from German company MaxData, and adjust their specification to suit music applications by selecting appropriate hard drives and setting up both the BIOS and operating system to suit the special needs of the musician. The review model came with 128Mb of SDRAM fitted, which is the most sensible minimum amount for musicians, and up to 256Mb can be fitted in total using two S.O.DIMM memory sockets, which ought to be enough for almost any application. The review model had an Intel Pentium III 700MHz processor and a 10Gb Toshiba hard drive; a 600MHz model is also available with 64Mb RAM and a smaller 6Gb hard drive, for those who need only MIDI and limited audio support. Both use the latest Intel Pentium III Speedstep devices, and have a motherboard fitted with an Intel chipset. This should provide the greatest compatibility with expansion products, especially since the PCI to USB Universal Host Controller chip is the Intel 82371AB/EB, which is generally regarded as the most widely compatible of all available chips for this function.

The BIOS is contained in 256K of Flash ROM, and can therefore be upgraded if required. As on most laptops, an audio chipset, in this case an ESS Allegro PCI Audio, is built in to the main board, and provides basic 16-bit audio recording and playback along with a Microsoft GS Wavetable Synth for MIDI playback. An MPU401 interface and gameport is also supported by the chip, but since a gameport socket isn't provided you can't access these.

RED SUBMARINE LAPTOP PC £2114

pros

- Enough processing power to run a complex studio setup.
- Guaranteed to work well with music hardware and software.
- Loads of I/O options including FireWire and Dual View monitor mode.
- Good crisp screen display and high-quality keyboard.
- Acoustic noise almost non-existent when cooling fan is inactive.

cons

- Not cheap!
- As with all laptops, the built-in sound chip isn't good enough for serious work.
- No gameport socket.
- Built-in cooling fan, although this is still fairly quiet.

summary

This Red Submarine laptop is an extremely powerful but portable PC, and should prove ideal for any musician who wants to make music on the move with no hassles.

SOUND ON SOUND

Graphics are provided by an ATI Rage Mobility M1/M3 PCI/AGP chipset with 8Mb of memory, along with a TFT (Thin Film Transistor) 14.1-inch XGA screen. This Active Matrix screen has a fast refresh and is bright and crisp, and I found I could see the display clearly over a very wide horizontal angle (handy when you're on the other side of the room), although as always, the vertical angle was less generous. Most people will leave the screen resolution and colour at the supplied settings of 1024 by 768 pixels and 16-bit, since these are the most suitable values for music software.

A valuable feature for many musicians will be the standard 15-pin D-type connector on the back panel to connect an external VGA monitor. This means that you can switch to a much larger screen when you wish: even better is the option to run both the laptop's own screen *and* an external monitor using Dual View mode, with your MIDI + Audio sequencer on the large screen and another application like a synth editor on the laptop LCD screen. You can switch between the various display modes using a combination of Function keys.

The keyboard itself has 87 full-sized keys, including the usual cluster of cursor and editing keys, although as on most laptop keyboards there's no space for a separate numeric keypad. Instead, the NumLock key activates a cluster of existing keys to provide similar facilities. An additional Fn key at the bottom left, in conjunction with other keys on the top row, provides a further 14 hot keys for extra functions such as contrast, brightness, and volume. A touch pad with two 'mouse' buttons beneath it replaces the standard mouse.

LEDs on the front panel show when the AC adaptor is being used, and the charge status of the batteries. One battery slot supports a 3000mAH Lithium Ion pack for about three hours of life, and full charging time is around two and a half hours. The battery pack can be replaced via a panel underneath the laptop, as can the hard drive, and the RAM can be expanded by removing yet another panel.

I/O Options

The left-hand side of the machine sports a TEAC CD224E 24-speed CD-ROM drive, while the right-hand side offers a standard 3.5-inch 1.44Mb floppy drive. Not all laptops fit both as standard, and some offer a single dual-purpose slot where you can swap a floppy with a CD-ROM drive. However, having both is extremely useful, both for installing software and moving data files to another PC. You can even play back audio CDs with the laptop powered down and the LCD screen closed, using a set of controls across the front edge of the laptop.

An RJ45 LAN (Local Area Network) connector provides a useful way to transfer data to and from another PC using the integrated 10/100 B/T Ethernet network card. You can buy a suitable card for your desktop PC and cable to connect the two for about £25. There's also an IrDA socket, which provides a virtual serial- or parallel-port infra-red connection to suitable peripherals such as printers; this offers an alternative method of transferring files to another PC by buying it a serial-port

Specifications Of Review Model

- Processor: Intel Pentium III 700MHz.
- Screen: 14.1 inch TFT XGA, up to 1024 by 768 pixel resolution at 32-bit colour depth.
- Graphics Card: ATI Rage Mobility 8Mb, with Dual View external monitor output, S-Video port for TV connection.
- System RAM: 128Mb S.O.DIMM, upgradeable to 256Mb.
- Internal hard drive: Toshiba 10Gb UDMA33.
- CD-ROM drive: 24-speed TEAC CD224E.
- Floppy drive: 1.4Mb 3.5-inch.
- Modem: 56K Lucent Win Modem.
- Network: Integrated 10/100 B/T Ethernet card.
- Keyboard: 89 full-sized keys, including two Windows keys and embedded numeric keypad.
- Mouse: built-in touch pad.
- Internal sound chip: ESS Allegro PCI Audio.
- Other ports available: 1 serial, 1 parallel, 2 PCMCIA, PS/2, Infrared, 2 USB, Firewire.
- Physical: 305mm wide by 250mm deep and 40mm high, 3.2kg weight.
- Three-year parts and labour warranty.

The right-hand side of the laptop features a built-in floppy drive, as well as the two PCMCIA slots, FireWire port, Ethernet port, headphone and mic sockets, and modem connector.

infra-red device for about £50. Transfers will be a lot slower than over a network connection, but you don't need a cable: you just place the two PCs close to each other.

A stereo headphone socket, suitable for 8Ω earphones or headphones, and tiny stereo speakers are also built in, along with a lo-fi mono mic socket. Completing the sockets on the right-hand side is an IEEE 1394 socket, which I used to try out an external FireWire hard drive (see the Firewire Storage box on page 110), and an RJ11 connector for the built-in Lucent 56K modem. Finally, at the rear of the right-hand side are two PCMCIA sockets, which let you hot-plug a variety of expansion devices. I tested the laptop with the Ego Sys WaMi Box, which is also reviewed in this issue (starting on page 200).

Ranged across the back panel are a 19 Volt DC input for the supplied AC adaptor, a PS/2 port into which you can either plug a standard-sized keyboard or a standard mouse, a nine-pin D-type COM1 connector for peripherals such as an external fax/modem or serial mouse, and two USB ports with a Replicator port beneath. If you travel a lot with a laptop, buying the optional Port Replicator will give you a full duplicate set of rear-panel sockets into which you plug your peripherals back at base, so that your laptop can be quickly reconnected to them all *en masse* when you get home. Completing the rear-panel sockets are a 25-way printer port (which is vital if you need to run *Cubase* with its dongle), the VGA monitor port mentioned earlier, and an S-Video port to connect a TV display.

This is a comprehensive selection of I/O options, and provides plenty of choice for a musician. Only a gameport socket is missing, which stops you plugging in an adaptor cable for a cheap MIDI interface. However, anyone spending this amount of money on a laptop is likely to be investing in a serious audio or MIDI interface of some type.

Software And OS

Windows 98SE was installed on the review laptop, and I suspect that this is the best choice for most musicians, since there are still far too many MIDI and audio peripherals without Windows 2000 drivers. Red Submarine had already set up the operating system for music use, so I scouted around to see what optimisations they had made.

I was pleased to see that the Active Desktop had been disabled, as had screensavers, system sounds, superfluous Windows animation for menus and lists, and the Task Scheduler, and that the only item in the StartUp folder was the WaMi Box Mixer. Power Management had been adjusted so that system standby mode was never entered, and the hard drive was never turned off, but sensibly the monitor was set to turn off after one hour's inactivity. Unfortunately, auto insert notification was still enabled for the CD-ROM drive, and both this and the main hard drive had DMA disabled.

Vcache had as yet no fixed settings, but installing *Cubase* set these up for me, and Windows had been left to manage its own virtual memory settings. Read Ahead optimisation was left at full, and write-behind caching was enabled — both sensible settings for most modern music software.

Intel's SpeedStep technology is a feature that normally switches the processor speed and

"Anyone spending this amount of money on a laptop is likely to be investing in a serious audio or MIDI interface of some type."

FireWire Storage

Along with the laptop, Red Submarine also supplied me with an external 20Gb Freecom FireWire drive to try out. A FireWire drive is a perfect solution to the problem of running out of audio storage space, and they can be used with any PC or Mac computer that has a suitable FireWire connection. Drivers were supplied on CD-ROM for those running Macs on Mac OS 8.6 or higher, but no extra drivers are required for Windows 98SE or ME users.

The Freecom drive can be operated either horizontally on the desktop, or vertically using the supplied stabilising foot. At 8 inches deep, 4.5 inches high, and just 1.25 inches wide, it looks rather like a silver VHS video cassette. Power comes from a supplied 12 Volt mains adapter, and the only features on the back panel are a socket for this along with a FireWire and iLINK (Sony's brand name for their FireWire equivalent) port. There is a tiny green power indicator LED at the rear of the right-hand side of the case, and a red 'busy' LED indicator on the front panel.

I plugged the new drive into the laptop and then powered up, and Windows 98SE detected it correctly and automatically assigned it a drive letter. It showed up inside Device Manager as a Samsung model. As with any new hard drive, you need to format it before you can store any data. Using the drive proved as easy as using the internal one, and you do have the advantage of being able to plug and unplug them while your computer is running, as long as they aren't being accessed at the time.

Strangely, the sustained transfer rate for both writes and reads varied quite a bit every time I ran *DskBench*, but the result for multitrack audio running with 64K disk buffers was rock-solid at 3.69Mb/second, giving a theoretical 43 tracks of 16-bit/44.1kHz audio — almost identical to the performance of the internal drive. This should be more than enough for any laptop owner, and at £199 the Freecom drive seems excellent value.

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The back panel sports a PS/2 mouse/keyboard port, a serial port, two USB ports, a parallel printer port, outlets for a VGA monitor and S-Video TV display, and a Replicator port allowing you to duplicate the functions of these ports on an external Port Replicator.

voltage to a slower power-saving mode when you switch from the AC adaptor to battery power — in this case, dropping the 700MHz processor speed to 550MHz, and the power supply from 1.6 Volts to 1.35 Volts. Red Submarine had sensibly abandoned this Automatic setting in favour of Maximum Performance, so that although battery life will be shorter you won't lose any audio performance when unplugged from the mains. However, if you regularly use your laptop for mobile non-audio activities then it would be sensible to change this back.

Meanwhile, a few changes had also been made in the BIOS (accessed by pressing the F2 key during boot-up). Normally, a tiny switch near the screen hinge ensures that the LCD display is disabled when you shut the lid to save some power, but the Suspend option had been deactivated in the BIOS, to avoid any degradation of audio performance during normal use.

In Use

As I expected, the laptop was whisper-quiet in normal use, and even when it was accessing the hard drive, acoustic noise was no more than a murmur in comparison with most full-sized 3.5 inch hard drives. After some minutes of almost silent operation, a tiny one-inch cooling fan with a fairly quiet but high-pitched whine switched in. This only operates as long as cooling is required, switching itself off again afterwards, and even with it running the laptop was blissfully quiet compared to most full-sized PCs.

The CD-ROM drive was also extremely quiet when playing back audio CDs, although the first time I inserted a CD-ROM I thought I was being buzzed by a hovercraft! However, this just proves how quiet the laptop was, since the 24-speed TEAC drive was actually no noisier than any other CD-ROM. Of course, musicians won't be accessing this during recording or playback, so it shouldn't prove annoying in practice.

The keyboard felt very responsive, although I found it harder to get used to the touch pad, and eventually resorted to plugging a standard mouse into the PS/2 socket was on the rear panel.

The 10Gb Toshiba hard drive was suitably formatted as FAT32 with 32K clusters primarily for audio use, although it might be better to create a second partition exclusively for this purpose, or use an external audio drive (see the Firewire Storage box), and then format the system partition with 4K clusters to waste less space with smaller system files. When I first ran the *DskBench* utility the hard drive performance was disappointing, because the DMA button hadn't been ticked in the hard drive Properties. Once I'd enabled Buss Master DMA and rebooted, however, performance improved dramatically, with sustained transfer rates of 15.1Mb/second read and 16.0Mb/second write, both with under 3 percent CPU overhead. With a fairly standard 64K buffer size, *DskBench* predicted that 43 audio tracks were possible, so I was intrigued to see what happened in practice.

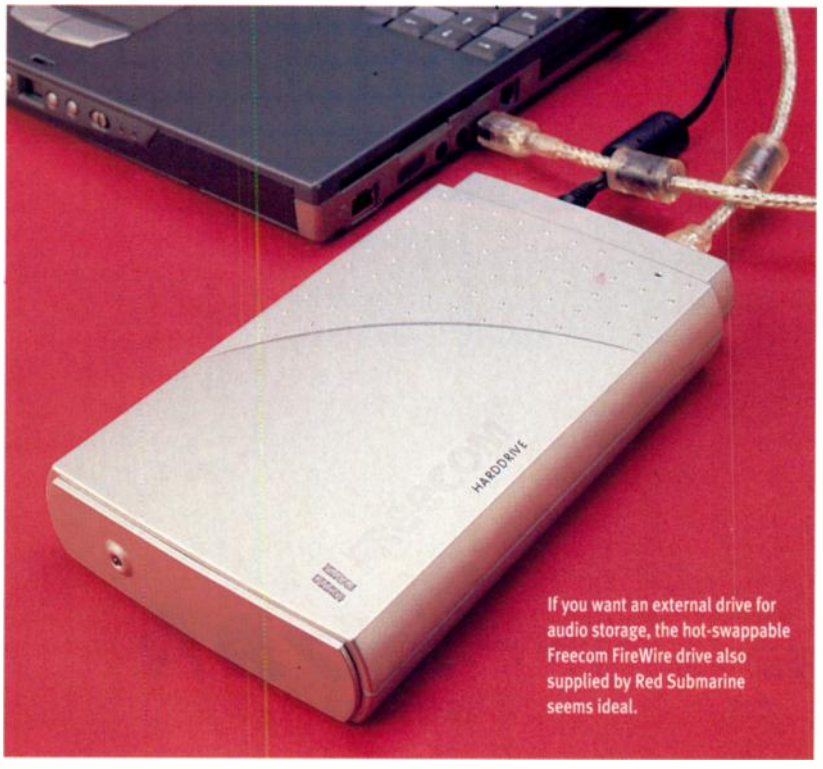
MIDI And Audio

I started by installing *Cubase VST*, and had no problem running this, although its chunky dongle was an extremely tight fit in the parallel port. If you buy *VST* with your laptop, however, Red Submarine will supply a six-inch extender cable free of charge (normal price £14.95).

My first choice for audio testing was the built-in

Technical Support

Red Submarine offer a three year parts and labour warranty on their laptops, and like most specialist music retailers have experienced technicians on their telephone support line who not only know all about PC hardware, but also all the ins and outs of music hardware and software. If you do get a problem, their helpline is open on Monday to Thursday from 9:00 to 17:30, and on Friday and Saturday from 9:00 to 17:00.



If you want an external drive for audio storage, the hot-swappable Freecom FireWire drive also supplied by Red Submarine seems ideal.

ESS soundchip. Its audio playback sounded perfectly adequate on headphones, but it's not a lot of use for recording audio, since you can only use the lo-fi mic input. The built-in speakers were also handy in an emergency, but plugging in an adaptor lead from the headphone output to my studio mixer gave disappointing results, with little or no bass and a harsh top end.

Nevertheless, the laptop managed to play back the 26-track *Cubase* demo song with no glitches, contradicting those who claim that PC laptops are incapable of more than half a dozen tracks! On the MIDI side, the ESS Allegro provides a Microsoft GS Wavetable synth which gives very basic MIDI playback facilities, and there's no built-in MIDI input for recording. However, most musicians will want to add an external MIDI and/or audio interface — I covered the many options available to laptop owners in last month's PC Musician.

For the purposes of this review I had installed the EgoSys WaMi Box system that I was also testing for this issue, and this gave me a much better chance to run the Red Sub laptop through its paces. Initially the laptop wouldn't boot up after I installed the WaMi Box drivers. This turned out to be a conflict with the ESS MPU401 driver — since the sound chip has MIDI facilities, the driver for these had been installed automatically by Windows, but as no MIDI In or Out sockets are provided on the laptop itself I just disabled this device inside Device Manager.

After this, the WaMi box ran properly, and the only other problem I had was that *Cubase* disliked running when the WaMi Box wasn't plugged in. I solved this by disabling it inside Device Manager while still plugged in; when I then removed it I could use *Cubase* successfully with the ESS soundchip as well.

Testing out *DskBench*'s claims for the internal hard drive, I kept adding more and more audio tracks to see what was possible. Using 64K disk buffers it started to get a bit twitchy at about 32 tracks with occasional 'overs', but I managed to get up to 48 tracks and about half a dozen real-time effects before *Cubase* got close to falling over. What more could you ask for?

Conclusions

The first words that came into my mind when I started to use the Red Submarine laptop were 'highly desirable', and nothing I found during the course of this review changed my mind. Those who insist that no PC laptop can manage more than half a dozen or so audio tracks should eat their words — this is an extremely capable machine that could form the nerve centre of a powerful recording system with the twin advantages of extremely low acoustic noise and portability.

Laptops are significantly more expensive than desktop PCs, and one as powerful as this is even more costly. The Red Submarine laptop reviewed here costs about £2100, and the full review system including *Cubase VST* 5.0 and WaMi Box is about £2700, rising to just under £3000 with the Freecom FireWire drive for those who want expandable storage. However, these prices aren't that much higher than for other laptops of similar specification, and for those musicians who want the ultimate portable solution, let me end this review by repeating what I said at the start. This model and its cheaper stablemate seem currently to be the only ones guaranteed to work well with MIDI + Audio software. You could buy elsewhere and take an expensive gamble, or you could get in touch with Red Submarine. If I had the money, I know what I'd do. SOS

information

£ Full 700MHz system as reviewed £2114; 600MHz version with 64Mb RAM, 6Gb drive, and no FireWire port £1761; Freecom 20Gb external FireWire hard drive £199; bundle of reviewed laptop, Freecom drive, WaMi Box and *Cubase VST* v5.0, £2949. All prices include VAT.

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synth secrets

PART 22: FROM SPRINGS, PLATES & BUCKETS TO PHYSICAL MODELLING

Everyone knows what happens when you place an echo unit at the end of a signal chain: you play a note and, after the original, you hear a number of repetitions, usually dying away over the course of a few seconds. Similarly, if you place a reverberator at the end of the chain, your note is extended, with added 'ambience' — the perception that the note is produced in a room or hall of some sort.

In both these cases, you are using electronics to model acoustic spaces. In the former case, the model is that of one or two surfaces which create a handful of discrete echoes. In the latter, it's a model of a closed space, imitating the thousands of echoes that merge into the dense phenomenon we call reverberation.

If you were now to consider a collection of modern synths, you'd notice straight away that many of them incorporate electronic delay lines and reverberators immediately before their outputs, positioned there to enhance the sound produced by the sound-generating circuits (indeed, some manufacturers incorporated these effects to invigorate synths that would otherwise be dull and lifeless). But let's ask what would happen if you could take one of these effects — the reverb — and place it somewhat earlier in the signal path.

Sadly, few synthesists can try this for themselves, because the vast majority of modern synths do not allow you to reposition the effects. However, those of you lucky enough to own a full-blown modular synth can do this, as can those with the earliest integrated synths such as the VCS3 (1969) and ARP 2600 (1970).

I've added the release dates of those synths for a reason... in the 1960s, when synthesis was in its infancy, reverb was seen as far more than simply a way to add ambience to a signal. It paved the way for realistic emulations of acoustic instruments that you cannot imitate using basic VCO-VCF-VCA architectures. The simple reverb was the key to what we now call 'physical modelling'.

To understand how it was capable of doing this, we'll need to discuss what happens to a sound within a reverberant space, or — for that matter — within an analogue effects unit designed to emulate such a space. So let's start by revisiting what we already know about delays and reverb...

From Delays...

Delays occur when sound reflects off solid objects.

Onboard effects may seem like a relatively recent synth innovation, but even old modular synths offered analogue effects. Although they were basic, the freely patchable nature of modular synths allowed them to be used to create convincing acoustic instrument sounds — thus effectively physical modelling. **Gordon Reid** explains how.

This phenomenon means that, in most circumstances, any sound produced by a point source will reach your ears from multiple directions (see Figure 1, right).

If we think of this in terms of synthesizer modules, we can construct a patch (see Figure 2 below) that attempts to recreate the acoustic environment shown.

Of course, this is hugely oversimplified. For one thing, there's no such thing as a point source — anything moving the air must have an appreciable diameter. Secondly, we've ignored the reality of a wall that, far from being a perfect reflector, will diffuse the reflected sound, modifying its amplitude and tone. Thirdly, air is a less-than-perfect transmitter. To confirm this, stand at the back of a soggy crowd at Reading Festival on a windy day, and listen to the way in which the sound level rises and falls as the wind gusts (been there, done that). Fourthly, the dense matter between your ears conducts sound from one ear to the other. Clearly, Figure 2 is quite inadequate, even for the oversimplified example shown in Figure 1.

More importantly, we've overlooked the reflections from the floor. This adds at least four further signal paths. So let's now consider what happens when we place the sound source and listener in a closed acoustic environment such as a room... I've restricted Figure 3 (above right) to a handful of paths with a maximum of two reflections, but it's already

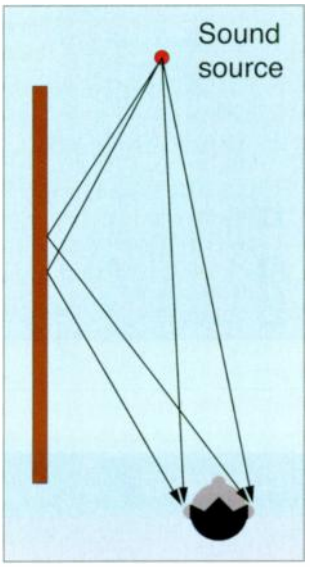

Figure 1: Delays off a hard surface.

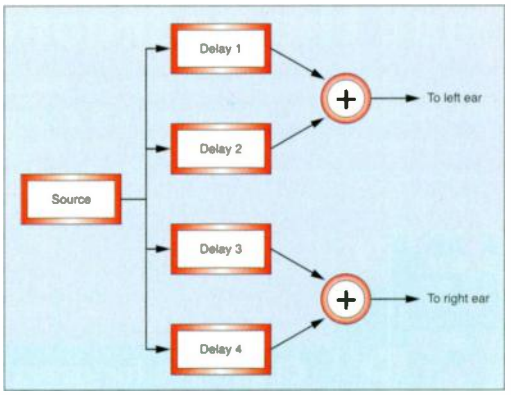

Figure 2: Using four delays to create the sound paths shown in Figure 1.

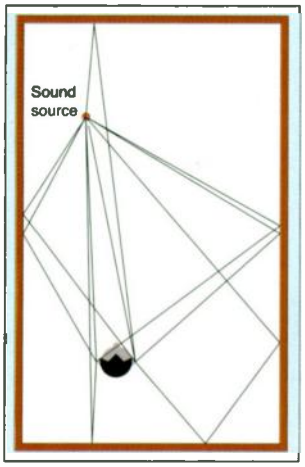

Figure 3: Some of the simplest wall reflections reaching the listener's ears (as seen from above).

getting complicated. Imagine how complex things become when we contemplate all the possible (and, therefore, inevitable) reflections off the walls, the ceiling and the floor. Indeed, if the walls are not acoustically absorbent, there's no reason why the sound should not bounce around hundreds or even thousands of times before it reaches your ears! Clearly, we can no longer think of this in terms of a handful of delay units...

...To Reverberation

Fortunately for those who like to look into these things, it's possible to analyse reverb by using a very short click (or 'impulse') to make sense of the sound reflections that occur in a closed space. If you were to do this, you'd find that there are three distinct temporal parts to the phenomenon (see Figure 4 overleaf). The first is the original click, while the second comprises the so-called 'early reflections'. These are the first, distinct, reflected sounds you hear — that is, the ones that bounce off just one or two of the available surfaces. The early reflections are rapidly followed by the thousands of reflected clicks that comprise the third region in Figure 4. Because the human brain is not usually capable of perceiving echoes separated by less than 30 milliseconds as distinct sounds (no matter how percussive the sound is), you hear the clicks in this third region as a composite sound — the 'reverb' portion of the reverbed click.

Because there's always something in a room that absorbs sound, natural reverberation dies away to silence, and we use a measure called the 'Reverberation Time' to quantify the rate at which it does so. This was defined by a chap named Wallace Sabine who, in the late 1890s, recognised that the difference in loudness between the human voice and the quietest sound you can hear is a factor of about 1,000,000. This difference is equivalent to approximately 60dB, so Wallace called his measure 'RT60' (see Figure 5, overleaf).

Fortunately (or not, when you try to do it) a simple formula allows you to calculate the theoretical value of RT60 for any given frequency for any given room. This can be your bathroom, your local rehearsal room or church hall, or even the Royal Albert Hall. You just need to know the size and absorbing properties of every material within it! Here is the equation:

$$RT60 = \frac{0.16V}{\sum (A \times S)}$$

In this formula:

- V is the volume of the room in cubic metres;
- A is the area of each type of absorber;
- S is the absorption coefficient of each type of absorber;
- and $\sum$ means 'the sum for all the different absorbers in the room'.

Room Modes

At this point, you might think that you know most of what you need to understand reverberation. OK, it's fairly unlikely that Baroness Chumondsley-Smyth sitting in row three at the Royal Albert is going to cooperate when you ask to measure her soft absorbers, but, in principle, you're ready to calculate RT60 for any room.

Unfortunately, useful as RT60 may be, it only gives you information about the decay of the reverberation. This could be described as a 'time-domain' characteristic, as it tells you about how the reverb behaves over time — but to understand reverb more fully, and to see how it can be used in physical modelling, we must also consider its characteristics in the 'frequency domain'. In other words, we must consider the frequency response of the reverberation in a room.

To do this, let's remove the source and the listener from our reverberant room, and consider the properties of the room itself. Just as a stretched string has a fundamental mode of vibration plus harmonics (see part one of this series, way back in *SOS* May '99, or look at www.sospubs.co.uk/sos/may99/articles/synthsec.htm on the Internet) there are frequencies at which a rectangular room with reflective walls will 'resonate'. However, whereas a string is essentially 1-dimensional, the room is 3-dimensional, so there are many more permitted modes, governed by the little darling that is this equation:

$$F = \frac{c}{2}\sqrt{\left(\frac{m}{x}\right)^2 + \left(\frac{n}{y}\right)^2 + \left(\frac{p}{z}\right)^2}$$

In this formula:

- F is a resonant frequency;
- x, y, and z are the dimensions of the room in metres;
- c is the speed of sound in the room;
- and m, n and p are whole numbers.

This may seem complex, but in principle the room actually behaves very similarly to the string. The difference deriving from the three-dimensional nature of the room (as opposed to the string, which is to all intents and purposes one-dimensional) is ▶

ARP's 2600, though not fully modular, did allow the free patching of the spring reverb module in the signal chain, and would therefore be a good synth on which to try out some of the techniques expounded in this month's Synth Secrets.

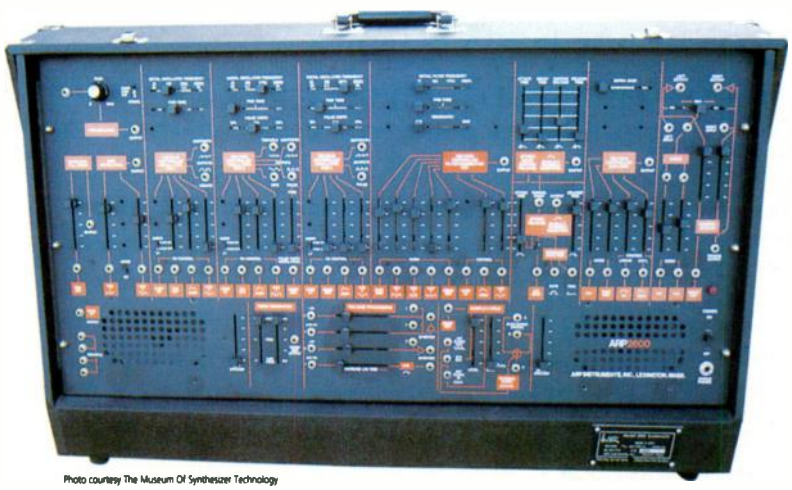

Photo courtesy The Museum Of Synthesizer Technology

reflected in the three 'squared' terms in the equation (the equation for the string would have just one). Therefore, if we consider, say, the first 10 integers for each dimension, instead of having 10 harmonics, we obtain 1000 resonant modes!

Analysis shows that the frequency response of one of the simple families of these modes (n=0, p=0, and m=1 to infinity) looks like Figure 6 (right), where each peak along the frequency axis corresponds to a mode. As you can see, this is similar in concept, if not exactly in shape, to the comb filter we discussed in Part 4 of this series (see *SOS* August '99, or www.sospubs.co.uk/sos/aug99/articles/synthsecrets.htm).

Fortunately, rooms — even rectangular ones with hard, reflective walls — do not act as comb filters. This is because the thousands of modes are distributed unevenly throughout the spectrum, so the overall response is far flatter than Figure 6, with numerous smaller bumps and troughs. Nonetheless, a reverberant room has a definable frequency response.

Whether you choose to consider reverb in terms of its time-domain characteristics or in the frequency domain, you are simply considering two aspects of the same phenomenon. This equivalence of a room's reverberation characteristics and its frequency response is an illustration of what physicists often refer to as 'time/frequency duality'. We'll return to this point shortly...

There's just one thing to get across before we move on. It might seem as though moving the walls to change the room from rectangular to irregular would destroy room modes, but this is not the case. Sure, the modes will be distributed somewhat differently, leading to a changed frequency response, but an irregular room will, by and large, have a similar response to a regular one of the same volume. This will become an important consideration later in this article when we start to think about irregularly shaped musical instruments.

From Theory To Practice

Right, that's enough acoustic theory — this is *Synth* Secrets, after all. Now let's turn our thoughts to music, and the ways in which reverb was recreated before the advent of cheap digital effects processors.

Given a large enough studio, a meaty enough power supply, and almost unlimited funds and patience, there's no reason why you couldn't create reverberation effects using thousands of delay modules and VCAs. But, obviously, it's impractical, even with an RT60 of just a few fractions of a second. What we need is a cheap and simple device that will produce the innumerable 'echoes' that comprise reverberation. Furthermore, it must make them die away in such a fashion that a sensible value for RT60 is obtained for the perceived 'resonant space' suggested by the delay of the unit.

The simplest way to do this is also the most impractical... you use a large, reverberant space called an 'echo chamber', and record your performance in this. If your sound is generated electronically rather than acoustically, you place a speaker at one end and a microphone at the other, play the 'dry' sound through the former, and re-record the 'wet' sound using the latter. In order to maximise the amount of reverb, you would not normally point the speaker at the microphone (see Figure 7, page 118).

A different reverb device requires a large steel plate, a suitable suspension, a large box, and a bunch of transducers. This is the plate reverb, a device of approximately the same size and weight — and a good proportion of the cost — of a grand piano. It uses a transducer to excite the plate, and one or more pickups that detect the reverberation created as the sound bounces around, reflecting off the edges (see Figure 8, page 118).

Unfortunately, neither of these mechanisms was small enough, light enough, or cheap enough to be placed within the early analogue synthesizers mentioned at the start of this article, so another device was needed. This, of course, was the spring reverb.

A simplistic view of the spring reverb suggests simply that you use a transducer to excite a spring, and a pickup to extract the reverberant sound at the other end (see Figure 9, page 118). In essence, this is true, but it is far from the whole story. Let's consider what's actually happening.

Let's say that the transducer excites the spring with an impulse.

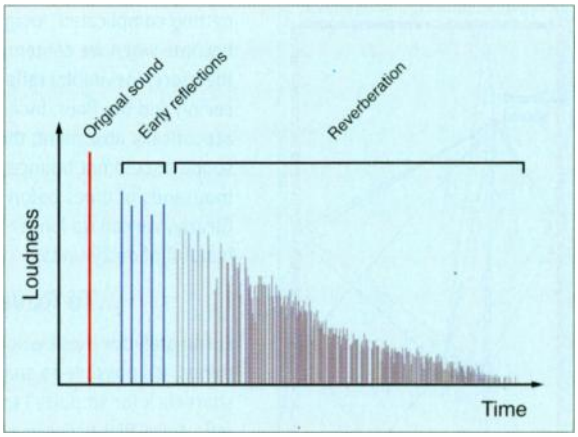

Figure 4: Reverberation.

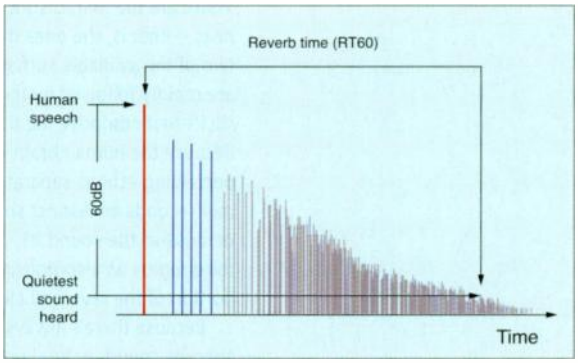

Figure 5: Defining the 'reverb time'.

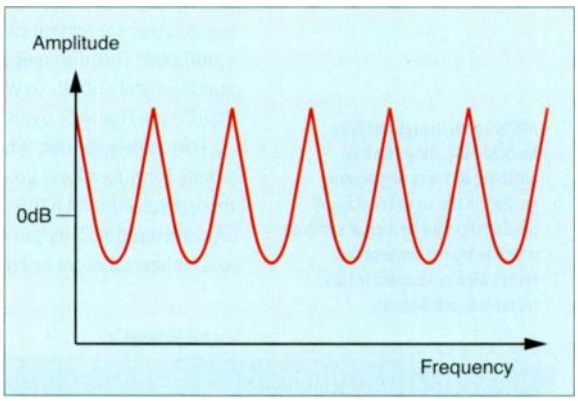

Figure 6: A family of modes in a rectangular room.

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oscillator creates the basic sound, a contour-controlled low-pass filter modifies the tone in some way, a contour-controlled amplifier modifies the loudness in some way, and a low-frequency oscillator introduces one or more forms of modulation. Finally, a reverb unit adds 'life' and 'air' to the resulting sound.

Flexible though this structure is, its low-pass filter cannot recreate the tonal quality of the modes exhibited by a reverberant space. Therefore, if you try to imitate a violin or acoustic guitar, the result is unconvincing. But let's now move the reverb 'inside' the patch (see Figure 13, right).

In this configuration, the reverb imposes its complex frequency response upon the output from the oscillator, emphasising some harmonics while suppressing others. Therefore, as you play up and down the keyboard, the characters of the individual notes change, much like those of an acoustic instrument.

Unfortunately, the reverb time of our spring reverb is far too long to emulate a real instrument. While it's not too shabby at recreating room modes, the spring would synthesize a 'violin' with a cavity over four metres long! Smaller springs would, for obvious reasons, produce more appropriate modes, and it is for this reason, perhaps, that early synthesists were able to use the six-inch springs in their instruments in this way. Nevertheless, we're not quite where we need to be, which is in the delay range of about 1mS to 4mS.

So now we turn to a device invented in 1969 by John Sangster at Philips, and introduced into affordable music technology in the mid-'70s: the Bucket Brigade Device. The BBD is a series of transistors connected in such a way that, if you present an analogue signal to the input, the signal comes out the other end, slightly delayed, slightly distorted but still recognisably the same signal. The name comes from the image of firemen passing buckets of water up a human line to quench a fire. Think about sampling the fluctuating voltage of an audio signal, and then passing each voltage down the line in a bucket... you get the picture.

You can chain BBDs to increase their delay times, and modulate the speed at which the 'sample buckets' are passed from one stage to the next. This makes them ideal for analogue effects units such as choruses, phasers, and flangers. They are also ideal for use as comb filters (as you may remember from part four of this series, comb filtering results when you combine two otherwise identical signals when one is very slightly delayed with respect to the other). But when placed in circuits with audio feedback to create reverb effects, it is the BBD's ability to produce very short delays that is important to us.

This, finally, explains how we can achieve physical modelling by placing a reverb with a suitable value for RT60 within the signal-generating architecture of a synth. Far from simply adding ambience to a previously generated signal, the short delay times generated by a BBD reverb will — just like the body of a violin — superimpose frequency characteristics reminiscent of an acoustic space upon basic signals such as a sawtooth wave.

Of course, with a single BBD reverb, we're still limited to a single dimension. So let's add another two parallel reverbs to our signal path, and mix the results before passing them to the rest of the synth. Now we're getting somewhere... provided that the reverb times are different for each of the BBDs, we will obtain three families of modes, making the response more '3-dimensional' in its effect (see Figure 14, right).

We can now tailor each BBD to generate an approximation of the dimensions of the acoustic 'body' we desire (remember... an irregular space will have a similar response to a regular one of the same volume). We can even adjust RT60 (normally called the 'reverb time') to determine whether our 'virtual instrument' is made of a hard substance or a softer, more absorbent material.

Unfortunately, I doubt that you'll be able to test this with your latest digital workstation, because it's unlikely that it will allow you to place its reverbs at the correct point within the signal chain.

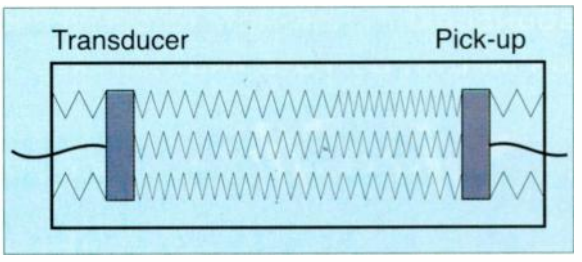

Figure 11: A three-spring assembly using dissimilar elements in each.

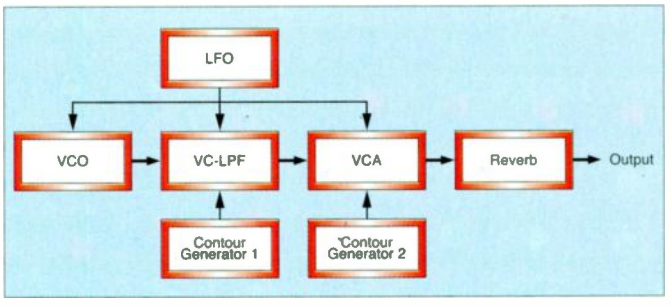

Figure 12: A simple monosynth structure.

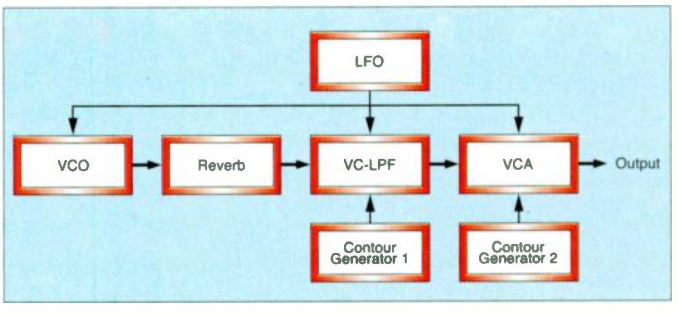

Figure 13: Using a spring reverb to imitate the 'modes' of an acoustic space.

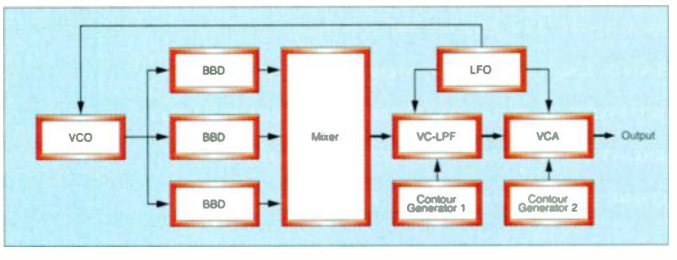

Figure 14: Modelling an acoustic space using analogue modules.

I would like to thank Christopher Hicks and Dave Betts of CEDAR Audio who, once again, have tried to ensure that I don't end up with physically modelled egg on my face. Any remaining cock-ups are entirely my own.

Photo: Mark Ewing

Not many modern synths have the signal-routing flexibility to allow the kind of experimentation described in this month's article, but Clavia's fantastic Nord Modular, whose signal routing is freely patchable in software, is one such instrument.

However, if you have a genuine modular synth that incorporates a number of BBD delays/comb filters, you'll be able to create some remarkably authentic acoustic instrument sounds (this is also true with the more modern 'virtual modulars', such as the Nord Modular shown opposite, because these too offer short delay lines). Sure, you'll have to think about the size of the instrument you want to emulate and then calculate the appropriate delay times, but that's no big deal. In fact, you can do this with a sharpened pencil and just a little GCSE maths.

To prove this, let's take the equation on page 115 and say that we want to calculate a one-dimensional mode of an instrument with a lowest resonance at, for example, 500Hz. Given that the speed of sound is approximately 340 metres per second, we obtain the following relationship:

$$500 = \frac{340}{2}\sqrt{\left(\frac{1}{x}\right)^2}$$

If you manipulate this a little, you'll find that x (the dimension of the cavity) is 340/1000, which is 0.34m, or about 13 inches. Furthermore, since the speed of sound is 340 metres per second, and the sound has to travel from one end of the cavity to the other, and then back again... it follows that the delay time needed is two microseconds, exactly as we would expect for a resonance at 500Hz.

So here's this month's Synth Secret:

You don't need powerful DSPs to dabble with physical modelling of acoustic spaces... a few analogue reverbs are more than enough.

Of course, once you've emulated your acoustic instrument, you'll want to place *another* reverb at the end of the signal chain, just to place the sound in a pleasing ambient 'space'. Indeed, you'll probably choose a huge, digital hall reverb algorithm with a slow early-reflections setting and an RT60 of many seconds, because acoustic instruments often sound best in 'concert-hall' sized spaces. It just goes to show that, as always, there's more to this synthesis lark than you might first imagine.

Finally, I'm going to leave you with a bit of a teaser... This month's entire Synth Secrets has dealt with the duality of reverberation and the frequency responses of closed (-ish) acoustic spaces. But couldn't we have avoided this talk of echoes, RT60s, room modes, and all that other stuff, and achieved the same result with a bunch of fixed (or 'formant') filters? That's what we'll discuss next month... SOS

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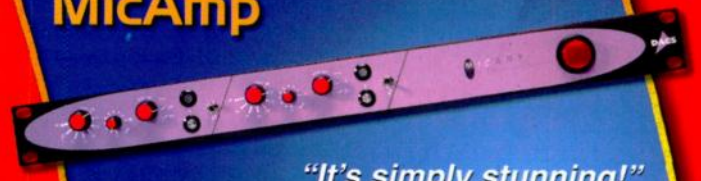

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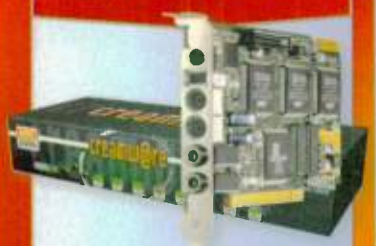

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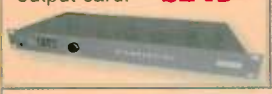

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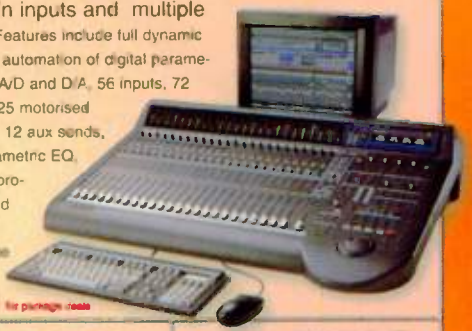

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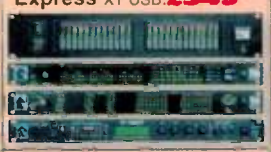

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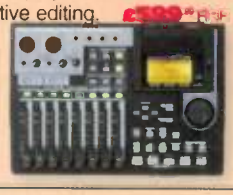

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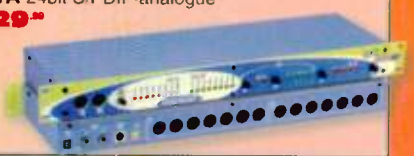

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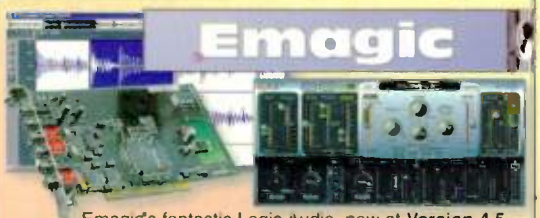
Emagic



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Nuendo Millennium are main dealers for this revolutionary Native DSP system - **call for details.**

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BOSS JS5

With its host of programmable backing patterns and an audio track for live recording, the Boss JamStation is designed to enliven the tedium of solo practice, or provide an instant sketchpad for ideas. **Nicholas Rowland** strikes out on his own...

Photos: Mike Cameron

backing bronco

BOSS JS5 JAMSTATION BACKING SEQUENCER

Nothing is more boring than practising an instrument alone. And even the most dedicated bedroom musician will agree that you learn faster and are much more creative when working with other musicians (furthermore, there's always the possibility that someone else will get the drinks in down the pub afterwards).

The Concept

Over the years, there have been several stand-alone hardware 'band-in-a-box' units designed to improve the lot of the solitary musician by providing a group of virtual backing musicians. While they may not buy the beer, they at least stop and start when you tell them. The Boss JS5 Jamstation is just such a device — a four-part, auto-accompaniment 'backing generator' to give it its full description. But the JS5 adds a significant new twist in the form of a digital audio track that enables you to record vocals or guitar alongside the auto-accompaniment patterns. More importantly, this track boasts an automatic time-stretching facility, which means that you can change the tempo of the song and the audio elements will keep pace accordingly (without changing pitch, naturally). As well as backing and composition duties, this means that the JS5 can also find employment as a phrase trainer — allowing you to record in your favourite Allan Holdsworth guitar licks, slow them down to manageable speed and then learn how to rip them off big time [*surely 'use them as a starting point for your own work?' — Ed*].

Connections & Storage

In physical terms, the JS5 is a neat unit — slightly larger than a video cassette case — with a clearly laid-out front panel that makes it easy to use, even if you can't be bothered to read the manual properly. Connections comprise MIDI In and Out, Left/Mono and Right outputs on quarter-inch jacks, a mini-jack Headphone socket, an input for one or two footswitches and a recording input which is switchable for guitar, microphone or line. This mono input works in audio-through mode — in other words the external instrument is merged with the JS5's output (handy when you're working with a practice amp that has only one input...). On the side of the unit is a slot for a SmartMedia card, onto which you can save audio tracks and song data once the onboard memory is full. You'll need to budget for at least one card as, in its unexpanded state, the JS5 offers a paltry one minute and 35 seconds of recording time in its so-called 'Hi-fi' mode. You can squeeze another 23 seconds out of it by switching to the other 'long recording' mode, but even so, it doesn't give you much to play with. The good news is that because they have become very much the standard for digital camera storage, SmartMedia cards are now relatively inexpensive. A 32Mb card will give you 34 minutes of recording time (27 in Hi-fi mode) while a 64Mb card gives you just over 68 minutes (54 in Hi-fi). To be honest, I didn't notice any wildly significant quality difference between the two modes, and considering that the JS5 will be mainly used as a scratchpad for ideas, I should imagine that most users will go for length over quality. ▶

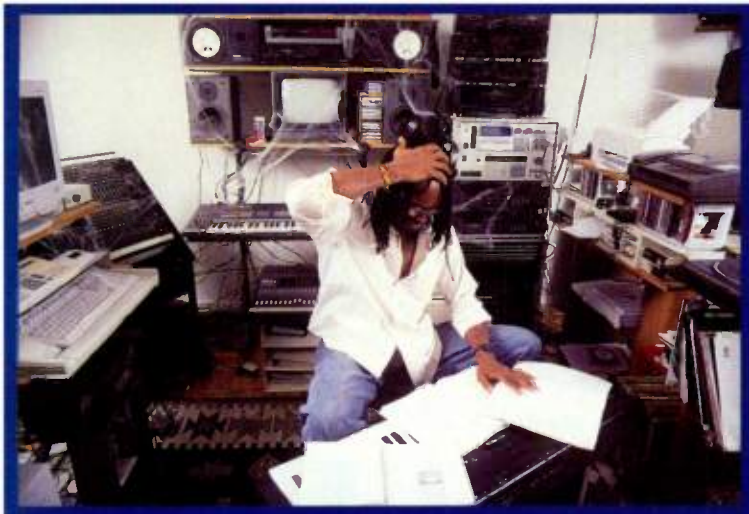
BOSS JS5 £399

pros
- Easy to use.
- Time-stretch is impressive given the price.
- Presets are well-programmed.
- Decent sounds.

cons
- Limited recording time.
- No effects on the audio.
- External device needed to create own patterns.

summary
The first hardware 'band in a box' to offer audio recording. Although the format has its limitations, the JS5 makes an excellent songwriters tool, enabling you to get basic ideas down and then try them out with different arrangements and tempos.

SOUND ON SOUND



Their idea of a project studio...

"This is a superb songwriting tool and highly addictive."
Julian colbeck
EM

"The SK is a sophisticated powerful and imaginatively designed workstation with plenty of depth and flexibility. Its sonic capabilities are impressive and versatile."
Simon Trask
Sound On Sound

"The SK has an array of connections and options that would make many a synth turn green with envy. If you are thinking about a keyboard which is versatile and programmable with a good set of sounds and automatic accompaniments, then you're thinking about the SK."
John Bates
Keyboard Player

So you finally have your own project studio.
Now if only you could get everything to work together properly, you'd be ready to start letting your ideas live and breathe.
It doesn't have to be this way you know.
Consider the GEM SK series - simple, versatile and inspiring.
Over 1000 professional quality sounds plus the ability to import new samples from Kurzweil®, Akai®, WAV, AIFF and other formats with up to 40MB of sample RAM. Up to 32 sounds can be layered together using 32 simultaneous MIDI channels

The ingenious style section lets you take a simple idea and produce a professional sounding sequence in just minutes with no programming, (selecting from the 200 on-board styles which automatically detect the chords you play anywhere on the keyboard).
Add to this one of the most powerful on-board sequencer in the industry (250,000 events, 32 tracks, 16 songs), and the ability to store everything you create on the internal hard disk (Power Station versions only), it's not difficult to see why GEM's SK series is the dream solution to those project studio nightmares.

SK880
88 piano-weighted keys

SK760
76 lightweighted keys

Also available, the SK760PS (Power Station) and SK880PS include a 1.5 GB internal hard disk pre-loaded with hundreds of new songs, styles and sounds.

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BOSS JS5

Inside

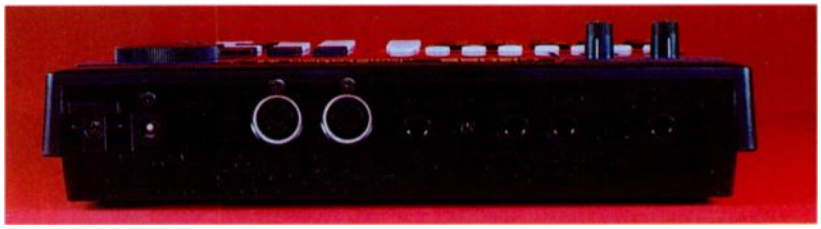
The accompaniment section offers 200 preset songs, 100 user song locations and the facility to store up to 100 more user songs on each SmartMedia card (regardless of the card's overall capacity). Note that storing song data does cut down on the maximum audio recording times. The basic building blocks of songs are a Style and a chord progression, plus data such as tempo, voice assignments and part mix parameters. While you can't record audio alongside a preset song, you can copy a preset to a user location and then work with that. Each style is made up of an Intro, Ending, two Verses, two Fills and two Breaks, the JS5 collective noun for these being 'Forms'. The 200 preset styles cover the usual auto-accompaniment territory, with three banks of Rock and one each of Pop, Ballad, Blues, R&B, Jazz, Fusion, Dance, Latin, Country and World. Programming-wise, it's all pretty competent, especially in the Rock, Pop and Blues areas. Like many auto-accompaniment devices, where the JS5 tends to be weakest is with styles such as House and Techno, though this is unlikely to bother most of the JS5's potential purchasers. Certainly if you're an aspiring Van Halen, BB King, or Carlos Santana, you'll find the JS5 fun to jam along with.

Each pattern consists of four parts – drums, bass, and two melodic voices — with control over mute, volume, pan, reverb, chorus and insert effects sends and voice assignments. The JS5's 128 melodic voices and 16 drum kits sound pretty good, being particularly strong in the bass and guitar departments. I was surprised to find that the soundset didn't follow the usual GM/GS pattern — a bonus in my book, though not so good for anyone hoping to use the JS5 as an external module to play back prerecorded MIDI files. While sounds can't be programmed, there's a lot you can do with the effects section, which offers reverb, chorus and inserts effects busses. There are no less than 40 insert effects types, and like the choruses and reverbs they are extensively programmable. The bad news is that effects cannot be used on the audio track, which is surely where they are likely to be needed most. D'oh and double D'oh!

Song Patterns & Audio Recording

Easy is definitely the word for the JS5's EZ song-creation mode. You simply tap in what style, chord progression template, tempo and key you want and — bingo! — there's your basic song. Then it's a question of recording the sequence of verses, fills and so on, which can be done in real or step time. The JS5 has 26 chord types to play with, which is more than enough for most purposes. During playback, the LCD displays which chord is currently playing, which is great when you're attempting to improvise to a preset song. If you want to program your own accompaniment patterns from scratch, though, you have to plug in a MIDI keyboard or guitar — there's no facility for doing this from the front panel. Happily, you can use the JS5 as a four-part expander in a sequencer setup. Apart from the non-GM mapping of the melodic voices, most of its MIDI spec follows the GM/GS standard, so it should be easy to use for the technically challenged.

Recording audio tracks is again pretty straightforward. Arming the track displays a bar-graph input meter for setting the levels from the external device and also gives you control over precisely which measures you want to record over.



The JamStation's audio input is switchable between guitar, line-level and mic-level sources — a footswitch can be used for remote control of start, stop and cycle.

This feature is essential for making the most of your available memory and also means that you can go back and replace dodgy sections with new takes.

I have to confess that I wasn't expecting that much from the time-stretching — after all, a facility like this can be dodgy even on top-notch samplers. But I was pretty impressed. For example, vocals remained fairly coherent — well, as coherent as my vocals ever are — up to 40bpm either side of the tempo they were originally recorded at. Guitar riffs and solo runs also remained pretty much intact over a wide range, although with chords played on acoustic guitar there was a noticeable chorusing effect as soon as the tempo deviated by more than about 10bpm from the original value. However, I don't see this as a real problem. What soon became clear about the JS5 is that it's a great tool for songwriters, particularly if you want to try out a basic idea at different tempos with completely different backing arrangements. While it can be quite disconcerting to hear a song that was conceived as Van Halen meets the Sex Pistols to come back at you as Bluegrass or a freeform jazz experience in 5/4, it can give you a useful new perspective on your music.

As its full title suggests, the JamStation is also great for practice. One useful feature here is the ability to loop sections within songs, so that, for example, you can concentrate on soloing over just the verse or just the middle eight. In that respect alone, the JS5 is a fun tool to have around. But its audio track and particularly its time-stretching facility really does raise its potential as a composition tool. If you're an anti-social singer/songwriter who's had one musical difference too many, this could be the band you've been looking for! SOS

information

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- Chord progression templates: 26 user.
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flexible working

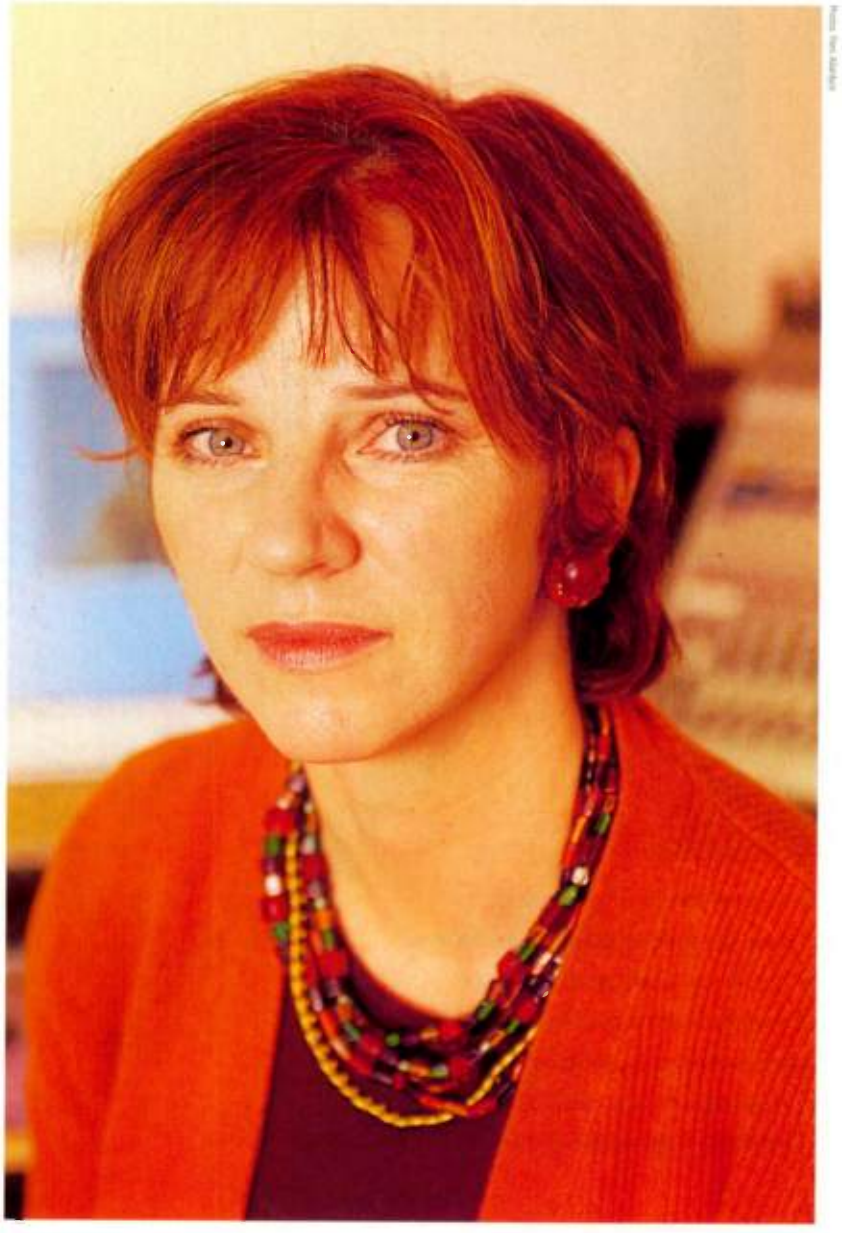
TV COMPOSER ELIZABETH PARKER

Elizabeth Parker is one of Britain's best-known composers of music for television, and is renowned in the business for her ability to complete projects to the tightest of deadlines. **Sam Inglis** visits her unique personal studio to find out how she does it...

As the BBC's famous, but increasingly redundant Radiophonic Workshop tottered into the '90s, its employees were perhaps the only composers in the world who still had staff jobs. Though resources had been cut to the bone and morale was low, they could at least count on a regular wage — until the unit was axed altogether in 1996, forcing its staff to compete in the cut-throat world of freelance television music. Among the composers enjoying new-found freedom, but also new-found insecurity, was Elizabeth Parker, a veteran of 18 years at the Workshop during which she scored innumerable BBC series, including the classic *Blake's Seven* and *The Living Planet*. Now working from her own highly individual studio in Long Ditton, in the London suburbs, Elizabeth clearly has no regrets about the change in her circumstances, and a quick glance at her list of credits over the last couple of years shows up major series such as the BBC's *The Human Body*, and a move into film soundtracks with a commission to write new music for a rerelease of *Monty Python And The Holy Grail*. So how does she keep ahead in an increasingly demanding TV production market? The key, it seems, is flexibility.

"Since leaving the BBC I've been able to work for Channel 4, Channel 5, ITV, all the channels, and the one thing I've tried at every point to be is utterly reliable and professional," she explains. "Obviously the music is the only thing that really matters, but people need to know that they can come to you on the Tuesday and have something back for the programme on the Thursday, if for some reason they've forgotten, or they suddenly find they need some music. I don't mind doing that, I quite like the adrenalin rush of having to worry about it, and knowing that they're trusting me to do something nice for their programme. And so that does happen quite often, especially with people I know, who know I can do it. It's amazing how many people forget about music until the very end. They forget about it, and then they only have two and sixpence to pay for it!

"People want the music yesterday, and if you're working on documentaries they want to know that you're going to get it right, and so I go to a briefing, come away, have my ideas and send them to them within three or four days, just so they know what I'm thinking of. Then they can say 'No, that's not what I want,' or 'Yes, it's on the right lines.' I had an example last week: I'm working on a programme for Channel Four about doctors in the Third Reich, and the experiments they did, and I'd had a very quick chat to the director, and I got totally the wrong idea, so I took



Elizabeth Parker's studio, showing the horseshoe-shaped desk that was rescued from the BBC Radiophonic Workshop. The thought paid to routing during the construction means that all the wiring is hidden, yet easily accessible if need be.

along a CD on Thursday, and it wasn't right. I could tell as soon as we started to properly talk about it, so I said 'OK, I'll come up with something else.' So I came home, had another idea on Friday, finished it off on Saturday, and he got it on Monday morning. He didn't realise he was going to get a CD then, but he listened to it, rang me up and said 'Brilliant, that's absolutely right.' So now the rest of the project is easy. But it was essential for that to happen, for him to be able to trust me, and know that I was going to get it right. Otherwise, he was going to start worrying. Now he's totally behind me, and it's going to be a really good programme, but you have to have that kind of response if you want people to trust you.

"To keep going on your own, as a composer of music to picture, is quite hard, because there are so many competing interests. People can download stuff off the Internet if they want, and TV people are just desperate for producers to use library music. I did the music for *The Human Body* two years ago, and I sent in a very late demo VHS. I was hauled in to have a chat, and the producer said that I'd got the job, and that it was really on the strength of the video. And he hauled open two drawers cram-packed with demos, and said 'These are all the people who've written to me wanting to do the music for this series.' I'd just, literally at the last minute, thought 'Oh, I'd better put something in for that.' But there were drawers and drawers of demo tapes — how do you make a mark? I don't know. What I would always say to young composers is if you've got a chance to work with young film directors, that's the way to do it, because those film directors at film school are going to go on and do other things, and hopefully go into television."

Radio On

Of course, 18 years' experience at the Radiophonic Workshop has been valuable in providing Elizabeth both with the skills to work so fast, and with the contacts necessary to get commissions. The influence of the BBC is also clearly apparent in her own studio, which was originally designed by the Radiophonic Workshop's Peter Howell, and has been extensively developed by another ex-colleague at the BBC, Rupert Brun, who kindly agreed to talk me through some of the technical ▶

Reinventing The Grail

"I've just finished doing some music for the re-release of *Monty Python And The Holy Grail*," says Elizabeth. "It's a lot of background music, incidental stuff. We tried rewriting all the music — Terry Jones wasn't very happy with the original music, because a lot of it was just De Wolfe library music. But it's become such an integral part of the film that I almost talked myself out of a job, because I said 'You can't change that, everybody knows it!' It's a very interesting case in point, because they'd used library music that was really not written with the film in mind at all, and it works brilliantly — quite often because it's a complete contrast to what you might expect. They did have a sort of cod-medieval score written before, but Terry found that it wasn't quite what he was looking for, so they used a lot of library music. And he'd thought that it would be nice to have a new score, but ultimately even though what I did was very close, it just wasn't the same, and there's something about the original music. So what I've done is given him some new music for places that didn't have music before, which he wanted to improve the dramatic impact."

thinking behind its design.

Elizabeth originally joined the Radiophonic Workshop at the height of its importance: "I did Fine Arts and Music at the University of East Anglia, and at the time they were thinking of running one of the first electro-acoustic music courses in the country at postgraduate level, so they said to me 'Look, we'll fund you, would you like to try it out?' Trygg Tryggvason, who used to work for Decca, was running it along with Tristram Carey [*composer and co-founder of EMS*]. I'm not sure I got on terribly well with Tristram Carey, because we had a big EMS Synthi 100, and he was telling us how to make music, you know 'You put a pin in here, and you put a pin in there, and you get a wave, and then you can alter it,' and I was thinking 'This isn't music! This isn't what I want to do!' I always had this idea that I could make electronic music sound more musical.

"I went to the BBC as a studio manager, because that was the way in to the BBC — it was either that or secretarial, but I got in as a studio manager — and then I got an attachment to the Radiophonic Workshop, because I thought it would be an interesting place to work. Then, all of a sudden, somebody left in the middle of *Blake's Seven*, and I was up for the job. They said 'You haven't done much television, do you think you can take on a major BBC science-fiction series?', and I said 'Yes, of course I can!' That was a baptism of fire! It was a wonderful training ground. I did *Blake's Seven*, and *The Living Planet*, among other things. Amazingly, jobs like that just went to whoever got into the office first in the morning!"

The Downward Spiral

As studio technology and electronic music-making equipment became more affordable in the '80s and '90s, however, the Radiophonic Workshop began to look like an expensive anachronism. Things might have turned around had fresh blood from the dance scene been drafted in, but staff turnover remained non-existent, and the introduction of the BBC's internal market put such a high cost on the Workshop's services that producers could no longer justify using them. "It cost an awful lot more than someone in their back bedroom," explains Rupert, "because the studios at the BBC were very, very highly specified. They were pin-quiet, they had air-conditioning ducts about two feet square so as to get the low-velocity airflow through, they were fantastic and totally overspecified for the job that was being done. I mean, there was on-site engineering support 12 hours a day, seven days a week, but that sort of thing costs an absolute fortune, and with all the BBC overheads as well, there's no way it could compete with what somebody could do at home in a room like this."

"It was wonderful," says Elizabeth. "If anything went wrong you just picked up the phone and an engineer, or two, came down within a minute. And if you needed something, you just got it. If I wanted a new synthesizer, I'd go to my boss and say 'Hey, this is really great, any chance of getting it?' and it would arrive. In fact, six of them would arrive, one for each studio. But then it got to a phase where no money was spent at all, because there was no money. So by the time the Workshop actually closed we had a lot of very old gear and we were definitely past our sell-by date. And the worst thing was that I was there right until the

Some of the studio's vital specially built components. The buttons on the Peavey PC1600 are used to control the routing system for record/replay devices, while the black box behind it is Rupert Brun's timecode router. The monitors were also custom-built.

The Universe Of Masters

Until recently, there was only one medium TV composers ever had to use to deliver their finished masters: timecoded DAT. As the broadcasting industry switches over to both real-time digital editing and surround sound, however, Elizabeth Parker is finding that this is another area where flexibility is essential: "I'm finding that producers want music on CD almost all the time now. What I do is I actually master from the Mac onto DAT, and then Rupert's set it up so I can just go straight onto CD here, so I've got my library of all my stuff on DAT, but because everyone's editing on Avids now, they just put the CDs straight into the Avid. I have to ask now 'Do you want it on timecoded DAT, or do you want it on CD?' With timecoded DAT they know they can just put it straight into the programme, but CD is often useful if you're doing music before any video has been cut properly, because you give them a whole load of stuff, and they can just put it in and lay it where they want, which is quite nice and quite creative for them. And it usually means they end up using more music! With other programmes I would end up doing a master DAT, laying the pieces of music onto the DAT with timecode behind them.

"Timecode is still necessary for your 5.1 mixes, too. Andre Jacquemin, who does the Monty Python stuff, rang me up and said 'We're going to be mixing in 5.1, so can you mix it onto separate tracks?' Then I rang Rupert, and said 'Do you think we ought to invest in a Dolby system?' and basically Rupert said 'Well, no, because that's the final mastering stage, and you wouldn't want to do that in your studio.' What I have to do is put everything on separate tracks so it can go into the final mix and they can put things where they want. You're separating the bass, the rhythm, the strings, and the effects, so that you have complete control at the very end of the mix when the narration and all the foley stuff are added — instead of having to pull the whole of the track down when the narration comes in, you can just pull down the stuff that conflicts with it. And with the praying mantis programme I'm doing for *Wildlife On One*, we're doing the same thing, we're splitting off the tracks so that that can have a really special mix. These days they're taking that much care with TV soundtracks, certainly on some natural history programmes."

There is no universally accepted standard for 5.1 masters. Elizabeth makes hers on timecoded ADAT, but often finds herself needing to bring the ADAT machine itself into post-production studios that are only equipped with Pro Tools or Tascam multitracks. "Say I've got 30 tracks," explains Elizabeth, "I divide them into how they're going to go onto the ADAT, so I'll have all the strings maybe going onto ADAT tracks one and two, percussion onto three, rhythm onto four and five, and so on, and then I'll offload them onto ADAT at the level that they were in the stereo mix. So basically, when it gets mixed down they won't have to do a lot of internal mixing — all the tracks will be at the right level, it's just they can get rid of the rhythm or whatever if they want to."

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888/24 - Digidesign's flagship 24 bit interface , 8 inputs and outputs of both balanced analogue and AES/EBU signal. Built in meter bridge, stereo SP/DIF connection and the ability to act as a stand-alone A/D - D/A convertor.

1622 - 16 Input interface for ProTools , allows you to mix 16 simultaneous inputs into ProTools which lets you take advantage of the on board DSP and mixing power of TDM.

882/20 - Digidesign's 8 channel 20 bit interface offering TRS balanced jack connections and a stereo SP/DIF digital input and output.

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very end, and it was horrendous, it was horrible. It was just so sad because it had been such a great place. I think people probably thought I'd never manage on my own, because I'd had this instant support, but it's been fantastic, and Rupert's been absolutely fantastic in getting it working. The first year I spent scared out of my wits!"

Bringing Work Home

When the Workshop closed and Elizabeth decided to set herself up as a freelance composer, she needed her own studio. Since her livelihood would depend on that studio, however, she couldn't afford to wait months for it to be constructed, nor to see it go down for weeks at a time as it was upgraded. In the beginning, therefore, the studio was set up in exactly the same way as Peter Howell's own, since this design had been tried and tested. Since then, it has evolved under Rupert's watchful technical eye into a very personal studio which reflects Elizabeth's own ways of working. "It's nice working with Elizabeth," says Rupert, "because a lot of people, when they talk to you about a studio, they come to you with a shopping list of kit they want, whereas Liz comes to me and says 'I want to be able to do this, how do I do it?' And that's much more satisfying, because I think you cannot build a good studio unless you start from what you want to do, how you want to do it, and how you want to feel about it when you're doing it. Do you want it to look hi-tech, do you want it to look relaxing, do you like software or do you want knobs? So many people seem to skip that stage and go straight to the shopping list of kit, and then wonder why it doesn't quite gel. If you do start from there, very often the choice of equipment and how to connect it together just falls out of that. And that's one of the reasons I enjoy doing this sort of work, because you're thinking about what you want to be able to do. There's a sort of evolutionary path to where we want to get to that allows her to keep working all the time, because you can't stop for two months whilst everything changes."

Rupert Brun, a former colleague at the BBC, assisted Elizabeth in developing the technical side of the studio.

In The Round

The most immediately striking feature of the studio is the unique horseshoe-shaped desk, which allows the solitary composer on a wheeled office chair instant access to every piece of equipment. This originally used to be Elizabeth's desk at the Radiophonic Workshop, and was rescued from the skip for the princely sum of one pound when it closed. These desks were introduced in the

Favourite Gear

• Emu Proteus 2 and Proteus 3 sound modules.
Elizabeth: "You see them almost everywhere. I think they're about 10 years old now, but they're jolly good basic bits of kit."
• Emu XL1 Xtreme Lead sound module.
• Roland S760 sampler (x2).
Elizabeth: "I do masses of sampling, and I can work them backwards. They've got all the expandability, so they've both got mice on them, and they've got the extra memory. I don't have a dedicated drum machine, I tend to use either sampled kits or put my own together as a patch."
• Roland XV5080 sound module.
Elizabeth: "I think this is my first experience of a JV-series module, and the range of sounds is fantastic. It took me a while to get my head round, though. I couldn't work out how you could change the patches — you have to do it in the Part menu rather than the Patch menu! It's actually quite confusing, and the manual isn't terribly good. I've got the extra sample memory in, and I'm going to connect my old magneto-optical drive so that I can load samples into it. I've got 240 magneto-optical discs, and I just felt that I needed to get onto Zips, because I felt that the new samplers would probably be using Zips rather than MOs, and I didn't want to get left out on a limb. I load them onto the MO and then save them on Zip, so I'm building up everything as a library on Zip."
• VHS video recorders (x2).
Elizabeth: "It means I can make copies very quickly, and at the moment I have a TV on top so that I can play VHSs very easily. I only ever record on the top one; the left-hand track of the VHS will carry the dialogue, and the right-hand has timecode, so it will run the sequencer."
• TC Electronic M2000 multi-effects.
Elizabeth: "This transformed my mixes when I first got it, it's brilliant. It's not just reverb, I don't know what it does to the sound, but it does something nice!
• Denon cassette recorder.
Elizabeth: "I still have to send things on cassette sometimes, and it's very cheap, it's only 50p a cassette — just for demos."
• Spirit Folio mixer for record/replay devices.
Rupert: "There are a number of reasons why we use this little Spirit Folio, one of which is price, but the other is that the EQ on it is absolutely lovely, an absolutely beautiful-sounding EQ. You could spend an awful lot more money and not get EQ that's as sweet as that, it's gorgeous."
Elizabeth: "It's incredibly useful. If I've got a sample on DAT, and I'm not terribly happy with the sound, or I just want to make it more toppy or whatever, it's really easy, I don't have to go through the main desk or anything."
• Yamaha Promix 01 and 01V digital mixers.
Elizabeth: "Originally the studio just had the Promix 01, and we've just added the 01V because we wanted more inputs, because the 5080's on the 01V, and also because I was worried that the Promix might start to go down at some point, in which case we'll just get another 01V. All the inputs from the synthesizers come into the 01. The 01V is the absolute master. The 01 comes up on this fader, so you've got all the benefits of the nice effects and so on that the 01V has."
Rupert: "We take the S/PDIF out of the 01 into the digital in on the 01V. You have to do a bit of flipping around to get the input to come up on a fader rather than straight into the master."
• Custom-built nearfield monitors (see Monitoring box).

The main rack of sound sources includes (from top) MOTU MIDI Timepiece AV synchroniser and MIDI interface, Emu Proteus 2 and 3 modules, two Roland S760 samplers, and a recently added Emu XL1 sound module.

Plug-ins

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Comprising Intonator and VoiceStrip this Plug-in bundle will save you hours and hours of recording and editing time: TC|Intonator tunes notes on the fly and TC|VoiceStrip includes all you need for vocal sound processing: Compression, De-essing, dedicated Voice EQ, Lo Cut Filter and Gate.

Take your audio into creative new realms of sound with Bruno/Reso, using a new cross-synthesis technique to "synthesize" existing audio in real-time. Timbre, amplitude, pitch, stereo spread, low-pass filter, "Q" and follower can be all be fully automated.

Focusrite d2™ and d3™ are high quality, TDM Plug-Ins for Pro Tools users. Through collaborative engineering development, including precision measurement and modeling, Digidesign and Focusrite have created a software equalizer and compressor based on the highly acclaimed Red Range.

DUY

DUY offer a wide range of advanced processing Plug-Ins for TDM, AudioSuite and RTAS. EVERPACK is a bundle of 5 Plug-Ins, formed by VALVE, SHAPE, MAX, WIDE and the brand new Z-Room Reverb, ideal for 001 and VST users who need a variety of plugins on a budget. VALVE - physical-modeling based classic tube simulation. SHAPE - sound enhancer featuring 3-band smooth filters with continuous crossover points. WIDE - stereo and multichannel spatial enhancer allows sound placement outside the physical speaker locations. MAX - seamless level maximizing. TAPE - physical modeling of analogue tape. DSPider - modular Plug-In creation for TDM, link 40 modules in countless different ways to develop virtual emulation of any type of existing processing device. ReDSPider - preset only version of DSPider.

Digidesign 001

18 simultaneous inputs and outputs on dedicated external hardware, including two high quality mic pre-amps. Ships with Pro Tools 5.0 LE software offering 24 tracks of audio with real-time effects and up to 128 tracks of MIDI, mix external inputs in conjunction with your recorded audio. The ultimate studio bundle on a budget. Apple G4/400 inc 192Meg, 10 Gb internal drive, DVD/CD ROM, Formac 17" Monitor, Digidesign 001 Including ProTools 5.0 LE **£2499**

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Apple Powerbook

Apple Powerbook running Cubase VST or Logic Gold with VX Pocket audio card and Sport 2X2 midi interface

Storage Solutions

Hard drive and backup drive requirements vary with every system supplied, we can offer either 'off the shelf' desktop drives or custom built racked solutions utilising fixed drives, tape mechanisms, DVD RAM and/or CDR. Call to discuss your requirements, we can demystify the process of storage....

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Earthing Secrets

One of the key factors in studio design, according to Rupert Brun, is ensuring that mains wiring is properly earthed, since this affects not only the safety of the studio but its sound: "A lot of this equipment has unbalanced inputs and outputs, and with long cable lengths, hum could potentially be a problem. The important thing is to sort out the mains earthing so as to make sure you get a very low earth-loop impedance, which is the impedance from substation to your socket and back again. The IEE Wiring Regulations standard for domestic wiring on a 32 Amp ring main with a 32 Amp fuse is 1.09Ω, which is designed to be low enough that that under a fault condition of the most dangerous type, where the live wire becomes connected to the exposed metal case of a piece of equipment, the fuse will blow in less than 0.4 seconds. For a recording studio, though, to avoid hum, taxi pickup, buzzes, splats and clicks, you've got to really get the earth-loop impedance down below about 0.5Ω — in Liz Parker's studio we achieved a figure of under 0.4Ω. And to achieve that, it's no good just using standard mains cable, because that's designed to have a low impedance at 50Hz, and won't have a low impedance at the higher frequencies generated by modern digital audio equipment and computers, up around 10kHz and beyond, so you have to have very specially selected cable, configured as a star arrangement so as to avoid earth loops. If you do that, you're nine-tenths of the way to getting a very clean output.

"The important thing is to get as many strands as possible. You need a large cross-sectional area to get the earth-loop impedance down at 50Hz that's needed for safety, but in order to get low impedance at the higher audio frequencies, and the sort of frequencies of hash that digital equipment can put out, you need many hundreds of strands, because the higher frequencies travel more along the surface of the strand than inside the thickness of the copper. The more strands you have, the more surface area you have, and the more you can soak away high-frequency sounds. The exact specification of the cable you need will depend upon the details of each specific installation, such as the precise over-current characteristics of the protection device you're using, whether it's a fuse or miniature circuit breaker, so you can't just recommend one type of cable for all studios. In fact, this is one area of studio design which is best left to a qualified engineer, especially as the correct earth loop impedance is vital for safety and can only be measured using specialist (and very expensive) test equipment!

"The other thing we've done in Liz's studio is to put the computer on an uninterruptible power supply, not only for the obvious protection that gives the computer from fluctuations in the mains, but because it will also isolate the rest of your earthing distribution from the hash which the computer can put out back down its mains lead."

Workshop's last refit in 1988 — an event which was covered in *SOS* February 1989 — and originally housed seven Yamaha DMP7 digital mixers, five of which served as submixers spaced at equal distances along the surface to minimise cable lengths from the various sound sources. The DMP7s are long gone, but their replacements include a Yamaha O1V which acts as the studio's main mixer, a Promix 01 which serves as a submixer, and a Spirit Folio analogue desk which is part of the studio's interesting MIDI-controlled audio routing system. This uses the guts of an Akai router, modified to work with a Peavey PC1600 MIDI controller rather than the original Akai control surface. There's also a completely separate routing system for timecode, which was built from scratch by Rupert.

These routing systems typify the distinctive BBC approach to studio engineering held by both Rupert Brun and Peter Howell: rather than make do with commercial equipment that doesn't quite meet a studio's needs, they choose to build their own, or butcher other systems, as Rupert explains: "The best thing in the world is if you can go down to the shops and buy, for a sensible price, exactly what you want. But if you can't, you say 'OK, can we find the bits to make it?' I'm very proud of the fact that we've now got a studio where there's no plugging necessary to operate it and there's no cables kicking around. There is a jackfield, and Liz does use it occasionally, but it's primarily there as an engineering tool.

"The Akai routers were fantastic value for money, really good, but the hardware controller they sold to go with them was user-antagonistic in the extreme, absolutely dreadful to use. So we realised that although they had a special hardware controller with a great big four-pin XLR cable between it and the routers, it was actually talking MIDI protocol — at a different voltage level, but it was actually MIDI. And Peter Howell realised that you could use the buttons on the Peavey MIDI controller to control the router. In a way it's a bit of a waste, in that it's also got all these MIDI faders that we just don't use. But it means that Liz never has to plug anything.

"The audio devices — all the samplers, synthesizers and so on — all go straight into the Yamaha mixers, but the router does the record/replay devices. Whilst you can build a studio so that each sampler, sequencer and synth comes up on one channel and leave it there, with record devices, sometimes you want them to record the output of the studio, and sometimes you want to copy from one to another, so that's the area of a studio that you're constantly having to replug normally, and so that's the bit that's on the routing matrix. Every record/replay device is on the router along with the Spirit Folio, which acts as a copy mixer, so that you can adjust level and EQ on the way whilst making a copy if you want. For example, if you need to make a copy of something and adjust the level of it, you can do that through this separate subsystem while still carrying on composing on your main mixing desks and your audio equipment. All the record/replay goes via the router, and the monitoring of course, because that's the other area you constantly want to change — you sometimes want to listen to the output of your studio and sometimes to the output of the DAT machine or CD-R, or whatever — so the record/replay and the monitoring goes via the router, and everything else is pretty much hard-wired."

There can't be a composer or an engineer working with sound for picture who hasn't had reason to curse timecode and the attendant problems it can bring. Rupert's home-made

The Spirit Folio mixing desk is used for making level and EQ adjustments when copying from one record/replay device to another, or when sampling.

Mackie Designs

HDR24/96

The HDR24/96 is a stand alone 24 track hard disk recorder which, with the addition of an SVGA monitor, mouse and keyboard, gives access to the performance and editing power usually only available on high-end computer based recording systems. Until now a product of this specification could have cost up to four times the price of the HDR24. • 24 tracks with 192 virtual takes • Use stand-alone or directly link to the Digital 8-Bus • Intuitive editing software with drag-and-drop crossfades and regions plus track slip, audio phase inversion, waveform reversal, normalization, pitch-shifting, time compression and expansion.

Combining the power of both D8B and HDR24 in one system provides a complete recording, editing and mixing solution. With the inclusion of just microphones, monitors and a DAT machine it is possible to take a recording project from conception to final mix on one stand alone, fully integrated system.

D8B

A whole new class of digital console, a familiar analogue style interface with the accuracy, control, expandability and sonic quality usually only found on significa ntly more expensive consoles. The Digital 8-Bus offers 24 analogue input channels with up to 24 additional tape returns configurable to either analogue, AES, TDIF or ADAT format, with a further 8 aux inputs also available the D8B can offer up to 56 simultaneous inputs. A massive on board DSP resource allows internal processing using high quality dynamics, EQs and multi effects also allowing automation of these functions on forty-eight channels simultaneously.

Surround Solutions

There is an increasing demand on all studio facilities to provide 5.1 or LCRS surround mixes. We can supply and install surround monitoring and routing matrices to suit any system. ProTools owners have easy access to 5.1 mixing via Kind Of Loud's Smart Pan Pro (screenshot pictured) and the Axis Panner. Add fully automated surround mixing to your ProTools system for the cost of one plug in.

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VS2108 - Nearfield monitoring with midfield bass extension...., ideal for big bottom end in smaller production rooms.

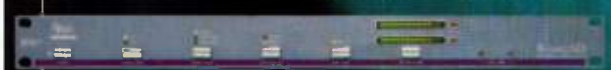
F11 - Injection moulded cabinets give the F11s a bigger sound from a smaller box.

VS3208 - The ultimate in midfield monitoring, 4-way active amplification, probably some of the best monitors you will ever hear.

Professional Outboard

Focusrite ISA430 - The ultimate channel strip, this unit combines Mic Pre, EQ, Dynamics with the option of high end Analogue to Digital conversion. Probably the best signal path available for either digital workstations or a conventional analogue studio.

TC M3000 - one of the best sounding, most versatile and easiest to use professional reverbs available. Combining ultimate control of directivity in the early reflections with a transparent and harmonically magnificent tail, the M3000 takes the art of reverberation to a new and higher level.



Apogee make what are commonly regarded as the highest quality analogue to digital and digital to analogue convertors available. With the introduction of the ***Rosetta*** (pictured) and the PSX100 you can add the depth and clarity of 24 bit Apogee conversion to any digital system for under £1000.

Focusrite Red2 - Widely accepted as the industry standard outboard equaliser, the Red 2 has two channels of two band fully parametric EQ with two bands of semi-parametric and separate high pass and low pass filters.

TC Finalizer - Fantastic hardware mastering tools with an incredibly simple user interface, the Finalizer offers 5 band fully parametric EQ, 3 band compression,3 band limiting as well as realtime normalising, format conversion (i/o of: A/D & DA, AES/EBU, S/PDIF and AdatTos-link), sample rate conversion (31 - 49k) , autofade and stereo adjustment.

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GLYPH X-PROJECT DRIVES

x hits the spot

Photos: Mark Ewing

Derek Johnson looks at Glyph's new SCSI and FireWire drives, and investigates the advantages of dedicated audio storage.

It's said that imitation is the sincerest form of flattery, and if that's the case then Digidesign must be feeling pretty pleased about Glyph's X-Project hard drives. Anyone familiar with the look of the recent (and very successful) Digi 001 digital recording interface will be able to see where Glyph got their inspiration for the cosmetics of the X-Project series. And it's hardly surprising that the 1U, rackmountable X-Projects match the Digi 001, because Glyph see the drives as ideal adjuncts to the 001 system. However, they also see them as being suited to anyone else who needs a fast, reliable, high-capacity solution for direct audio recording.

Overview

The X-Project family comes in two variants, each with a range of disk capacities. One line of the family is equipped with a SCSI interface (the large Ultra Wide connector is specified), and the other comes with a FireWire connector. In the case of the former, three capacities are available: a single 9Gb or 18Gb drive, or a dual-18Gb model yielding 36Gb total disk space. There are only two sizes for the FireWire model: 30Gb and dual-30Gb (total 60Gb). All X-Project units feature 7200rpm drives. In the case of the SCSI devices, I'm told that the drives are Seagate Barracudas modified by Glyph to improve access times by up to 23 percent — sustained data transfer rates can be up to 23Mb/second. On the other hand, IBM IDE drives, again customised by Glyph, are specified for the FireWire X-Projects, and these are capable of a sustained throughput of around 15Mb/second. If you're wondering about the reason for the different mechanisms, it seems that Glyph see the SCSI X-Projects as the more professional proposition, hence the 5-year warranty, whereas the FireWire drives, which are cheaper on a £/Mb basis, are aimed at semi-pro users, hence the 3-year warranty. Note that I reviewed these drives attached to a 450MHz single-processor Apple G4 (384Mb RAM), but that they can also be used with PCs.

X-Project drives come bundled with all power and connection leads (including terminators with the SCSI drives), driver software on CD, rack ears, and stick-on rubber feet for those who prefer free-standing use. The drives themselves are even ready-formatted. What the SCSI drives *may* need, if you're an owner of a recent Apple computer, is a SCSI card of some kind, since this connector has been banished from the latest Apple generation. And since the Glyph SCSI drives use Ultra Wide SCSI, with its larger 68-pin connector, the card will be slightly more expensive than a standard SCSI card. Luckily, Glyph offer packages based around a modified Advansys card that adds only a modest premium to the overall price.

Which X-Project drive you choose depends on you. FireWire saves you the need to install a controller card and is hot-swappable, plus the FireWire-equipped units in this range come with larger hard drives and are cheaper than the SCSI models. Though the SCSI X-Project drives out-perform the FireWire options in terms of data transfer, in practice both drives work perfectly with Digi 001/*Pro Tools LE*. Those working with this system and any drive in the X-Project range will easily manage this system's 24-track recording/playback, even with edits and fades. Either drive should also be compatible with software capable of more than 24-track simultaneous playback, and there are reports of 32 tracks being no problem with *Logic Audio Platinum*, Digi 001 hardware and the X-Project FireWire. However, the advantages of the SCSI X-Projects' greater data throughput may be evident on larger sessions. Other strengths of Glyph's SCSI ▶

GLYPH X-PROJECT DRIVES

pros
- Both SCSI and FireWire models available.
- Quiet, unobtrusive operation.
- Generous warranties.
- Nice match for Digi 001 system.

cons
- More expensive than generic equivalents.

summary
If you're serious about computer-based audio recording, it makes sense to buy an external drive optimised for the job, from a company that understands the requirements of the studio musician. Once you've made this decision, the Glyph X-Project range is highly recommended.

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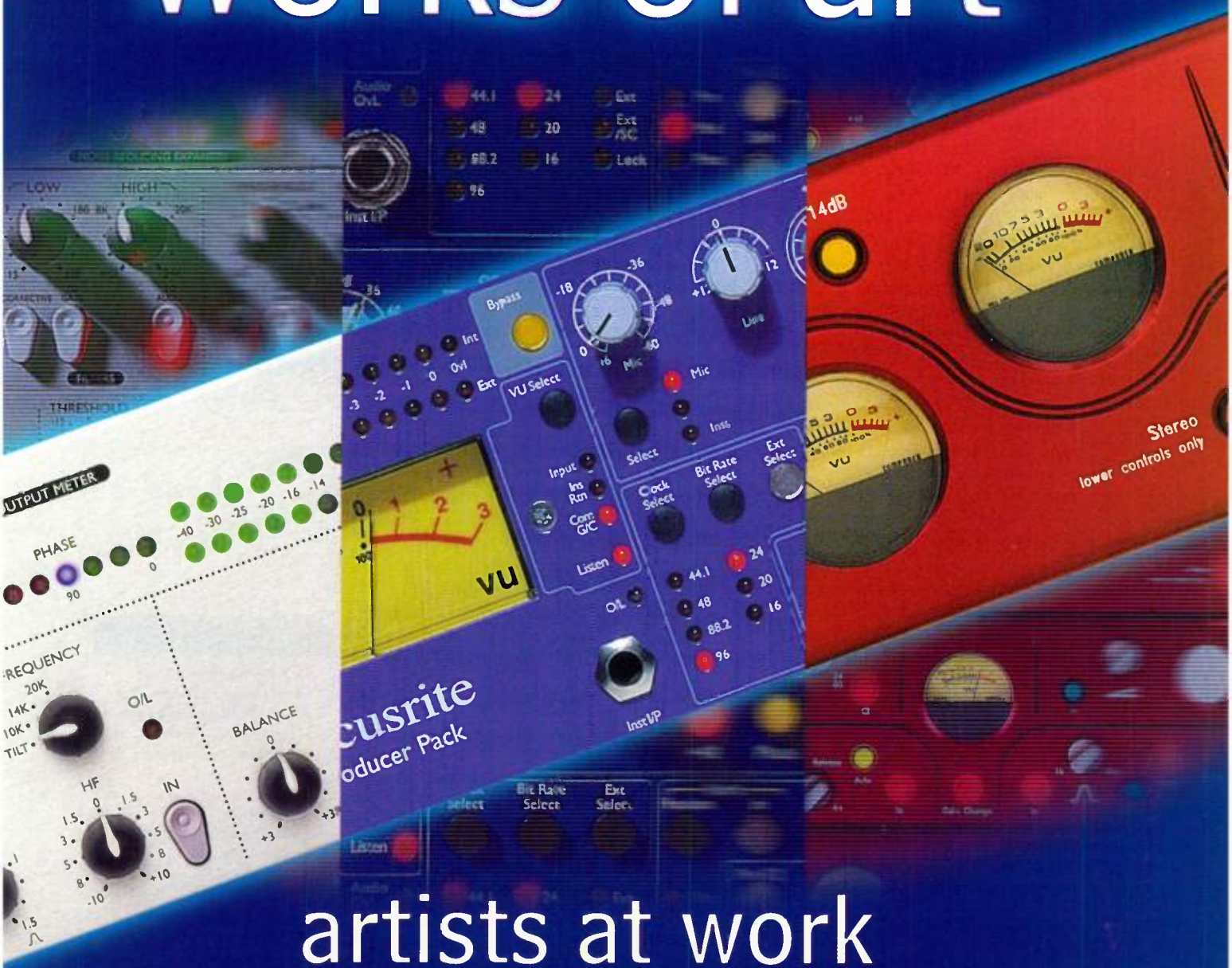

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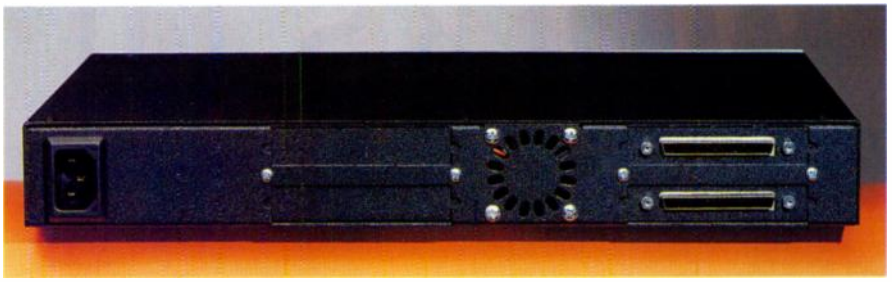
options may only show over time: for one thing, SCSI drives are generally thought of as more robust than IDE drives of the type specified for the FireWire X-Projects.



The main difference between the rear of each drive is the connectors, allowing you to incorporate them into a SCSI (above) or FireWire (below) device chain.

X-Project SCSI

The SCSI drive I had for review was the 9Gb model. It was supplied with the optional Advansys Ultra Wide SCSI PCI card, plus a chunky, good-quality SCSI cable and active terminator. There are no controls to concern yourself with beyond an illuminated power switch and a SCSI ID selector. An LED flashes with drive accesses. At the rear are two SCSI connectors — one of which serves for a through lead or terminator — and the power socket.

Anyone who doesn't already have a SCSI host card in their computer will have to install one before the drive can be connected. The software needed to allow the computer to talk to a SCSI device will depend on which card is chosen; in the case of the Advansys supplied by Glyph, it consists of a system extension and a little utility.

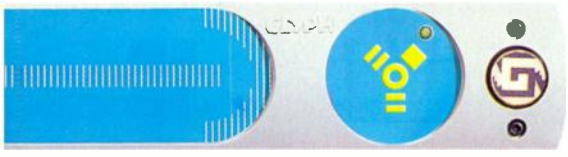
Once everything was installed, the first thing I noticed was the drive's low level of fan noise — Glyph have chosen one of the quietest I've encountered. The drive itself is well-damped, and the access noises produced during recording and playback of audio are refreshingly unobtrusive. The 9Gb model such as the one I had for review is capable of recording 43 minutes of continuous 24-track audio at 24-bit/48kHz resolution, and these figures increase for 16-bit/44.1kHz audio. I had no trouble getting full 24-track performance with the Digi 001.

X-Project FireWire

Physically, the FireWire X-Project is identical to the SCSI model, save for the FireWire logo near the power switch. It also has an access LED on the front panel and at the rear, two FireWire connectors take the place of the other unit's dual SCSI sockets. Obviously, a FireWire cable is provided, and the user doesn't need to install any additional hardware. A specific driver isn't required, though you'll need the latest FireWire drivers for your OS, and Glyph supply a handy utility/extension combo, El Gato's *Disk Control*, which prepares FireWire hard disks for use on the Macintosh — this can format, partition and test attached drives.

Once this is installed, following a reboot, everything is ready to go: one hot-swappable FireWire drive appears on your Mac's desktop.

The FireWire drive I had for testing was a 30Gb model, which can accommodate up to 144 minutes of continuous 24-track audio at 24-bit/48kHz. Again, operation was trouble-free and I easily achieved 24-track playback. Self-generated mechanical noise was at a similar level as for the SCSI model.



The FireWire logo on this X-Project drive indicates that it can be attached — without powering down — and used with suitably equipped Macs and PCs without the need to use up a PCI slot installing a SCSI card.

Conclusion

What can I say? Thankfully, not a lot, because both drives installed painlessly, were running in minutes and worked flawlessly, easily providing the speed and access performance required by the Digi 001/*ProTools LE* system. Personally, I would gravitate towards the FireWire drive, for the elegance of the controller card-free operation, but if I had an older, SCSI-equipped Mac, or wanted the extra robustness of a SCSI mechanism and the five-year warranty, the SCSI option would be ideal. Moreover, I hear that a further X-Project variation is on the way, combining one SCSI and one FireWire drive in the same package — it's expected that a 9Gb SCSI/30Gb FireWire combination will retail for under £600.

Glyph are great evangelists for the practice of keeping dedicated audio drives outside the host computer, and this makes good sense when you consider that the insides of a computer are an electro-magnetic minefield, and that stacking record drives next to system drives can introduce mechanical interference, as well as causing internal busses to become overworked. On a more practical note, if you tend to move between studios or recording setups and need to take your audio data with you, it's obviously much more convenient to drag around an easily portable drive such as the X-Project than a whole computer!

On the subject of price, you can certainly buy extra drives — even external ones — for less than the X-Project family. However, we're not talking differences of hundreds of pounds, and you wouldn't be benefitting from Glyph's optimisation of hardware and driver software for audio recording and playback, nor would you be able to take advantage of the three- and five-year warranties from a company dedicated to producing drives for digital audio. The bottom line is that if you're shopping for an external drive for audio recording, the X-Project models are a very good bet. They offer approachable pricing and Glyph reliability for all — not to mention aesthetic harmony for owners of Digi 001 hardware! SOS

Prices

The following list of X-Project 'manufacturer authorised prices' should give you an idea of what you'll pay, including VAT, at your local hi-tech emporium.

X-PROJECT SCSI DRIVES

- 9Gb: £410.
- 9Gb plus SCSI card: £499.
- 18Gb: £493.
- 18Gb plus SCSI card: £586.
- Dual 18Gb: £805.
- Dual 18Gb plus SCSI card: £922.

X-PROJECT FIREWIRE DRIVES

- 30Gb: £382.
- Dual 30Gb: £617.

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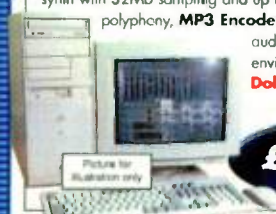

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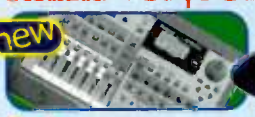

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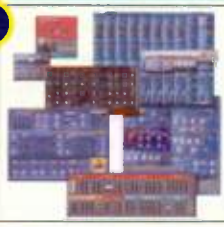

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WINDOWS 2000 AND THE PC MUSICIAN

Microsoft's latest operating system, although primarily designed for business and network systems, seems to offer many features that are attractive to musicians, including greater stability and support for dual-processor machines. But is there enough software support to make upgrading worthwhile? **Martin Walker** investigates.

Musicians who upgrade to Windows 2000 Professional from Windows 98 will find that it looks much the same on the surface. Underneath, however, it uses a completely different engine, and this is what may cause problems with some software and hardware.

People differ greatly in the way they react to a new operating system release. Some buy it the day it comes out because they simply must have the latest version of everything. Others look back on the time it took them to iron out operational problems with their current operating system, and how many tweaks they've needed to optimise it over the years, and leave well alone. This is commonly referred to as the 'If it ain't broke, don't fix it' approach, and is the reason why many musicians are still happily running Windows 95. Most foolhardy are those who get hold of pre-release beta versions of the very newest operating systems, either legitimately or via the back door, and try to use them not as intended — for in-the-field testing and feedback — but for serious music work.

The most common industry advice with a new operating system release is to wait for at least a few months to let the lemmings discover the pitfalls before taking the plunge yourself. So, since it's now been almost a year since Microsoft's Windows 2000 operating system was released, it's time to take a more considered look at its advantages and disadvantages for the PC musician.

Stability And Reliability

Before I wade into the main issues that affect musicians, it's worth quickly going over the main features of Windows 2000. There are three versions — Professional, Server, and Advanced Server — and which one you need depends on how many PCs you need to support. The cheapest Professional version should suffice for all musicians, which is lucky, since the Server version starts at about £800, while the Advanced Server is more like £3000. You can buy the full Professional version at a street price of about £250, as an upgrade from Windows 95/98 for about £170, and from Windows NT for about £100.

It's a mistake to think of Windows 2000 as an update of Windows 98, since all three versions of it are based on Microsoft's operating system for business users, Windows NT 4.0, and as such have rather different aims. For most musicians the attraction is not so much the feature set, although this does offer the tempting prospect of multi-processor support, but rather its claims for much better reliability and stability. These qualities are crucial for those running 24-hour-a-day applications such as office networks and web servers, and even though running a PC 24 hours a day for months probably isn't high on most musicians' lists of priorities, trusting it not to crash during a vital session is. Like Windows NT before it, Windows 2000 runs each application in its own section of 'protected' memory, so that even if one does crash, the system will carry on regardless without requiring a reboot.

However, this stability does come at a slight price: you have to have Windows 2000-compliant setup programs to install software. If your choice of music software doesn't specifically state its

System Requirements

Although Microsoft suggest a minimum of a Pentium 133MHz processor and 64Mb of RAM to run Windows 2000, most industry experts think a 200MHz Pentium and 128Mb a more sensible recommendation. You'll also need a hard drive at least 2Gb in size, with 1Gb of free disk space. The full version can obviously be installed on a blank hard drive, but you can also upgrade from Windows NT 3.51 or 4.0, or Windows 95/98. You can't upgrade from Windows 3.1.

"If your choice of music software doesn't specifically state its Windows 2000-compliance, then you may not be able to install and run it successfully, even though it runs beautifully on Windows 95 and 98."

Windows 2000-compliance, then you may not be able to install and run it successfully, even though it runs beautifully on Windows 95 and 98. Some manufacturers, like Steinberg, have embraced Windows 2000 wholeheartedly, and any version of *Cubase* from 3.71 onwards can be installed under Windows 2000. Philippe Goutier's *Wavelab*, also marketed by Steinberg, makes good use of dual processing, and he claims that it gives slightly better performance under Windows 2000 than with Windows 98. Cakewalk have been similarly enthusiastic, and all their current products can be run successfully on Windows 2000. However, although Emagic's *Sound Diver* synth librarian/editor is compatible, they don't recommend that their *Logic* users upgrade to Windows 2000 until a new compatible version is released in Spring 2001.

There is a sneak workaround for those who desperately want to use a particular application that doesn't officially offer Windows 2000 support, but of course I can't officially recommend this, or be held responsible for any consequences. If you are about to upgrade from Windows 95/98 to Windows 2000, and you leave an existing non-compliant application on your hard drive, there's a good chance that it will still run on Windows 2000 after the upgrade, although MIDI timing might well be seriously affected.

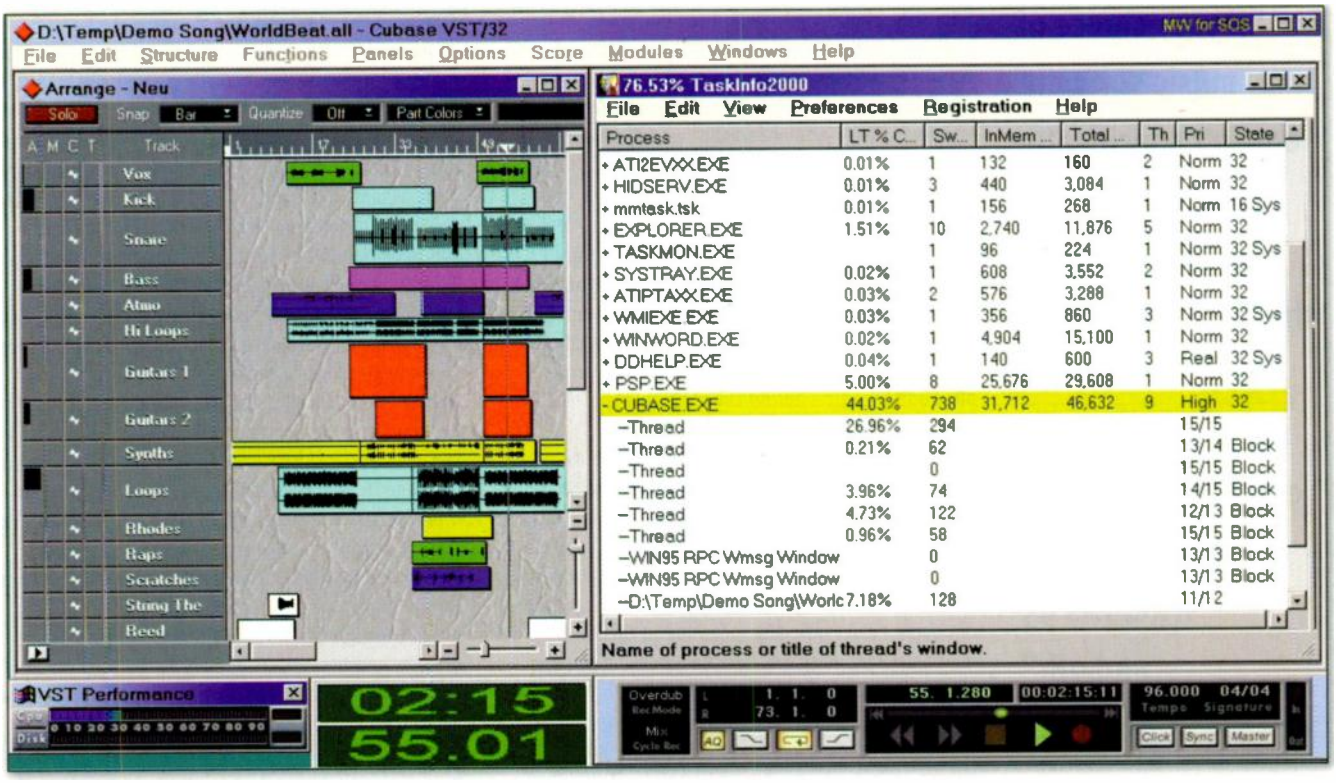
Another aspect of Windows 2000 that may not sound immediately useful to musicians is increased data security. However, while it's vital to those running Internet servers and office networks that malicious hackers can't gain access to cause damage, many of us now spend a lot of time surfing the Net at home, and Windows 95/98 has no security measures built in to stop this. Both Windows 2000 and Windows ME (the latest in the long line of Windows 95/98 releases) also have file protection, which ensures that badly behaved applications can't change a protected system file. Both these aspects will help to keep your PC running smoothly and reliably.

Catching Up With Windows 98

Graphically speaking, Windows 2000 looks fairly similar to the Windows 95/98 family, and Windows ME has already had a graphic makeover to make it look almost exactly the same as Windows 2000, so you won't really notice much difference if you make a sideways upgrade. The main differences are under the surface, and in the area of third-party compatibility and support.

Some of the 'new' features that were added in the development of Windows 2000 from Windows NT 4.0 have already been available to Windows 95/98 users for some time. These include Plug and Play for easier hardware detection, and support for USB and FireWire. Some people have also claimed that Windows 2000 USB performance with music peripherals is better than with Windows 98, but I've yet to hear conclusive evidence. DirectX 7.0 is also included in Windows 2000, once again to bring it into line with Windows 98. In NT 3.51 there was no DirectX support at all, while DirectX 3.0 support was added in NT 4.0. However, in this early version DirectSound was only supported by an emulation mode through the MME (MultiMedia Extensions) drivers, and most of us already know how much soundcard performance drops with software synths when using emulated drivers. The reason for this was due to NT's security features, which prevented multiple applications accessing the same piece of hardware. Under Windows NT, the version of DirectX couldn't be upgraded by the user either, so those applications that checked for the required version and even offered to install a later version of DirectX because they needed one of its new features could only be run on Windows 95/98.

One new Windows 2000 feature that may sound useful to musicians is Hibernation — the ability to save the current state of your PC including open applications, window positions, and desktop, so that when you turn it back on everything is exactly as you left it. If you're in the middle of working on a song this could be a godsend. If, however, like most musicians, you have lots of memory installed, it may take longer to use Hibernation than shutting down and booting up normally, since the entire contents of RAM are first saved to disk, and then reloaded afterwards. In addition, your PC needs to have a fully ACPI-compliant BIOS to fully support ▶



To make it possible to divide any application's workload between multiple processors it needs to be split into threads, like *Cubase VST* 5.0, shown here. This uses nine threads: the most processor hungry at the top of its list is for audio processing, while disk I/O for audio playback is the bottom of the list, and takes much less power. The remainder are for such things as MIDI I/O, graphic updates and the user interface.

this feature. While most machines sold in the last 18 months or so will have this, others won't — see the Installation section for more details.

Multiple Processors

Given that buying a faster processor is the most popular upgrade among PC users, it seems a waste to simply throw the old one away or stick it in a cupboard to gather dust — and perhaps the most attractive feature of both Windows NT and 2000 for musicians is that, unlike the Windows 95/98/ME family, they can support multiple processors. Windows 2000 Professional can use one or two processors, while the Server version can support up to four, and the Advanced Server up to eight! For musicians using software plug-ins to run all their EQ and effects, the thought of being able to add more processing power simply by plugging in a second processor alongside their existing one is enticing.

However, there are restrictions. Not only does your motherboard have to be specially designed to take two or more processors, but you can only use one of a few suitable processor models. The main one at the moment is the Intel Pentium III, although at least one motherboard manufacturer makes a model that can use two Intel Celeron processors, even though Intel does not support this. Most importantly, however, to gain any significant benefit the software also has to be specially written or adapted with multiple processors in mind.

The way multi-processing works is that applications are divided into multiple 'threads', semi-independent processes that can be run in parallel. Even with a single processor there can be advantages in this programming approach. Many applications use multiple threads to enable multi-tasking, so that one task can carry on while another is started; and when multiple processors are available, different threads can be allocated to each CPU.

With some processor-intensive programs, such as 3D graphics and CAD software, it's comparatively easy to split off different functions to each processor. However, the situation is somewhat more complicated when it comes to an application like a MIDI + Audio sequencer, since all the different elements are being streamed in real time, and must remain in sync.

Music applications can be split up so that audio mixing and effects are handled in one thread, MIDI processing in another, and user interface responses in yet another, and while it's possible to specifically assign each task to a separate processor, you can also let Windows handle its CPU resources dynamically across a single processor, by giving them different priorities. The lowest priority is nearly always given to the user interface, which is why your screen updates get sluggish when you run lots of real-time software plug-ins.

This approach is taken by quite a few different applications such as Steinberg's *Cubase VST*, *Wavelab*, and *Nuendo*, Emagic's *Logic Audio*, and all of Cakewalk's multitrack products. If you want to see whether your own applications are written using multiple threads, you can use a utility like *TaskInfo2000*, which I discussed in PC Notes August 2000 (you can download this at www.iarsn.com/downloads). I've shown it running alongside *Cubase VST* in the screenshot.

When this sort of application is used with two identical processors, the entire audio processing workload is normally handled by one processor,

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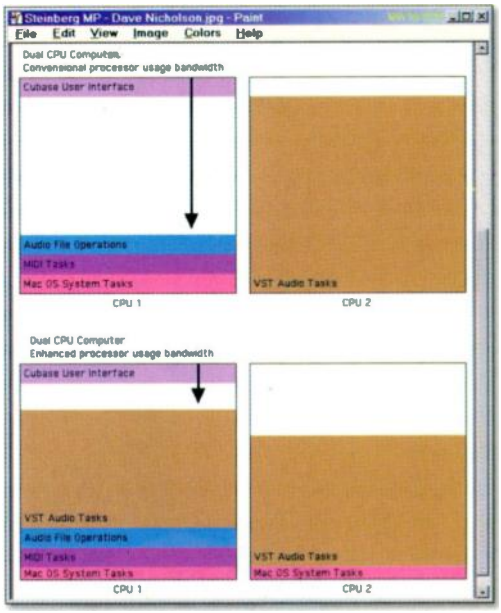
with any remaining tasks left to the other one. Since audio processing is by far the most significant overhead for any music application, this approach results in a typical overall performance improvement of just 20 to 30 percent — not that much considering the extra cost of setting up a dual-processor system. To get further improvement you need to split the audio processing in some way between the two CPUs, so that it can be processed in parallel. This means added code and complexity, and until far more of us are running dual-processor systems I suspect that few PC applications will be rewritten to run like this. However, with the introduction of the new multi-processor Mac G4 series, several music developers have devoted more time to dual-processor support in their Mac versions. Emagic have optimised version 4.5.1 of *Logic Audio Gold* and *Platinum* for dual-processor Macs in such a way that the second CPU is used for all the main audio processing including plug-ins and mixing, while the first CPU is used for the Mac OS, screen redraws, MIDI processing, audio data loads and saves, live soft synths and their plug-ins, and live inputs and their plug-ins. By distributing the audio processing in this way, performance improvements vary between 20 and 60 percent, depending on what proportion of your music is being processed 'live'. Sadly, at the time of writing these optimisations aren't yet available for the PC version, but Emagic are currently working on it.

Another developer working in this area is Steinberg, whose Advanced Multiple Processing Support was introduced on the Mac version 5.0 of *Cubase VST*. This Advanced MP code will also put in an appearance in the imminent PC version 5.0 revision 2. Once again the audio processing is split between the two processors, giving much larger performance boosts of 50 to 60 percent. Steinberg's Product Manager Dave Nicholson has written a very informative article about the differences between a conventional single-processor system, a conventional dual-processor system, and their Advanced Multi-Processor system in the Knowledge Base section of their web site. You can find this at service.steinberg.de/knowledge.nsf/show/mac_multiprocessor.

Neither approach will give a dual 800MHz processor system the same performance as one with a single 1.6GHz processor, but then buying two 800MHz models is considerably cheaper. Looking at a December PC catalogue, 800MHz processors were the slowest advertised on the Pentium III list, and cost only £188 including VAT. So, assuming a 50 percent improvement running the updated *Logic Audio* or *Cubase VST* when they become available for PC, you could have the equivalent of a 1.2GHz Pentium III for just £380, though this would probably equal only a 1GHz Pentium III for less optimised software.

Ultimately, if you want to run the maximum number of real-time effects, buying the single fastest processor you can afford is the best bet when running music software. However, there are other advantages of running a dual-processor system that many people overlook. By splitting the graphics, file I/O, MIDI, and main audio processing into different threads you gain a more responsive user interface, and if these threads are then handled by two processors, the situation improves noticeably. Every developer I spoke to independently stressed this: when a single-processor system is pushed to the limit it becomes sluggish and unresponsive, whereas a dual-processor system remains far more comfortable to use. In fact, the second CPU can be loaded to 99 percent while the first will still happily respond to key presses and open new windows; if you tried this on a single CPU system it would appear to have crashed.



Steinberg have already perfected Advanced Multiple Processor support in their new Mac *Cubase* version 5.0, and this will appear in the imminent PC version 5.0 revision 2.

Using dual processors can also increase the maximum number of simultaneous audio tracks beyond what is possible with a single CPU, although ultimately this is still limited by the speed of your hard drive. It can also benefit MIDI timing — Emagic claim that by splitting audio and MIDI processing to separate processors on the new Mac version of *Logic* they achieve "a new level of USB MIDI timing precision", which must be good news for all musicians. The only disadvantage is that CPU performance meters tend to be far less accurate.

Driver Support

Sadly, the biggest stumbling block to widespread use of Windows 2000 by musicians is a scarcity of suitable soundcard and MIDI drivers. The current situation will be far clearer if I briefly explain the different types of Window driver in use, starting

Formatting Hard Drives

One decision that needs to be made before installing Windows 2000 is how to format your hard drives. Windows NT used a hard-drive file system named NTFS (New Technology File System), which was different from that used by Windows 95/98, although it could also recognise the FAT16 formatted drives used by Windows 95. NTFS provides more security for a system that will get used by various people, by keeping multiple copies of its master file table, to protect against corruption and data loss. FAT32 was introduced in Windows 95 OSR2 and wastes far less space than FAT16 by having a variable cluster size, and this is what most people now use with Windows 98.

Windows 2000 recognises both NTFS and FAT32, and during an upgrade from Windows 95/98, the installer will ask you if you want to convert the partition to NTFS. If you're going to run it alongside Windows 95/98 as a multi-booting system you will have to use FAT32, or your common data be invisible when running the Windows 95/98 partition. Conversely, if you already have an NT 4.0 installation and want a multi-booting system you'll have to choose NTFS, although you should be aware that Windows 2000 upgrades the drive to NTFS version 5. This can still be used from NT4, but its *CHKDSK* drive error checking utility won't work any more.

If you have need to retain compatibility with Windows 95/98, most experts agree that NTFS is a better file system than either FAT16 or FAT32, although a few people have found its hard-drive read/write performance under Windows 2000 worse than either NT or 98, especially with older motherboard chipsets. If you're in any doubt about changing the partition type during the install, choose the 'No Changes' option, since you can always change your hard-drive format afterwards using the *Convert* utility, or with a third-party application like PowerQuest's *Partition Magic*.

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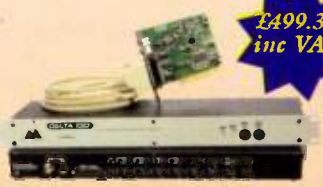

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with Windows 95. This used so-called VXD-style drivers, and each soundcard developer had to add into these the appropriate routines to support DirectSound for lower latency. As most of us remember, without DirectSound support Windows used an 'emulation layer' that pushed latency back up to the level of the more basic MME drivers.

Meanwhile, Windows NT 4.0 required a completely different design of driver from the consumer Windows 95/98 platform. Since it was primarily a business OS, few soundcard manufacturers bothered to devote much effort to the extra development required. While the few NT soundcard drivers that were released were fairly successful for audio recording and playback, as I mentioned earlier, DirectSound was supported in NT only through a high-latency emulated version, which made NT rather unsuitable for many software synths. There were also various problems with MIDI timing under NT, which is the reason why neither Steinberg nor Emagic ever released versions of *Cubase* and *Logic* specifically for NT systems.

Like Windows 95, Windows 98 could also use VXD-style drivers, but on this platform Microsoft also introduced a completely new design: the WDM (Win32 Driver Model) format. This is intended to simplify future driver development, by providing a unified design suitable for both consumer and business operating systems, such that one driver will be totally compatible across all future platforms. Another advantage of WDM drivers is that they are better-suited for busses like USB and FireWire. WDM also incorporates a standard low-latency wave interface into Windows itself, so that a WDM driver automatically gets both MME and DirectSound support from Windows without needing special code added by each soundcard manufacturer. Unfortunately, WDM drivers are far more similar to the NT ones than to the older VXD model used by both Windows 95 and 98. Given that so few soundcard manufacturers had thus far developed NT drivers, it's perhaps hardly surprising that even fewer took up the option of WDM when Windows 98 was launched, especially since their existing Windows 95 VXD ones still worked well under Windows 98.

In the case of Windows 2000, two types of driver can be used — Windows NT 4.0 and WDM — but you must use one or the other for each hardware expansion device in your PC, including your graphics card, MIDI interface, soundcard, and so on. You cannot, therefore, assume that Windows 95/98 drivers will run under Windows 2000, since most are still in VSX format. Moreover, although existing NT4 drivers may work well with some peripherals, NT4 soundcard drivers will still suffer from the same limitations as they did when running under NT4. Obviously, the best solution is to use WDM drivers, but here we return to the fact that few soundcard manufacturers have developed them, so we face a chicken-and-egg situation: until Windows 2000 is taken up by huge numbers of musicians, few manufacturers are likely to write suitable soundcard drivers for it.

As you might expect, there is no shortage of books and other resources for those who want to know more about Windows 2000.

Another Hurdle

Until recently, there was a further complication for WDM audio driver developers. WDM provides a single driver model for all future Microsoft operating systems, as well as multi-client access to audio hardware, so WDM drivers should, for

Windows 2000 Checklist

If you are intending to upgrade, here are the things to check *before* you get out your credit card.

- Make sure that your motherboard BIOS is Windows 2000-compatible, and if not, whether a flash update is available. This should ensure that features like Power Management work correctly.
- Make sure all your hardware expansion cards have Windows 2000-compatible WDM drivers by looking on the manufacturers' web sites. You can install these before you upgrade.
- Failing this you will need Windows NT 3.51 or 4.0 drivers, although these will only provide emulated DirectSound support.
- Check that all your software is Windows 2000-compatible.

There are some specific areas to watch out for when attempting to run existing software under Windows 2000. Because it handles CD-ROMs differently, CD-R software that worked in Windows NT 4.0 or 98 has to be updated, so you should double-check to see if a new version has been released. You should be very wary of any utility program that changes things at a low level, such as a hard-drive defragmenter. Those written for NT or 98 won't work, although Microsoft do bundle their own. By their very nature, virus-checking utilities are specific to each operating system, so you will definitely need a new version.

If you want to take advantage of Windows 2000 multiple processing you will also need:

- A motherboard with dual-processor support.
- Software applications that are multi-threaded, and preferably optimised to give optimum performance with multiple processors.

instance, allow you to run a soft synth and audio sequencer on the same stereo output or mix together loads of audio streams, using WDM's own audio mixer. Unfortunately, however, this built-in audio mixer has some 30mS of latency.

At the NAMM show back in February 2000, Cakewalk managed to get representatives from 24 music hardware and software companies to discuss support for a WDM driver extension to get around this limitation. The initial response to their detailed proposal was 'overwhelmingly positive', and Cakewalk have made great progress since then by working closely with Microsoft themselves to resolve this latency problem. The result is the publishing of a new WDM Kernel mode streaming interface that bypasses the internal mixer, and which will work with any WDM audio driver running on Windows 98, 98SE, or 2000. These interfaces are now available to every audio manufacturer who expresses an interest, and will also be included in the Whistler development kit (of which more later).

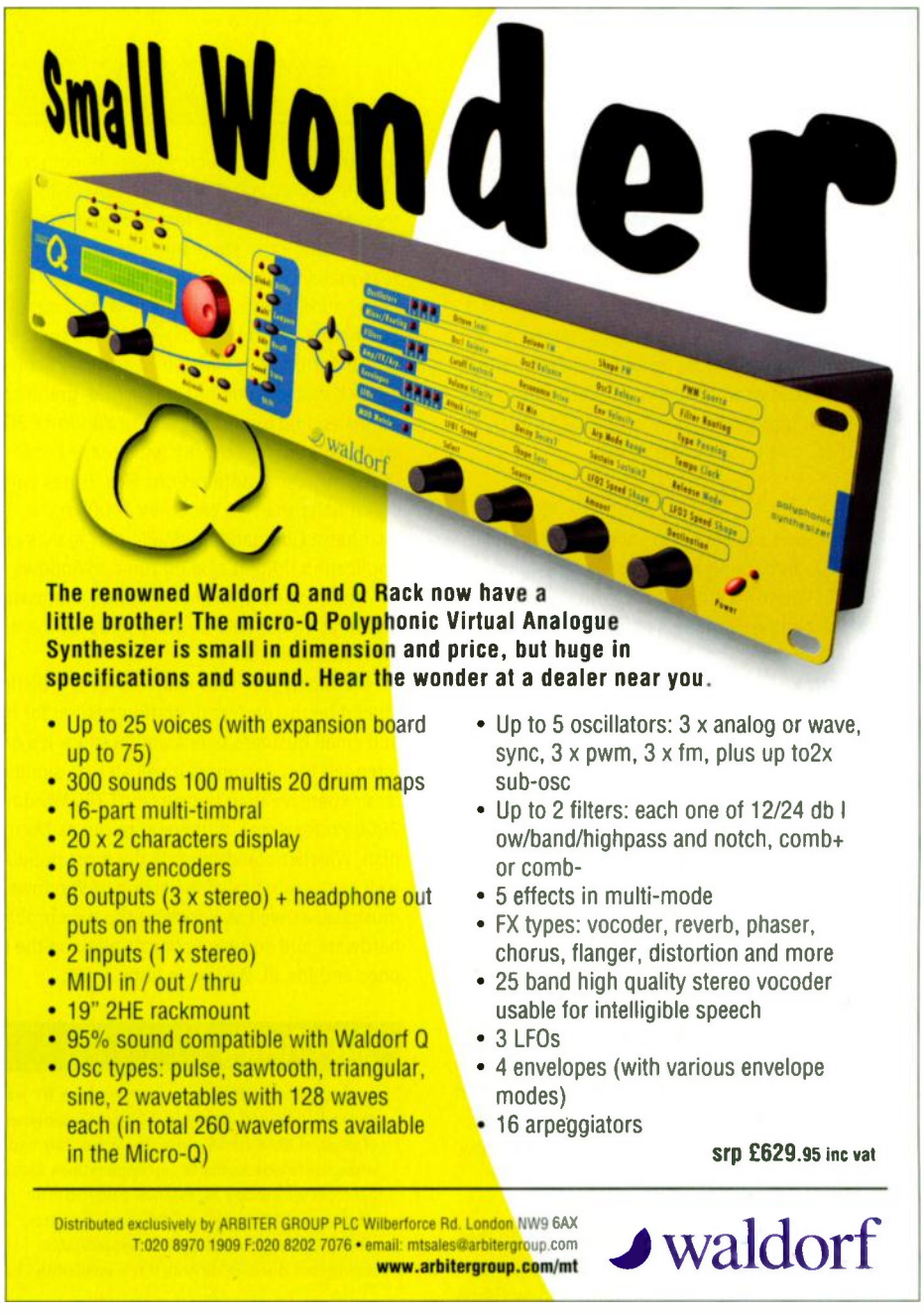
Cakewalk have already managed to achieve 10mS latency with an unmodified Soundblaster Live! card, and 1.5mS with M Audio's Delta series, and have used this technology in their next-generation *SONAR* multitrack digital recording system, to be launched at the Winter NAMM show in January. *SONAR* is optimised for both Windows 2000 and WDM, and provides "ultra low-latency mixing as well as real-time effects processing on input".

Installation

If you decide to take the plunge, there are various things you should check before parting with any money (see the Windows 2000 Checklist box, left). Microsoft also have a Windows 2000 Compatibility web site (see screenshot on page 154) which offers more pre-installation information. Bear in mind that installing a new operating system is the most fundamental change you can make to your PC, and that should anything should go wrong during the procedure you might be left with a PC that needs its hard drive completely reformatting and every application reinstalled from scratch. Windows 2000 performs plenty of checks on existing applications and drivers to check for compatibility, but the chance of many music applications being included in this checklist is unlikely.

"We face a chicken-and-egg situation: until Windows 2000 is taken up by huge numbers of musicians, few manufacturers are likely to write suitable soundcard drivers for it."

For this reason, it's well worth considering a clean install on a different partition, or better still another hard drive, since this will allow you to start with a clean slate and lose all the unnecessary dross that always accumulates on every hard drive given half a chance. Your Registry will also start its new life in a fresh and compact state, and generally ▶



you'll give your PC the best chance of optimum performance in its new incarnation. The only time you should consider upgrading over the top of your current operating system is if you've got loads of applications already installed that you don't want to (or can't) reinstall, or as mentioned earlier, as a way of running an application that can't be installed under Windows 2000, but which runs quite well if you smuggle it in under cover of the upgrade.

However, the Windows 2000 installer can also automatically configure a multiple-booting system with either Windows 95/98 or NT 4.0, so that each time you boot your PC you can choose which version of Windows you want to run. If you decide to do this, or to upgrade over the top of an existing operating system, you can start the Windows 2000 Setup.exe file from inside Windows. Otherwise, you can boot from the Windows 2000 CD-ROM if your PC allows this, or failing that use the supplied boot floppy disks. Before you complete the installation you'll have to decide which format to use for your operating system hard drive (see Formatting Hard Drives box on page 150).

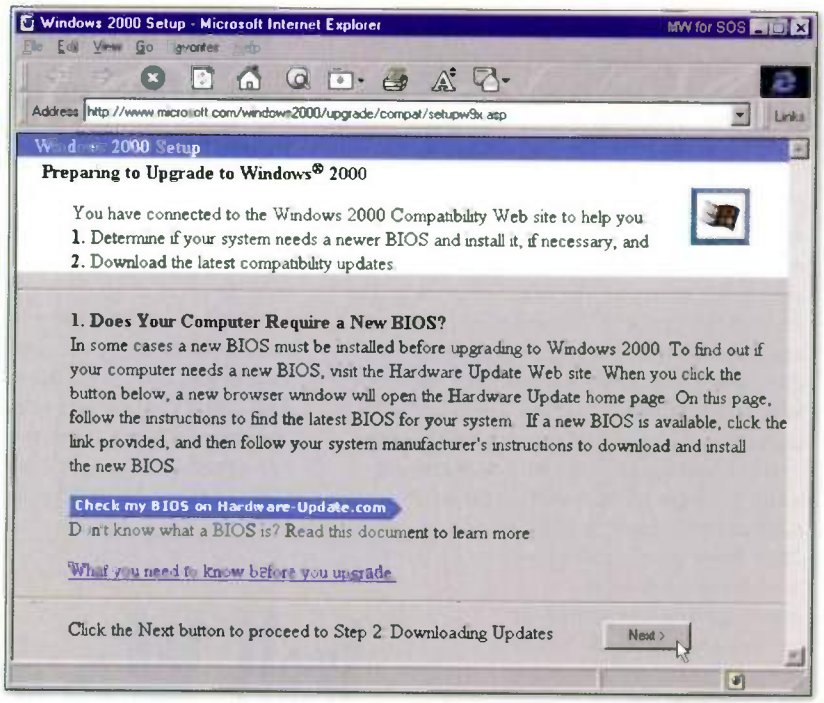
It goes without saying that you should back up everything before you start. You should make sure you have a copy not only of all your songs, accounts, and word processing files, but also things like plug-in presets, INI files that contain all your favourite settings, VST Instrument patches, and all those update files that you downloaded to bring your applications up to their latest versions, and which you'll probably now need once again. This is another good reason to keep your data either on a separate partition, or on a different hard drive altogether, safely out of harm's way.

The Future

On my Internet travels I came across a user poll asking whether people would use a consumer version of Windows 2000 if one were available, and an overwhelming 78 percent said 'yes'. This is hardly surprising, since if you combine the stability and security of the current Windows 2000 Professional version with the multimedia and consumer support of Windows 98 you would have a winner. Well, Microsoft have long wanted to take this path, so that they can concentrate on further development of one rather than two major Windows platforms. The problem in the past has been that the hardware requirements of NT have always been significantly higher than those of 95/98.

However, such is the march of technology that when the next version of Windows 2000 (codenamed Whistler) is launched, its requirements will be supported by most new consumer PCs, and it will incorporate many of the remaining bells and whistles from the consumer platform. It will be available as a minor upgrade for existing Windows 2000 users, and a major upgrade for those still running Windows 98/ME. Two versions are expected — Professional and Personal — with the more expensive Professional version having more security features and support for Intel's new 64-bit Itanium processor. Microsoft are hoping to launch both in the latter half of 2001. A beta 1 version has recently been released for industry testing, and even at this early stage initial feedback is reasonably positive. One of the biggest issues being addressed is software and hardware compatibility. To be widely accepted by the consumer market, Whistler needs to be able to run a much wider range of soundcards, graphics cards, modems, and applications than Windows 2000 currently can. Microsoft have already confirmed that many more applications like games will run on Whistler than on Windows 2000, and the former also has a Compatibility Mode that makes an application think it's being run on Windows NT 4.0 or Windows 95. This makes things a lot easier, although you should be wary of using this to run low-level utilities.

Ultimately, the Personal version of Whistler should be the perfect operating system for home and small business users, and because it's mainly intended for consumers it will also be significantly less expensive than the current £250 Windows 2000 Professional. If things turn out as Microsoft plan, Whistler could become the most popular as well as the most reliable version of Windows for the musician, as well as knocking the twin problems of hardware and software compatibility on the head once and for all. We live in hope... SOS



Before you decide whether or not Windows 2000 is for you, check first that your motherboard is fully compatible.

I would like to thank the following developers for their expertise, opinions, and feedback during the research for this article:

- *Joe Bibbo of Nemesys Systems.*
- *Philippe Goutier, author of* Wavelab.
- *Ron Kuper of Cakewalk.*
- *Michael Kurz of Native Instruments.*
- *Dave Nicholson of Steinberg.*
- *Marc-Pierre Verge of Applied Acoustics Systems.*
- *Christine Wilhelmy of Emagic.*

MIDI Timing

As mentioned in the main text, Windows NT was generally avoided by music developers because of its poor MIDI timing, and was especially bad when users attempted to run applications that used code intended for Windows 95/98. The situation with Windows 2000 is much better, since its design ensures much more stable timing, but once again only if the application has been written using Windows 2000 APIs (Application Program Interfaces), and not 95/98 ones. Splitting tasks between two processors doesn't seem to make MIDI timing any worse either. The most important thing to ensure is that your MIDI interface has Windows 2000-compatible drivers, and there are still not too many of these around!

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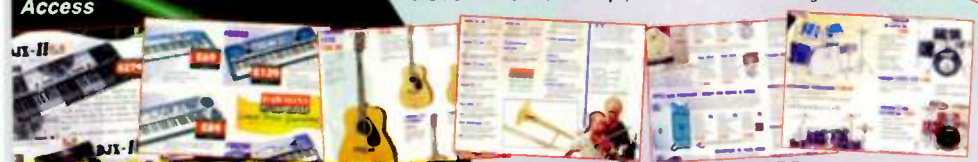

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Roland SDP20

E-Percussion™ 5000
Roland TD-8 *(V-Drum Sound Module)*
Roland PD-7 *(Dual Trigger Hi-Hat Pad - plugs into SPD20)*
Roland PD-80R *(Dual Trigger 8" Drum Pad)*
Universal Drum Pad Clamp (2of) *(clamps the PD5)*
Roland KD-7 & Roland FD-7 *(Kick Drum & Hi-Hat Trigger)*
Dual Support Pad Stand *(fits the PD-7 & PD-80R)*
Module/Brain Stand & Bass Drum Pedal &
Drum Throne *(to sit on - just in case you didn't know!!!)*
TOTAL PACKAGE PRICE £1349

Other Pads available:
PD-9 *(10" Dual Trigger)* £169
KD-80 *(Acoustic Feel Kick Trigger)* £229
PD-100 *(Acoustic feel snare/tom trigger)* £195
PD-120 *(Acoustic feel 12" Dual snare/tom trigger)* £329

We can put together a Drum Package for you including Pads, Stands, Stools and Amplification. Please call us for a quotation

Call us for an E-Drum Flyer on 01925 245422

Roland V-Drum System

Yamaha DD50 Drum Machine with Pads and Midi Out

If you want to add some Real feel to your Music then the DD50 could well be the answer. It has 60 built in sounds to operate as a standalone device but it can also be used as a Drum trigger with 7 pressure sensitive pads. Comes with a Yamaha KPA3 Power Supply Unit, 2 Drum Sticks and 2 Pedal Triggers Free of Charge

£179.99
Save £20 off RRP

Digital Audio Workstations

Akai DPS12i inc 8 Gig Drive
£37.50 per month
£99 Dep. plus 24 x £37.50
Total 0% Credit Price £999

Akai DPS16 inc 10Gig Drive
£62.45 per month
£0 Dep. plus 24 x £62.45
Total 0% Credit Price £1499

Fostex VF08 inc 5 Gig Drive
£44 per month
£71Dep. plus 12 x £44
Total 0% Credit Price £599

Roland VS1880 inc CD Writer
£81.25 per month
£249 Dep. plus 24 x £81.25
Total 0% Credit Price £2199

Yamaha MD8S + 5 Disks
£45 per month
£99 Dep. plus 18 x £45
Total 0% Credit Price £909

Fostex VF16 Ltd. Stocks
£869
Usually sells for £1099. Save £230 for a limited time

Yamaha MD4S + 5Disks
£43 per month
£79 Dep. plus 10 x £43
Total 0% Credit Price £559

	Tracks	Drive	Rec.Time	Effects
Akai DPS12i	12	8Gig	1600mins	2
Akai DPS16	16	10Gig	2000mins	2
Fostex VF16	16	5.1Gig	1000mins	2
Yamaha 4416	16	12Gig	2400mins	2
Yamaha MD8S	8	DataDisk	18mins	x
Yamaha MD4S	4	DataDisk	18mins	x

Some of the rec. times above take into account Data Compression

We can also fit bigger drives into any model, past or present. Call us for a price

Yamaha F310 Acoustic Guitar

Ever fancied owning a Proper Acoustic Guitar. Now we give you the chance at a bargain price.

The Yamaha F310 has a great tone and will complement any recording

£88.99
Yamaha F310

Includes a **FREE Yamaha Tuner worth £19.99**

Zoom PS02 Persoanl Recording Studio with Effects

Cigarettes Not Included!!!

Zoom PS02
£20 per month
£59 Dep. plus 12 x £20
Total 0% Credit Price £299

Zoom PS02 Digital Multi-Track Recorder. 3 Tracks with 10 Virtual Tracks per track. Auto Punch in/out and Bounce Functions. Built in High Quality PCM Sampled Drum and Bass Tracks to play along with or record with over 200 preset patterns. 50 Effects for Guitar, Bass, Keyboards or Vocals. "VAMS" Technology Amp Modelling for realistic sound. Mix down Effects. Backlit LCD Display. Built in Mic Input. Battery (1 x AAA not supplied). Comes with Power Supply and 8 Meg Smart media Card providing 3 minutes or recording time (if you erase the demo song)

Samplers

Akai S2 inc CD-Rom Player & 18 Meg Memory
24Months at £22.99/month Total 0% Credit Price £551.76
Akai S3000XL inc CD-Rom Player & 18 meg Memory
24 Months at £40/month Total 0% Credit Price £960
Akai S5000 inc CD-Rom Player £59 Dep + 24 x £49
Total 0% Credit Price £1235
Akai S6000 inc CD-Rom Player £299 Dep + 24 x £72 = £1807 0%
Akai MPC2000XL inc 32 Meg Memory £99 Dep + 18 x £44 = £891
Emu E Card inc Connecting Leads £269 inc Connecting Leads
Emu ESI2000 inc 10 CD-Roms & Drive £49 Dep + 18 x £35 = £679
Emu E5000Ultra inc 20 CD-Roms £79 Dep + 18 x £99.95 = £1118.10
Emu E6400 Ultra inc 9 CD-Roms £199 Dep + 18 x £77 = £1585
Emu E4XT Ultra inc 9 CD-Roms £249 Dep + 24 x £79 = £2145
Emu E Synth Ultra inc 9 CD-Roms £299 Dep + 18 x £98 = £2363
Yamaha A4000 inc 9 CD-Roms £749
Yamaha A5000 inc 9 CD-Roms £1149 and including FREE SU200
Creamware PowerSampler PCI Card
£49 Dep plus 10 x £40 Total 0% £449
Korg Electribe S £99 Dep plus 12 x £27 Total 0% £423

£49 per month
£59 Dep. plus 24 x £49
Total 0% Credit Price £1235

Akai S5000 includes 10 CD-rom from Akai and a CD-Rom Player with the correct lead to play them on

£22.99 per month
£0 Dep. plus 24 x £22.99
Total 0% Credit Price £551.76

Akai S2000 Sampler inc CD Rom Player

A5000 Includes FREE SU200 call for details

£1149
inc Free SU200

£1949
inc 5 Zip Carts

Power Sampler

£159 Akai S5000

£259 Akai EB16 Effects

£35 per month
£49 Dep. plus 18 x £35
Total 0% Credit Price £679

£40 /month
see deal in text

Accessories available including 64 Meg from £89!!!

Synths & Expanders

£59 per month
£299 Dep. plus 24 x £59
Total 0% Credit Price £1715

£45 per month
£119 Dep. plus 24x£45
Total 0% Credit Price £1189

£35 /month
see deal in text

£48 /month
see deal in text

£50 per month
£99 Dep. plus 12 x £50
Total 0% Credit Price £999

£38 /month
see deal in text

£39 per month
£79 Dep. plus 12 x £39
Total 0% Credit Price £547

Emu XL1 Multi-Timbral Lead Module	£83 Dep + 18 x £27 0% £569
Emu Proteus 2000	£99 Dep + 12 x £50 0% £699
Emu Virtuoso	£99 Dep + 18 x £43 0% £869
Korg Triton (inc. GigBag & Stand	£249 Dep + 24 x £59 0% £1715
Korg Triton Pro (76 Keys with above)	£345 Dep + 24 x £70 0% £2099
Korg Triton ProX (88 Keys Fully weighted)	£2439 Call for finance deal
Korg MS2000 Kybd (inc. Stand)	£99 Dep + 12 x £50 0% £699
Korg MS2000R (inc AKG D880 Mic)	£139 Dep + 12 x £39 0% £947
Korg Electribe A inc Leads	£49 Dep + 10 x £25 0% £299
Novation Nova Desktop	£99 Dep + 18 x £39 0% £769
Nova II Keyboard (12 Voice)	£119 Dep + 24 x £42 0% £1127
Nova II X Keyboard (24 Voice)	£129 Dep + 24 x £46 0% £1281
Nova II XL Keyboard (32 Voice)	£139 Dep + 24 x £50 0% £1339
SuperNova II Rack (24 Voice)	£119 Dep + 24 x £45 0% £1199
Supernova II Rack (36 Voice)	£139 Dep + 24 x £50 0% £1339
Supernova II Rack (48 Voice)	£159 Dep + 24 x £55 0% £1479
Supernova II Keyboard (24 Voice)	£119 Dep + 24 x £57 0% £1487
Supernova II PRO Keyboard (36)	£169 Dep + 24 x £61 0% £1633
Supernova II PRO X Keyboard (48)	£189 Dep + 24 x £67 0% £1797
Nord Lead II	£189 Dep + 18 x £48 0% £963
Nord 2 Rack	£799 Available on Low Rate Finance
Nord Electro	£1149 Available on Low Rate Finance
Nord 3 Synth	£1585 Available on Low Rate Finance
Nord Micro Modular	£40 Dep + 10 x £35 0% £399
Roland XV3080 inc SRX Board	£1299 (also includes cables to connect)
Roland XV5080 inc SRX Board	£1699 (also includes cables to connect)
Yamaha CS1X	£99 Dep + 12 x £29 0% £397
Yamaha CS2X	£99 Dep + 12 x £44 0% £567
Yamaha CS6X	£149 Dep + 24 x £47 0% £1277
Yamaha CS6R	£99 Dep + 18 x £45 0% £673
Yamaha S30 Synth	£99 Dep + 18 x £39 0% £799

See Deals in Text

£43 per month
£99 Dep. plus 18 x £43
Total 0% Credit Price £873

£44 per month
Total 0% Credit Price £1047

DJ Gear

£299
KAM Silver Dwarf KIT

Numark Battle Pack
£479
Direct Drive Decks, Mixer & Carts. Includes Speakers

KAM KMX100 KIT
£32 per month
£79 Dep. plus 10 x £32
Total 0% Credit Price £399

For loads more deals on DJ Gear, Call us on 01925 245422 for a DJ Flyer

Belt Drive Decks, Mixer & Carts. Includes Speakers
£329

Groove Zone

£499
Roland MC307

Alesis AIRFX	£199
Roland MC307	£499
Akai MPC2000XL 32 Meg Memory	£849
Roland SP808EX inc 2 x 250 Meg Carts	£1099
Available for £143 Deposit plus 24 x £39	
Korg ES-1 Sampler	£99 Deposit plus 12 x £27=£423
Roland MC505 inc Stand or Headphones	£860
Yamaha SU200 Sampler	£299

WRH

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Call 01925 245422
till 7pm - 6 Days (Mon-Sat)

or order on-line at
www.dawsons.co.uk

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PC Packages Viper 1000 & 2000

Buy a PC Package from Dawsons Music and all software and hardware will be configured and installed. All you need to do is Switch on & Go. They also include seperate Graphics Cards and Seprate Soundcards unlike High Street PC to make future upgrades easy.

Viper 1000
Genuine Intel PIII 700
64 Meg Fast Ram
56K Internal Modem
6.4Gig Hard Drive/52x CD
17 inch XGA Monitor
SoundBlaster 1024 Live
Steinberg Cubasis VST
£999

Viper 2000
Genuine Intel PIII 700
64 Meg Fast Ram
56K Internal Modem
13.5Gig Hard Drive/52x CD
17 inch XGA Monitor
Guillemot ISIS Card inc
Emagic Logic Audio SE
£1349

Includes Free Delivery (usually costing over £30 from the High Street)

Any Questions, please call us on 01925 245422

PC Packages Viper 3000 & 4000

With higher specs and more Ram these machines will give you more tracks and let you run more VST plug-ins. They both come with Free Delivery and all installed software. You even have the option of adding a 41 Key Touch Sensitive Controller Keyboard (worth over £130) for just £50 when you buy one of these PCs from Dawsons.

Viper 3000
Genuine Intel PIII 800
128 Meg Fast Ram
56K Internal Modem
13 Gig H-Drive/52x CD
17 inch XGA Monitor
Iomega USB CD Writer
Yamaha SW1000XG
Steinberg Cubase VST 5
£1999

Viper 4000
Genuine Intel PIII 800
128 Meg Fast Ram
56K Internal Modem
20 Gig H-Drive 52x CD
17 inch XGA Monitor
Iomega USB CD Writer
Midiman Delta 1010
Midiman USB 8x8 Midi
Steinberg Cubase VST 5
£2549

Just £49

Any Questions, please call us on 01925 245422

Tascam USB Recording for Mac or PC

Now a complete Digital Studio Recorder Interface from the people who invented Portastudios. The US428 allows you to control your Midi Sequencers Audio and Midi Tracks with real faders. It's control surface gives you access to EQ, transport and assignable buttons. Built in Audio In/Out Stereo as well as Midi In/Out and also Digital in/out. Comes complete with a copy of Steinberg Cubasis VST (PC) and Mac ASIO Drivers

£40 per month
£49 Dep. plus 10 x £40
Total On Credit Price £449

Macintosh Packages

Apple Mac Systems are all available on a low rate finance scheme. Please call us for details. Units will have software and hardware installed and tested prior to us sending them out. All peripherals are 100% Mac compatible and we do not use Grey Imports.

Media 2000
G4 400MHz
128 meg Ram
20 Gig Drive
DVD-Rom/CD-Rom
56K Modem
17 inch Monitor
Yamaha SW1000XG
Steinberg Cubase VST
£2279

Media 3000
G4 400MHz
128 meg Ram/20 Gig Drive
DVD-Rom/CD-Rom
56K Modem
17 inch Monitor
Midiman Delta 44
Emagic Logic Gold
Midiman USB MidiSport
£2289

Media 4000
G4 400MHz
192 meg Ram
30 Gig Drive
DVD-Rom/CD-Rom
56K Modem
17 inch Monitor
Digidesign 001
£2399

USB CD Re Writer only £199 inc VAT

Video on the Mac

Broadcast Video Editing Systems available based around Macintosh, Apple Final Cut Pro and DV Video Cameras with DV in and out. Call us for more information on 01925 245422

Mac on a Budget

Media 1000
iMac G3 450Mhz with 128 Meg RAM
20 Gig Internal Drive & 56K Modem
DVDRom (plays CD-Roms too)
FireWire for Digital Video Cameras
Midiman USB MidiSport 2x2
Emagic Logic Silver Software
£1399

Reason Software for Mac or PC

Reason comes in the shape of a classic studio rack, packed with all the gear you could possibly need. Samplers, Analog synths, Mixers, Step time drum machines, Effects, and a realtime multi-track sequencer for fast and intuitive music making. Everything is there except the drawbacks: no tripping over cables or locating ground hum. All of Reason's 16 devices have the look and feel of the real thing, but more importantly, they have the sound, the performance and the attitude to rival any hardware out there. And you can use each device as many times as your CPU can handle. Units include: NN19 - Sampler, SubTractor - Polyphonic 2 oscillator synth, and loads more

£99!!!

SoundScape Systems - Complete Solutions inc. Computer

Soundscape

True Stability with a Sound Quality 2nd to None. Check out the PC system that more and more people are starting to use for Advance Sound Editing and Recording. Can be Locked to Video for syncing Audio or your Video soundtrack or adding Sound effects quickly and accurately.

Complete SSHDR-1 Systems inc PC from
£2999
Installed, Configured & with FREE Delivery to UK Mainland

PC Soundcards

Please find below a listing of the majority of Soundcards, software and Midi Interfaces that we can supply. There are new products being launced every day so if you cannot find the product you want, please call us on 01925 245422. The prices "with a PC" & "With a Mac" mean that those prices are only valid if the item is bought at thew same as the Computer. Please call us for any finance options

Description	Singly	With a PC	With a G4
SoundCards			
SoundblasterLive Platinum	£169	£159	x
Guillemot ISIS Card (8in and 4out with Midi)	£219	£209	x
Emagic Audiowerk 2 (2I/O + SPDif I/O)	£175	£170	£170
Midiman Delta 44 (4I/O)	£205	£199	£199
Midiman Delta 66 (4I/O + SPDif I/O)	£299	£279	£279
Midiman Delta 1010 (8i/o + SPDif i/o & Midi i/o)	£549	£529	£529
Midiman Delta DIO 2448	£109	£99	£99
Midiman Delta DIO 2496 Dig I/O + Analogue out)	£199	£179	£179
Yamaha Sw1000XG	£379	£369	£369
Yamaha DSP Factory	£499	£479	£479
Emu E-Card	£269	£249	£249
Gadget Labs Wave 8/24	£449	£429	£429
EgoSys Wami Box	£399	x	x
Event Gina 24	£399	£369	£369
Event Layla 24	£799	£779	£779
Creamware Pulsar II	£899	£799	£799
Creamware Power Sampler	£449	£399	£399
SekD ARC88	£349	£329	£329
SekD ProDif Gold	£349	£329	£329
SekD ProDif Plus	£279	£259	£259
Terratec EWS88MT	£319	£299	x
Soundscape Mixtreme 2000 Bundle	£599	£579	x
Steinberg Project Pack (inc Cubasis VST & 2 i/o + Digi i/o)	£199	£179	£179
Korg OASYS	£899	£849	£849
Lexicon Core 2 inc MP100	£599	£549	x
Digidesign 001	£749	£699	£699
MOTU 1224 Core System	£1199	£1129	£1129
MOTU 2408 Core System	£899	£799	£799
Nord Micro Modular	£399	£379	£379
SeaSound SOLO EX Recording System includes Cubasis VST	£579	£549	£549

£219

£399 Wami Box

£399 inc. MP100 Effects

£499 Yamaha DSP & AX16AT

£749 Digidesign 001

£379 Yamaha SW1000XG

£549 Midiman Delta1010

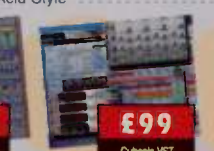
Software

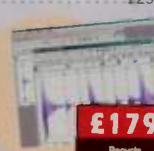
Steinberg Rebirth	£139	£129	£129
Steinberg Recycle	£179	£169	£169
Steinberg WaveLab 3	£349	£329	£329
Steinberg LM4 (VST Drum Machine)	£99	£89	£89
Steinberg Model E (VST Analogue Synth)	£149	£139	£139
Steinberg Pro 5 (VST Prophet Analogue Synth)	£149	£139	£139
Steinberg Cubasis VST PC Only	£99	£89	x
Steinberg Cubasis AV Mac Only	£99	x	£89
Steinberg Cubase VST	£279	£269	£269
Steinberg Producer Pack	£549	£529	£529
Bias Peak (Two Track Audio Editor for Mac)	£299	x	£279
Emagic Logic Audio Gold	£369	£349	£349
Emagic Logic Audio Platinum	£549	£529	£529
GigaSampler LE	£79	£69	x
Gigasampler Full Version	£219	£199	x
Sonic Foundry SoundForge inc CD Architect	£249	£229	x
Sonic Foundry Vegas	£239	£229	x
Sonic Foundry Acid Pro	£229	£209	x
Sonic Foundry Acid Music	£79	£69	x
Sonic Foundry Acid Style	£29	£29	x

£279 Cubase VST

£239 Vegas Pro

£139 Rebirth V2


£99 Cubasis VST


£179 Recycle

£69 GigaSampler LE

Midi Interfaces

Midiman MiniMacMan	£39	x	x
Midiman Winman 1x1 (ISA Card)	£45	£39	x
Midiman Winman 2x2 (ISA Card)	£69	£65	x
Midiman USB MidiSport 2x2 (2 Midi I/O)	£69	£65	£65
Midiman USB MidiSport 4x4 (4 Midi I/O)	£139	£129	£129
Midiman USB MidiSport 8x8 (8 Midi I/O)	£299	£279	£279
Midiman BiPort 2x4S (2in4out Serial Midi w SMPTE)	£129	£119	x
Midiman Portman PCP (Parallel Port)1x1	£49	£45	x
Midiman Portman PCS (Serial Port) 1x1	£49	£45	x
Yamaha UX256	£179	£159	£159
Emagic AMT8	£319	£299	£299
Emagic Unitor8 MkII	£449	£419	£419
MOTU Micro Express USB	£245	£239	£239
MOTU Midi Express USB	£339	£319	£319
MOTU Midi Timepiece AV USB	£579	£559	£559
MOTU Micro Express	£245	£239	£239
MOTU Midi Express	£339	£319	£319
MOTU Midi Timepiece AV	£579	£559	£559

£69 Midiman USB2x2

£579 MTP AV

Call 01925 245422 or order on-line at www.dawsons.co.uk

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or order on-line at
www.dawsons.co.uk

Effects & Outboard Processing

Lexicon MPX100	£184
Lexicon MPX500	£389
Lexicon MPX1 Save £150 Only	£549
SPL Stereo Vitaliser	£139
Vitaliser MK2	£559
Behringer Tube Composer T1952	£279
Behringer Tube Dual Mic PreAmp T1953	£279
Behringer Ultratec II T1954	£279

TL Audio FAT1 Compressor with Presets	£299
TL Audio 5001 4 Channel Valve Mic	£POA
TL Audio 5013 2 Channel Valve Parametric EQ	£POA
TL Audio 5051 Mono Valve Voice Processor	£POA
TL Audio 5050 Mono Valve Preamp & Compressor	£POA
Digitech S200 MultiEffects Processor	£149
Korg KAOSS Effects	£219
Electrix Filter Factory	
Electrix Warp Factory	
Electrix MO-FX	£339
Electrix Filter Queen	£179

Electrix EQ	£179
Alesis Midiverb IV	£199
Alesis Microverb IV	£169
TC Electronics M-One Multi-Effects Processor	£379
TC Electronics D-Two Intelligent Tap Delay Line	£379
TC Electronics Finaliser Express	£729
TC Electronics Finaliser 96K	£1769
Joe Meek VC3MkIIQ Mono Valve Mic Processor	£169
Joe Meek C2 Stereo Compressor	£169

Focusrite VoiceMaster	£349
Focusrite Tone Factory	£349
Focusrite Compounder	£399
Focusrite MixMaster	£699
DBX 266XL Dual Compressor/Gate	£149
DBX 286XL Mic Preamp/Voice Processor	£169
Digitech Vocalist Performer	£339
Digitech Mid Vocalist	£449
Digitech Vocalist Workstation	£539
Line 6 Guitar Preamp	£249
Zoom RFX1000 Effects Processor	£99
Zoom RFX2000 Effects Processor	£169

Studio Monitoring

Spirit Absolute Zero8 Passives	£179
Spirit Absolute Two8 Passives	£225
Spirit Absolute 4Pre (Powered)	£499
Yamaha NS10MS	£249
HHB Circle 3 Passives	£239
HHB Circle 5 Passives	£315
HHB Circle 3 Actives	£529
HHB Circle 5 Actives	£749
Event 2020 Passive Monitors	£299
Event PS8 Active Monitors	£449
JBL 4208 Passive (Ideal for Dance - 8" Driver)	£225
Genelec 1029A Active	£519
Genelec 1031A Active	£949
Genelec 1031A Active	£1679
Genelec 1032A Active	£POA
Roland DS88A (inc. Digital Input)	£775
Mackie HR824 Active	£969
Behringer Truth Active	£539
Tannoy Reveal Passive	£189
Tannoy Reveal Active	£389
Samson Servo 170 Amp (85+85 into 4 ohms)	£129
Samson Servo 260 Amp (130+130 into 4 ohms)	£189

Mics & Pre-Amp Packages

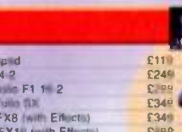
Rode NT1 Condenser Mic	£139
Rode NT2 Condenser inc Case & Suspension	£275
Rode NT3 New Condenser (Works on Batteries)	£129
AKG D880 Dynamic Microphone	£39
AKG C1000 Condensor (Works on Batteries)	£125
AKG C2000 Condensor inc Suspension Mount	£149
AKG C3000 Large Diaphragm Condenser	£189
AKG C4000 Large Diaphragm Condenser	£299
AKG C414 Large Diaphragm Condenser	£469
AKG Solid Tube Valve Mic	£399
Audio-Technica ATR97 Boundry Mic	£79
Audio-Technica AT4033 inc Suspension Mount	£239
Audio-Technica AT4047SV Condensor	£399
MXL 2001 Large Diaphragm inc Suspension	£179
Shure 55SH-2 (Retro Looking Dynamic Mic)	£189
MXL2001 & Joe Meek VC3MkIIQ	£319
MXL2001 & Focusrite VoiceMaster Processor	£479
MXL2001 & TL Audio 5051 Voice Processor	£539
AT 4033 & Focusrite VoiceMaster	£559
AT 4033 & TL Audio 5051 Voice Processor	£619

Mixing Consoles

Soundcraft Spirit Notepad	£119
Soundcraft Folio F1 14-2	£249
Soundcraft Folio F1 16-2	£299
Soundcraft Folio SX	£349
Soundcraft FX8 (with Effects)	£349
Soundcraft FX16 (with Effects)	£899
Soundcraft Spirit Studio	£999
Soundcraft Spirit Studio 24	£1499
Soundcraft 328 Digital	£2499

From **£1999** inc Pro Mixer Stand

Superb British Made circuitry and available with high quality expansion units. If you need loads of analogue inputs then you need to look at the Soundcraft Ghost. call us for more details.



Full Behringer Range Available. Please call us for Prices

Yamaha 01V Mixer	£1099
Yamaha 03D Mixer	£1899
Roland VM3100 Mixer with built in FX and Digital EQ plus Midi Mixing	£349
Roland VM3100Pro Mixer as above with 2 FX and RMDB connector	£899
Roland VM7100 Interface Unit (for use with VM7100C or VM7200C)	£1499
Roland VM7200 Interface Unit (for use with VM7100C or VM7200C)	£1799
Roland VMC7100 Controller (for use with 7100 or 7200)	£1999
Roland VMC7200 Controller (for use with 7100 or 7200)	£2249

Yamaha 02R Price Reduction

DPA

Achtung!
Yamaha UK and Dawsons have teamed up to offer the best ever value on a Yamaha O2R Mixer. These units are brand new and are designed for the 240 Volts UK (not 220 Volts European) Market. We have optional expansion boards available from stock and can suggest the right configuration for your Studio.

DPA - The Professional Division of Dawsons

£3389
Yamaha O2R

MACKIE d8b

Fancy a quick one...?
Dawsons have bought a Mackie D8B just for taking around and demoing. Do you live within 50 miles of Manchester and Liverpool? If so then call us and we will bring the demonstration to your studio. We might then even lend it to you for a few weeks if you ask us nicely!

Part Exchange
Please call us for an instant valuation of your old multitrack desk against a Mackie D8B. You are guaranteed a fair price!

HDR2496
Package Deals involving the D8B available on the new 24 Track Hard Disk recorder from Mackie. Please call us on 01925 245422 and we will be delighted to work out the right configuration for you

Standalone Digital Recorders

Special Package Deals for Mixers and Recorders. Please call us for a Personal Quotation 01925 245422

Mastering Devices

Tascam CDRW700 Recorder
£44 per month
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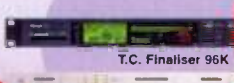

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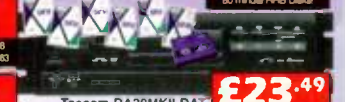

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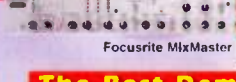

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WRH

Paul White evaluates a unit designed to recreate the unique sound of many of the classic vintage distortion pedals.

down and dirty

LINE 6 DM4 DISTORTION MODELER EFFECTS PEDAL

Following in the footsteps of the Line 6 DL4 Delay and MM4 Modulation boxes (reviewed in *SOS* March 2000) comes the DM4, a heavy-duty floor unit in gleaming gold, which is capable of digitally modelling 16 different types of distortion pedal. Like the other boxes in the series, the effects are selected and controlled from the front-panel knobs, and four footswitches provide easy storage and recall of four user patches. Because many of the original pedals had only two or three controls, Line 6 have provided additional tone control whenever any of the DM4's front-panel knobs are otherwise unassigned. The DM4 can be run from a wall-wart PSU, or from batteries.

Most of the distortion boxes emulated here are solid-state devices dating from the mid-'60s to the present day. Only the Tube Driver emulates a valve preamp, and can thus produce a more subtle overdrive. Because vintage distortion pedals are often noisy, Line 6 have added a noise gate that may be switched in or out for all but the most DSP-hungry model — the Jet Phaser. With none of the footswitches engaged, the unit is bypassed, with a relay providing a direct connection from the input to the output to avoid any audio thump. Note that no speaker simulator is included, but I tried it with a Pod, a Johnson J Station and a small valve amp, and it worked fine in all cases. A nice performance feature on the DM4 is that it allows you to morph between two different settings of the same model using an attached footpedal — this can be used to vary the sound in a number of expressive ways.

Accurate Emulation

It's surprising how different the various distortion boxes can sound, but I can attest, having used some of the originals, that the emulations come very close. The range of pedals modelled runs right the way from warm and woolly to sharp and abrasive, so most options are covered. Most of the basic overdrive emulations were quite usable, though I couldn't get enough overdrive out of the Maestro-inspired Buzz Saw to recreate that well-worn 'Satisfaction' riff using my Strat — the downside of remaining authentic to the gain range of the original.

Once you get away from the basic overdrives, things get wierder. Jet Fuzz, for example, combines overdrive with flanging to produce that very dated whooshing-jet effect. Weirder still are the two octave-fuzz effects, one of which produces a sub-octave and the other of which adds a tone an octave above the original prior to fuzzing the result — this Tychobrahe Octavia-based model is particularly realistic in the way it chokes the sound after the signal level drops below a certain point.

Cost Effective

Whatever your taste, there ought to be something here for you — though they haven't emulated every fuzz box ever made, the models chosen cover the available tonal range pretty well and the few oddball inclusions add to the interest. Obviously, if you're after a particular sound, you have to remember to use the right amp or amp model with the DM4 — for example, for the Hendrix sound, your best bet would be a Marshall stack. With the DM4 costing around the same as two or three separate analogue overdrive boxes, and having the benefit of being programmable, this is a pretty cost-effective way to achieve a variety of overdrive flavours. SOS

LINE 6 DM4 £219

pros
- Easy to set up and save settings.
- Robust and ergonomic.
- Sounds very authentic.

cons
- Faithful modelling means the limitations of the originals have been retained.

summary
The Line 6 DM4 provides uncannily realistic emulations of a number of well-known overdrive boxes in a well-engineered package.

SOUND ON SOUND

information

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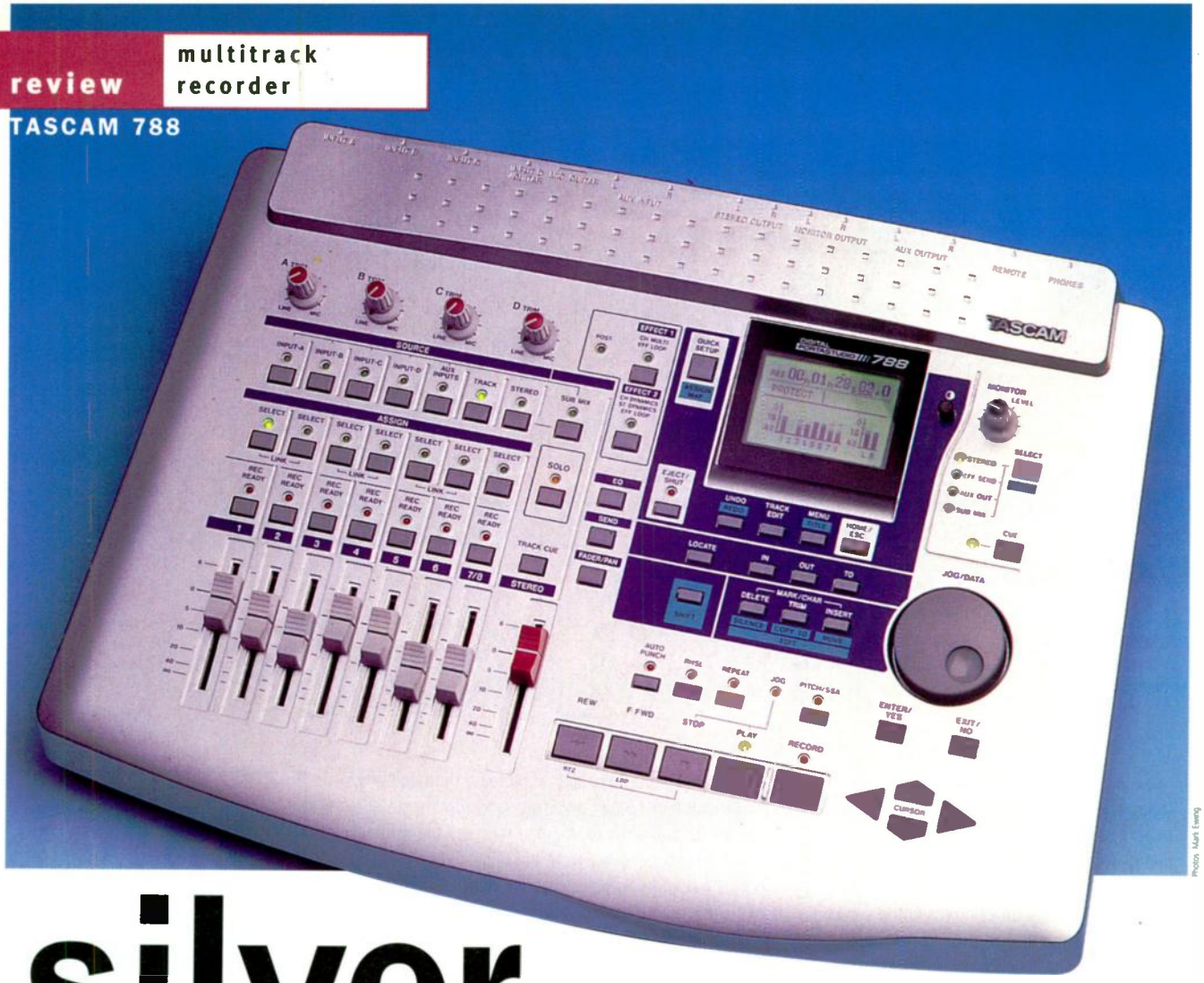
- Classic Distortion: based on the ProCo Rat.
- Heavy Distortion: based on the Boss MT2 Metal Zone.
- Colourdrive: based on the Coloursound Overdriver.
- Buzz Saw: based on the Maestro Fuzz Tone.
- Facial Fuzz: based on the Arbiter Fuzz Face.
- Jumbo Fuzz: based on the Vox Tone Bender.
- Fuzz Pi: based on the Electro-Harmonix Big Muff Pi.
- Jet Fuzz: based on the Roland Jet Phaser.
- Line 6 Drive: based on a modified Coloursound Tone Bender.
- Line 6 Distortion: Line 6's own interpretation.
- Sub Octave Fuzz: based on the PAiA Roctave Divider.
- Octave Fuzz: based on the Tychobrahe Octavia.

TASCAM 788



Photos: Mark Ewing

silver service

TASCAM 788 DIGITAL PORTASTUDIO

Paul White finds out how Tascam, the originators of the Portastudio concept, have updated their idea into today's world of 24-bit digital hard disk recording.

While some musicians are happy carrying out absolutely all their recording tasks with a computer, there are many who still prefer to place their trust in dedicated hardware. Pretty much all the big-name manufacturers have a number of products to offer in this department — including Akai, Yamaha, Roland, Korg, Fostex and, of course, Tascam, whose new 788 Digital Portastudio continues the Portastudio tradition into the digital age.

The 788 combines an eight-track recorder and a digital mixer with a pair of digital multi-effects processors. Recording is uncompressed and to an internal 7.5Gb fixed hard drive, with a SCSI 2 port provided as standard for direct recording and backing up, as well as for burning audio tracks to a suitable CD-R/CD-RW drive. External hard drives may be used for recording providing they meet the speed requirements. Comprehensive MIDI sync and control facilities are provided, enabling the 788 to function either as timecode master or slave, and mix automation is available with a MIDI sequencer. A small LCD is used for parameter display but it can also show the audio waveform when editing.

Virtual tracks can be recorded to save alternate takes (up to 250 per song, drive space permitting) and a full set of non-destructive cut/copy/paste/move edit commands is available (see 'In, Out, Chop It All About' box). If you run out of tracks, you can digitally bounce tracks internally, though there is no 'bounce forward' capability to allow you to bounce all eight tracks to disk. Finally, to simplify routing, several commonly used routing presets are included, as well as the flexibility to create your own.

TASCAM 788 £799

pros
- Splendidly easy to use.
- Good basic sound quality.
- Includes guitar DI mode
- SCSI connection as standard
- Comprehensive MIDI Sync facilities

cons
- No onboard mix automation
- No digital input
- Effects offer limited adjustment

summary
What the Tascam 788 loses in sophistication, it makes up in sound quality and ease of use. It really is a one-box solution to making quality eight-track recordings.

SOUND ON SOUND

Tascam Tour

The Tascam 788 is moulded from silver-coloured plastic with a steel sub-chassis and takes up less desk space than an open copy of *Sound On Sound*. It makes about as much noise as a typical laptop computer so it should be possible to record in the same room without too many problems. On the rear panel is a stereo quarter-inch headphone jack for monitoring or mixing, followed by a remote jack that accepts an optional punch-in/out footswitch. Although there are onboard effects to cover most eventualities, Tascam have provided stereo Aux Input and Aux Output connections so that you can involve your own outboard equipment. These operate at a nominal -10dBV level and are unbalanced. The Aux Inputs may also be assigned to an internal submixer or used as an input source when recording.

All of the Tascam 788's connectivity is clustered on its rear panel, providing more space on the front panel of the unit for the operational controls.

All four main inputs (labelled A to D) are on balanced jacks and can accept balanced or unbalanced mic or line signals in the range -50dBu to +4dBu. As is common with units of this type, there's no phantom-powered mic input, so capacitor mics need to be used with an external preamp that provides phantom power. Input D also features a mic/guitar switch, that converts it into a high-impedance electric guitar DI input. The Stereo Output and stereo Monitor Output are on phonos for easy connection to a hi-fi system or stand-alone recorder.

Power for the 788 comes from a hefty external supply and, as with all disk-based systems, it is essential that the recorder is shut down properly rather than just being switched off, otherwise work will be lost.

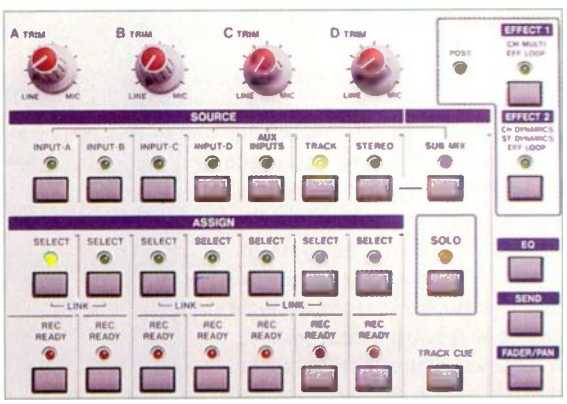
MIDI In and Out connections are provided alongside the SCSI 2 connector. Finally, there's a single coaxial digital output, but no digital input.

Assignable Mixer

Though every manufacturer has their own interpretation of the assignable mixer concept, the 788 is surprisingly intuitive and follows established paradigms rather than trying to reinvent the wheel. The Assign section, with its familiar Select buttons, is used to choose the channel to be adjusted and, as with the Yamaha series of mixers, there's a data wheel and a set of cursor keys in the master section that are used to locate and edit parameters.

At the top of the channel strips is a row of buttons corresponding to recording Sources: Input A, B, C and D, Aux Inputs, Track and Stereo. Preset routing options are included for recording (inputs A to D go to tracks one to four), mix down or bounce (first six tracks bounced to 7/8), but if you need to create a new routing setup, you can do this by pressing the required Source and Assign buttons at the same time to make the connection. An input/output grid in the display shows the overall routing status very clearly. Custom routing setups may be saved in a routing library for future use and channels may be paired for stereo operation by pressing both their Select buttons together and agreeing with the subsequent dialogue box.

Note that routing setups are also saved as part of a Scene, where a Scene is essentially a snapshot of all the main mixer settings, including effects, ▶



The assignable mixer section of the Tascam 788.

The 788 In Context

The Tascam 788 has a number of competitors, though the 16-bit Korg D8 (which retailed at £849 at the time of its review in *SOS* April 1998) probably comes closest in concept and simplicity, being based around an internal hard drive that records without data compression. However, it can only record two tracks at a time. Roland's VS880 series (with an initial retail price of £1739 in March 1996, though the street price is now less than half this) undoubtedly offers greater flexibility, especially in terms of effects and mix automation, but some people find them over-complicated to use and don't like the idea of using audio data compression. Then there's the Fostex FD8 (reviewed in *SOS* January 1999) or the older DMT8 (reviewed in *SOS* December 1995), which combine digital recorders with analogue mixers. The mixing on these machines isn't nearly as flexible as that on the 788, but they are easy to use.

If you think eight tracks is too limiting, but you can't run to 16, there's also the Akai DPS12 to consider, which records to a hard drive, has a digital mixer and provides 12 recording tracks at a competitive price. The Boss BR8, the Roland VS840 and the Yamaha MD8 are also attractive propositions, with the BR8 and VS840 having particularly strong effects sections, but you have to be willing to accept the limited recording time and cost of the removable recording media they use.

However, if you're after eight tracks of uncompressed 24-bit audio, the Tascam 788 has no competition in its price range, as none of the above machines offer this facility.

levels and routings, that can be stored for later recall. Up to 10 scenes can be stored per song, but they can't be recalled while the transport is playing and so can't be used for mix automation. Analogue controls such as the input trim and monitor levels are not saved as part of a Scene.

Because the physical fader positions may not be the same as the internal values once a Scene has been recalled, Tascam have provided a way to match the physical fader settings with the virtual settings. Catch mode leaves the virtual setting unchanged until the physical fader passes through the corresponding value and takes over. Real mode ignores the virtual setting and hands all control over to the real fader. If 'Real' is selected, the fader level remains under manual control, even when a new scene is loaded — which had me scratching my head for a while. A third mode, Jump, causes the virtual value to jump to the physical fader value as soon as the fader is moved, after which the physical fader takes control.

Despite the apparently sparse control surface, the mixer has three-band EQ on every channel, where the mid-range is fully parametric and the high and low filters have variable frequencies. If the EQ button is pressed, the display shows a set of EQ controls, and the cursor buttons below the Jog/Data dial are used to select and adjust the EQ parameter you want to change.The Jog/Data wheel and the four cursor buttons located right below it can be considered as the 'steering wheel' of the 788. Their layout makes it easy to move the cursor with your thumb while twiddling the knob with your forefinger — the Enter/Yes and Exit/No buttons are also close by for convenience.

The only other button in the channel strip is Rec Ready, complete with obligatory red warning LED, for each recorder track. Channels one to six are mono whereas tracks seven and eight have ganged stereo controls for either recording stereo sources or for bouncing stereo mixes, meaning that tracks seven and eight cannot be recorded independently. A large Solo button in the centre of the unit, used in conjunction with the Assign buttons, enables individual channels to be soloed via the monitor and phones system.

Each mixer channel can have two aux sends switchable pre-fade, post-fade or off. Selecting Fader/Pan brings up a display of the selected channel fader and pan controls, where the channel fader is used to adjust the channel level and the Jog/Data wheel sets the pan position. A graphical representation of the physical controls is shown in the display (including both 'real' and internal fader values) along with their numerical values.

When mixing, outside sources such as sequenced MIDI instruments may be brought into the stereo mix via a submixer section that makes use of the unused inputs A to D plus the Aux input. Any of these inputs may be routed to the submixer — this provides basic level and pan control, but with no access to effects and no master submix fader. The control room monitoring section is in the top right-hand corner of the machine where the monitor source can be selected from Stereo, Eff Send, Aux Out and Sub Mix and there's a dedicated monitor level control with the facility to monitor in mono.

When overdubbing, the faders adjust the input levels, while the monitoring of recorded tracks is set up using the Track Cue and Cue buttons. When you switch to mixdown, the physical faders control the mix levels. There is no onboard mix automation but many of the mixer parameters,

MIDI Matters

The Tascam 788 can transmit MIDI Clock or MTC (30fps, 29.97fps drop-frame, 25fps and 24fps), and can be either the slave or the master when using MTC. There's an internal tempo map facility for applications where an external device needs to be sync'ed via MIDI Clock. Each bar can have a different tempo and/or time signature and MIDI Song Position Pointers (SPPs) are sent out along with the MIDI Clock data so that external devices can locate to the correct place in the song.

There's an internal metronome, though this only operates when the 788 has a tempo map set up and is switched to generate MIDI Clock — it doesn't work in MTC mode. In addition to generating plain beeps, the metronome can also send out MIDI Note messages so that you can trigger something that sounds less annoying!

Where the internal tempo map doesn't offer a high enough resolution, as may be the case when you want to program a gradual tempo change, the 788 has the ability to record and replay a MIDI Clock track (generated by an external sequencer or drum machine) using a special 'sync' track. When set to record, this track records all incoming MIDI Clock information, including SPPs, without depriving you of one of your audio tracks.

The MIDI In accepts MMC to control the transport of the 788 and it's also possible to use MIDI to access the main mixer controls, and to recall Scenes and effects patches. Note, however, that Scenes cannot be recalled while the transport is playing, so you can't implement snapshot automation using them. Some degree of dynamic automation is possible via MIDI, though the 788 cannot transmit MIDI controllers, which means you can't use the physical faders to record automation data to your sequencer.

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▶ including levels, pan and EQ, can be controlled remotely via MIDI continuous controller data. See the 'MIDI Matters' box for details.

The Recorder Section

It's always difficult to separate the recorder from the mixer in products such as this one as they are so symbiotic — for example the 'record ready' buttons reside in the mixer channel strips and the mixer makes use of the Jog/Data wheel and cursors located in the recorder section. It's possible to put all eight tracks into record at once if you want to, but having just six possible input sources (four mono mic or line inputs plus the stereo Aux input) places a practical limit on how many tracks you can usefully record at once.

When starting a new song, it is first necessary to create an empty song to record into, and at this point in the proceedings the 788 asks whether you want to work in 16-bit or 24-bit mode. Songs are given a number and can be renamed if required. Basic recording is conceptually similar to using a tape recorder, right down to the tape-style transport controls — though additional key combinations allow random-access functions such as returning instantly to the start of a song. What sets the 788 functionally apart from a tape recorder, however, is the range of non-destructive editing functions available — see the 'In, Out, Chop It All About' box for more details.

Beneath the display are buttons relating to the edit functions and those that have dual functions, accessed via the Shift key, are clearly marked with a green text box. If there's some function you can't find, the chances are it's accessed via the Menu button in this section. An Undo/Redo button can backtrack through up to 999 recording and editing steps while unwanted undos can be redone — if only life came with similar features! The Eject/Shut key starts up or shuts down the 788 and also ejects external removable media when relevant.

Up to 999 locate points per song may be stored directly for fast access to any part of a song and separate In and Out buttons define points for editing and automatic punching in and out. A further row of buttons is used to access Auto Punch and Rehearsal modes, Repeat mode or Pitch/SSA. Varispeed can be adjusted over a ±6 percent range, while SSA mode allows two-track passages to be played back at 85 percent, 65 percent or 50 percent of the original speed without affecting the pitch — this can help you learn the notes of fast passages.

Pressing Play and Stop together puts the machine into Jog mode, where the audio waveform is shown in the LCD window and you can scrub through the audio using the Jog/Data dial. A status LED shows when the Jog mode is active and the waveform display (of whichever track is selected) is zoomable. Though this facility is fairly basic, it does aid in the precise location of In, Out and To points, especially where there are prominent drum beats to aid navigation.

Being able to connect a SCSI CD-RW backup system is an important part of this machine, and the CD-R drive may be used to back up multitrack projects — across multiple CD-Rs if necessary. However, the 788 also has a pre-mastering facility that lets you create a disk image of your mixed song to the internal hard drive (space permitting) before burning it as an audio CD. The material to be pre-mastered always starts at the zero time location for the song and ends where you place the Out marker. Recordings may be trimmed to get rid of unwanted material or space at the start of a song, using the Cut edit command. While burning the pre-master, adjustments to channel parameters, such as EQ, may be made manually or via MIDI from an external device if necessary. Tracks can be burned to disk either one at a time, or in bulk.

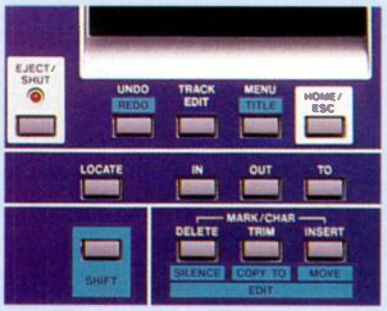
"Being able to connect a SCSI CD-RW backup system is an important part of this machine..."

Using The 788

As a test exercise, I decided to record six tracks, bounce them in stereo to tracks 7/8 (using the preset 'bounce' routing template) and then perform some edits on the stereo bounced track. I added a little internal reverb at this point, just to see how it would sound. I feel that Tascam's claim of high-end signal processing is more than a touch exaggerated, and the number of user-adjustable effect parameters is fairly restricted, but it's still possible to get the kind of results you'd get from a respectable budget multi-effects processor. It's also worth touching on the EQ section, which

In, Out, Chop It All About

After recording, material may be copied or moved, based on the In, Out and To locate point values. As with other Tascam machines, these may be entered when playback is stopped or tapped in on the fly using the In or Out button with the Shift key. These locations may be further edited in Jog mode using the on-screen waveform display and audio scrubbing.



When an edit mode is selected, you're automatically prompted to enter which track or tracks the edit applies to — it is possible to edit across all eight tracks if required. The manual goes to great lengths to explain that some edit functions change the timeline of the song while others don't. For example, if you copy a section of a song and then insert it later on, everything after the insert will move up to make room for the new part. On the other hand, a copy-and-paste edit replaces the material that originally existed at the paste-in point, so the song length is not changed. As well as copy-and-insert and copy-and-paste, it's also possible to open blank space within a track, pushing the two cut sections apart, or to silence material without changing the timeline. Cutting works as it does in a word processor by removing material and rejoining the two cut points, thus shortening the song.

The Clone Track option produces a duplicate of a complete track, and places it on another track. Delete Unused deletes any audio not used in a song, operating on virtual as well as playback tracks, and this operation cannot be undone. Entire tracks can be wiped using the Clean Out function. No destructive facilities are provided for functions like normalising, gain changing, creating fades or reversing sections of audio.

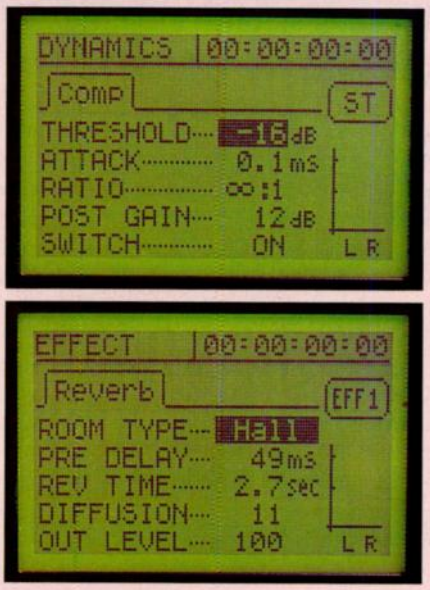
Onboard Effects

The 788 has two independent onboard effects processors (designated Effect One and Effect Two), which may be used in slightly different ways. Effect One is a multi-effects processor which can either be inserted or used in a send/return loop. It can operate in multi-effect mode, with up to five different effect elements in the signal path, or it can have all its DSP resources dedicated to a single higher-quality effects process. Effects available in the former configuration include Distortion, Flanger, Reverb, Delay, Pitch Shift, Parametric EQ, Compressor, Exciter and De-esser, and the choice of higher-quality effects in the latter mode include Reverb, Delay, Chorus, Pitch Shift, Flanger, Phaser or Gated Reverb.

Most of the effects algorithms are perfectly usable, though I probably wouldn't use the onboard reverb for anything intended for a serious release. What's more, there are only up to five editable parameters per effect, and this may not provide enough flexibility for some people. A number of the effects are designed specifically for guitar processing, but the overdrive is pretty basic, and tends to be a bit on the buzzy side — for serious work, an external guitar preamp would be preferable.

Effect Two has slightly different routing options. While it may be deployed in the aux send/return loop in exactly the same way as Effect One, it can also be inserted into the mix buss as a single stereo dynamics processor, or can provide up to eight dynamics processors for insertion into individual mixer channels. Preset libraries of all the various effects types are included for those too busy or too inexperienced to create their own.

If an internal effect is not needed, the send controls may be used to feed an external effects processor and a workaround (involving using the monitor output as an effects send) is explained for anyone who wants to use the internal effects and an external processor at the same time.



Though the two effects modules provide a number of flexible routing options, the editability offered by each effect algorithm is limited to only five user-adjustable parameters.

Tascam have managed to make reasonably smooth and musical — though, like many digital equalisers I've tried, you sometimes have to apply rather more of it than you might expect, in order to get the right subjective result. Having variable-frequency high and low sections plus a fully parametric mid-band provides plenty of control — a far cry from the bass and treble tone controls on early Portastudios.

Setting In and Out points on the fly is straightforward, though it's reassuring to know that you can fine tune these using the Jog mode if you wish. In practice, the scrubbing and waveform display are extremely usable, considering how small the LCD is. The edit points were smooth and quite glitch free, though it's up to you to ensure the material at each side of the edit matches up OK. The same is true of punching in and out, which is perfectly gapless and glitch-free.

After knocking together a stereo mix on the stereo track and trimming away any unwanted material at the start, I decided to try my hand at burning a one-track album. Unfortunately, my (very) old Teac CD-R drive wasn't compatible, but Tascam's web site included details of the many compatible models and Tascam kindly lent me a suitable drive to complete the review, so it didn't hold me up for long. With the new drive connected it was trivially easy to burn a track onto CD, and it played back on my hi-fi with no problems once finalised. Backing up multitrack recordings was no more complicated.

I tested the 788's ability to sync to MTC and to read MMC by getting it to follow my ADAT BRC. Lockup took around two seconds and the 788 responded correctly to MMC transport commands. It also locked quite happily when the BRC varispeed was adjusted to its extreme settings, though making rapid adjustments to the BRC's varispeed when the machines were running threw it on a couple of occasions. In most situations, I would imagine the 788 would be used as a master rather than a slave, but it's reassuring to know it can lock to an MTC source in most cases where it might be called on to do so.

Silver Lining

There is a lot of competition in this sector of the market, and it would be easy to criticise the Tascam 788 for its lack of a digital input or snapshot automation, or for the limitations of its onboard effects, but having used the machine for a few days, I have to admit to liking it quite a lot. Unlike those machines that rely on removable media, the 788's internal drive means you can record an entire album project (or even two if you don't use virtual tracks) before having to back up, and when you do need to make a backup, there's SCSI interfacing as standard. What's more, there's provision to back up or record mixes to a variety of CD-R/CD-RW drives.

Best of all is the ease with which multitrack recordings may be built up and mixed. After some of the convoluted operating systems I've tried, the 788 is a joy to use, and when you do have to resort to the manual, you'll find that it's clearly written with step-by-step practical examples. When you need more sophisticated sync options, they're available, they work, and if you feel the need to automate an eight-track mix, you can do it over MIDI.

I imagine the Tascam 788 will appeal more to those musicians who want to combine Portastudio simplicity with digital sound quality, than to those who want all the latest, most sophisticated features. If you want to get on with making your music rather than constantly pitting your wits against a machine that seems to enjoy being more of a puzzle than a tool, I think the Tascam 788 Digital Portastudio will suit you very well indeed. SOS

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Wave Mechanics *Speed*

Mac AudioSuite

Speed is an audio manipulation plug-in from Wave Mechanics that may be used with *Pro Tools* or other Macintosh software that supports the AudioSuite plug-in format. Unlike some earlier AudioSuite plug-ins, Digidesign hardware is not mandatory. Conceptually, *Speed* is very simple: it allows the pitch of music to be changed without affecting its tempo, or tempo to be changed without affecting pitch. This is by no means a unique feature, but the big claim for *Speed* is that it can vary either pitch or tempo over a 50 to 200 percent range with barely a hint of the pitch-shifting artifacts common to competing systems.

The install CD actually includes all of the Wave Mechanics AudioSuite- and TDM-format plug-ins, all of which may be used free of charge for a couple of weeks before they time out. An authorisation floppy (how I hate those things!) lets you authorise *Speed* or whichever other plug-in you've paid for, but means that if you are a G4 owner, you'll need to have a USB floppy drive.

Speed works on selected regions of audio, and does its processing off-line but, if you have a reasonably fast computer such as a Mac G3 or G4, a real-time preview mode lets you know what the end result will sound like before you press the 'Make it so' button. After processing, it is possible to undo the operation.

Once installed, *Speed* appears in the AudioSuite plug-in menu and comprises three plug-in windows. The first is called the Simple window, and has the standard AudioSuite control panel at the top, below which are two knobs, one for tempo and one for pitch. At the bottom of the screen are the familiar Preview and Process buttons with three further buttons above the knobs for selecting between the three *Speed* windows. In preview mode, the knobs work in real(ish) time with the first controlling either tempo or length, depending on which mode is selected. The pitch knob can be set to work in cents, semitones or frequency change percentage and in preview mode, the sound quality is identical to the finished result unless you're using a slow computer, in which case some glitches may be audible.

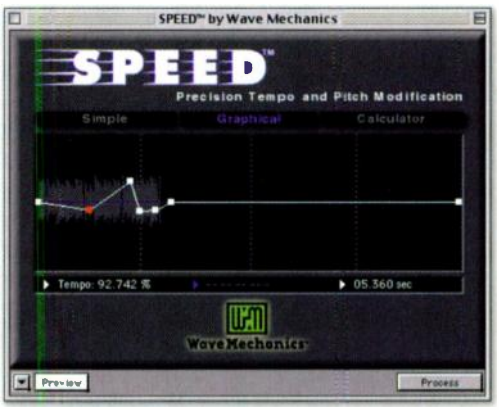
The second window is called the Graphical screen, and shows the waveform of the selected audio. Graphical envelopes may then be created to produce a time-related speed and/or pitch change. This makes it possible to create, for instance, a *rallentando* to slow down a piece of audio at the end of a track. The graphical envelope is adjusted in just the same way as automation data in *Pro Tools*, using straight lines and grab handles.

The third window is the Calculator screen, which is used for working out the shifts needed to create specific key and tempo changes. The answer to a calculation may be applied to the audio by pressing the Preview or Process buttons. Additionally, there's a tuning mode that can convert music from, for example, A440 to A442.

In practice, *Speed* turned out to be very intuitive to use, and the audio quality of the processed sound is almost too good to be true, even with very large changes in tempo or pitch. It's ideal for matching loop lengths where the quick-and-dirty time-stretching algorithms found in some sequencers or samplers aren't transparent enough, and it's equally effective at shortening a radio or TV commercial to fit a precise spot length. Working in the graphical editing mode requires a little more persistence if you need to create a precise fit to a piece of music that's slowing down or speeding up in a non-linear way, but again it works beautifully. My impression, therefore, is that anyone who has a need for a high-quality time- or pitch-changing utility, and who uses a Mac system that supports AudioSuite plug-ins, really should take a close look at *Speed*. It's just a crying shame that it isn't available in VST format. SOS

Paul White

Speed's Simple window.



The Graphical screen is used to create time-related changes in pitch or speed.

The Calculator screen permits precise key changes and tempo matches to be calculated.

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competition win

win Yamaha AW4416

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For the full *Sound On Sound* review of the Yamaha AW4416 see our November 2000 special 15th birthday issue. Alternatively, the review is available to subscribers at www.sospubs.co.uk/sos/nov00/articles/yamahaaw4416.asp

Professional Audio Workstation

Yamaha seem to have a habit of producing audio products which quickly become industry standards. Take, for instance, their NS10 nearfield monitors — almost every professional studio has a pair. Then there's the legendary DX7, the best-selling synth of all time. Yamaha also led the way in affordable digital mixing with the ground-breaking DMP-7 and the price-busting ProMix 01, leading up to the hugely successful O2R, which offered full automation at a price even small studios could afford.

Now it seems Yamaha are about to set another benchmark for price and features with the AW4416 recording workstation. By taking the guts of their 'O'-series digital mixers, adding a 16-track hard disk recorder, a sampler and CD mastering capability, they've created an all-in-one professional audio workstation with a specification that's almost impossible to fault — and amazingly, it retails for a mere £2599, or £2799 with built-in CD-RW drive.

Unsurprisingly, the AW4416 has become one of the most in-demand recording products of recent years, and they're flying out of the shops as fast as Yamaha can make them. Luckily for *Sound On Sound* readers, though, Yamaha have been kind enough to reserve an AW4416 as the stellar prize for this month's competition. As if that wasn't enough, the lucky winner will also get the chance of a full day of free product training at the prestigious Yamaha R&D Centre in London, where he or she can receive one-on-one tuition from the AW4416 product specialists, learning how to get the most out of their prize.

Like the O2R, the AW4416 offers up to 44 input channels and no fewer than 20 mix busses. Internal processing is 32-bit, with the EQ stage working at 44-bit depth to eliminate rounding errors. Incredibly for an audio workstation at this price point, the AW4416 is equipped with full mix automation including motorised faders, making it possible not only to record every slight mix adjustment, but also to instantly see the fader levels at any point during a mix. Faders can be assigned to any of eight separate groups, enabling all grouped faders to be moved by adjusting one fader. This is an extremely useful feature for controlling the overall volume of a string section relative to the rest of a mix, for example. Similarly, any two faders can be linked to create a stereo pairing, as can other channel parameters. Parameter libraries add to the mixer's programmability by enabling dynamics and effect settings to be recalled and saved as mix-automation events. Snapshot or 'Scene'-based memory is also available.

The AW4416 also matches the O2R with its EQ and dynamics implementation. Four bands of fully parametric EQ and six dynamics processors are provided on each of the mixer channels. Furthermore, all four EQ bands are sweepable from 20Hz to 20kHz. The dynamics facilities include compressor, gate, ducking, expander, hard- and soft-knee compander.

The AW4416's 16-track hard disk recorder comes with a 12Gb 2.5-inch IDE hard drive as standard, although any compatible drive can be installed up to a massive 64Gb. Any single song file can be as large as 6.4Gb, while the maximum number of songs is 30,000! Projects can be recorded at 16- or 24-bit resolution and a sampling rate of 44.1 or 48kHz. Extensive digital audio editing tools are provided including copying, moving, inserting and time-stretching/compression. Ninety-nine assignable locate points make for accurate and fast navigation within a project, whilst an auto punch-in/out point feature enables accurate overdubbing. Editing is non-destructive, with 15 levels of undo/redo, and the 16 physical tracks are augmented by 128 virtual tracks.

A very useful sampler has also been integrated into the AW, and is triggered using two banks of eight pads positioned just under the main screen. The pads can be used to trigger samples derived from the internal hard disk, from WAV-format CD-ROMs, or from external SCSI devices, with a maximum 90 seconds of playback time. Up to eight samples can be played simultaneously.

The option of a CD-RW drive is the icing on the cake as far as the AW4416 is concerned, as it allows direct mastering to audio CD from the hard disk without ever having to port the audio out of the digital domain, or indeed out of the AW4416 itself. The CD-RW also makes it easy to back up and archive recorded material onto CD or to directly load audio and other data from CD-ROMs.

The AW4416 ships with eight analogue inputs plus digital stereo inputs, but a further 16 analogue or digital inputs can be added with the simple installation of any of Yamaha's standard mini YGDAI cards. Other connections are provided for SCSI, headphones, footswitch, optical I/O, MIDI In, Out and Thru, computer 'To Host' connection and mouse. The AW can generate its own MTC (MIDI Time Code), or it can be synchronised to an external MTC source or MIDI clock signal. Word clock in and outputs are also provided.

To be in with a chance of winning this wonderful prize, all you need to do is complete the entry form included on this page. Answer *all* the questions, compose a suitable tie-breaker and remember to include your full address and **daytime** telephone number. Entries should be sent to the usual *Sound On Sound* address and must arrive by the closing date of **30th March 2001**.

the small print

1. Only one entry per person is permitted. 2. Employees of SOS Publications Ltd, Yamaha 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.

questions

The AW4416 shares many features with which other Yamaha product?

a. Yamaha NS10 ☐
b. Yamaha DX7 ☐
c. Yamaha O2R ☐
d. Yamaha acoustic guitar ☐

The AW4416 has motorised faders. Which of the following functions does this feature aid?

a. Mix automation ☐
b. Fader motivation ☐
c. Slider nudger ☐
d. Black magic ☐

Which one of the following is not included in the AW4416 ?

a. Digital mixer ☐
b. Sampler ☐
c. Hard disk recorder ☐
d. The lost city of Atlantis ☐

Yamaha AW4416 tie-breaker

It would take a confident person to bet against the AW4416 becoming an industry-standard product like the NS10 monitors, O2R desk or DX7 keyboard. What secret process do you think Yamaha use to come up with such market-leading product ideas? Answers in 30 words or less, please.

.....

.....

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Would you like to receive more information on Yamaha products? If not, please tick this box. ☐

Post your completed entry to: Yamaha AW4416 Competition February 2001, *Sound On Sound*, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ.

WRH

block buster

FREQUENTLY ASKED QUESTIONS: CREATIVE BLOCKS

Even if you have top-notch recording gear, and the expertise to use it effectively, there are still a number of more intangible problems that the recording musician can face. **Amanda Lowe** answers some of your questions on how to maintain creativity and a positive attitude in the studio.

Q I've been working on this track for so long now that I think I'm losing any sense of objectivity. Is there anything I can do to regain this?

Because building a track can be a lengthy and intense experience it is difficult to listen to the results without associating it with all the trials and tribulations you have gone through. This means that it's easy to end up listening emotionally and subjectively, rather than clinically and objectively. Therefore, if you want to be critical about your own tracks, don't listen to them just after you've mixed them. Get out of the studio, clear your head, let your ears have some quiet — they've been working hard. When you do sit down to listen, try to imagine that you are listening to someone else's work: what would you (honestly!) say to them about the mixes? It helps to have a pen and a piece of paper handy to jot down any thoughts you come up with.

Try thinking of where the music will end up being played, and then play it there. If you are creating music for people to listen to in their living rooms, then play a copy of it to yourself in your living room. If it's a dance track, dance to it — you'll immediately feel if it's hitting the right buttons. Also, try to listen in as many different situations as possible. Play a copy of your track on a crappy car stereo, on your mother's hi fi, on a really big PA rig and also listen to it on a couple of different sets of headphones.

Another way to get a fresh perspective on your music is to change the time at which you work on it. If you normally work during the night, have a critical listen in the morning, or vice versa. If you find yourself normally 'enhancing yourself chemically' (with caffeine, alcohol or whatever) while working creatively, then why not try abstaining for once, in order to get a completely uncoloured view of your material. After all, you'll be able to party twice as hard once you're sure that the job's well done!

Q I've got dozens of tracks that are only part-finished, yet I can never get to a point at which I'm totally happy with any of them. How do the professionals finish off their material?

The professionals, by their very nature, have to do what they do for a living. They don't do tracks just for fun, because they have to make a living from them, and they therefore have to deal in clear objectives and goals before they even sit down to create. Professionals will usually set themselves time limits — if a track isn't working within a certain number of minutes or hours then it will often be more viable, in financial terms, to bin it, because time wasted is potential earnings wasted.

It is important to know what you want from your tracks, if you are ever going to finish them. 'If you don't know where you want to go, the chances are you won't get there', as the old saying goes. In ▶

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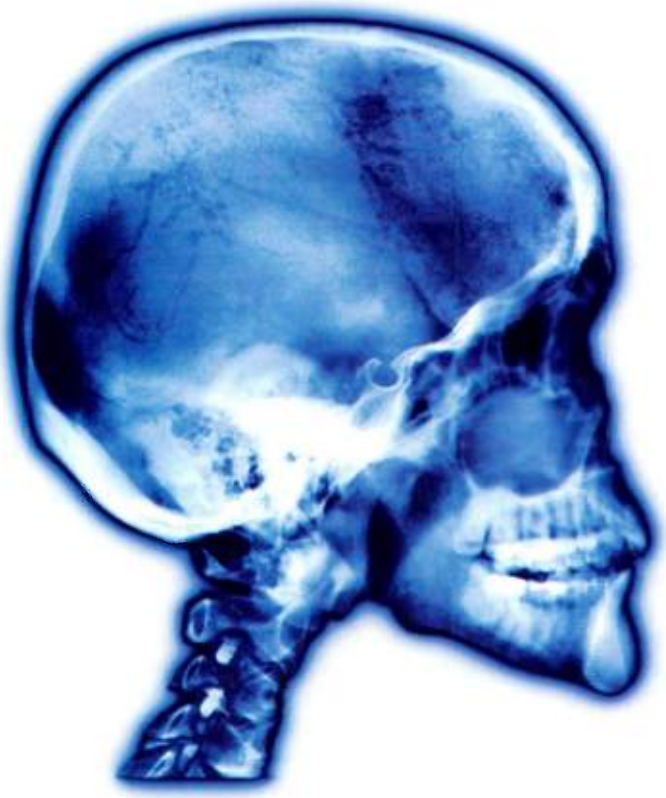

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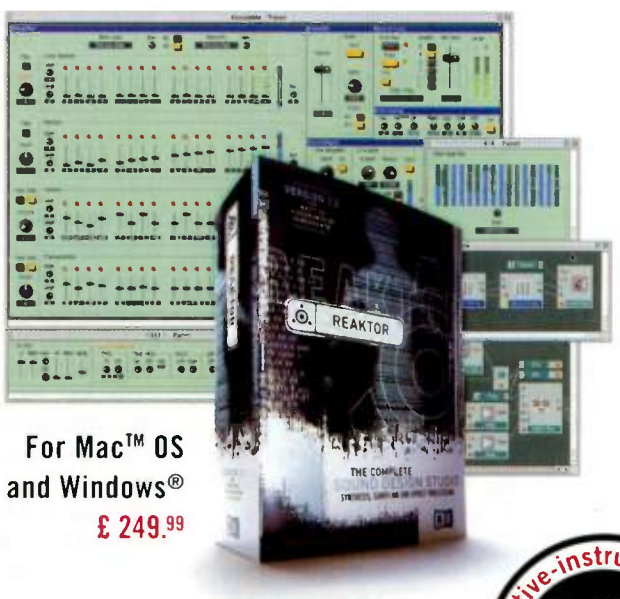

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order to sort out your tracks, get your goals and objectives sorted. The real professionals know exactly what they require of a successful track, and how long they are prepared to spend looking for it.

Whatever the goals you set yourself, they won't do you any good unless you set yourself clear objectives for achieving them. Specify exactly what you are going to do in order to reach your finished track (once again, pen and paper can be handy here to keep you focused) and set yourself a fixed time in which to achieve these objectives. Actively limiting the time you allow yourself to spend on completing a track is especially important if one of your goals is to make money from what you do — a finished track can earn you money but, in the hard-nosed world of the music industry, a dozen part-finished tracks aren't going to get you anywhere much. A professional attitude is about getting focused and getting your music out there.

Q I'm happy with my performance when I'm on my own, so how come I always seem to start making mistakes whenever I get into the studio with other people around? Is there anything I can do to stop this happening?

The moment you take your performance into the studio, with other people relying on you to come up with the goods, it is all too easy to get thinking along the lines of 'I mustn't get it wrong', 'I don't want to let anybody down', and 'I can't afford to make any mistakes now'. However, this is not a constructive habit to get into, because it won't do you any good no matter how much you tell yourself these things.

The reason for this is that the human mind is bad at processing negative commands, just by nature. Try telling yourself not to think of a plate of chips — what's the first thing you think of? So if you walk into the studio saying to yourself, 'I'm not going to start making mistakes today', it is only bringing the possibility of making mistakes to the front of your mind, making you more likely to slip up. As a result of this, the best way to go about improving your performance in the studio is to give yourself positive suggestions. For example, say to yourself, 'I'll be relaxed and confident when I am in the studio today' or 'I'm going to give a blistering performance in the studio today, which everyone will be happy with'. It may take a little while for this strategy to become effective, and it may be best to start with very easily achievable positive suggestions, but practising this will help increase your confidence.

If you regularly fail to perform up to your own high standards within the studio, it can be difficult to break the habit, because your mind has begun to connect negative feelings to certain situations. In the above example, the mind is anchoring 'making errors and being nervous' to 'playing in front of your peers in the studio', such that the latter automatically triggers the former, which then only serves to confirm the initial mental connection.

What you need to do is break this cycle — if you can find a way to perform in the studio without getting short of breath, even a few times, it undercuts the points of reference that your mind uses to connect this activity with the unwelcome behaviour. The real question is how to break the cycle.

It can help with this if you mentally rehearse your time in the studio before you go. This may sound a bit wierd, but it will help you practice staying in a relaxed frame of mind, simply because you're within an environment that you can control. Once you can see yourself as relaxed and successful in a mock-up, it'll be much easier to recreate that in the real studio environment. Though you might think such an approach to be a waste of time, such visualisation techniques are actually tried and tested, especially in sports competition. Championship runners, for example, visualise and preview their performance many times in their mind before a race — seeing the track, hearing the starter's gun, feeling their limbs working in a controlled manner, tasting the sweat on their lips and, most importantly, imagining themselves surging ahead of the pack.

For visualisation techniques to work, it is important to make the images as detailed as you can, while keeping yourself centre stage and in control. It can take a while to keep your attention focused, so you may have to allow yourself several attempts at mental rehearsals, but if you persevere it can really make a difference to the confidence with which you perform.

If this approach is not successful, you can also use visualisation to imagine yourself into a different environment that you find less hostile. You might be surprised at how easy this is to do. For example, many of us performed to ourselves when we were younger, imagining that we were in front of a screaming crowd of fans or that we were appearing on our favourite television show — the imagined environment was much more fun than the real one! If you can imagine a performance situation, however fictitious, where you can feel confident, relaxed and in control, then this can be used to increase your confidence, regardless of the reality of the situation.

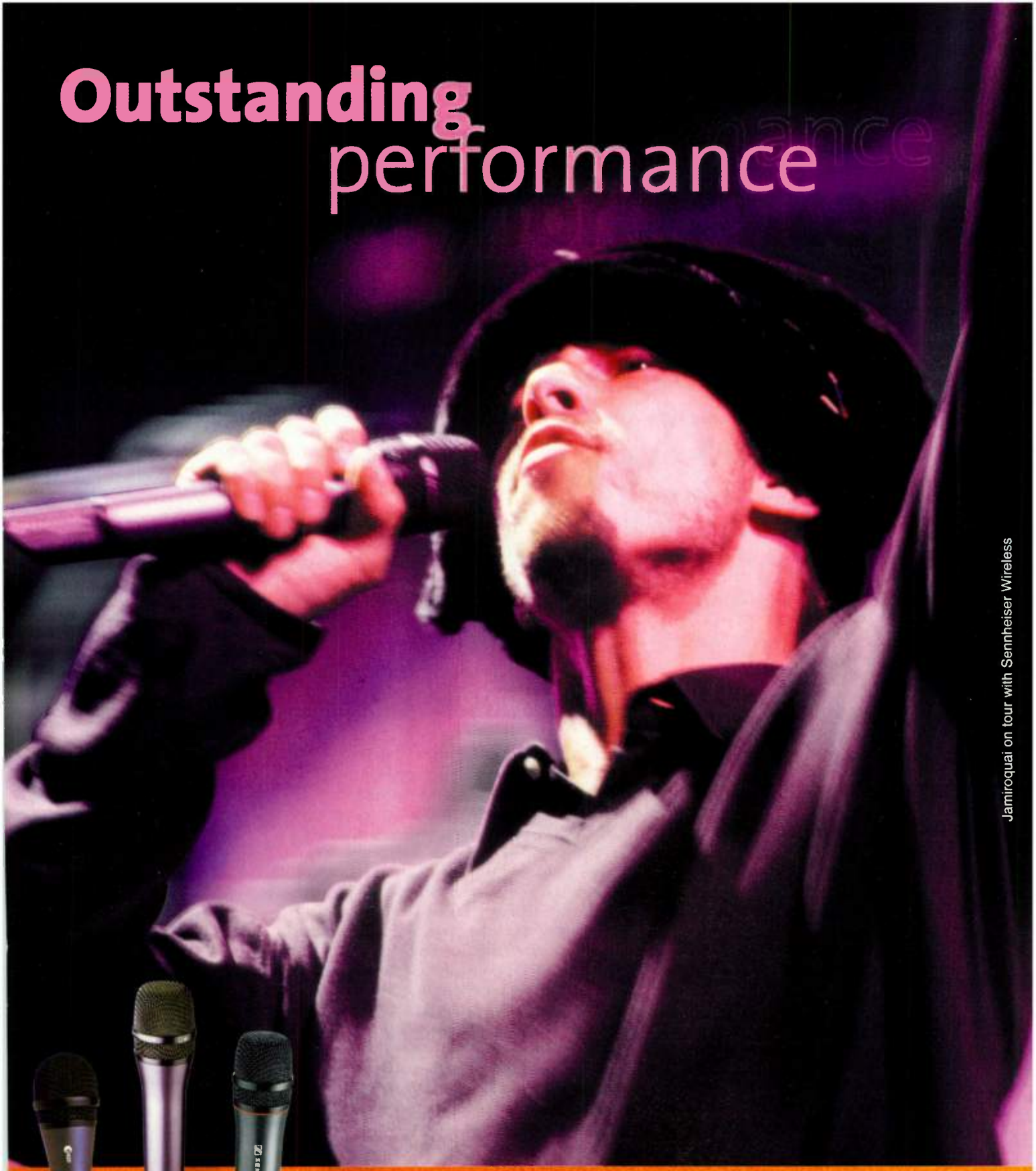
Your imagination is a wonderful thing. If it could let the younger you pretend that you were a megastar, and feel great about it, when you were only singing in the bath, then think what it might be able to do for you today.

Q After working on them for a while, every track I do seems to sound stale. How can I be sure that it's not just that my ideas are stale?

Creating your music should be a pleasurable activity and, indeed, most people feel a sense of excitement at the start of each new project, when

"Actively limiting the time you allow yourself to spend on completing a track is very important if one of your goals is to make money from what you do"

Outstanding performance



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there is a world of possibilities awaiting them. However, every part of the recording process should be enjoyable, not just the start, whether you're sorting out the beats, deciding on instrumentation, or even consulting your manuals to find a solution to some particular problem.

What we need to look at here is how to make sure that you enjoy every part of the process. One sensible way to increase your sense of achievement is to set yourself frequent small (and therefore manageable) tasks. For example, if you say to yourself 'by lunch I'll have finished the chord progression', or 'before *Oprah* I'll decide what effect to use on the vocals', then you'll probably be able to sit down to lunch/*Oprah* having achieved a fixed task. If you can see yourself progressing with a track, and can tangibly see your progress, then it's much less likely that it will go stale. While not setting yourself goals with limits provides you with limitless scope, it does mean that it's easy to allow yourself unlimited time for each track, and this can easily lead to you getting bored.

Another useful tactic in beating staleness is to change what you're working on every couple of hours if possible. Try working on the drums for a couple of hours and then on the vocals for the next couple of hours, in order to stop yourself getting stuck in a rut. Given that so many SOS readers now work with computer-based systems with instant recall of most settings, there is very little reason not to alternate periods of work on different tracks, even! While it is wise to try to achieve small goals every time you work, this doesn't mean that you have to achieve each of them all in one go — you can always go back to it in an hour or so if progress is slowing.

In addition to setting goals and varying what you work on, staleness can also be combatted by limiting the time you allow yourself for each track. If, at the end of the time, the track is stale, or isn't working, either bin it or get some fresh input. See if a friend can do anything with it, for example — a fresh look at something can make all the difference, and 50 percent of an earner is better than 100 percent of nothing. Also, have a look at your working methods, and see if you can vary the patches, effects and controls that you use. Dipping your toe into the unknown can often inject a bit of excitement into your work.

Q Whenever I hear a recording of my voice, I hate it, and I find I can't even tell whether it's a good performance or not. It doesn't sound like that in my head, and we've tried everything we can think of in the studio to sort it out. Is it just me?

It could be you, or it could be your recording equipment or techniques. The latter of these is what most of *Sound On Sound*'s reviews and technique features cover, so the best solution if you're concerned is to check out *SOS*'s back issues on the technical aspects of vocal recording — Hugh Robjohn's article in *SOS* March 1997 and Paul White's 20 Tips in *SOS* October 1998 are both good places to start. Though the technical elements of getting a vocal performance require experimentation and experience to get right, this is probably the easier of the two problems mentioned above to overcome. What can be much trickier to overcome is if the answer to 'Is it just me' turns out to be 'yes!'.

Where are you listening to the recordings you've done of your voice? It is important that you

Original Photo: Richard Ecclestone

listen to them with no distractions and with a critical ear if you're going to improve your performance. By 'critical', I don't mean that you have to critisise yourself in a negative way, but rather that you have to concentrate very carefully in order to discern what exactly it is about your vocals that is good and what is bad. Bear in mind, though, that there is something about listening to one's own voice that makes even the most accomplished performer cringe. In this case we are often our harshest critics — many a famous performer dislikes hearing the sound of their own voice, even when many fans love it. If you can stand it, it can really help to get some feedback from other musicians about your recordings. You can also ask relatives or best friends, though they may well provide a positively biased viewpoint. If you can find people who you can trust to give honest appraisals of your voice, then really try to make the most of their opinions.

One other thing to consider is that it might not be your voice, as such, that is the problem. It could be that you're attempting to sing in a manner that just isn't appropriate for the material you've chosen. You have to be clear in your mind exactly what you want to deliver. Is the style smooth and sophisticated, raw, bland, or in-yer-face? What is the emotional content of the track: anger, love, passion, humour, despair...? Are you going to belt out the line, or are you going to keep it more quiet and intimate?. What aspects of your voice do you want your audience to hear?

If you really have no idea about how you want

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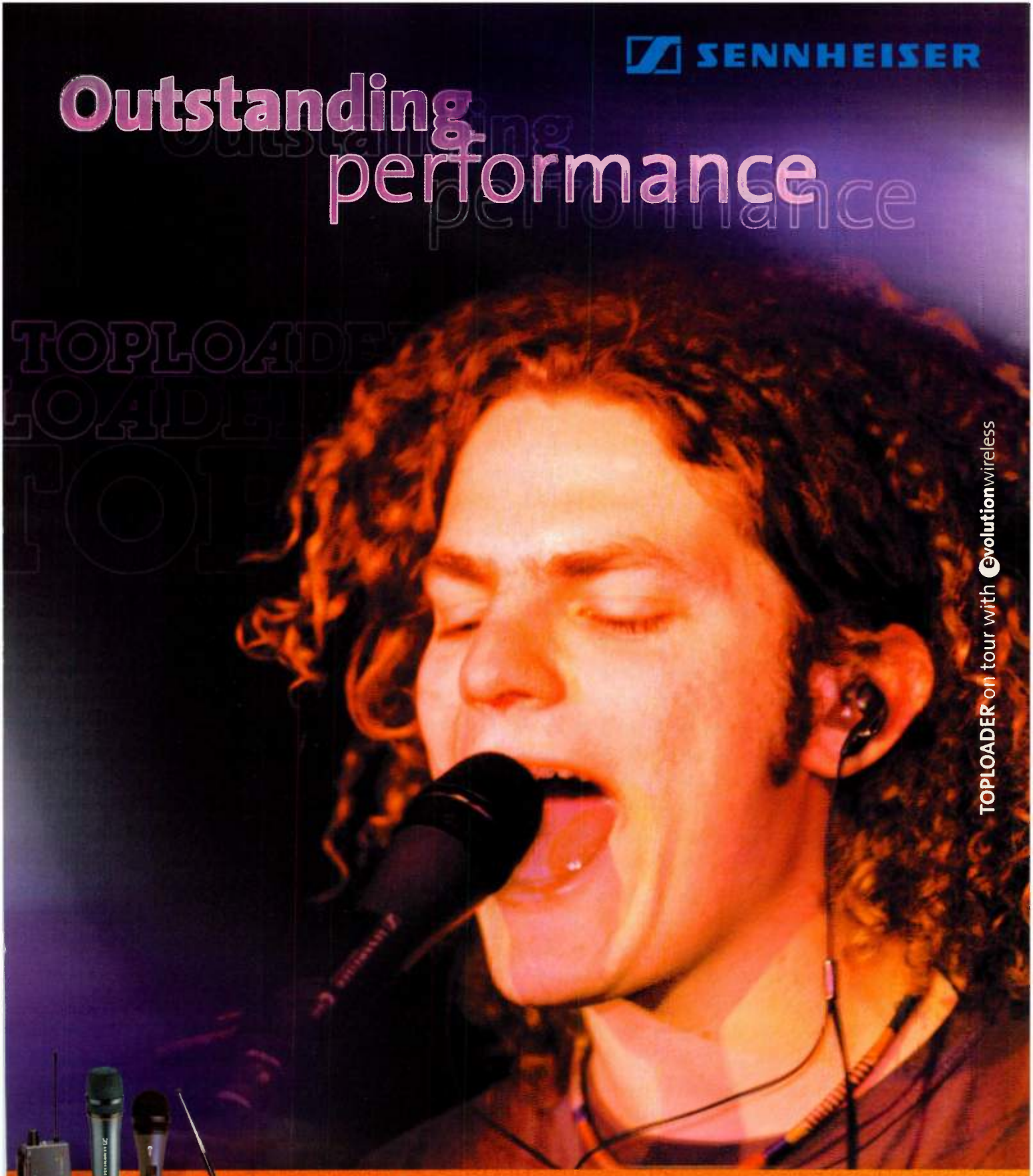

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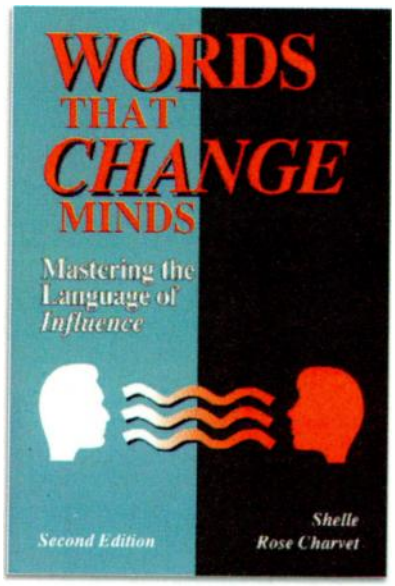
to perform with your voice, try listening to performers who you admire, and try to work out what it is they do when they sing. The good news is that you don't necessarily need to be able to sing to be able to bring a song to life — a fact of which Bob Dylan fans will undoubtedly be aware! However, it's also true that, even with the best voice in the world, no amount of studio jiggery-pokery will liven up a mediocre performance, so it's worth spending the time perfecting your performance before you even think of recording it.

Q My band has landed a small advance to record some new material in our local studio. We've been after a break like this for ages, so it ought to be going great. However, the other members of the band seem suddenly to be developing time-wasting into a fine art — they are unhappy with every take, they bitch about each other's performances, and progress on the album is really slow. Help!

If the members of your band truly consider this their big break, then it's odds on that they're going to be really scared of botching it up, even though this is not something they're ever likely to admit to each other or even to themselves. In such situations of pressure, people are often unwilling to proclaim anything satisfactory because this lays them open to being judged on their performance — and, as I've just explained, it is understandable that this judgement fills them with apprehension. Your band may not even realise this, but all the poor performances, bitching, and general bad vibes are probably delaying tactics, putting off the moment when they will have to be accountable for their efforts.

However, while this may go some way to explaining their behaviour, it doesn't really help you much on its own. As I explained above, the band have obviously now begun to associate the session's activities with their negative feelings, so you have to attempt to break this link that they're making. Try giving them only one chance to do things, saying that you want them to play like it's the last time they'll ever do it — keep the tape running and let them really go for it. Or suggest that everyone act as if they really love everything that's been recorded, just for a laugh — just the change in vocabulary can break the cycle. How about starting early and finishing early for a few days, to try to change the routine? Order in some different food and some booze to catch them off-guard — if you get them in a good mood then you might find that some magic starts to happen.

If you think that being assertive might just have them phoning round for a new producer, then it's worth trying to establish some rapport first. One important technique which can help improve how well you get on with people in the studio is often called 'pacing'. By this I mean matching certain aspects of your behaviour with those of your collaborator: for instance, if you are working with someone who speaks loudly and rapidly, where you generally speak quietly and more slowly, then try matching their speech patterns. By this, I don't mean taking things to extremes where they think you're parodying them, but just splitting the difference. The same can apply to posture and movement — if someone is laid-back and relaxed, then it makes little sense to seem too alert alert and poised, for example. You'll make far more progress with people if you subtly mirror how they sit or stand, and how they move. You can even try matching their breathing patterns — this is almost imperceptible to the casual observer, but if done well can make an incredible difference to the way other people in the studio relate to you.



Obviously, there are many more ways in which to establish rapport than I can go into here, but if you're interested in following up this subject then there are a number of worthwhile books on the subject. Try *Words That Change Minds* by Shelle Rose Charvet (Kendall & Hunt, ISBN 0787234796), *The Magic Of Rapport* by Jerry Richardson (Meta Publications, ISBN 0916990206), and *Influencing With Integrity* by GZ Laborde (Crown House Publishing, ISBN 1899836012).

Q I can't seem to find any good ideas anymore: I always seem to end up playing the same sort of grooves. Is there any way I can get out of this rut?

There is a world of musical inspiration out there, even though it sometimes seems difficult to find any. You have to remember though, that the music you produce will inevitably be affected by the music you take in, so if the latter has remained the same for a while, the former may also be stagnating. Therefore, one of the best ways to inject a little life into your music is simply to change what you take in.

Set two weeks of your spare time aside for doing nothing but absorbing new music. The only limit to your listening should be that you're not allowed to listen to what you normally do — your usual CDs, radio station and sample discs are banned for these two weeks, as is playing your usual instrument. Get yourself down to your local library, and take out a pile of music that you wouldn't normally give a second look. Go to your record shop and have a look through some sections that you have never ventured into before. If something looks interesting then why not treat yourself to it? Go to some gigs that you wouldn't normally be seen dead at, and tell yourself you're broadening your education. By the end of two weeks you will have heard and experienced enough to get yourself out of your rut, and your abstention from making music ought to have you itching to get going again! SOS

Amanda Lowe is a qualified hypnotherapist who has been involved with the music business for almost 20 years.
For details of her range of self-tuition cassettes, please write to: PO Box 123, Beverley, East Yorkshire.

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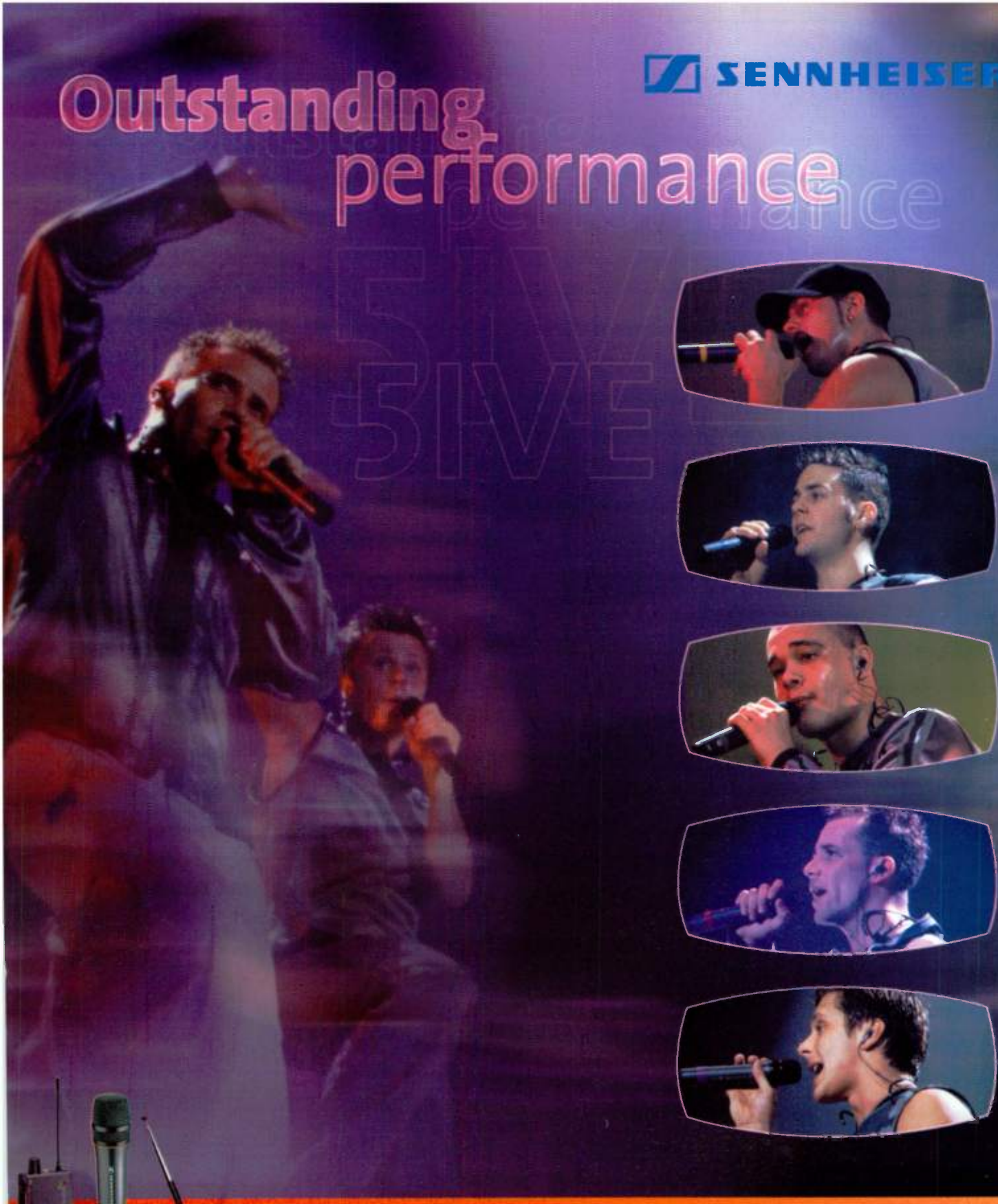

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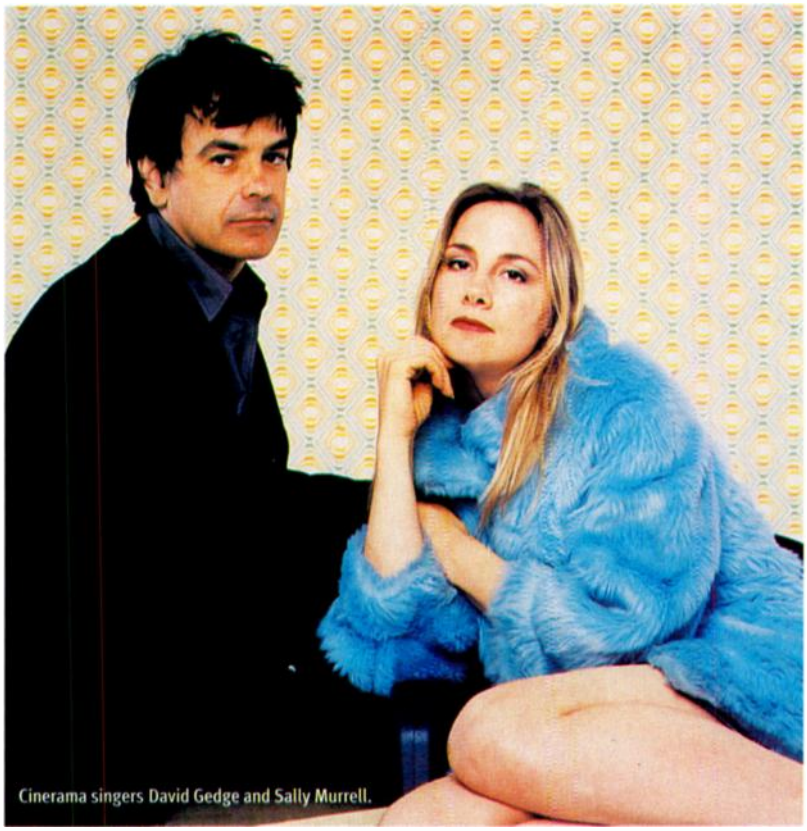
RECORDING *DISCO VOLANTE*



Cinerama singers David Gedge and Sally Murrell.

Wedding Present frontman David Gedge and engineer/producer Steve Albini are both associated with brutally loud guitar-based alternative music — so what would happen when they collaborated on an album influenced more by Serge Gainsbourg than The Stooges? **Tom Flint** investigates...

DAVID GEDGE, DARE MASON & STEVE ALBINI: RECORDING CINERAMA'S *DISCO VOLANTE*

cinema paradiso

"When I explained my idea on the phone he said 'That sounds hideous!'" laughs David Gedge, describing Steve Albini's initial reaction to the Cinerama concept. It was perhaps not entirely surprising that the idea of arranging and producing Gedge's indie rock/pop compositions in a style more typical of John Barry and Ennio Morricone should provoke such a response from Albini, given the latter's history as a producer and engineer. Having first gained notoriety as leader of American hardcore-punk band Big Black, Albini went on to produce Nirvana's *In Utero*, The Pixies' *Surfer Rosa*, and PJ Harvey's *Mansize*. To most, therefore, he would not have seemed the most obvious choice for such a project like Cinerama, but David Gedge has often been unpredictable in his choices.

David Gedge is best known as the guiding force in The Wedding Present. From the release of their 1987 debut album *George Best*, the band were championed by John Peel and considered by the music press to be the natural heirs to The Smiths' indie-pop throne. Although their music was typically based around drums, bass, two guitars and Gedge's straightforward vocals, the band were never afraid to experiment, even recording an entire album of Ukranian folk tunes called *Ukrainski Vistupi v Johna Peela*. They also displayed a taste for TV themes and film-score music, recording covers of the themes from *Shaft* and *Twin Peaks* among others.

Over a decade after the release of *George Best*, Gedge put The Wedding Present on hold to concentrate on his new project, Cinerama. The new band's first album *Va Va Voom*, released in 1998 by Cooking Vinyl, was a co-production between Gedge and engineer and producer Dare Mason. Now, two years later, Cinerama's second album *Disco Volante* has been released on Gedge's own Scopitones label, with accompanying singles 'Wow', 'Lollobrigida' and 'Your Charms'. This time production duties were shared between Gedge, Mason and the sceptical Steve Albini.

Va Va Voom

Gedge explains how the whole Cinerama project began: "I've always been interested in cinematic music, by which I mean soundtracks and TV themes, and I've always wanted to do something in that kind of field. The Wedding Present is an established guitar band so it was never going to happen in that context. We did cover some theme tunes, but it didn't really satisfy my desire so I decided I'd like to start a solo project.

"So many rock bands write and record a song

then slap a string section on to make it sound posher and bigger. Well, I hate that, so I wanted to build it into the songs rather than writing a song then tagging on a bit. So I started listening to a lot of soundtrack CDs — Ennio Morricone, Italian Westerns, John Barry, Eric Winstanley, and things you remember like the theme from *Department S*.

I also became more interested in vocals. The Wedding Present were not seen as a vocal band because the guitars were so important. I've always liked the female backing vocals of easy-listening records, so I was writing with that in mind."

Before any work got underway on what was to eventually become *Va Va Voom*, Gedge asked his manager to help him find a suitable producer who could help him realise his vision. As luck would have it, ex-Townhouse engineer Dare Mason had just hired the same manager to find him artists to work with, so the two were naturally brought together. Immediately, the limited project budget dictated the nature of the recording. "I would have had to spend all my fee on booking a studio!" admits Dare. "I wouldn't have been able to pay myself, so I couldn't do the album unless I could do some work at home. I had an Akai MPC60 and a 16-track Fostex D160, and for *Va Va Voom* I was still putting the MIDI onto the MPC60 and the Audio on the D160 — but now I've graduated up to a Mac with *Cubase*."

Photo: Richard Ecclestone

Disco Volante **Producer, Dare Mason.**

Getting Started

Gedge's first problem to overcome was how to get his ideas for strings, brass, and other typically cinematic instruments from his imagination into reality. "I didn't learn music at school and I haven't had any classical training, I just wanted to be in a rock and roll band!" he admits. "A friend gave me a copy of *Cakewalk* and I started writing with that. From then I realised it was what I needed, so I got a better version, a digital 8-track, and an Akai S3000 sampler. I started programming using strings from sample CDs."

"David had the basic idea of the kind of music he wanted to do, which was a sophisticated cinematic type of music," explains Dare Mason. "He sent me a tape of loads of stuff he was into, which was a very eclectic mix, and to tell the truth, it didn't help me at all. That was a learning process for me as much as him, because I had to get into his head and see what kind of sounds he wanted. Then he sent me a rough four-track demo of his album which contained a drum machine, guitar, vocals and maybe the odd bit of keyboard. Originally he thought he wanted all programmed drums so I created loads of loops and I even programmed a few keyboard sounds. Some of the sounds worked, some didn't, but it quickly became clear that loops were not his taste. He was asking 'Where are the fills?' all the time. He'd been used to having a talented drummer playing behind him.

"I think I opened his mind to a few sounds. At first David didn't know what a lot of them were called, so we narrowed it down. The horn he likes is a French horn, so on the last album we got a French horn player in to double all the sequenced parts. He was also really into John Barry-type sounds so I got a sample of a zither and played it to him, He said 'Wow, what's that? I've got to use that!' so that became part of our library. Now I've got a 'David Gedge' disk that's got zither, strings, theremin, vibes, Mellotron flute, Mellotron strings — anything Mellotronic basically — plus an old instrument called an Optigan."

Gedge describes some of the compositional stumbling blocks he encountered. "Originally I thought I could just plunge in and do it in three or four months, but it took me years of trial and error to work out how to do those things. For example, I was inputting the piano parts one finger at a time, then I'd print the score from *Cakewalk* and the pianist would say 'I need three hands to do this!', or the violinist would say 'I can't possibly play this because my instrument doesn't go that low.'

"I also wrote an idea for two oboes, with a harmony thing going on. The oboe player said, 'You can't have two oboes playing together.' I said 'Yes you can, I've just done it on this demo.' He said 'You can't because it's not a natural tone. The ▶

Cineramic Favourites

David Gedge explains some of his thoughts on cinematic music and composition: "What appeals to me is the hugeness and the emotional quantity of film music — it's so big! I used to think to get a big sound you just get a great drum sound then pile it all on. It does sound fantastic, but when you've done that there's nowhere left to go. These cinematic things work with the dynamics of the instruments. The horns may come in for a change of level but it's not always the horns, sometimes it's the strings, so it's they way it all fits together. For example, I quite like the flute which can really cut through because it's so high-pitched and clear, and when I need a big sound, it will probably be a cello at the very bottom with horns over the top. There are certain instruments I come back to time and time again because they sound great, and others I hate. I don't like the sound of saxophone. To me it just sounds like '80s MOR as soon as I hear it, so I never use it.

"I see *Disco Volante* as quite modern-sounding. At the moment, many of those instruments have the connotation of being retro and the tremolo guitar can be seen as that as well, but I've drawn from the '50s, '60s, '70s and '90s for this sound. With technology now you have all these great sounds at your disposal, so you should use them."

The move away from distorted guitars towards orchestral instruments certainly hasn't dented the power of Gedge's music, however. "The track 'Wow' starts off massive and ends up gargantuan!" exclaims Dare Mason. "David was saying 'When that guitar comes in it's got to be louder!' and I was saying 'Look at the compressor, it's already doing that!' So I have to back off on the compression then get the guitar coming in as loud as he wants. He's built up a knowledge of how that wall of sound works. At the end of 'Wow' there must be at least five separate guitar parts in addition to bass, drums, flute, cello, violin, horns, and there's probably a couple of keyboard parts in there as well.

"At the end of 'Manhattan', which is a single we did before the album, we totted up what was going on and there were something like 24 different instruments. Everything David loved was on at the end of that song. It's great as a mixer to try and find a way to fit all that in, and you have to use all the tricks. You have to find the right frequency range for the instrument, you have to pan it into the right place and use tricks with reverb and delay so it's in the right acoustic space. There isn't any space at the end of that track."

flute produces a clear note, but the oboe has weird overtones.' So he played it, and the first part he played sounded fine, but the second part sounded awful! Now I'm aware of what the limitations can be I'm a little bit more capable of writing."

The completed *Va Va Voom* contained cello, violin, flute, oboe, trumpet and theremin as well as the usual guitars, bass drums and vocal. Female backing vocals also featured heavily, courtesy of Sally Murrell.

Reviews were favourable, but the album fell short of Gedge's own ambitions. "In retrospect it didn't really achieve what I set out to do, so I wanted to do it again. That was the driving emotion behind *Disco Volante*. On *Va Va Voom* I was so desperate to get away from the Wedding Present sound that it ended up sounding a bit acoustic. I'd first thought it might be interesting to use loops and have everything sequenced and I did start going down that path, but after we started using a real drummer it seemed to come to life and sounded miles better. So with *Disco Volante* I set out to purposely write for those people. There's some sequencing in there, but it is mainly musicians. It's not as though I don't want to do the Wedding Present kind of thing any more, so I merged the two together more on this record."

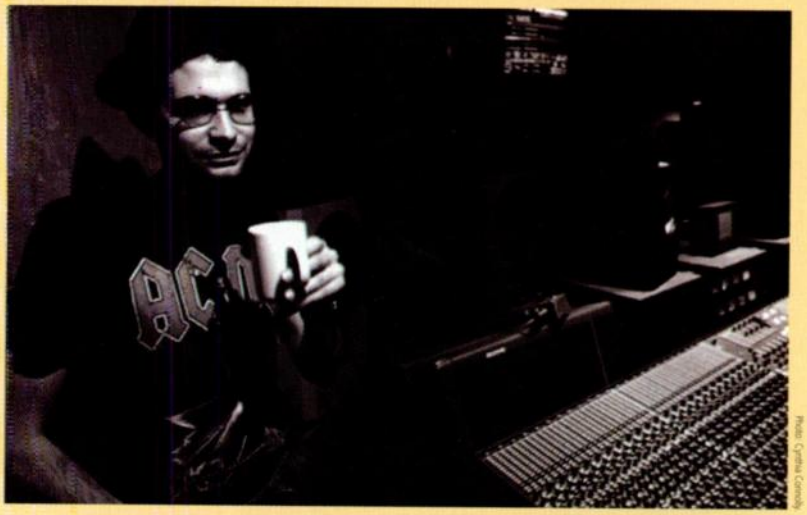
New Deal

For *Disco Volante*, Gedge decided to set up his own label, named Scopitones (See the 'Keeping Your Independence' box on page 182). By doing so he took on the responsibility of financing the album himself, so as with *Va Va Voom*, the budget was a limiting factor.

As if to acknowledge the John Barry influence and to firmly set out his intentions for *Disco Volante*, Gedge named the album after the hydrofoil owned by Largo in the 1965 James Bond film *Thunderball*. Once again Sally Murrell was available for backing vocals, but also joining the band was Wedding Present guitarist Simon Cleave who supplied what were to become the *Disco Volante* 'surf guitar' parts. Aiming to introduce a little more of the Wedding Present feel into the project, Gedge decided to re-establish his collaboration with Steve Albini, who had produced The Wedding Present's 1991 album *Seamonsters*. "I chose Steve for quite a few reasons," explains Gedge. "I think he's one of the best engineers in the world and I've really liked the sound of everything he's done. His technique isn't anything mystifying. He's got a massive collection of mics, so for his drum sound all he does is get a great drum kit, then mike it up in an acoustically perfect room with great mics. If you think about it, it's so obvious to do that and it works. I thought it might work with Cinerama as well, but a few people in the band were saying it couldn't possibly, which made me more determined.

"I gave him a list of 'influences' which would've included The Wedding Present, Ennio Morricone, John Barry, Burt Bacharach and surf music, amongst others, but it was probably when

Steve Albini's Recording Maxims



I mentioned Serge Gainsbourg that he went 'Aaaaargh!'. He always uses the adjective 'French' in a disparaging way, so after that I played it down a bit and was a bit more sparing with the information! From that point on, whenever he didn't like something we'd done in the studio he'd say 'That sounds sooo French!'

"I didn't give him an advance cassette, and in the past he didn't work from tapes. When we play the songs it's the first time he hears them. I was thinking that if it didn't work I'd have to do it again with a more sympathetic producer, but when he got into it he wanted to do the whole project, which was a relief!"

Albini explains his initial thoughts on the proposed album. "In the abstract, it sounded like an exploration of territory that quite a few people were covering at the time — light orchestrations, soundtrack influences. But I had innate faith that David would be smart and tasteful enough to avoid the formulaic triviality of many of the laid-back orchestrated pop projects, and Cinerama is better than you would expect if the music had been described to you."

Albini: "I had innate faith that David would be smart and tasteful enough to avoid the formulaic triviality of many of the laid-back orchestrated pop projects..."

Electrical Effects

All of the initial band recording was done at Electrical Audio in Chicago, a facility designed by Albini and constructed to his own specification. One of the most significant design features of the studio is its deliberate 'all analogue' setup, based around a Studer 820 24-track, Neotek Series II console, Ampex ATR102 half-inch mixdown deck and B&W 805 Matrix monitors. The exclusively analogue setup at Electrical Audio determined which elements of the Cinerama album could and couldn't be recorded there, as Dare Mason explains. "David wasn't sure how he wanted to do the second album but he did want Albini to do the really crucial things, like the guitar and the drums.

Disco Volante is just one of countless projects that Steve Albini has engineered at Electrical Audio — but his philosophy has remained consistent across all of them, as he explains. "I don't know how many specific techniques are common to the work I've done with other bands, but the underlying conceptual rules would be the same:

- Be prepared for anything the band wants to do.
- Fix it now, not later.
- If it doesn't sound good to the band, it doesn't sound good.
- The band is the boss. I consider myself to be an engineer. The producer is responsible for artistic decisions on the record, and I am not. An engineer is responsible for the technical execution of the recording, as I am.
- Don't take shortcuts if they will be noticeable."

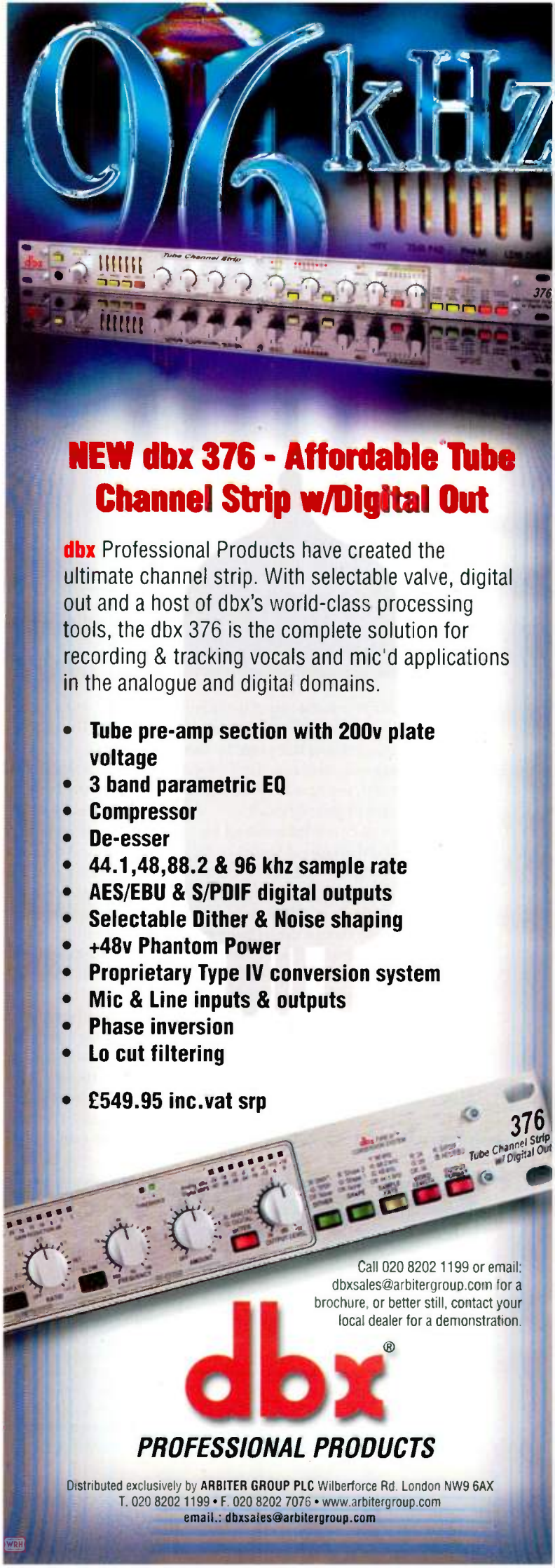
Again it was down to budget constraints. If he'd done it all on analogue it would have taken weeks, we wouldn't have been able to fly in any vocals, or do all the cutting, pasting, dragging and dropping that you can in digital audio, so they would have had to play and sing everything on the album, which would have taken far too long and cost far too much. The plan was to bring the project back here and have lots of time to do things like vocals and strings. We knew the string, horn and trumpet players we wanted to use so it made a lot of sense for the overdubs."

Given the music's heavy John Barry influence and the vintage analogue surroundings, it would only have taken the addition of a few men wearing white coats and clutching clipboards to complete the image of the SPECTRE headquarters from a 1960s Bond film. And, as Gedge explains, that image was surprisingly close to the truth: "All the people who work there wear overalls. It's like the technical department of BBC Radiophonic Workshop or something. Albini said they just felt that they were at work and in a different frame of mind when they put their overalls on, so they kept wearing them."

Albini reveals more of the reasons behind the curious protocol. "It isn't a dress code, any more than when fly-fishermen all wear wading boots. One day I came to work and one of the guys had gotten a bunch of these overalls made. He handed me a set and said, 'Here's your jumpsuit.' I've worn them in the studio ever since, and so do most of the other guys here. They are an ideal work outfit — big pockets for carrying things around, heavy protection from bumping into things and for carrying things, and they keep my clothes from getting dirty and torn up. Most of making a record is like working in a warehouse (without the forklifts) — carrying things from one place to another, lifting things, crawling around under things, tidying up, and so on. The jumpsuits are great for that."

The Recording Process

Although no strings or brass were to be recorded in Chicago, they were integral to the Cinerama sound, so Gedge took his Akai S3000 sampler loaded with the relevant samples and a laptop running *Cakewalk* to trigger them. "When we rehearsed, we played to a click track and I had the sampler ▶



Dare Mason's West London home studio, where recording for *Disco Volante* was completed.

going through a PA into the rest of the room," explains Gedge. "It was a bit weird, because the band had to play knowing that would be added later, but it was well rehearsed. That's the other thing about Albini, you have to be well rehearsed because he loses patience quickly."

Once again Albini is emphatic about his preference for well-rehearsed bands and his approach to recording. "It stands to reason that if a band is ready to play its music before arriving in the studio, the end result will be more confident, and that decisions about it can be made more efficiently than otherwise. If you've never heard a song played all the way through before, how will you know if it's played to its full potential? It always helps to have a memory of the song being played as a reference.

"I try to audition things as they are set up, starting with the drums and moving from one instrument to the next, readjusting whenever something sounds bad. It isn't my style to use a standard setup and make adjustments after the recording is done. Certain songs require a different technique on one instrument or another depending on volume, tone and mood. It is part of the job to be sensitive to such things and make adjustments on the fly as necessary.

"I don't remember which mics and preamps I used precisely, but there would have been close mics on the drums, overhead mics and distant ambient mics. I was trying to be prepared for any eventuality in the final mix. There is occasionally some spillage, but I try to ensure that it is never a problem. I wasn't there when it was mixed, so I don't know if there were any later complaints. I seldom use any compression, limiting or EQ, except in specific trouble cases. I probably brightened the snare mic, and I think I limited one of the overhead mics as a special effect. That's probably about it. I don't recall which mics I used on the rest of the session. it could have been any of a dozen mics for each, depending on how it sounded on the day. I have over 200 microphones, and each of them has special characteristics that

Keeping Your Independence

Disco Volante is an independent album in the truest sense of the word, having been released on Gedge's own Scopitones label. Gedge explains why he decided to go it alone: "The Wedding Present used to have their own label called Reception Records and we signed other bands. Cud had their first single 'Never Mind The Gap' on our label.

"When my label manager, Steve Young, left Cooking Vinyl it was the final straw, because he was a really good bloke. There were a few other record labels who were interested, but they were all about the same level as Cooking Vinyl. Then Steve said 'If you want to set up your own label, I'll manage it on a freelance basis,' and that's what we do. He takes a commission as distributor, does all the day-to-day running and just phones me if he wants to make a big decision. It works really well and it make sense for bands who want to run their own label. You get 80 percent of the income rather than 13 percent, but the main thing is having the control. If it happens or if it fails it's because of us rather than someone else."

"I think it's a great way for David to go," agrees Dare. "He owns his own record. He's been in the business long enough to know that means a lot. The only thing some bands want is to get signed, but you have to think about it. OK, so you've made an album, but the record company own that album, and the master tapes as well. They can delete it, license it, can sell it at whatever price, and they've got choice over the distributors. If you continue as a band on a different label and you want to put out a 'best of' or a re-release then you have to go cap-in-hand to the record company. I think David has chosen the right way for the level he's on. I hope he earns a fortune from it."

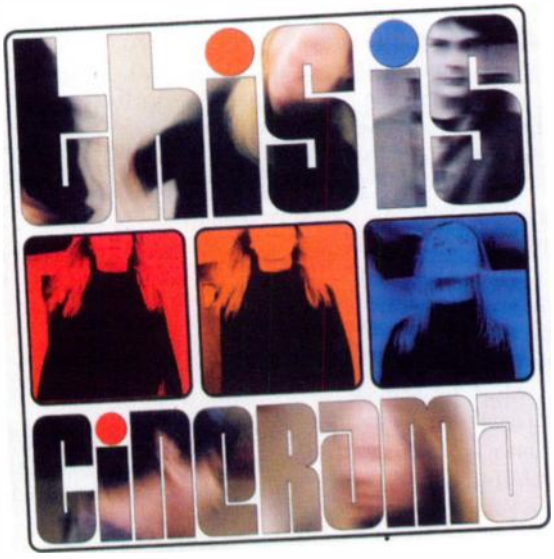
make them useful or not in different circumstances. Knowing them is part of the job. I don't recall using any effects, but I may be mistaken. The studio has a huge collection of equipment, so anything that was required was available, but I don't recall what was used in each instance."

Over The Top

By the end of the Chicago session, the drums, bass, some of the electric guitars and some vocals had been recorded. Albini then sent the 24-track two-inch master to Dare Mason for the addition of the overdubs. But before any work could commence, the audio had to be transferred into *Cubase*.

"It was a bit of a nightmare!" admits Dare. "Dave is nothing if not methodical and organised, but it wasn't as simple as he though it would be. The sequenced sounds and click had been dumped onto a couple of analogue tracks. The main problem was that the click was not generated by SMPTE so it wasn't tied to any kind of timecode. I received a 24-track tape with a shaker for a click which was just 'shhh shhh shhh', and it had crosstalk all over it from the guide tracks. On top of that, the tape had been edited by Albini between various takes.

"I found a way around it with the help of another engineer called Chris Madden. Firstly we transferred it from 24-track onto RADAR so we knew it was going to be stable with no wow and flutter problems. We managed to sync RADAR and *Cubase* via the word clock and MIDI sync at the same time via a very complicated process that I can't even remember



now! It was like being a bomb disposal expert for two days."

Once the audio was successfully sync'ed and transferred, the business of adding the overdubs began in earnest at Dare's home studio. "The first stage for me and David was to listen to what had been done in America and see if there was anything that needed to be redone. By and large it sounded pretty good apart from one or two of the guitars. Unfortunately Simon had just been playing live with the bass and drums and didn't really get a chance to examine his sound, so we decided we'd keep all the bass and drums and redo some of the guitars. We decided some of the cleaner guitars could sound better, especially the tremolo ones. The distorted guitars were all fantastic and all the acoustic guitars sounded fine.

"After that I think we started working on programmed ▶

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sounds. The string samples on this album were off David's S3000. We transferred David's programmed MIDI into *Cubase* via MIDI clock. Then I went through all the programmed strings he'd done and made sure it was all in time with the Chicago session. Once that was in, we got the real string players in, which was one violin player and one cello player. We found that until you multitrack them up at least three, possibly four or five times, you don't start to get the benefits of multitracking. Even then, you're still talking about the same player with the same style and same violin. It works but it's a particular type of sound, so we found the best thing to do is get one really good track of a violinist doubling the programmed part then mix that in with the programmed part. That gives it a lot more life than just having programmed strings."

Finishing Off

Between the recording of *Va Va Voom* and *Disco Volante*, Dare Mason had upgraded his recording setup. His main recorder was no longer the Fostex D160, but an Apple Mac equipped with a MOTU 2408 interface. He recorded the acoustic instruments straight into *Cubase* at his home studio using his standard rack of equipment, plus a hired Neumann U47 for strings and vocals: "I put the string players out in the hall with the Neumann U47 valve mic. That went through the Mackie desk preamp without any EQ, then through my TL Audio compressor as clean as I could get it into the MOTU 2408. I didn't want to colour anything, because I knew when I got to the mix I could do it there."

The mix took place at Intimate Studios, London. "I had to ship the whole lot to Intimate including the monitors, samplers and the Roland Sound Canvas which we used for an organ sound and vibes. We used my Emu for a few sounds but mainly the S3000," explains Dare Mason. "There were no more than 24 tracks of audio on any song, so I used the outputs from the MOTU. It's got a bank of 24 ADAT output channels, so I patched 16 of those into the D160 and its converters to shove analogue out. I also used the eight analogue outputs on the MOTU to get a full 24 outputs.

"At Intimate we used a Harrison MR2 desk. Anything through the Harrison immediately sounds right to me. I didn't use any outboard EQ on the tracks, which I know will shock some people — but if the desk has got it, why bother? I'm a big fan of compression and they've got some UREI 1176s, a couple of Summits, a Dbx 160S and some little upright compressors called Gain Brains, which you can put together in a rack. I used those on guitars, although the guitars didn't need much compression.

"The drums had an awful lot of compression. I ended up submixing them to a stereo track then compressing them. There were 10 tracks of drums to choose from. He'd put mics on the front and back of the bass drum, and there were four or five ambient mics. Two of those were overheads with loads of room sound on and I think he'd tried to compensate by moving the other overhead mics quite close to the cymbals. Albini had had to record 13 tracks in four days, and 'Wow' had to be completely finished apart from strings and horns because Dave wanted to release a single before the album came out, so they did work the poor guy's butt off. I had the luxury of working in a very relaxed fashion here.

"Absolutely no reverb was added to the drums. I know it's hard to believe, but it's all just the live room. Albini must have recorded it in a massive room with the mics quite distant. If anything that was a problem, because even the close mics sounded like they were recorded in a big room. It's all about your taste and subjectivity, and if it had been up to me the drums wouldn't have been so ambient because I like things to sound like they're recorded in the same space, but David has a different vision, which is great because it sounds more unique than it would if I'd mixed it to my taste. David would be saying 'Can't we make the drums sound a bit more ambient?', while I was saying 'For f**k's sake man, it sounds like Led Zeppelin already!'

"If I'd had the choice on this album I'd have definitely had a spring reverb, a plate reverb and ideally a chamber. We didn't have any of those at Intimate so I used a Yamaha SPX1000 preset called Old Plate on the orchestral instruments and a Lexicon 224 Rich Plate as needed. Unlike the drums, David likes his vocals to be fairly up-front and dry, and on 'Lollobrigida' I didn't use any vocal effects at all. There's a program on my Alesis Microverb called Reverse which I find is a fantastic

Some of the gear in Dare Mason's studio. From top: Alesis Microverb 3 and Lexicon Alex multi-effects, Alesis 3630 compressor, TLA C5021 valve. compressor, Sony DAT recorder, MOTU 2408 recording interface and Fostex D160 hard disk recorder.

Dare Mason's Emu E6400 sampler, Roland Sound Canvas module and MOTU Micro Express MIDI interface.

Pure Analogue

Steve Albini explains why digital equipment has no place in his studio: "Analogue sounds better than digital to my ears, more true to the sound of the instruments and voices. There are no real advantages to abandoning either the proven equipment or techniques, and analogue masters are permanent — lasting 100 years or so at last estimate — while digital masters are not. There's an arcane technical discussion involved here, but the gist of it is that digital recording systems keep being discontinued, or are no longer functionally adequate, and the masters are either hard-disk files with no physical being, or physical tape/disc copies, which deteriorate of their own accord in a relatively short time period, and I consider the minimum requirement of my job to be making a permanent recording.

"Digital systems invite an entire slew of problems, akin to computer glitches in all other walks of life, into the studio, and I don't want to inflict them on the band or their audience. Analogue systems are more reliable, faster and easier to use. They're more robust with respect to abuse, easier to maintain and repair, better suited to creative/experimental recording techniques and less fatiguing on the operators and listeners. Lastly, analogue equipment holds its value far better, which is a consideration when investing in equipment for the long term."

effect for making a vocal sit in a mix. At, say, a 200 millisecond delay, it works in a different way to slap-back delay at that setting because it's smoother and more subtle, so it's cross between a short reverb and a slap-back. I'm a real fan of anything budget like that, because they're just so simple to use, and you usually find there's one or two things they do better, in a less complicated way, than expensive effects.

"Once I've got organised on the first mix in terms of channels on the desk and where things are coming up, it pretty much flows through. I get the band sounding pretty good then put the vocal in and work on that. Then I start putting all the bits of icing around. Once I have everything in at a balance that I like, Dave will come in and ask for a little bit more ambience on the drums, and say 'Aren't the vocals a bit loud?' That's usually what it boils down to and that's usually a bit of a fight between me and him. I think I've persuaded him that the vocals do need to be a bit louder than he thinks. He's so used to them being buried under the guitars in The Wedding Present. The lyrics are at least 50 percent of what Cinerama is about, so I really like people to be able to hear the words, but Dave gets his own way with the drums and the ambience!"

Into The World

Once the mixes were complete, the album was mastered at Hilton Grove by Guy Davis and released in the summer of 2000. A special heavy vinyl edition was sent by Gedge to Albini (knowing his preference for that format), and was the first opportunity for the engineer to hear the finished result. While describing the album as 'a fine record' Albini had reservations about the process. "I always prefer to be involved from start to finish because I have high standards, and I like to see them maintained. It breeds inconsistencies and compromised results when a project is taken from one engineer and environment and thrust into another. This is as true for Cinerama as anything else."

While happy with the results of this hybrid project, Gedge also sees a full project with Steve Albini as a possibility. "I'd like to do a whole project with Albini from beginning to end with all the orchestration because he's quite into that. He's known as this grunge producer, but his big idol is George Martin and he loves Abbey Road studios. I think he gave *Disco Volante* a certain edge it wouldn't have had otherwise — and the drums sound great! I do want to do some more Wedding Present stuff again in the future but I'm not sure if I'll try to bring in more instruments or just enjoy the limitation again. Only time will tell."

You can hear samples from the Cinerama album Disco Volante *on the* SOS *web site. Surf to www.sound-on-sound.com/sos/feb01/audio/cineaudio.htm.* SOS

WALDORF MICRO Q

q continuum

WALDORF MICRO Q POLYPHONIC RACK SYNTH

Stardate 02/2001: the most compact and affordable of Waldorf's bright yellow workstation synths is beamed into the *SOS* Editorial dome. Is it the work of a superior intelligence, or does it have all the appeal of a Vulcan nerve-pinch? Mind-meld with **Paul Nagle** and find out...

The Waldorf Q has had an 'interesting' life so far. When it reached UK shores (and stores), it was an expensive, knobby, and yet obviously unfinished virtual analogue keyboard. Time passed, software and hardware people laboured, and a version in sound-module format, the Q Rack, was born, costing just half the price. The rapidly maturing Operating System received bug fixes, new features, and yet more fixes, resulting in an instrument that *SOS* reviewer Gordon Reid described as "(now) a hugely powerful synthesizer that deserves attention and respect". But it faced some tasty competition, and the Q Rack still weighed in at over the magic thousand-pound mark in the UK. Waldorf needed to do something to recover their investment — so they made a second, even cheaper rackmounting Q, the Micro Q.

As the Q and Q Rack have been extensively reviewed before in *SOS*, I suggest you read those reviews, from December 1999 and June 2000 respectively, or surf to the SOS web site (see www.sospubs.co.uk/sos/dec99/articles/waldorfq.htm and www.sospubs.co.uk/sos/jun00/articles/waldorf.htm).

To quickly recap, the Q (keyboard and rack) is a 16-note polyphonic virtual analogue synth, expandable to 32 notes. It features the usual 'analogue' waveforms but incorporates elements of Waldorf's wavetable synthesis too. A powerful dual-filter design has the expected low-pass and high-pass modes (and others too) but also boasts positive and negative comb filters. With three LFOs, no less than four envelopes, a modulation matrix, and an effects section, it's a synth of considerable complexity. And the list goes on to include patch morphing, a step sequencer, 16-part multitimbrality and digital output. For the bulk of this review, I'll concentrate on how the Micro Q differs from its bigger siblings, and which of these features had to go. Naturally, I'll offer my own slant on what has become quite a controversial synth, not least because of Waldorf's 'open-ended' design philosophy, which might be rendered as "if something you want isn't in the Q today, who knows, it might be available tomorrow?" The original Q took this to extremes by being initially released for sale with many fundamental features not operational at all! I remained well aware of this as I received the Micro Q: my first action was to upgrade it from OS version 1.01 (with which it shipped) to v1.1...

Physical Remodelling

Let's kick off with a look at how the price has been trimmed down. First to be chopped were those

WALDORF MICRO Q
£630

pros
- The most affordable Q yet.
- Impressive programming potential.
- Upgradable to 75-note polyphony.
- Not just another 'analogue wannabe'.

cons
- External power supply.
- Display is too small for the number of parameters on offer.
- Unremarkable effects implementation.
- Some important features still "in the pipeline...".

summary
By stripping the Q down to its essentials, the Micro Q sacrifices remarkably little depth and no sound quality. The matrix system of editing is less of a burden than you might expect, so it really is most of a Q at a fraction of the price.

SOUND ON SOUND

Photos: Mark Ewing

expensive continuous knobs — the original Q has an impressive 58 of them. Instead, Waldorf have adopted the matrix-style editing method, as seen on their marvellous analogue monosynth, the Pulse. With this system, the Micro Q needs just four continuous knobs to edit values selected from seven rows of parameters (the active row being shown by an LED). Navigation is via up/down/left/right keys, so a little flicking about to reach the parameter you want will be needed. Some rows have multiple LEDs to represent multiple parameter sets (envelopes, for example; since there are four of them, four LEDs are required). And almost all parameters have a second edit option courtesy of the shift key. If this lot isn't sufficient, yet more options are available for each row by pressing the Edit key. It's a system which is a good deal easier to use than it is to describe, and I'd say it is no worse than the Q in terms of patch editing. Obviously, you can't just reach directly for the control you want (which would have been nice for live performance), but that's an inevitable drawback when you cut down on the number of physical controls. Incidentally, the Micro Q's knobs are tapered but unlike those of the Q, they are ridged — an improvement as far as I'm concerned.

The central section of the Micro Q panel will look familiar to Q owners. It comprises: a small (2 x 20) LCD, four instrument selection buttons, two knobs, a red alpha dial and a further eight buttons (to handle access to various parameters and utilities, such as global settings, and store and compare utilities). There's no dedicated volume control; this duty is performed (in play mode only) by the leftmost knob under the display. At least there *is* a headphone socket, which takes care of one of Gordon Reid's most vociferous criticisms from previous *SOS* reviews.

Sneak Preview

Whilst in the middle of my review, I did receive a sneak preview of the next operating system from Waldorf (which isn't even at official beta stage yet). This offered a new delay effect — essentially five delays at once using all six of the audio outputs. The revision also addressed a problem I had noticed in v1.1 where the delay does not become active for a few moments after patch selection.

The Micro Q is small but hard to ignore; it's like a Pulse in a loud suit. You'll doubtless have noticed that like its elder brothers, it's bright yellow, but what can I say? The day Waldorf make a conventional synth is the day Ann Widdecombe gets into 'jazz cigarettes'.

Peering at the Micro Q's rear, I see that only the Q's digital output and pedal/CV connectors have been lost. Everything else is there: MIDI (of course), stereo input and six audio outputs. One small concern was that the audio sockets are directly attached to the motherboard but *not* fixed to the outer casing. As a result, they wobble slightly when you insert a cable and care must be taken not to put too much pressure on them, although I suppose once the Micro Q is racked this would be less of an issue. Unlike the Q keyboard and Q Rack, the Micro Q has an external power supply and the one which arrived with the review unit was a bulky, Euro-type two-pronged monstrosity. According to UK distributors Arbiter, this was a temporary replacement and a proper UK PSU will be supplied with units on sale via dealers. If this turns out not to be the case, contact Arbiter or have your dealer do this on your behalf. Despite this slight irritation, I got the Micro Q up and running, and the techno-style demo songs soon had me smiling.

A Q(uart) In A Pint Pot?

While the physical differences between the Qs are obvious, I was reassured to find that the Micro Q lacks only a few programming features of the 'full' models. The step sequencer is gone; it wouldn't have been much fun to use via the Micro's interface anyway. Perhaps surprisingly, I didn't feel this was a loss. Although I personally love step sequencers, I was never convinced by the Q's version as it just doesn't have enough dedicated controls. A more important omission is the Xphorm function — Waldorf's version of patch morphing and a versatile tool found in synths such as the Yamaha AN1x and Oberheim OB12. It's a shame it didn't make it into the Micro Q.

In raw synthesis terms, the most significant difference between models is in the filter routing. In the Q, this was continuously variable between serial and parallel operation, but in the Micro, it's serial or parallel with no steps in between. I was concerned that the loss of this unique feature would compromise the power of the Micro, but once I'd tried it out I didn't think it suffered much at all. You can still control the balance of each ▶

The Micro Q At A Glance

FEATURE SUMMARY

- Six audio outputs.
- One stereo audio input.
- 16-part multitimbral mode.
- 300 sounds.
- 20 drum maps.
- 100 Multis.
- Three oscillators per voice with pulse, saw, triangle, sine and two wavetables with 128 positions (two additional sub-oscillators are available when wavetables are used).
- Frequency Modulation of all oscillators and filters is possible.
- Oscillator sync (Osc 2 to Osc 3).
- Two filters with 24dB/octave and 12dB/octave low-pass, band-pass, high-pass, and notch and comb types.
- Three LFOs (at up to audio frequencies).
- Four envelopes.
- 16-entry modulation matrix.
- Arpeggiator.
- Glide (portamento, glissando).
- 25-band Vocoder.

HOW THE MICRO Q DIFFERS FROM THE Q

- No Xphorm (morph) function.
- No CV/Pedal inputs.
- No step sequencer.
- No continuous filter routing — serial or parallel switch with no 'in-between' settings.
- The second effects unit is a global effect and is the only effect with delay.
- The maximum delay time is reduced from that available on the Q.
- Dynamic voice structure can yield up to 25 voices.
- Expandable to up to 75 voices (although the hardware option to do this is not yet available).
- In Multitimbral Mode, up to five effects can be used in total, four effects for the first four parts, and one global effect with adjustable mix level in each instrument.
- No digital output.

oscillator's output into the filters, and the Q's filter-panning options are retained. Furthermore, you can control this panning dynamically via various modulators (LFOs, envelopes, velocity), so it remains a tremendously flexible system.

Most of the differences I've mentioned so far result from the Micro Q's internal architecture. Instead of the Q's three DSP chips, the Micro Q has just one processor (albeit one of increased power). Thus it has a unique Operating System not shared with its bigger brothers (by contrast, the Q and Q Rack share the same OS). The Micro Q can import Q patches (although they may end up sounding slightly different), but the Q can't (yet) import Micro Q sounds. The Micro Q's single-DSP design also means that the number of simultaneous effects are reduced from the Q's eight to five and the delay effect can only be used in the Global effect slot. The maximum available delay time (1.48 seconds) is also less than that of the full Q.

Unexpectedly, there's an area where the Micro Q surpasses its larger relatives. Unlike them, it uses a dynamic voicing method, and so can produce up to 25 notes of polyphony (the unexpanded Q is fixed at 16 notes). It would have been nice to have had some means of displaying the current polyphony of each patch, as on the Nord Modular, but I did come across some general rules on maximising the available number of notes (see the 'Q Tips' box above for these).

The Micro Q responds to the same MIDI controller numbers as its larger siblings but, alas, these numbers don't correspond to those of other Waldorf synths such as the Pulse or Microwave XT. If you were thinking of using the XT's knobby surface to control a Micro Q, think again.

Sounds

Showing that their days of quirky, near unusable factory patches are behind them, Waldorf have filled the Micro Q with sounds that are (mostly) very good and a few that are excellent. There are impressively deep basses, thick flanged strings, dirty organs and shimmering pads, plus snappy sequencer-ish patches, courtesy of the highly versatile arpeggiator.

I was struck by how the Waldorf personality pervades almost every patch. There's a certain hardness of tone that's always present, a rather distinctive chorus-like sound that Waldorf oscillators make when detuned. Perhaps because the oscillators were modelled on those of the Pulse, they sound wonderfully rich and full; I was particularly impressed by their presence and clarity in the upper registers. The wide frequency range on offer can really spice up patches which use the ring modulator or oscillator frequency modulation.

The filters aren't the most analogue-sounding I've heard, but then the Q family shouldn't be classified as just another set of analogue imitators. Even leaving aside its wavetables, this is audibly a digital synth, and excels at those things digital synths do best (electric pianos, bells, thumping percussion and aggressive, cutting solos). Some of the wild noises I generated with the Randomise Patch utility hit my ears like flying concrete, and in general, the Micro Q demonstrated a capacity for sound effects like no synth I've known before.

Some Niggles

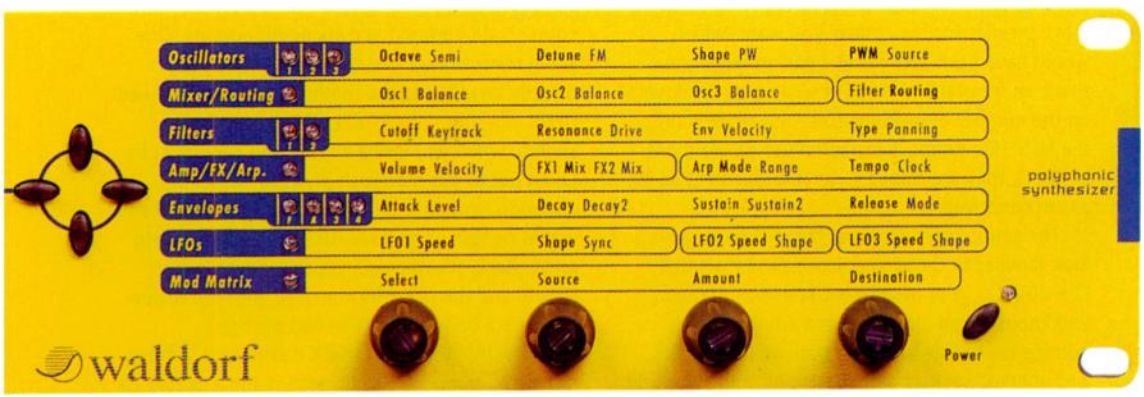
I explored some of the Micro Q's innovative features such as looping and one-shot envelopes, yet failed to find such basics as envelope multiple triggering. Annoyingly, the envelopes always start from zero which hampers some monophonic lead synth emulations. In the current Operating System, there's also no way to turn off MIDI program change reception, which is a minor nuisance, and it doesn't respond to a couple of controllers that it should. Sure, these things are probably being addressed as I write this but they would be handy now! Happily, I experienced no crashes with the Micro Q.

My only real sonic disappointment was with the

Q Tips

The Micro Q's dynamic voice allocation can provide up to 25 notes at once, depending on how many unused parts of the sound engine there are.
A future hardware upgrade will take this up to 75 notes, although no details are yet available of when this may appear (or how much it will cost when it does!). By turning off oscillators, filters, and effects, you can squeeze more voices out of the Micro Q, as shown in the following guidelines:

- Use oscillators in the order 1, 2, 3 and turn off unused oscillators with the Shape parameter. Turning off oscillator 1 or 2 but leaving on oscillator 3 will not help.
- Turn off FM when you don't need it. Either set FM Source to off or FM Amount to off.
- Use the filters in the order 1, 2. Turn unused filters off with the Type parameter.
- Turn off Filter FM as described above when you don't need it.
- Set unused effects to Bypass.



In order to make up for the loss of most of the physical controls seen on the Q and Q Rack, the Micro Q adopts a matrix editing interface similar to the one seen on Waldorf's Pulse monosynth. The lit LED on the left denotes the row of parameters which can be accessed for editing with the four knobs below.

"The internal and external changes made to keep the cost down have left the underlying Q personality remarkably unscathed."

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effects section. The Q series has considerable DSP power, and yet it still lacks a reverb effect (one is scheduled for early 2001). The effects that are present are rudimentary, confusingly implemented in Multi Mode, and none of their parameters appear as entries in the modulation matrix. Fortunately, the Micro Q's sound doesn't rely on effects and its comb filters in particular go a long way towards providing the Q's best flanging, chorus and phaser sounds.

Rotary Qlub

I'm quite a fan of Waldorf's continuous control knobs for live performance but I understand previous comments (like those of Gordon Reid in *SOS*, and others too) that it's hard to work out at any one time what parameters are set to. If Waldorf took a leaf from Access' book and displayed the original (stored) parameter values alongside any newly edited value, it would improve things. In the current Operating System, if you want to see a parameter on the LCD before you change it, you must press the Peek button, and then, before the parameter can be edited, you have to press it again.

There's no avoiding the fact that the Micro Q's LCD is small and can only ever represent a fraction of what's going on in the synth. A computer editor would be an ideal partner — if it could keep up with Waldorf's frequent OS updates, of course! There *is* an edit menu that displays all the ADSR parameters at the same time but there's no such display for oscillator levels, filter settings and so on. Mostly, just two parameters are visible at once, corresponding to the two knobs under the display.

Conclusion

If you are looking for a synth that attempts more than just traditional analogue emulation, the Micro Q offers a palette of sounds guaranteed to set you apart from the crowd. Perhaps it lacks the maturity and sheer class of synths such as the Access Virus, but Waldorf devotees doubtless hope to receive new and improved features as time goes by. I feel the effects section, in particular, needs attention; if Waldorf want to compete in the feature-count game, they should press ahead with their reverb and add a little polish to the existing effects too. Nevertheless, the internal and external changes made to keep the cost down have left the underlying Q personality remarkably unscathed. If you can live with the Micro Q's user interface, there is programming depth within to reward even the most cerebral synth boffin for years. Certainly if I were buying a Q it would be this one, and I have no doubt it will prove to be the most popular member of the family. If you dare to go where no-one has gone before, you should arrange a meeting with one of the Q. SOS

System Updates

As stated in the text, I reviewed version 1.1 of the Micro Q's OS (which is not, remember, the same as the Q's OS). Waldorf maintain a page on their excellent web site (www.waldorf-music.de) solely for Micro Q OS updates (www.waldorf-music.de/micro_q/mq_system.html), so it's worth checking back there regularly — that was how I came by v1.1. If you're interested in learning more about the Micro Q before you take a look at one, you can also download the English manual from www.waldorf-music.de/micro_q/microqen.pdf.

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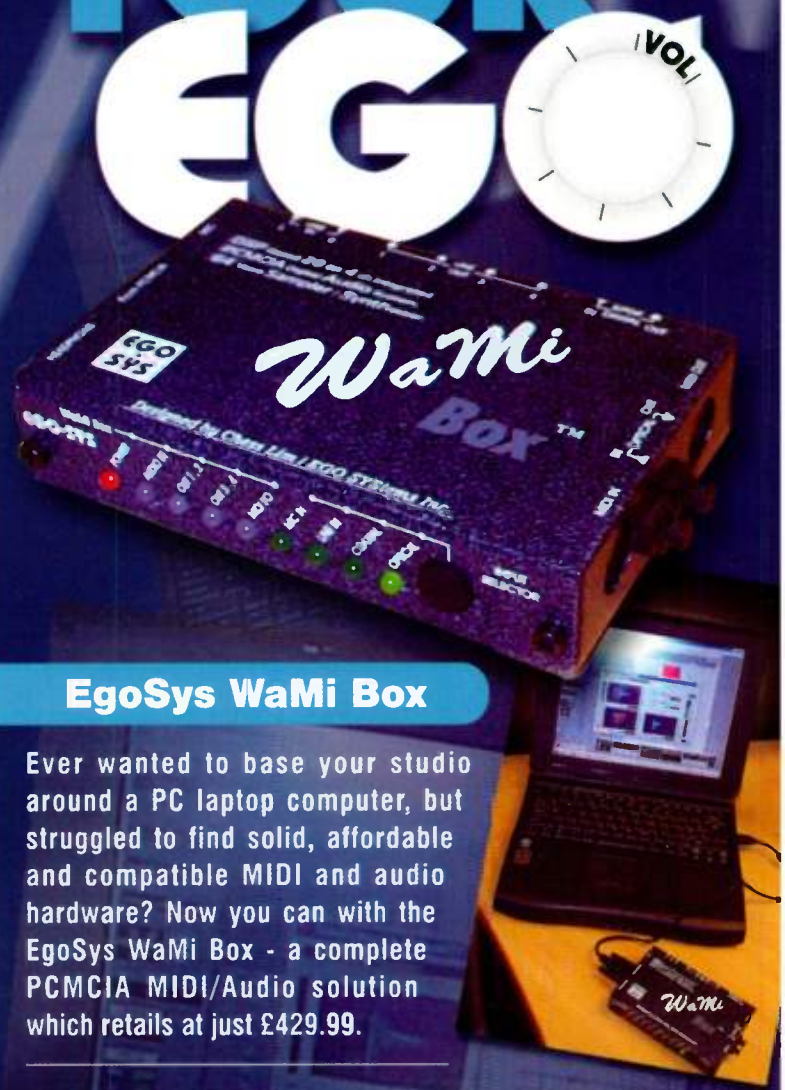

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Akai MPC2000	£849	NO DEPOSIT	6 x £141.50 = 0%
Akai DPS10	£999	NO DEPOSIT	24x £41.62 = 0%
Akai S6000	£1599	NO DEPOSIT	6 x £266.50 = 0%
Akai S5000	£749	NO DEPOSIT	6 x £176.50 = 0%
Akai S3000	£749	NO DEPOSIT	6 x £124.83 = 0%
Akai S1000	£399	NO DEPOSIT	6 x £66.50 = 0%
Alesis ADAT LX20	£999	NO DEPOSIT	6 x £164.83 = 0%
Boss BR8 digi 8 tr	£499	NO DEPOSIT	6 x £83.15 = 0%
EMU ESI2000	£549	NO DEPOSIT	12 x £45.75 = 0%
Emu ESI32 Ultra	£1499	NO DEPOSIT	12 x £124.91 = 0%
Emu E4000	£1199	NO DEPOSIT	24 x £24.96 = 0%
Emu Ultra E4XT	£2399	NO DEPOSIT	36 x £66.63 = 0%
Emu Proteus	£679	NO DEPOSIT	12 x £56.58 = 0%
Emu Virtuoso	£799	NO DEPOSIT	24 x £33.29 = 0%
Emu Xtreme Load	£549	NO DEPOSIT	24 x £22.87 = 0%
Emu Mo Phat	£549	NO DEPOSIT	24 x £22.87 = 0%
Emu Bl Module	£499	NO DEPOSIT	24 x £20.79 = 0%
Fostex VF16	£899	NO DEPOSIT	6 x £149.83 = 0%
Korg Trinity Pro	£2149	NO DEPOSIT	36 x £59.69 = 0%
Korg Triton	£1999	NO DEPOSIT	36 x £55.52 = 0%
Korg D16	£949	NO DEPOSIT	6 x £158.16 = 0%
Korg ES1 Sampler	£395	NO DEPOSIT	6 x £65.83 = 0%
Korg Electribe	£279	NO DEPOSIT	6 x £46.50 = 0%
Korg SP100	£549	NO DEPOSIT	6 x £91.50 = 0%
Lexicon MPX500	£395	NO DEPOSIT	6 x £65.83 = 0%

	PRICE	Deposit	Per Month
Logic Gold	£310	NO DEPOSIT	6 x £51.66 = 0%
Logic Platinum	£429	NO DEPOSIT	6 x £71.50 = 0%
Yard	All products available 36 months Interest Free		
Novation	All products available 36 months Interest Free		
Roland VS1880	£1799	NO DEPOSIT	12 x £149.91 = 0%
Roland VS890	£1199	NO DEPOSIT	12 x £99.91 = 0%
Roland VP9000	£1799	NO DEPOSIT	12 x 149.91 = 0%
Roland JV1080	£999	NO DEPOSIT	6 x £116.50 = 0%
Roland XP30	£949	NO DEPOSIT	12 x £79.08 = 0%
Steinberg VST	£249	NO DEPOSIT	6 x £41.50 = 0%
Steinberg Producer Pack	£699	NO DEPOSIT	24 x £29.12 = 0%
Tascam DA78	£1999	NO DEPOSIT	35 x £56.52 = 0%
Tascam DA30	£449	NO DEPOSIT	6 x £74.83 = 0%
Soundcraft Spirit Digital	£2499	NO DEPOSIT	12 x £207.50 = 0%
TL Audio Range	£399	NO DEPOSIT	24 x £16.62 = 0%
TC Finalizer MK	£1799	NO DEPOSIT	12 x £141.91 = 0%
TC M One & D Two	£459	NO DEPOSIT	24 x £19.12 = 0%
TC Finalizer Express	£799	NO DEPOSIT	24 x £33.29 = 0%
Tascam TM-D4000	£3299	NO DEPOSIT	35 x £91.83 = 0%
Yamaha A4000	£749	NO DEPOSIT	6 x £124.83 = 0%
Yamaha A5000	£1099	NO DEPOSIT	6 x £183.16 = 0%
Yamaha CS6X	£999	NO DEPOSIT	6 x £166.50 = 0%
Yamaha O1V	£999	NO DEPOSIT	6 x £166.50 = 0%
Yamaha S08	£1449	NO DEPOSIT	24 x £145.79 = 0%
Yamaha P80 Piano	£999	NO DEPOSIT	6 x £116.50 = 0%

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Digital Mixer
RRP £499 Mega Deal £319

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KORG D16
Amazing deal on this Digital 16 track workstation with on board FX
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GAK PRICE £949

NOVATION NOVA II & SUPERNOVA KEYBOARDS
At last killer performance meets Unrivalled versatility. Sheer Sonic extosy!
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RRP £1199
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XV3080
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VSR880 Rack mounted 8 track
RRP £1399 £1099 - 0% NO DEPOSIT

NEW VS890
New version of the classic 8-track recorder, inc FX board and drive,
64 virtual tracks RRP £1399 £1199
12 x £99.91 = 0% NO DEPOSIT

NEW VSR8800
New Rack mountable 8 track recorder with 6GB internal drive RRP £1299
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NEW VS840GX
Some great effects on this new version of the 8 track digital recorder
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The mega huge selling digital piano on the world's greatest finance deal...
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VP9000
Variphrase Processor. Manipulates pitch, time & format in real time!!
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MC505 with keys and D-Beam controller
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TD5
RRP £799 24x£33.29 - 0% NO DEPOSIT
V-Drums
RRP £2799 36x£77.75 = 0% NO DEPOSIT

JV1010
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Onboard session card + complete sounds from the 2080 make this the product of the month
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TOP NEW PRODUCT
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RRP £1299 £899

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Boss SP202	£249
Boss DR202	£179
Roland SRV3030 RRP £499	£199
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Roland RD100 RRP £949	£659
Roland MC80 RRP £849	£649
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88 note graderd hammer action. 64 note poly. Very lightweight (16KG).

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FS1R

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RRP ~~£649~~ £429 0% NO DEPOSIT

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Superb new sampling production tool with built in multi FX + trigger pads. Expandable to 68 MB RAM

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New SU10 Sampler	RRP£299	£129
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P200	RRP £1295	£1095
MD8	RRP £899	£699
MU15	RRP £199	£MEGA
QY700 sequencer	RRP £849	£599
NS10s monitors	RRP £349	£245
CS1X synth	RRP £599	£349
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76 note version.

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Desktop analogue synth & rythm machine. Incredible new sounds, the result of some stunning new analogue technology.

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KAOSS

Realtime Dynamic effects controller. A must for all DJs incorporating the touch pad of the Z1, 60 programme FX & a five second sampler.

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SG Rack ..... £399 Best Piano Module around

N1 ..... £999 Weighted Keys. N5 Synth Engine

X5 DR Module ..... £239 Unbeatable Value

NSEX ..... £399 New version of N5 synth

Z1 ..... NOW £799 EXCLUSIVE DEAL

D8 ..... £499

TR Rack ..... £549 Sounds like the Trinity + more

1212 I/O Card

£239

TASCAM

788

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RRP ~~£349~~ GAK Price £265

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Multitracker £95

414

Portastudio RRP ~~£399~~ GAK Price £199

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Industry Standard DAT machine.

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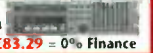
DA78



24 bit 8 Track RRP £1999 24 x £83.29 = 0% Finance

novation

SUPERNOVA

Voted best synth of '98. Now 20 note polyphonic, 8 part multitimbral. Amazing analogue modelling.

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COMING SOON Nova II & Supanova II Keyboards

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- 0% FINANCE
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- WE NOW HAVE 9 RCOMS CRAMMED FULL OF THE LATEST EQUIPMENT
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Marvellous new 16 track digital recorder with 4 Fk busses, 250 virtual tracks and no data compression. Massive 20GB drive
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FREE 32 MB RAM Incredible New Features PLUS at last incorporates Time Stretch
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16 outputs, 128 note poly. Removable front pannel / remote controller EBX20 F/X standard NEW Operating Software INCLUDES 5 FREE CD-ROMS
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PRODUCT OF THE MONTH

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E5000 SAMPLER
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£1199
24 X £49.95
0% Finance with NO DEPOSIT

E6400 ULTRA
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Delta 66 PCI digital recording interface	£289	BIPort 2x4	£129
Audio Buddy	£85	2x4 PC	£79
MIDISport	£65	4x4 Parrallel	£179
SuperSport	£209	PC/S PC serial	£65
CO2	£45	PC/P PC parrallel	£49
CO3	£139		
Midiman Thru 1x4	£19		

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The ultimate mastering solution.
RRP £3099 £1769 = 0% NO DEPOSIT

FINALIZER EXPRESS
RRP £799 £719 = 0% NO DEPOSIT

M ONE
New dual effects processor with brilliant reverbs and more RRP £459 £369 = 0%

D TWO
Probably the best value delay unit around.
RRP £459 £369 = 0%

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Multi Compressor RRP £495

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RRP £1769 - EVERY LOW

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16 audio tracks % 2 FX £99

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EXS24 £239

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AMT8 £299

AUDIOWORK 8
for PC/Mac gives 2 analogue ins & 8 analogue outs
RRP £349 £249 0% FINANCE

AUDIOWORK 2 RRP £199 £175

UNITOR 8
Interface providing 8 MIDI ins & outs & SMPTE
RRP £499 £449 - 0% FINANCE

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GAK PRICE £299

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KORG OASYS £129

LEXICON CORE + FX DAUGHTER BOARD £399!

MOTU

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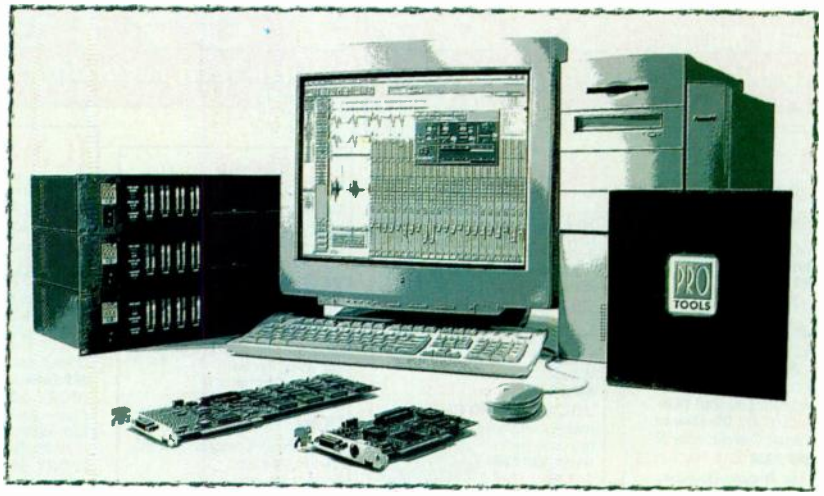
Simon Price begins a three-part series designed to demystify that staple of modern music production, Pro Tools. This month, he looks at the various components that make up Digidesign's systems.



tools of the trade

DIGIDESIGN'S PRO TOOLS EXPLAINED: PART 1

Whichever way you look at it, Pro Tools has become part of the standard kit used in professional audio production. In an admittedly sad attempt to back up this statement I counted at least 23 references (not including adverts) to Digidesign's computer-based audio workstations in a recent issue of *Sound On Sound*. Regular *SOS* readers will have noticed that many of the producers and artists interviewed use Pro Tools, some for basic multitrack recording and/or editing, and others increasingly during the creative process itself. This, coupled with the fact that the Digi 001 has brought Pro Tools into many home and project studios, has prompted *SOS* to take an in-depth look at the system that has changed the way many sound professionals work.

Part one of this three-part series aims to serve as a detailed introduction to those wishing to find out more about the applications and architecture of the Pro Tools system. Part Two will offer an overview of the software and starter operational guidelines for the many new *Pro Tools* software users. Finally, Part Three is intended as a Pro Tools 'masterclass' featuring useful techniques and working practices.

Current Pro Tools systems are, roughly speaking, the fifth generation of audio workstations produced by Digidesign. The company started life in the late '80s, producing sound chips and tapes for a handful of drum machines and sample modules. They developed a software sample editor, which evolved into the widely known *Sound Designer* software. *Sound Designer* became the front end for the Sound Tools computer-based hardware system, capable of recording and editing stereo digital audio. Since then the march of progress has seen ever-doubling track counts, progressions in software through *Pro Edit* and *Pro Deck* to Pro Tools, and the move to modular systems via TDM technology (see below).

The Pro Tools Range

Digidesign's systems now nearly all follow the same basic pattern. A computer (Apple Mac or PC with Windows NT) runs the software front-end of the system, the *Pro Tools* application (currently at v5.01). The computer is linked to the outside world via one or more PCI cards which in turn connect to a range of audio interface hardware. Having said that, there have been versions of the *Pro Tools* application that can run without dedicated hardware, and Digidesign have recently released a cut-down version of *Pro Tools* v5 as a stand-alone program — for free! Conversely, many other music software packages can also take advantage of the Pro Tools hardware — more on that later.

The current Pro Tools range consists of Toolbox, Digi 001, Pro Tools 24, and Pro Tools 24 Mix and MixPlus. Toolbox and 001 run the *LE*

The latest version of the *Pro Tools* software.

version of the *Pro Tools* software, which uses the host computer's power for recording, mixing and processing audio. The rest of the range uses dedicated DSP processor chips built onto PCI cards to handle these tasks. There's plenty more to be said about this distinction, as the argument over whether dedicated DSPs are necessary — or at least whether they represent a good price/performance advantage — is likely to hot up over the next year (see the 'Playing Host to Controversy' box on page 196).

The Toolbox system consists of Digidesign's trusty Audiomedia III PCI I/O card and the PC/Mac application *Pro Tools LE*.

HOST-BASED SYSTEMS

▪ Toolbox

The Toolbox system is basically a bundle featuring *Pro Tools LE* software, with I/O connections being provided by Digidesign's long-serving PCI card, the Audiomedia III. Uniquely in the range, this card does not break out to an external connection box; instead it has RCA/phono connections on the board itself, for both analogue and digital stereo in and out.

▪ Digi 001

Clambering up a rung, the Digi 001 (reviewed in *SOS* December '99 or at www.sospubs.co.uk/sos/dec99/articles/digi001.htm) uses the same *LE* software alongside a dedicated I/O box connected to a single PCI card. This makes room for increased connectivity: eight analogue ins and outs, ADAT optical, S/PDIF digital, and MIDI In and Out to round it off. Other advantages over Toolbox are 001's 24-bit converters and mic inputs.

DSP-BASED TDM SYSTEMS

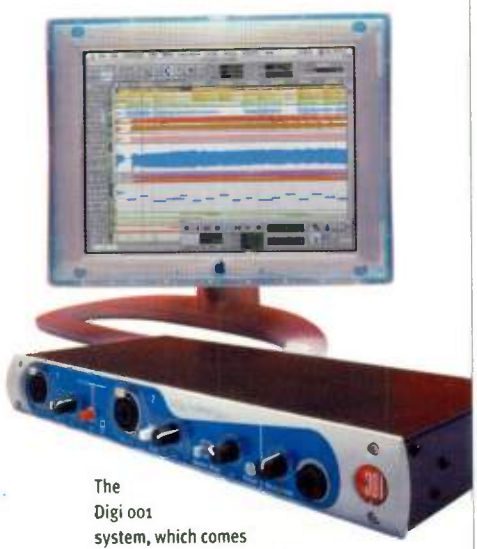
From the 001, it's a hefty leap to the modular, DSP-based TDM systems. In order to get audio in and out of these, eight or more channels of interface hardware have to be connected to the PCI cards (see the 'Interface Facts' box on page 198 for more on this). For those of you wondering, TDM (Time Division Multiplexing) is the technology that allows data to be routed between the various Pro Tools PCI cards and their onboard DSP chips. It might sound unexciting, but TDM has added expandability and flexible mix routing to the powerful recording and editing possibilities of the desktop studio, and also made possible the concept of plug-ins, of which more in a moment.

▪ Pro Tools 24

The cheaper of the two TDM options, this is essentially a 24-bit upgrade to Digidesign's earlier 16-bit TDM system. The basic system includes *Pro Tools* software, a PCI card that handles playback and record of 32 tracks, and a 'DSP Farm' card that takes care of mixing and processing. This system works well in situations that don't require the considerably increased processing capacity and track count of the next-generation Mix product. It's also worth mentioning that some newer powerful plug-ins, such as six-channel surround reverbs and software synths, will only work with Pro Tools Mix.

▪ Pro Tools 24 Mix & MixPlus

Most current TDM Pro Tools setups are Pro Tools 24 Mix systems, whose basic building block is Digidesign's Mix card, a standard PCI board containing six Motorola Onyx chips (the DSP providers also found in some Sonic Solutions DAWs and the Access Virus synth). A system containing two of these cards constitutes what Digidesign call a MixPlus (see review in *SOS* April '99 or at www.sospubs.co.uk/sos/apr99/articles/protools.htm), but in fact anything up to seven Mix cards can be stacked into one Pro Tools rig.



The Digi 001 system, which comes with its own I/O breakout box and *Pro Tools LE* software.

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HARDWARE ADD-ONS

Finally, if you want to add a more 'hands-on' feel to the system, Pro Tools can be controlled by MIDI fader banks, such as the popular JL Cooper CS10 and CM Automation's MotorMix. There are also two controllers that were built with Pro Tools specifically in mind — the Mackie HUI (see *SOS* December '98 or www.sospubs.co.uk/sos/dec98/articles/mackiehui.143.htm) and Digidesign's own ProControl. While the HUI has gone on to support other applications, ProControl (see *SOS* May '99 or www.sospubs.co.uk/sos/may99/articles/digipro.htm) is so specific that it has remained a Pro Tools-only device. ProControl is a hefty investment, but those that do dig deep in their pockets get a unit that looks like a pro console, with touch-sensitive motorised faders, and the cunning advantage of communicating over Ethernet, thereby achieving better speed and resolution than you would with MIDI controllers.

Pro Tools TDM systems require separate audio I/O hardware, such as the top-of-the-range 888 analogue and digital interface shown here.

CM Automation's MotorMix control surface offers motorised faders at a fraction of the cost of a ProControl hardware control surface.

Plug-ins & Third-Party Support

The TDM architecture behind Digidesign's DSP-based products turned out to be more beneficial than just making the systems modular and expandable. TDM paved the way

Playing Host To Controversy — DSP-based Versus Host-based Systems

There are definite signs that a showdown is brewing between the developers who back host-based audio products and those who process audio with purpose-built hardware. Steinberg's advertising for their recently released Nuendo package claims: "One of the great myths of digital audio systems is that truckloads of audio hardware and DSP chips are necessary to build a capable audio workstation." Mark of The Unicorn's excellent range of audio hardware, which works with host-based processing software, has also caused people to ask, "why should I spend extra on a DSP-based system?"

Well, for the time being at least, a deciding factor is cost. It would be difficult to argue against the fact that if you can throw enough money at a DSP-based system (ie. buy enough DSP cards) it *will* be more powerful than even the latest blistering PCs or Macs. The question is better stated as, "for what I'm doing, do the differences justify the extra cost?" So what are these claimed differences? The discussion tends to focus on two key areas: performance and latency.

• PERFORMANCE

By performance, I mean basics like how many tracks the system can play back, how complicated the mixer routing can be, and how much real-time signal processing it can manage. The DSP-based system manufacturers like Digidesign say they have the advantage here, because if you run out of processing power, you can upgrade by adding more DSPs. The host-based product developers take a different angle on this, saying that a DSP system is limited by the amount of hardware you have, while their product will improve with a newer faster computer. It's difficult objectively to compare performance between the two sides, but at this point in time a top-flight PC/Mac host system will give a basic (unexpanded) DSP-based system a good run for its money. In response to this, Digidesign focus on the — as they put it — 'power-on-demand' factor of using DSPs. By this, they are referring to the fact that with their DSP systems your track count is guaranteed. What they are alluding to is that with a host system, you may have the *potential* to do as much or sometimes more, but the performance ceiling varies depending on how much other work the PC or Mac processor has to do, and you don't always know how much you can expect to achieve.

• LATENCY

The other consideration, latency, can refer to two different limitations within a digital audio workstation — I'll call them throughput delay and controller delay. The first of these comes about because any signal processing imposed on audio in a digital system, whether it is gain changes, signal mixing or effects, is a mathematical function which takes time to process. This includes analogue-to-digital and digital-to-analogue conversion (a round trip takes about 1.5 milliseconds in most converters) so all systems suffer this problem. In a host-based workstation though, the main computer processor has to take care of all the calculations, so the software has to impose a delay on the whole system to give the processor enough time to handle everything. A DSP-based system doesn't have to worry so much about this, because all the mixing and effects are being shared by a bank of sub-processors working in parallel, and this typically results in delays of only a few samples. When you have signals coming into a host-based system from the outside world and being routed back out with the rest of the mix, however, this delay can become significant. Given enough latency, it's difficult for musicians to play in time if they're hearing themselves with a delay. You also get this problem if, say, you send out MIDI or MIDI Clock to a drum machine and monitor it through the system. There are ways to get around these problems, such as using 'low-latency' monitoring paths that don't go through any processing, but I think it's fair to count low latency as an advantage of the external DSP-based systems.

The other issue — controller latency — is the responsiveness and resolution of the system to parameter changes (like fader movements) in the software. Again this is potentially a difficulty for host-based systems where the processor is busy and is expected to handle lots of automation as well. The worst-case scenario would be 'zipper noise' as the processor struggles to keep up with parameter changes smoothly.

In summary, on the host-based side the manufacturers' main concerns are to keep throughput latency to the bare minimum, and controller resolution as smooth as possible. For the hardware developers, the constant goal is to make sure that each generation of DSP-based hardware is sufficiently more powerful than the current PC or Mac processors to justify the extra expense. In the meantime, Digidesign have recently opted for a 'have your cake and eat it' approach; version 5.1 of the *Pro Tools* software (due for release by the time you read this) will be able to combine DSP and host-based processing within the same project.

AV — Pro Tools For Audio-Visual Applications

Unusually among music software packages, much of Pro Tools' development is intended to benefit those using the system in TV and film production. Pro Tools is now widely used in these industries for track laying and mixing music and effects, editing music and dialogue, and rerecording location dialogue. While perhaps this is not of much interest to those purely making music, the knock-on effect is that Pro Tools is really good at working sync'ed to picture; and consequently it gets plenty of use among people writing soundtrack music for video, film, games and multimedia.

There are several options when working to picture with Pro Tools. The system can receive timecode and clock information from third-party sync boxes, like MOTU's popular MTP AV, but Digidesign also have their own proprietary sync hardware option called the Universal Slave Driver. This unit not only has the coolest name of any piece of hardware on the market, it can also sync to an exotic array of timecode and clock formats.

Digidesign's proprietory synchroniser, the Universal Slave Driver.

Many video post-production facilities use Pro Tools to control Umatic, Betacam SP and Digital Beta video decks, and increasingly you can also find Pro Tools in film-dubbing theatres chasing projectors. Many home- and project-studio users favour the popular Quicktime-based capture cards, which allow you to digitise video to hard disk. Pro Tools, like most of the other music programs, can open up these movies and display them during playback, eradicating the need to wait for a video machine to cue into position and get under way.

The two new Pro Tools video systems — Pro Tools AV and AV/XL — extend this functionality to the professional broadcast level by employing the video capture and playback hardware found in Avid video editing systems. Avid — who just happen to own Digidesign — make the systems on which a sizable proportion of what we see on TV and film is edited, so by using this hardware Pro Tools gets broadcast-quality video alongside file-format compatibility. Smart.

for most current computer audio systems, by allowing you to insert software effects and signal-processing modules into the on-screen mixer — plug-ins. The key to the success of Pro Tools was that Digidesign opened up the TDM format, so that many third-party developers could create plug-ins to integrate into the same environment. Equally important was the encouragement they gave sequencer manufacturers to build in TDM support for their MIDI + audio packages. This meant that if you were a *Logic Audio* user, for example, but wanted the benefit of the Pro Tools hardware's mixing environment, you could replace the *Pro Tools* front-end software with *Logic*. Eventually all the big packages — Emagic's *Logic*, Steinberg's *Cubase*, Opcode's *Studio Vision Pro*, and MOTU's *Digital Performer* — included support for Pro Tools TDM hardware. Crucially, Digidesign divided their code for Pro Tools into two separate applications: the *Pro Tools* front end, and the Digidesign Audio Engine, which runs in the background handling communication with the hardware and disk access. When a program wishes to use the TDM hardware, it works alongside DAE, reducing the amount of development needed by the third party.

Similarly, it's also possible to drive the Digi 001 and Audiomedia III hardware from different software, and still get access to the hardware's ins and outs. In this instance, the software runs its own host-based audio engine and uses the hardware more like a conventional soundcard. Again, this is useful if you prefer, say, *Digital Performer* to *Pro Tools LE*, or if you want to go over *LE's* 24-track limit, or use some *Logic* plug-ins, for example. *Cubase VST* can join the party in this way too, as Steinberg have an ASIO driver that works with Digidesign's PCI hardware.

Pro Tools In Use

Pro Tools systems with Mix hardware can play or record up to 64 audio tracks at 24 bit, and with a sampling rate of up to 48kHz. Two of the first Mix card's six chips are devoted to playback and record services, but you can tell the software to free one of these up if you don't need to go over 32 tracks. The rest of the chips are available to take care of mixing and plug-ins. The user can ▶

Pro Tools Interface Options

With TDM Pro Tools systems (Pro Tools 24, Pro Tools 24 Mix and MixPlus), you choose one or more rackmounting connection boxes, depending on how many channels of I/O you require and what connection formats you need. Each Pro Tools Mix card (or older Pro Tools 24 card) can handle up to 16 channels of I/O — this can either mean one 16-channel box (like the 1622 or ADAT Bridge) or two eight-channel boxes. The maximum total number of physical ins and outs supported is 72. Without wishing to sound too much like a brochure, here's a round-up of the available options:

888/24

This is Digidesign's top-of-the-range unit. It features eight channels of high-spec 24-bit A-D and D-A on balanced XLR connections, eight channels of AES-EBU digital, and stereo S/PDIF digital. This unit is mostly the choice of professional music studios and post-production facilities.

882/20

This interface boasts eight channels of analogue input and output on balanced quarter-inch jacks with 20-bit converters, and stereo S/PDIF. The lower cost of this interface and its eight jack outputs make this well suited to project studios based around an analogue mixer.

1622

The 1622 has 16 analogue inputs (with 20-bit A-D converters) on balanced quarter-inch jacks, plus two channels of analogue out (with 24-bit D-A converters), and stereo S/PDIF as usual. This one's ideal for music studios wishing to mix within Pro Tools rather than a separate mixer. It features digitally controlled input-level trimming.

ADAT BRIDGE

This box sports two sets of standard eight-channel ADAT optical ports for 16 channels of connection to suitably-equipped digital mixers, or of course ADATs and similar MDMs. The ADAT Bridge also has stereo AES I/O, and a stereo analogue out in addition to the obligatory stereo S/PDIF.

NON-DIGIDESIGN OPTIONS

Apogee produce two interfaces that can be fitted with a card to allow them to be used directly as Pro Tools interfaces. The top-end AD8000 is similar in functionality to Digidesign's 888/24, while the company's newer Trak2 has only two A-D converters but also includes two mic preamps and expansion options.

assign recording to any hard drives connected to the host computer on a track-by-track basis, or tell the software to share the load automatically. Two fast drives are usually enough for 64-track recording. With a Toolbox or Digi 001-based Pro Tools, the track count is down to the software and available processing power of the host computer. As mentioned above, when using the *Pro Tools LE* software with these systems, the maximum is set to 24 tracks, irrespective of the power of the host.

So a Pro Tools Mix setup is a 64-track recorder, but the system is actually also a 128-channel digital mixer. This means that as well as having 64 tracks playing back off disk, the mixer can also handle another 64 inputs coming in from outside (if you've got enough interface hardware for all those connections). As with a conventional console, these can be used for bringing in live or MIDI synth sources, or creating send/return or insert connections between Pro Tools and outboard gear. Meanwhile, any spare outputs can be used to set up cue mixes, multiple mastering recorder destinations, and so on. In addition to the audio, Pro Tools also provides up to 128 tracks of MIDI playback and record.

Given all this you'd be forgiven for thinking that Pro Tools has something of an identity crisis: is it a multitrack recorder, an editor, a digital mixer or a MIDI sequencer? The answer, of course, is that it can be all of these — but not everyone makes use of all of its capabilities. The classic scenario in larger music studios is that Pro Tools is used as an supplementary tool alongside another multitrack, such as a two-inch tape machine, digital multitrack tape or Otari RADAR, for example. In this situation, the contents of the multitrack can be transferred to Pro Tools to edit drums, tune and comp vocals, make song structure changes, and also serve as a backup. Other studios record directly into Pro Tools, enabling them to save transfer times, as well as take advantage of loop recording, quick access to multiple takes, and so on. When these two schools of thought meet in the pub they will inevitably argue about sound differences between these recording methods — on this occasion I'm going to stay clear of this and go to the bar! The chances are, however, that both camps will still be using a hardware mixing console. However, more and more studios are taking seriously the possibility of using Pro Tools for mixing as well as recording and editing. This has been helped by the ProControl mix surface, which offers a reasonably familiar, mixer-like means of controlling proceedings. Taking it to the extreme, several newer studio installations have done away with a separate mixer altogether, using ProControl-equipped Pro Tools rigs, with separate preamp units for input gain control. This might sound strange, until you realise that the heart of many digital mixer systems is a PC with DSP capability and a control surface... does this sound familiar? I suspect Pro Tools' mixing capabilities will be used more and more if surround mixing becomes popular in music production — the next release of Pro Tools software will have multi-channel mixing and panning built in.

The people most often stretching Pro Tools to fill all its potential roles are those using home studios and music-writing setups. As Pro Tools' MIDI functionality grows, other writers and artists, who aren't necessarily so concerned with budget,

"You'd be forgiven for thinking that Pro Tools has something of an identity crisis: is it a multitrack recorder, an editor, a digital mixer or a MIDI sequencer? The answer, of course, is that it can be all of these."

A top-of-the range Pro Tools TDM setup, running processing plug-ins (visible on screen) with an expanded ProControl hardware control surface.

are also choosing to use the system during writing. Having all the recorded audio, MIDI and mix automation in one place makes it easier to move between concurrent projects.

Finally, it's worth mentioning that Pro Tools is becoming much more widely used in video and film post-production applications — see the 'AV' box on page 197 for more details.

Coming Next Month...

Hopefully, all this leaves you better informed if you've been looking to buy a Digidesign system, or at least ready to deal with the many different flavours of Pro Tools you may encounter. Next month, I'll explain how to coax *Cubase VST* and Emagic *Logic* into working with Pro Tools hardware, and look at how the *Pro Tools* software works. SOS

Current Pricing

As a guide, here is a list of the Pro Tools components mentioned this month, with their current retail prices. You can soon work out how much a system suitable for your particular requirements would cost. Prices include VAT and are correct at the time of going to press.

W www.digidesign.com

OFF-THE-SHELF SYSTEMS

• Toolbox (Audiomedia III and *Pro Tools LE* software)	£480.58
• Digi 001	£880.08

INTERFACES

• 888/24	£3253.58
• 882/20	£1103.33
• 1622	£1408.83
• ADAT Bridge	£1103.33

CARDS

• Audiomedia III	£445.33
• Pro Tools 24 Core	£5274.58
• Pro Tools 24 DSP Farm PCI	£1761.33
• Pro Tools 24 Mix	£7037.08
• Pro Tools 24 MixPlus	£8787.83
• Additional Mix Farm card	£3512.08
• Additional Mix I/O card	£703.83

CONTROL SURFACES

• ProControl	£10550.33
• MotorMix*	£880.08

* *manufactured by CM Automation, but marketed worldwide by Digidesign.*

POST-PRODUCTION OPTIONS

• AV option for Pro Tools	£7037.08
• AV/XL option for Pro Tools	£11431.58
• Universal Slave Driver	£1843.58

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Ego Sys' WaMi Box is one of a very small number of recording interfaces for laptop PCs, providing analogue, digital and MIDI I/O along with a synth/sampler, DSP effects and mixing — and no fewer than six separate software control utilities. **Martin Walker** gets to grips with it. Eventually...

single wami

EGO SYS WAMI BOX PCMCIA DIGITAL AUDIO RECORDING SYSTEM FOR PC

The last time Ego Systems appeared in these pages was in *SOS* September 2000, when I reviewed their flagship WaMi Rack 24, a clever combination of four analogue inputs with switched mic preamps, eight analogue outputs, co-axial and optical S/PDIF I/O, and four MIDI Ins and Outs. This time round I'm looking at the only other WaMi (Wave and MIDI) product currently in their range: the WaMi Box, a high-quality audio and MIDI solution for laptop owners which connects via PCMCIA. This also has a generous and novel combination of features. There are two analogue ins and four outs with 20-bit converters, optical and co-axial S/PDIF I/O, and a single MIDI In and Out, but it's what hidden that makes it unusual — an internal hardware DSP mixer with 17 reverb/chorus programs, a two-/four-band stereo graphic EQ, and a 64-voice sampler/synthesizer.

The WaMi Box is also compatible with the DLS (DownLoadable Sound) standard. It comes with 16Mb of RAM, and 1Mb and 4Mb wavetable sound sets are supplied in both GM and GS formats. In addition, Ego Sys have recently joined forces with Terratec to port their EWS64 technology to the WaMi Box, albeit in a slightly cut-down form, allowing the full 16Mb of RAM to be used to create large sampled instruments using Terratec's *Edison* sample editor. So, with 20-bit audio recording and playback, a MIDI synth, and a sampler, the WaMi Box looks perfect as an all-in-one solution for PC laptop owners.

Overview

The WaMi Box consists of two components, the external unit and a PCMCIA adapter. Unusually, two cables — one half a metre in length, the other a full metre long — are supplied, so you can choose whichever length you need for a particular job. The metal case of the external unit looks very sturdy, is just 14cm wide by 9cm deep and 3cm high, and is finished in exactly the same grey-speckled crackle finish as the WaMi Rack. The I/O sockets are spread over the left-hand, rear, and right-hand sides of the case, with their descriptions labelled around the three edges of the top plate to make them easier to see at a glance. The left panel contains the stereo headphone output and stereo mic input, both on gold-flashed quarter-inch stereo jack sockets, along with the 15-way D-type connector for the PCMCIA adapter. The rear panel contains a row of eight gold-flashed phono sockets for left and right Line In, Line Out 1, 2, 3 and 4, and S/PDIF co-axial In and Out, while the right-hand panel houses twin Toslink connectors for S/PDIF Optical In and Out, and two five-pin DIN sockets for MIDI In and Out.

The front panel uses LED indicators to indicate power on and signal activity at the audio and MIDI I/O sockets. These light up green when a signal is detected, and red to indicate an audio overload. The final four green LEDs indicate the current choice of input — mic, line, co-axial digital, or optical digital — and pressing the adjacent momentary push-button selector cycles through these options. Any signal plugged into either of the digital inputs will be simultaneously output from both formats of digital output, as well as from the analogue line outputs. This is useful if you want to convert one format to the other, the only restriction being that the WaMi Box's converters run at a fixed rate of 44.1kHz. However, this can be useful in itself, since you can convert 48kHz DAT recordings into 44.1kHz 'on the way in' in real time.

Whipping off the top cover revealed a very compact and tidy circuit board containing, among

EGO SYS WAMI BOX
£399

pros
- Capable of very good audio sound quality.
- Valuable sample-playback synth with 16Mb of RAM.
- Well-written MME drivers.
- Comprehensive input selection.

cons
- ASIO drivers glitch badly when inputs or four-channel playback are selected, making them unsuitable for recording.
- Built-in effects are barely suitable for serious use.
- Utilities and driver software are extremely confusing.
- Electronic manual badly needs updating.

summary
The WaMi Box is a well-designed audio and MIDI synth/sampler that is currently let down by confusing software and buggy drivers.

SOUND ON SOUND

Specifications

- Hardware format: PCMCIA Type 2 connector with flying lead to external metal case.
- Analogue I/O: one stereo mic and two mono line-level inputs, one headphone and four line outputs.
- Analogue connectors: phono sockets for line I/O, quarter-inch stereo jack sockets for mic and headphone, all unbalanced and gold-plated.
- Line input and output levels: -10dBV nominal.
- A-D and D-A converters: Crystal 20-bit delta/sigma.
- D-A signal-to-noise: 108dB.
- Supported bit depths: 8, 16.
- Supported sample rates: 44.1kHz.
- Frequency response: 20Hz to 20kHz (no deviation quoted).
- Digital I/O: co-axial and optical S/PDIF.
- MIDI: one MIDI In and one MIDI Out with MPU401 compatibility.
- Internal effects: eight reverb and eight chorus programs, two-/four-band equaliser, V-Space 3D algorithm.

others, two Crystal chips: a CS8420 sample-rate converter and a CS4226 surround sound codec. The latter handles the WaMi Box's A-D and D-A conversion, and actually includes six 20-bit D-A converters along with its stereo 20-bit A-D converters, even though the Box has only four analogue outputs (and even though recordings can only be made at 16-bit resolution). Although the full six-speaker 5.1 surround spec is not supported, the WaMi Box's V-Space 3D processing algorithms will work with either two or four speakers.

Installation

Installing drivers in a laptop is exactly the same as with a desktop or tower PC, since PCMCIA devices are detected in the same way as PCI expansion cards. However, although they are hot-swappable, you have to power down your laptop before plugging them in for the first time for the detection procedure to work properly, and you should always close all audio and MIDI applications before removing the card to avoid crashes. My WaMi Box came with the version 1.1 installation CD-ROM, which not only contained the driver and utility software, but also demo versions of *Cakewalk Home Studio*, *Cubase VST/24*, *Sound Forge* 4.5, and *Wavelab*. However, the Ego Sys web site had version 2.0 drivers available for download, providing new support for both DirectSound and ASIO 2.0, as well as more stable MME drivers. The recent tie-up with Terratec has also seen the previous WaMi Box mixer utility replaced by a far more comprehensive version from Terratec, complete with their *Ed!son* sample editor. This now makes it possible to use the WaMi Box as a sampler using its 16Mb of internal RAM.

The only fly in the ointment is that while the version 2.0 driver download is just 118K in size, the full set of five new zipped files for the drivers, application software, new manuals, SoundFonts, notes and utility programs totals 11Mb. However, the 7.5Mb wamiboxfonts.zip file is the same as that on the Installation CD-ROM, so all you actually need to download are the other four zipped files totalling a much more manageable 3.5Mb. If you already have previous WaMi Box drivers installed on your laptop you should first run the supplied egoclear.exe file and then manually delete the drivers inside Device Manager to clear all traces of previous versions.

The only problem I had during installation was a crash when rebooting, which I traced to a conflict with the existing MPU401 MIDI interface provided by the laptop's internal soundchip. Since a gameport wasn't present on the laptop I was using there was no point in having this driver running anyway, so I disabled the device inside Device Manager, and had no further problems.

Driver Options

The WaMi Box has only one stereo input, but its drivers let you choose the number of audio playback channels from within the Settings page in Device Manager. Although the default is two, up to 32 stereo channels can be selected, and you can balance their relative levels as well as adding various amounts of the built-in reverb and chorus to each one. The effects use on-board DSP for their processing, so there is no drain on your main CPU, but since there is a fixed amount of available DSP power, you have to trade off the number of channels against the maximum number of synth and sampler voices. No specific figures are provided, but the manual mentions that 'voice borrowing' will occur from the MIDI synth when DSP power is running low, and eventually from the Wave channels as well. However, this is still a useful way to make your laptop processing power go rather further than normal.

The virtual channels make choosing the appropriate driver option inside your choice of MIDI + Audio software a little more difficult. On the audio side, there is only ever one stereo recording channel, which appears inside audio applications as WaMi Box Synth Record. Playback channels are labelled as WaMi Box Synth Play #1, #2, #3, and so on, depending on how many stereo channels you have enabled. On the MIDI side the 64-voice synth option is labelled WaMi Box MIDI Play, while the external MIDI input and output are WaMi Box MIDI Record and WaMi Box MIDI-1 respectively. As with the audio playback channels, you can also choose the number of virtual MIDI channels available and balance their levels.

Once the new drivers are in place you install the various other applications by running the WAMI Box.exe file, which leaves you with six new shortcuts to the Audio In Panel, Control Panel, *Ed!son*, FX Panel, Set Manager, and Virtual Channels utilities. By far the easiest way to proceed is to launch Control Panel, since this also contains launch buttons for the other five. It also provides a simple audio mixer panel divided into four sections — Record, MIDI, Wave, and Master — to set the level of each sound source, its pan position where appropriate, and the overall volume. There's also a fader to set the signal mix between outputs 1/2 and 3/4, if the FX Panel switch is set to four-channel ▶

There are lots of controls on offer in the WaMi Box's Terratec-written utility software, but it can be extremely confusing to use.

mode (see later). A Master level fader controls overall volume of all three signals, and both this and the Wave panel also feature Mute buttons.

FX Panel

The WaMi FX Panel is identical to that of Terratec's EWS64, and contains a total of nine panel sections labelled MIDI, Wave, Mod (which is not currently supported), Audio In, Record, Reverb, Chorus, Equalizer, and V-Space. The majority of the controls are for adding effects to different aspects of the WaMi Box. The MIDI and Wave sections handle routing to the effects. Each contain Reverb and Chorus send controls, along with a switch that decides whether or not each signal is also routed through the EQ and V-Space effects. The Wave section also has an FX/4Ch switch that lets you choose between adding the internal effects or using Line Out 3 and 4 as effect send outputs. The Audio In section provides a Reverb send control, plus Echo send with associated On/Off, Delay, and Feedback controls.

The Reverb panel itself provides controls to select one of eight different program types including rooms, halls, plate, delay, and pan delay, and also has further controls for Time, Feedback, and Level, while the Chorus panel also supplies a choice of eight program types including four different choruses, feedback, flanger, short delay, and feedback delay, along with Delay, Feedback, Level, Rate and Depth controls. Both sections have a global effect on/off switch, while chorus also has an EQ/V-Space send switch to divert its output signal through the Equalizer and V-Space. If either the Reverb or Chorus sections are enabled, analogue outputs 3 and 4 are automatically disabled. This, I suspect, is due to lack of available DSP power: the manual mentions that switching off effects will leave more for other 'virtual devices'.

V-Space is a basic 3D algorithm suitable for either a two- or four-speaker setup, while the Equalizer can be used in either two- or four-band mode, and features draggable points in a frequency response window, along with manual gain and frequency controls beneath.

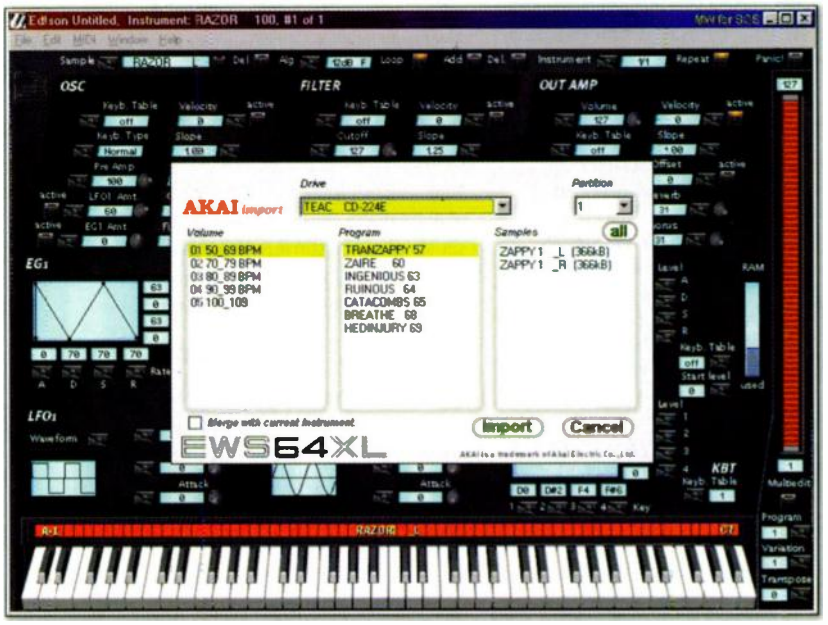
Finally, the Record section simply has a switch labelled Mix/Audio In. In the Audio In position, you can record the signal present at the mic or line input sockets, while Mix records the entire output of the mixer, complete with any DSP effects used. This is ideal when recording a master mix, since both MIDI and audio signals will be included in the final stereo recording.

Most of the controls in the FX Panel, such as the level and pan positions and effect settings, can also be set using NRPN MIDI messages, while various internal MIDI synth settings can also be adjusted using SysEx commands.

Other Utility Panels

The Virtual Channels window contains a virtual LCD-style display with two horizontal rows of 16 boxes, where you can select any one of the available channels, depending on how many have been enabled in Device Manager. The currently selected virtual channel can then be muted by clicking in the lower box, and various settings altered using the sliders beneath. Here you can adjust its overall audio Volume and Pan position, the MIDI Synth channel volume for this virtual channel, and the Reverb and Chorus return levels for this audio Wave channel. There is also a wave pitch slider, and a Reset button to return all channel settings to their default positions. If the effects are disabled, the Reverb and Chorus controls are replaced by a single surround-sound panner, which mixes the level between all four Line outputs. Moving this in the horizontal direction also moves the normal pan control in the main Mixer, while up/down movements set the relative levels between outputs three and four.

The Audio In window contains a volume fader to set the input signal level for recordings, along with a mini Pan fader and Mute button beneath. To the right of this are three more faders to control the



The *Ed!son* instrument editor provides all the facilities you need to create your own SoundFonts up to 16Mb in size, and also reads Akai-format CD-ROMs.

User Interface

Having reviewed Terratec's EWS64 and EWS64XXL (in *SOS* March '98 and July '99 respectively) I have seen most of the elements of the user interface used in the WaMi Box's version 2.0 utilities before. However, I still found the whole system initially impenetrable. This is largely because even though it's spread over several windows, it has interconnected controls. For instance, to get reverb onto Wave playback you have to make sure you are using Outputs 1 and 2 (since Outputs 3 and 4 are disabled as soon as you enable either reverb or chorus), then open the FX Panel to set the Wave Send Level, reverb parameters and level, and then open the Virtual Channels window, choose the appropriate channel number and set the Reverb return level.

Even more confusing is the fact that controls in some windows may appear and disappear depending on the settings in a completely different one! For example, the surround pan control in the Audio In and Virtual Channels windows is replaced by reverb and chorus sliders as soon as either of these effects are enabled in the FX Panel. Once you get your head round it there's a lot on offer, but it's so spread out that many features don't make sense at all until you've read and digested the documentation from start to finish.

Sadly, even reading the manual in its entirety before you start will prove confusing for new WaMi Box users, since some features aren't mentioned at all, while some that are refer to non-existent EWS64 controls such as a second MIDI port and a game/MIDI port. Ego Sys should insist that this is revised as a matter of urgency. Perhaps I'm being a little hard on Terratec, but their idea of a dream user interface seems to be a nightmare for most other people, and I haven't had to expend so much effort trying to fathom out what does what for a long, long time.

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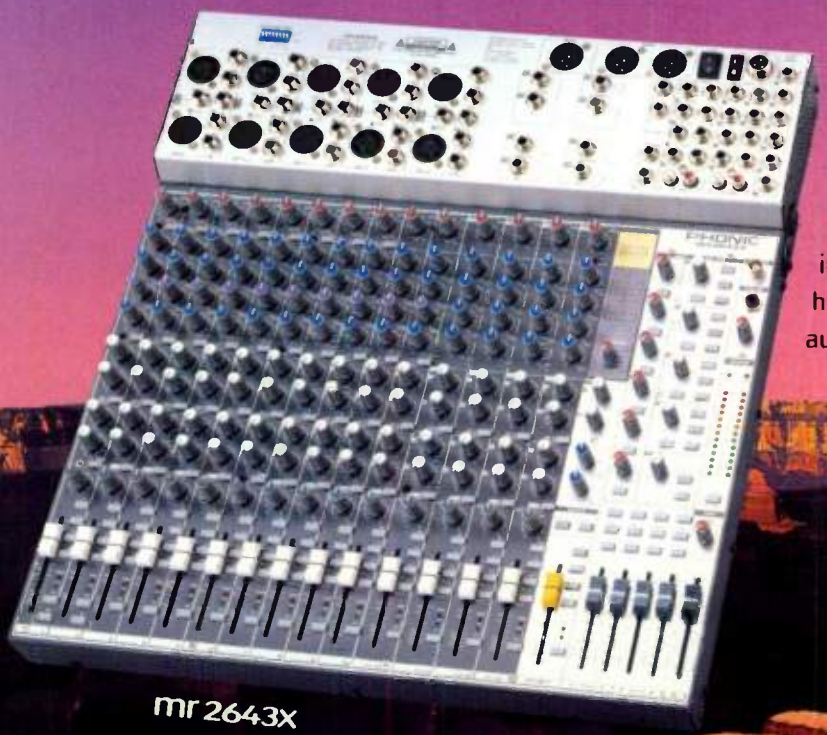

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level of Echo, Reverb, and Chorus. Confusingly, the Echo and Reverb sends are duplicates of the ones in the FX Panel (moving one updates the other in real time), while for some reason there is no Chorus send in the FX Panel.

MIDI And Sampling

You can select startup sound banks for the MIDI synth from a page in the WaMi Box Properties section inside Device Manager, and this is useful if you want the same default bank ready for action every time you boot up. For more specific requirements, launching the Set Manager from the WaMi Box Control Panel is the easiest option. Here you can load and delete multiple sound sets up to the 16Mb maximum space available, and use the Mute and Solo buttons to hear single banks in isolation.

Banks are recognised in three formats: Terratec TTS, Dream 94B (the format used by the supplied files), or Creative Labs' SoundFont SF2 (the most common). There are now lots of commercial, shareware, and freeware SoundFonts available, and you can also design your own using *Ed!son*. Sample-processing and synthesis options include an oscillator and a 12dB or 24dB/octave resonant low-pass filter, each with its own ADSR envelope generator, along with two LFOs.

Ed!son certainly looks the part, with its impressive graphic interface, complete with draggable envelopes and a built-in graphic keyboard for auditioning your sounds. One extra entry in its File menu adds a great deal to its versatility: Akai Import allows you to grab sample data from any Akai-compatible CD-ROM. It's a good job I spotted this, since I could find no mention of it in any of the manuals. Although 16Mb probably doesn't sound like a huge amount of sample memory nowadays, it's still possible to do a lot with it, and once you've got used to *Ed!son*'s quirks the WaMi Box's sampling and synthesis facilities could be very valuable to the musician on the move.

In Action

Playback quality of 16-bit audio files was very good, and the difference between the WaMi Box and my Echo Gina was subtle, with only a slight harshness and lack of clarity from the WaMi at the top end. However, as I explained in last month's PC Musician feature, audio quality can be somewhat dependent on the laptop grounding, so I spent some time investigating this aspect.

I had the WaMi Box plugged into Red Submarine's laptop (also reviewed in this issue), and using this there was no discernible difference in background noise during playback when running on battery or mains power, or when recording using a mic. I used *Wavelab* 3.0 as usual to measure the RMS background noise during recording, and measured a good -92.5dB RMS using the line input — just half a dB worse than most 16-bit PCI soundcards. Recordings sounded good through both the mic and line inputs, and you can add the built-in effects on the way in if you wish.

However, when recording audio from other mains-powered devices like MIDI synths I did get some hum, as well as background noises when the mouse or hard drive were used. These noises disappeared altogether when running the laptop on battery power, so this is what I did during takes.

I had to spend some time tweaking *Cubase*'s ASIO Multimedia drivers before I got them working reliably, and eventually got the best results after choosing 'DMA Block Output' as sync reference. Surprisingly, I also managed to get glitch-free operation right down to three buffers of 1024bytes, giving me an excellent latency figure (for MME) of 186mS, and with these settings I had no problem running a 26-channel audio song. However, whatever the buffer size I could only manage a maximum of three Wave Play channels to use as multiple outputs for adding effects. The new DirectX drivers also proved successful with a default 204mS latency, although using these you can only select one stereo output channel at a time from those activated however many you enable, and they only work for playback.

Sadly, I had to spend ages altering settings for the new ASIO drivers before I managed to get them working in a glitch-free fashion. They give you two playback options inside *Cubase* — 'WaMi Box ASIO Play (2 channels)' and 'WaMi Box ASIO Play (4 channels)' — but the four-channel version still only gives you a choice between the two stereo outputs in *Cubase*, not both at once. There is also a single 'WaMi Box ASIO Record' driver option with a tick box to activate the inputs, along with a drop-down four-level priority box.

The default buffer size is 4096 samples, giving a latency of 93mS, but this can be adjusted anywhere between 16384 samples, giving a latency of 372mS suitable for a very slow machine, right down to 512 samples for a latency of 12mS. Initially I found it impossible to get glitch-free playback with any buffer size setting, until I disabled the inputs and selected two-channel playback. With these settings and the 700MHz Pentium III Red Submarine laptop I managed to get right down to the lowest 12mS latency with no sign of audio glitching at all when replaying a song with 24 audio tracks, and I'm sure I could have managed more.

However, switching to four-channel playback or activating the inputs gave me lots of glitching whatever I did. This problem with playback was subsequently confirmed on a different laptop running the WaMi Box and the same ASIO version 2.0 drivers. Users have been waiting for these drivers for a long time, so it's a big disappointment that you can't record using them, despite their excellent 12mS playback-only performance. Judging by my findings you would be safer recording using the MME drivers for recording, and then switching to ASIO during playback.

The supplied GM and GS MIDI SoundFonts in 1Mb and 4Mb sizes are fine for general use. However, they were produced way back in 1997, and most musicians will want more modern sounds for their compositions. *Ed!son* is certainly comprehensive enough if you want to create your own sound banks,

PCMCIA permits 'hot-plugging' of devices, so the WaMi Box can be plugged in without restarting your laptop.

"Users have been waiting for the version 2 drivers for a long time, so it's a big disappointment that you can't record using them, despite their excellent 12mS playback-only performance."

System Requirements

The WaMi Box requires a bare minimum of a Pentium 75MHz processor, 32Mb of RAM, and a fast ATA hard drive with 50Mb or more free space, although a Pentium 233MHz or higher and an Ultra DMA33 hard drive are recommended. A screen resolution of 800 by 600 with 256 colours is the minimum display requirement, but once again you will probably need a 1024 by 768 screen if you want to run a suitable MIDI + Audio sequencer as well. The drivers will run with either Windows 95 or 98, but Windows 98SE is strongly recommended.

although you could use any SoundFont editor such as Creative's *Vienna*, Time Signature's *Wien*, or even convert from other formats using Amazing Sounds' *CDxtract* utility.

I found the built-in effects and controls very confusing to use (see the User Interface box on page 202). The built-in chorus effects sound good for audio processing, but the reverbs are all rather metallic and are easily surpassed by most modern software plug-ins. You can therefore make things a lot simpler by ignoring the reverb, chorus, and echo effects altogether and using plug-ins instead, as long as you have sufficient CPU power. If you take this decision the extra virtual channels also become largely redundant, which further simplifies use of the WaMi Box.

The WaMi Box's audio I/O is handled using gold-plated phono connectors.

Digital transfers worked well, with the Audio In LED displaying the presence of a valid clock signal, although as with any design that employs sample-rate conversion on the input you don't get a bit-for-bit copy of the incoming signal, even when both sample rates are identical. However, being able to use the WaMi Box as a digital signal converter and sample-rate converter is also useful, as long as you're happy with its fixed 44.1kHz output rate.

Final Analysis

The WaMi Box's audio quality is very good, and although only 16-bit recording and playback is available this is perfectly adequate for the majority of purposes, as long as you are careful to keep your levels within a few dB of clipping. The synth/sampler is a valuable addition, and along with the 16Mb of built-in RAM adds a great deal to the package. However, the built-in effects are poor, and the Terratec-written drivers and utility software extremely confusing, so serious musicians will probably choose to give themselves an easier life by disregarding the effects and the virtual channels.

Overall the WaMi Box offers a lot of features in a small space, and is undeniably a unique product. Digigram's VXpocket is the only other PCMCIA audio card currently available, and though it is smaller, it doesn't offer synth or sampler facilities, and is also £100 more expensive. The VXpocket does have 24-bit converters, although on a laptop the 20-bit converters of the WaMi Box may well provide a similar dynamic range.

MME and DirectSound driver performance was very good, and were it not for all the problems I had with the ASIO drivers and utility software I would recommend the WaMi Box wholeheartedly. As it is, I can still give it a cautious thumbs up, since it's one of the most compact and cheapest ways to add quality MIDI and audio recording and playback to a PC laptop. However, if Ego Sys can iron out the current problems with their drivers and simplify the software then they will sell far more. SOS

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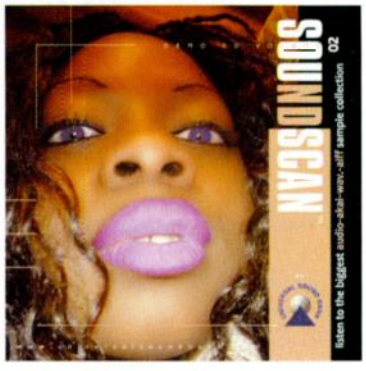

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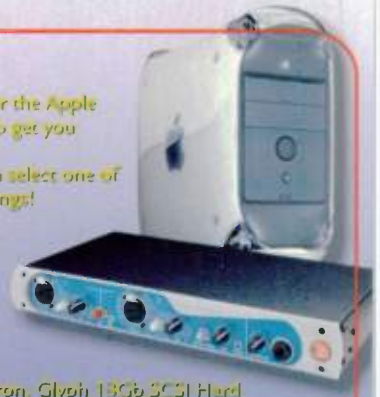

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FXPANSION *DR005*

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FXPANSION *DR005* DRUM SAMPLE PLAYER

Reflecting the growth in the number of VST Instrument plug-ins, as opposed to those designed purely for processing or effects treatments, established plug-in developers FXpansion have now produced *DR005*, a 'soft drum machine'. **Paul Ward** snares a copy...

FXpansion's range of graphically pleasing, no-nonsense effects plug-ins have been available for some time, and have proved popular enough to spur the company to continued development. Their new *DR005* 'Drum Sample Player' is a VST 2.0-compatible instrument plug-in that aims to deliver instantly gratifying drum machine capabilities to your sequencer.

The idea is certainly not new. Steinberg's *LM4* had much similar aims, but earned some mixed reviews based upon its excellent specifications, yet clumsy interface (see *SOS* July 2000). FXpansion have clearly seen a market for a simpler drum sample instrument.

Memory Management & User Interface

The interface is certainly more user-friendly. At the top of *DR005*'s plug-in window is a row of file-name boxes. Clicking on these boxes and navigating to some sampled material loads sounds into channels ready for playback — simple.

Samples may come from anywhere on your computer — you don't have to keep them all in a particular folder. *DR005* is currently restricted to WAV format for the PC version and AIFF for the Macintosh. Various bit depths are supported on the PC, including compressed WAV files; on the Mac eight-, 16-, 24- and 32-bit uncompressed AIFFs should work, but I have to say that when I tried some 24-bit samples, I got little more than a distorted mess!

DR005 will load stereo samples, but the left and right signals are summed to mono during playback.

DR005 running under *Cubase VST*.

FXPANSION DR005
£40/$60

pros
- Great price.
- Ability to load and audition samples on the fly.
- Simple user interface.
- Settings and sample assignments saved with song.
- Non-destructive trimming of sample decay.
- Four pairs of stereo outputs.

cons
- Stereo samples replayed in mono.
- No cross-platform sample support.
- No velocity sample-switching.

summary
A deceptively simple VST 2.0-compatible instrument that gets the job done with a minimum of fuss. Sample format restrictions and inability to use true stereo samples may put off some users, but at this price it is hard to think of anything that comes close. A true gem.

SOUND ON SOUND

This is a shame, because it precludes recording your own drum samples in stereo with room ambience, thus freeing up valuable processor cycles. I found that there was also a nasty tendency for *Cubase* to crash on my Mac if I attempted to load a sample that was too big for available memory.

To preserve screen space, each pair of file names is stacked above two fader channels. I found that this could get a little confusing. There is a yellow arrow that attempts to point out with which channel each file-name slot corresponds (see left), but my eyes did not take easily to this cue. I received the same feedback from a few others that tried out the *DR005*, so I'm obviously not alone — maybe the graphics could be enhanced to give a more obvious link?

But this is minor carping. All of the other controls are stacked in a single channel and will present no problems to a typical user. Sixteen channels are offered, all with identical facilities. At the top of the control window are Import and Export buttons; the latter allows the current settings of *DR005* to be stored in a single file. This file also includes all sample data, which makes it a very convenient method of archiving favourite drum kits, or swapping kits between sessions. FXpansion are even making several kits available on their web site. I managed to load a PC-exported bank into the Macintosh version, although I had to reset some of the mute and solo buttons which seemed to take on strange settings following the import.

At the top of each of *DR005*'s 'channel strip' is the Unload switch, which frees memory up by clearing that channel's sample (the file-name box then reverts to displaying '<none>'). Beneath the Unload switch is the note number display, with attendant Up/Down nudge buttons for changing the trigger note. Sadly, there's no option to double-click to enter note numbers directly, nor can you drag the Macintosh mouse up/down to scroll through numbers quickly.

The yellow arrows at the top of each sample channel strip are supposed to show which sample is loaded into which channel, but they're not exactly the most unambiguous of indicators!

Pitch is adjustable over a generous two-octave range (one up, one down), which should cover most possible uses. *DR005* also allows the pitch of a sample to be swept down from its starting pitch by a variable rate. This is great for generating certain kinds of weirdness, from pseudo-Simmons 'cat-sneeze' percussion to TR909-soundalike bass drums. There is no way to change the depth of the pitch sweep from its preset value, but nevertheless, this is a nice bonus feature.

I'm a fan of long samples when it comes to drums, particularly for tom and cymbal samples, where the ambient decay can add a sense of realism to a mix. But there are times when it would be nice to have the option of shortening a sample, perhaps as a corrective measure to remove noise or ambience from the end of a sound, or to tighten up a ringing bass drum. *DR005* allows you to do just that with its Amplitude Decay control (entitled 'Amp.Dcy' on screen). This is a simply brilliant feature, allowing you to fine-tune samples so that they sit in a mix without all of that tedious flipping between drum machine and sample editor.

DR005 has four stereo outputs and these are selected for each channel by a group of buttons. Also amongst these buttons are the Choke Group controls. If you assign two or more sounds to a Choke Group these sounds will become mutually exclusive — so that closed hi-hats cut off the natural decay of an open hi-hat, for example. Two independent choke groups are provided.

The Mute and Solo buttons are very welcome, but of course they only work within the confines of *DR005* — that is, you have to use the host program's Solo function to hear *DR005* in isolation first, before you can completely solo individual samples. The channel strip is completed by the Pan control and a good-sized Volume fader.

Drumming It Home

In use, the *DR005* does its job with little fuss. I did discover a bug in the Mac version during the course of this review that could cause *Cubase* to crash in certain circumstances, but this was quickly fixed by an update which FXpansion sent on to me. Other than this, my time with the plug-in was trouble-free. I was able to play samples in real time from a MIDI keyboard in exactly the same way as I would have with a hardware drum machine. When a lot of activity required samples to overhang one another the processor load did increase dramatically, but this is no different to any other software sampler, drum machine, or synth. The sheer convenience of trying out different samples in context, and then exporting the whole shooting match to a single file is very liberating. Whether or not you choose to save the current kit to a single file, *DR005*'s settings and sample assignments are stored along with your song data.

I tried *DR005* with various sampled material, including loops and phrases, and was impressed by the immediacy with which I was able to work. *DR005* calls itself a Drum Sample Player, but to think of it as 'just' a drum machine is to perhaps forgo some interesting applications. In addition to using drum samples, I found that pitch-bends on sampled vocal snippets produced some strangely inspiring percussive elements, and I enjoyed triggering some E-bow guitar phrases panned to various points across the stereo image.

Conclusions

I hope the *DR005* goes on to great things; it certainly deserves to. I have already sent in a list of user requests, and found the developers to be very open and responsive. What's more, a new Mac version with increased polyphony is due very shortly.

In its current form, *DR005* is all about simplicity, but don't be fooled into thinking that this implies a lack of functionality. Loading and auditioning samples is child's play and the mixer-style layout is a natural interface for most of us. The amplitude decay control is inspired and the pitch sweep is a bit of quirky fun. OK, 24-bit samples are not (yet) supported, neither is any velocity mapping — although it is velocity sensitive. But if such features are important to you, you really need to be looking elsewhere. *DR005* delivers a solid, traditional-style drum machine and does it very well indeed. SOS

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- SAMSON PH60 AND RH-SERIES HEADPHONES
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Samson PH60, RH100, RH300 & RH600 Headphones

Photo: Mike Cameron

Samson have expanded their range with some new headphones: the PH60 and the RH range, comprising RH100, RH300 and RH600. These are all of the open-backed variety, a design approach that tends to produce a more pleasingly open sound quality for a given price. However, this makes them unsuitable for foldback monitoring in the studio, because of the potential for sound leakage to colour the recorded sound or even to create howlround.

The PH60s are the bargain end of the range, but their low price doesn't mean they can be dismissed out of hand. The drivers use isotropic ferrite magnets, which are less powerful than the neodymium ones typically used for high-quality headphones, but they manage to convey a reasonably big, open sound with a pleasantly balanced sound spectrum and reasonable bass response. The claimed frequency response (20Hz to 22kHz) has no tolerances given and, to be honest, I would estimate the response between the -3dB points to be rather narrower, especially at the bottom end, though it's perfectly acceptable for non-critical listening.

The RH series of headphones all use neodymium magnet assemblies, and all have the same all-embracing 20Hz-to-22kHz frequency response. The over-the-ear design of these models applies sufficient side pressure to ensure a good seal without being uncomfortably tight. Plug adaptors are supplied for use with standard quarter-inch stereo headphone sockets.

The RH100s are the cheapest of the three, but still manage to deliver a good specification and reasonable audio reproduction in a comfortable and durable design. The RH300s have a higher-quality transducer which achieves a respectable level of performance, with a pleasing balance and an ability to play surprisingly loud. Though higher impedance is often associated with higher performance, the RH300s actually have an impedance of 32Ω, compared to the RH100s' 64Ω. The top-of-the-range RH600s boast slightly larger driver capsules with more responsive diaphragms and an impedance of 40Ω. The sound quality is another notch up from the RH300s, providing a clean and uncoloured sound with a good portrayal of dynamics and a nicely balanced frequency response

Comparing these headphones with my own £100 AKG K240s, even the RH600s revealed , unsurprisingly, a significant resolution gap. The differences were mainly in the ability to extract the more subtle details in recordings, such as the ambient room signatures on simply recorded material. The Samsons also struggled to maintain clarity and individuality between different instrumental lines in complex mixes. As a result, I wouldn't want to have to make critical recording and mixing decisions based on what these Samson headphones reveal.

That sounds rather negative, but these headphones all actually represent good value for money. For general-purpose listening, I would certainly suggest trying out a Samson model alongside similarly priced Yamaha, Sony, AKG, Sennheiser or Beyerdynamic models. However, you generally get what you pay for in the audio business and headphones are no exception, so I would take Samson's 'professional reference' marketing tag with a very large pinch of salt. *Hugh Robjohns* SOS

information

£ PH60, £14.99; RH100, £29.99; RH300, £39.99; RH600, £49.99. Prices including VAT.
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With both PC and Mac platforms switching over to USB as a standard interfacing protocol, the original serial and SCSI connections seem slowly to be being abandoned, notably on the 'boiled sweet look' iMacs, iBooks, G3s and G4s. This leaves many of us with 'legacy' (polite term for obsolete) equipment which we can't plug in. While SCSI PCI cards are an option for G3s and G4s, iMacs and iBooks have no such slots, which means an alternative is needed.

Adaptec have come up with a neat solution to the SCSI problem in the form of USBXchange, a USB-to-SCSI adaptor. While USB is considerably slower than modern SCSI connections, it does at least mean you might not have to throw away all your old SCSI peripherals. In practice the Adaptec USBXchange would be fine for use with things like scanners or CD-R drives (of up to 4x speed), but connected hard drives will only really be useful for backup rather than for multitrack recording or playback.

The USBXchange converts from a USB connection to a mini SCSI 2 connection. The USB end ought to be connected either directly to the computer or to a powered hub, as the unit's power is supplied by the USB interface or by the SCSI peripheral itself. The support software comes on CD-ROM and installed very easily on my Mac. It added another item to the Control Panel in order to be able to switch between mass-storage devices and other peripherals — it's important to switch to the correct mode for the SCSI peripheral you're using. You can connect to only one SCSI device at a time, but because the connection to the computer is via USB, hot plugging and unplugging at the USB end is OK.

Following the software installation, I booted up Adaptec's *Toast* and my old Yamaha SCSI CD-R drive was brought on-line straight away. I then had no problems burning a backup at 4x speed.

Though the USBXchange is fairly slow by SCSI standards, it does provide a cost-effective means of connecting SCSI peripherals to USB interfaces. Indeed, in the case of iMacs and iBooks, an adaptor such as this may be the only practical option. *Paul White* SOS

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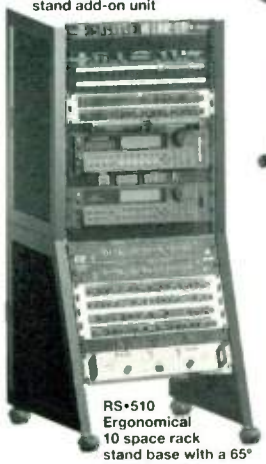

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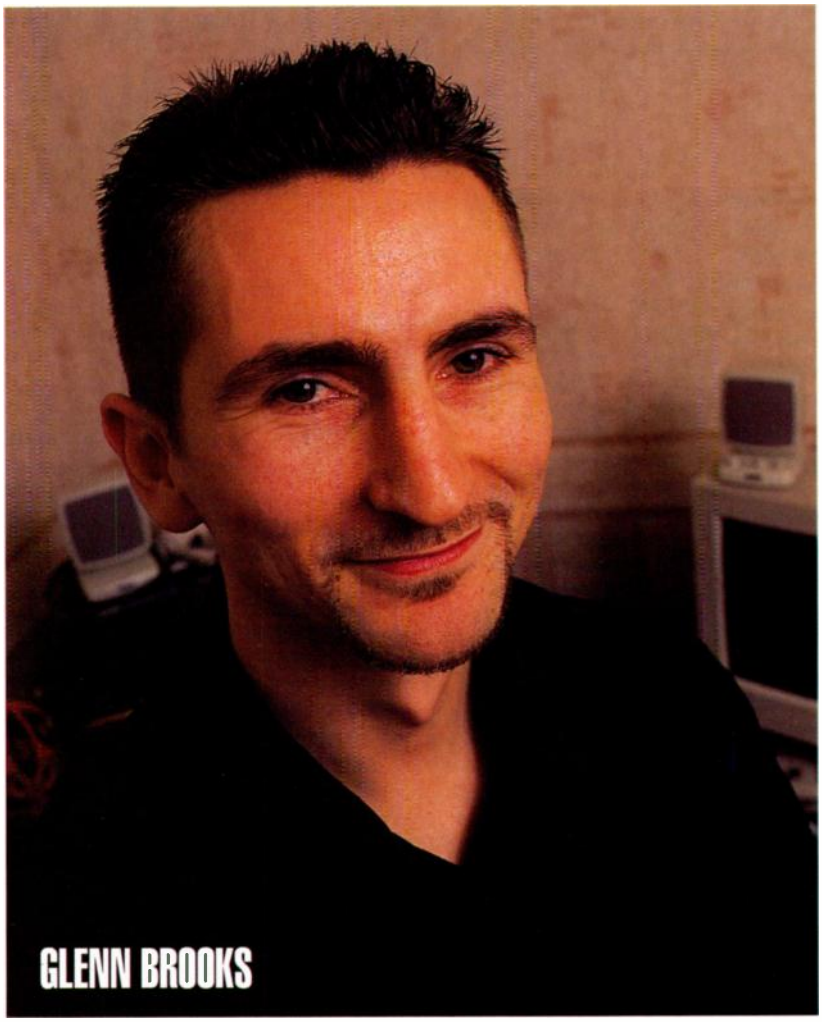

Photos: Richard Ecclestone

For some people, a studio is not a studio unless it's packed to the rafters with racks of vintage keyboards and esoteric recording equipment. Others take a more minimal approach, content to let their computer provide their sounds, add their effects and mix and master their recordings. *Sound On Sound* reader Glenn Brooks and his Thornton-Cleveleys-based studio fall firmly into the latter category. Working under the name The Pearl Works (www.thepearlworks.com), Glenn has a small recording studio, furnished with a modest collection of equipment, in the front room of his house. At the heart of the setup is a Pentium III 500 PC running Steinberg's *Cubase VST* v5.0 and loaded with software synth plug-ins including Steinberg's *Model E* and Native Instruments *Pro 5* and *B4 Organ*.

"It's probably just a phase I'm going through but I prefer to keep everything digital because there's no hiss", explains Glenn. "That's sad in a way, because it means I'm using my hardware synths less and less. The way it's going, everything will be inside the computer. The studio's not as big as I'd like it to be, but for the things I'm doing I don't need mega amounts of space. If it ever gets to the stage where a vocalist is coming round, I've got a downstairs loo to record them in!"

By day, Glenn works as an IT consultant, which provides his main source of income, but although he hasn't yet managed to earn a living from his music, his studio is more than just a hobby. "I'd love to be a producer. That's my goal. Eight hours a day I sit in front of the computer for my job, but it's not interesting. I'd rather be in front of the computer with *Cubase*. Even if I got a wage for it that would be a start. This is where my heart is. Coming home and doing this is tough on my private life as well. I don't get to see my fiancée Gina half as much as I'd like to, but she understands. If something does come of it, it should be big."

Factory Worker

Thanks to his day job in IT, Glenn has been using the Internet as a source of information for many years. As a result of one particular web browse, Glenn started working with The Vocal Factory, a web-based organisation which provides high-quality MP3 vocal samples for remixing. Now, much of Glenn's time is taken up doing remixes for The Vocal Factory. He explains how it started.

"I've known about the Internet and I've been using it as a technical resource for years, but I hadn't really looked at it as a music resource or somewhere you could create a community until recently. I'd been writing songs and trying to get people to come and sing them. Getting a vocalist was hard, but getting one that could sing or didn't have an attitude was a nightmare. So I was resigned to just doing instrumental music. Then, while I was trawling through the Steinberg newsgroup on the web, I saw an ad from The Vocal Factory saying, 'Remix professional vocals free of charge', so I looked into it.

"The two guys who run The Vocal Factory have a back catalogue of songs on DAT doing nothing. Their idea was to give people like me the chance to work with some professionally pre-recorded vocals. You sign on to the site and then you download one of their songs as three or four MP3 'zipped' files. One has all the verses, another the chorus or bridge, and one nas ad-libs. There's also a low-quality Real Audio guide track of how they originally recorded the song. From that you can get the tempo and key and some sort of idea of how it goes. The vocals are quite well encoded, so they don't really lose any quality, and once they're in the mix you can't tell they're from an MP3 file. ▶

Main Equipment

- Pentium III 500 PC with 256Mb RAM
- Creative Labs Live! soundcard system
- Steinberg *Cubase VST/32* v5.0 sequencer and VST virtual instruments
- Ensoniq ESQ1 keyboard
- Korg 01/RW rack synth

report by: tom flint

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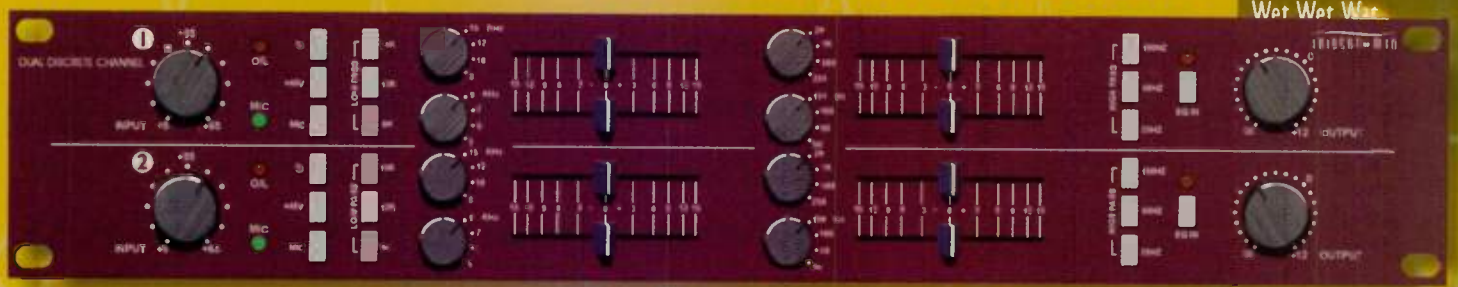

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"I send in a snippet of my mix. They have some A&R guys working for them, who listen to the mixes. If they like them, they ask for the full mix and they try to pitch them to record labels. If the label picks up a mix, the remixer (ie. me) gets a one-off fee. The Vocal Factory are the writers and own the publishing to the song, so they'll get the biggest share. But if, for example, you write a mix that makes number one, they will negotiate a better contract to keep you. There are no prizes, but they guarantee your stuff gets played to proper A&R men. I always do one where I keep it as commercial and as short as possible, plus a far-out mix of what I'm into, with my own flavours.

"Every six weeks they put a project up and it's always in a different genre, but that's not necessarily the style they want for the remix. If you want to do a Morris-dancing mix of it, you can! Anything goes, basically, but they have an idea of what's current and popular. You can pick and choose, but I do as many as I can, as quickly as I can. I want to keep my output constant, because one of them, one day, is going to be *the* one."

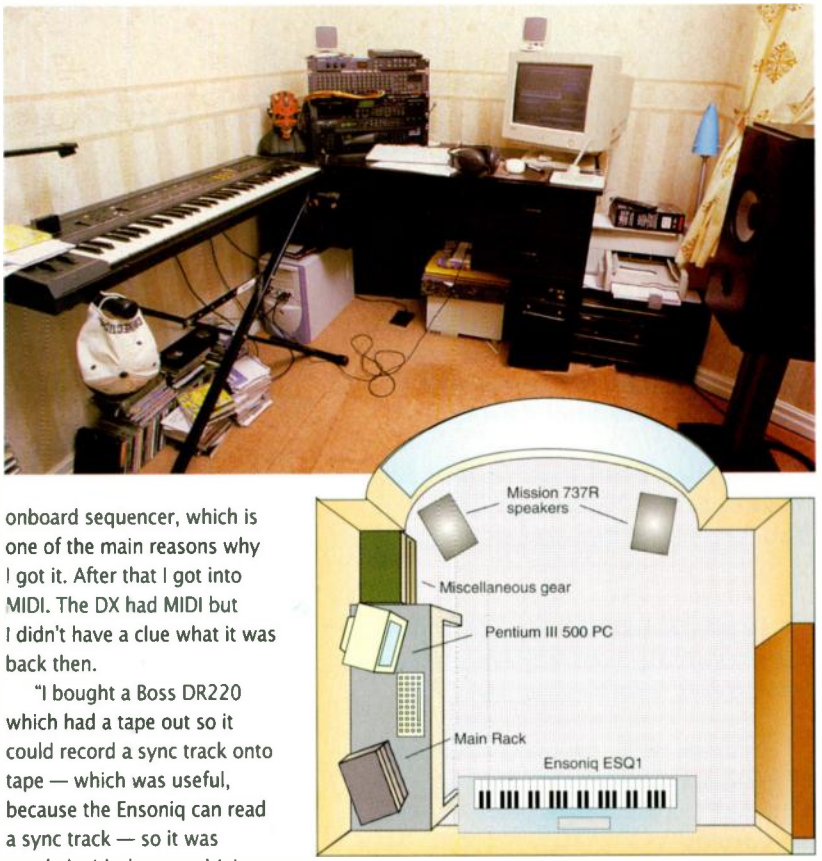
It's a testament to the opportunities available for musicians via web sites these days that Glenn has managed to find other mix work besides the Vocal Factory collaboration. He tells the story...

"Epic records have set up an online A&R site called 'Deal With Epic', where you can upload your stuff and they'll sign you if you're good enough. Firstly I looked on their forum message board to see what people were saying, and someone had asked the question 'I'm a lyric writer, can I just put my lyrics up there?' Epic wrote back and said 'no, we want full songs', but a label called Babywax had replied saying people could send lyrics to them and they'd have a look. So I dropped them an email to see if they wanted any material remixing. A guy called Danny James rang me back and asked me to send some stuff. He runs Darkside Music UK and Babywax records and is the song writer for Babywax. I already have stuff on the web, so I just gave him the URL to download. He rang back and said it was brilliant stuff, and he asked me to do a remix. He sent vocals on CD done by Penni Tovey. She's otherwise known as Arrola, the singer from Ruff Drivers. I've done three or four songs for Danny so far."

Where It All Began

Glenn's interest in music technology began back in the early '80s, when the computer-based studios and Internet collaborations were just a twinkle in a software designer's eye. Glenn describes some of the steps he had to take to get to where he is today.

"I first got into Depeche Mode, Erasure, Propaganda and Yello — those sort of bands are my influences. They really got me thinking 'I want to have a stab at this myself', so I bought a Yamaha DX100. But I was a bit shocked when I took it home, because it didn't have a built-in speaker! I was only about 13 or 14. The Ensoniq ESQ1 was one of the first serious bits of kit I bought, and I've never found anything better as regards keyboards. It has an onboard sequencer, which is one of the main reasons why I got it. After that I got into MIDI. The DX had MIDI but I didn't have a clue what it was back then.



Glenn's small but uncluttered home studio.

"I bought a Boss DR220 which had a tape out so it could record a sync track onto tape — which was useful, because the Ensoniq can read a sync track — so it was sync'ed with the tape driving the keyboard. The ESQ1's only 8-part poly and 8-part multitimbral, so it was stealing notes, but there was nothing better at the time. The pad sounds took up the most polyphony, so I used to bounce them onto tape and sequence the rest. I didn't have reverb or delay, so I used sequencing to replicate a delay. I couldn't do the same with reverb, so then I bought the Alesis Midiverb III, which has MIDI and has four effects at once."

Glenn's early recordings were achieved with nothing more than a Tandy mixer, two tape decks and lots of bouncing. After that, he graduated to a Yamaha MT4X cassette 4-track, then a Fostex 280 multitracker, before finally moving into the digital domain with his *VST* setup. A few keyboards also came and went along the way, including a Sequential Prophet 5, a PPG Wave 2.2 and a Korg M1. "With the M1 I thought 'Wow, I've arrived! This is all I need,"

"I compress the hell out of vocals and drums using *Cubase*'s built-in compressor."

Glenn's Gear

- Pentium III 500 PC with 256Mb RAM
- Creative Labs Live! soundcard system
- Steinberg *Cubase VST/32* v5.0 sequencer
- Steinberg *Wavelab v3.01* digital editing software
- Steinberg *B4 Organ* and *Model E* virtual instruments
- Steinberg *Mastering Edition ME* mastering processor
- Native Instruments *Pro 5* virtual instrument
- Waldorf *D-Pole* filter
- Waldorf *PPG Wave 2.V* virtual instrument
- TC Works *Native Reverb*
- DB Audioware *Dave Brown's Plug-in Suite*
- Waves *L1 Ultramaximizer*
- Waves *Renaissance Compressor*
- Boss DR550 drum machine
- Ensoniq ESQ1 Keyboard
- Kawai K1r rack synth
- Kawai K4r rack synth
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admits Glenn, "but when the Korg 01R/W came out I was blown away, so I part-exchanged for it.

"I was a bit conned with the Kawai K4 rack. The keyboard version with effects was brilliant, but the shop I bought the rack from never mentioned that it didn't have any effects. When I plugged it in, it sounded totally lame, but I have managed to get some decent sounds out of it. Now I record the K4 as audio in *Cubase*, then apply all my plug-in effects from within the sequencer.

The Sounds

Many of Glenn's sounds are now generated by his growing collection of soft synths and samples. Glenn describes how they are generally put to use in his recordings. "I've got absolutely thousands of drum sounds and loops, although I try not to use loops if I can help it. If I've got a loop in mind I'll use it, but I'm not one for trawling through sample CDs — it wastes too much time. I tend to write the drums myself. I've got the Steinberg *LM4* VST Instrument with the Wizoo kits, which are awesome. They make it sound as though you've got a drummer in your house. I tend to use traditional sounding drums rather than Roland 909 or 808 sounds, so *LM4* is the main tool.

"The most recent software instrument I bought was the Native Instruments *B4 Organ*. That's useful because the commercial mixes I do sometimes require an element of cheese — which I don't particularly like, but it's got to be done. The Waldorf *PPG*, and the Steinberg *Pro 5* and *Model E* instruments are absolutely brilliant for analogue sounds, and I've got some fairly decent multisampled SoundFonts for guitar. The Ensoniq is very good for synth-bass sounds, so I tend to write the bass part using that, whack on the delay from the MIDIVerb, then play around until something sounds good. I play everything in using the Ensoniq, which is basically my controller."

Glenn masters his own recordings within his computer, ready for posting as MP3 files on his or other web sites, or for burning to CD. Once again, software has been instrumental in all aspects of mastering and file preparation.

"I use Steinberg's *Wavelab* to convert vocals coming in on MP3 to WAV files. In the case of my work for The Vocal Factory, the vocals have been recorded professionally but using analogue equipment, so when you open them up you can hear a little noise. I use *Wavelab* to clean them up and get rid of any bleed. I also de-ess everything and optimise the volume a bit, before bringing the audio into *Cubase*.

"*Wavelab* is also handy for working on fade-outs, and I use it to apply a maximiser. You think the audio is as loud as it will go, but when you put it through this maximiser it's louder! I've got Sonic Foundry's *Sound Forge* as well, which is a lot better for pitch-shifting and time-stretching.

"I compress the hell out of vocals and drums using *Cubase*'s built-in compressor. I use that mostly because it's instant and has very low overhead on the CPU. I've also got Steinberg's multi-channel mastering compressor, which is good for a complete song where you want the bass or top end boosted a bit. A lot of the plug-ins you can't run in real time, otherwise your computer will just die, so I apply many during mastering.

"I use a Sound Blaster Live! card in the PC. There's a breakout box, which means you're not fiddling round the back of the computer all the time. It's got S/PDIF I/O, MIDI In and Out, and a couple of line inputs on the front. It can take up to four simultaneous inputs, but I never use them because I'm not recording much audio.

The outboard equipment stack, comprising, from top to bottom: Boss DR550 drum machine, Alesis Midiverb III effects processor, Fostex 2016 mixer, and Kawai K4r, K1r and Korg 01R/W rack synths.

"The beauty of this setup is that I've got 8mS latency. So the VST instruments work almost instantaneously. Until I got a decent soundcard I had a quarter of a second of latency, so I just didn't use the VST instruments."

Although Glenn's setup seems to be becoming ever-more digital, there's still a place for the good old-fashioned keyboard in the studio. Furthermore, an ageing acoustic guitar leans against one studio wall, ready for when Glenn starts his planned guitar lessons. It seems that the day when an entire studio resides on the hard drive of a PC may never actually arrive in Glenn's studio.

"I'd never get rid of the Ensoniq, because I've written most of my songs with it", exclaims Glenn, "but I was thinking of getting a Triton or Trinity because I've always been impressed with Korg stuff. I want to get something that's going to be totally different. The Nord and Virus virtual analogue synths are good, but they're not producing sounds I haven't heard before. That's probably a difficult thing to ask of a synth, but there's nothing out there at the moment that's making me think 'I've got to have that'.

"After I got the Korg 01R/W, I said to myself 'If I can't write any decent music with this kit now, there's something wrong with what I'm writing. I might as well hang my keyboard up.' At the end of the day, some of the best tunes have been written with just an acoustic guitar." SOS

Hearing Is Believing

"I do 90 percent of my monitoring through headphones so I can really hear fine detail, but I've got some Mission hi-fi speakers just to see what it sounds like on Joe Smoke's hi-fi. I've also got some mini speakers for MP3 stuff. Nine out of 10 people who are downloading MP3s are going to be playing them through the speakers that come with their computer package, which tend to be crap, so I bought some crap speakers with a bass box that rattles your fillings out."

Glenn Rises Up: Web Chart Success

At the time of our interview, a remix of Glenn's, entitled 'Melody Rise Up', is enjoying some considerable success in several web charts, as he explains. "At the moment I've got a number one on the MTV Europe Undiscovered charts on the Internet. I'd shoved my track up on getoutthere.bt.com, just to see what sort of feedback I'd get from it, and it got to number one. Then they submitted it to MTV Undiscovered. I didn't know anything about it. People go onto the site, download tracks, and vote. I went to number one in the Dance charts at the beginning of November. Then they compile a chart of charts (dance, rock, pop and alternative). I went straight in at number one on that for December."

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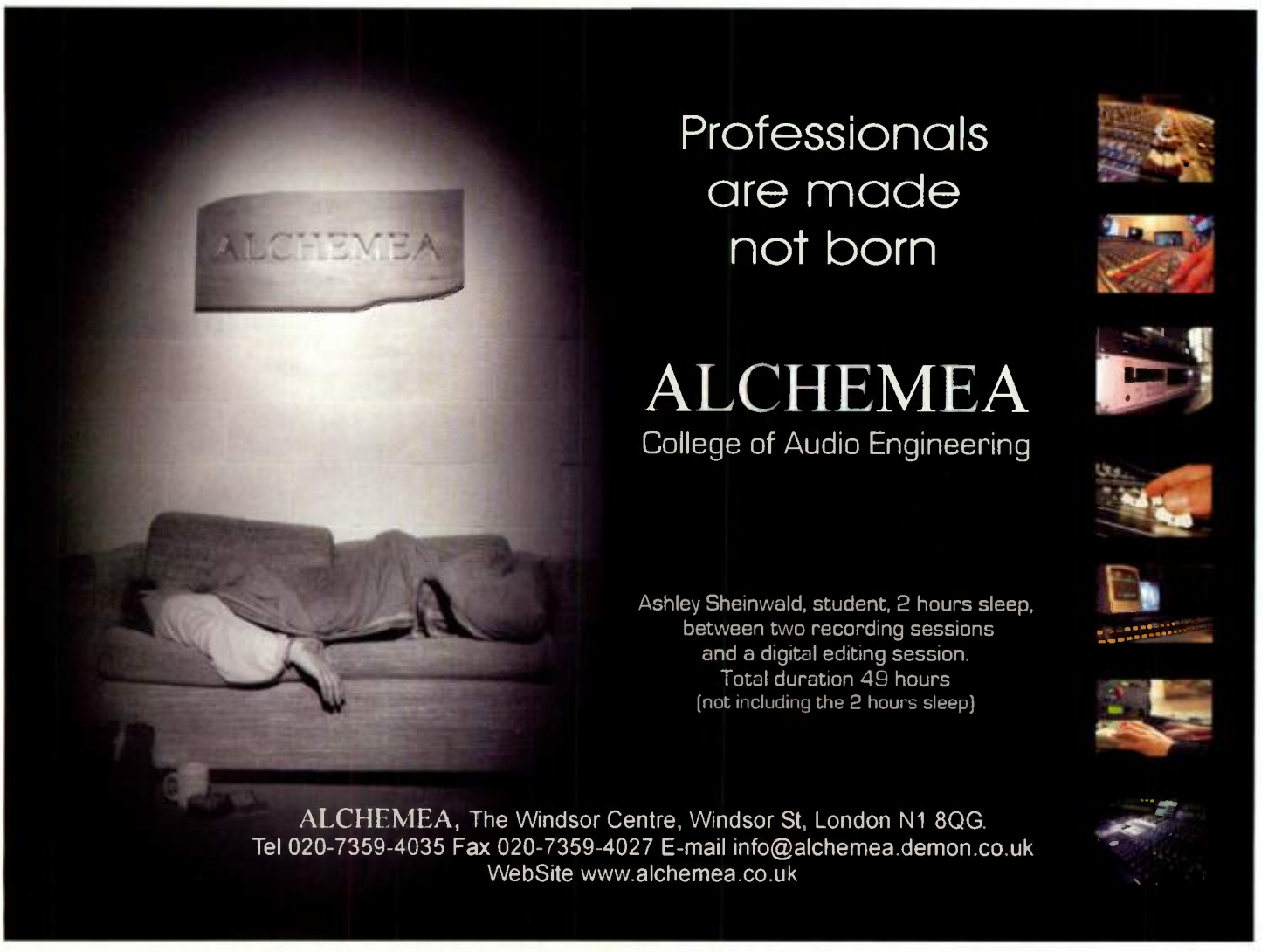
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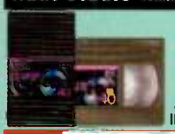

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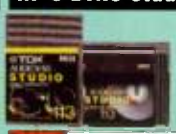

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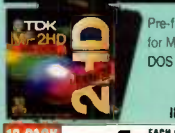

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BIG GEORGE'S GUIDE TO COMMERCIAL SUCCESS

I was rummaging through the pieces of paper that litter the *SOS* office every month, waiting to be glued into the next issue of the finest magazine on the newsagent's shelf, when I came across a letter slated to be featured in the Q&A section of this issue (see page 32). This letter is about finding a manager, and what that manager should do when you've found them. The answer, given by our very own Tom Flint in his best handwriting, is comprehensive, accurate and level-headed. Not the sort of answer you would expect from *me*...

Suspicious Minds

If you're looking for a manager, the obvious thing might be to start with the established, high-profile management companies. There are many such companies out there but, needless to say, demand for their services is high. You might get lucky and be the latest act on their roster to be totally overshadowed by their top act, who takes precedence over everything. Or, even worse, you might *be* their top act, proving that they don't have any really famous clients. How tragic would that be?

Ask yourself which of these alternatives is better: first, getting into a very long queue with a load of other acts waiting for the established managers to jerk you around for a bit, before rejecting you; or, second, finding someone who *doesn't* follow the recognised blueprint for stardom (which has a guaranteed success ratio of one in a billion), is loud, proud and wrong, knows sod-all about the ways of the music industry, but is willing to have a good go at launching you as a global phenomenon. What would Elvis Presley have said, being a semi-illiterate truck driver managed by a fun-fair ride operator, who became far and away the biggest act this planet will ever know?

What it's all about is finding someone who will push you to the max and, crucially, whom you trust. Trust is not a simple concept to quantify. Trusting someone doesn't mean you have to *like* them, or even agree with their methods. The important thing is whether you think they will work in your best interests. Do they have the same goals as you? Will they protect you? Do you think they're capable of ripping you off?

Hit Factory?

Obviously, if Peter Waterman, Tom Watkins or Nigel Martin Smith took an interest in you, you'd be guaranteed a Top 10 record, or at the very least an appearance on *Top Of The Pops*. But you'd have no input in the making of the record, and you'd have to wear stupid designer shell-suits and learn a dance routine that looks ridiculous when the TV sound is muted. (Try it at home yourself — next time a brand-new boy band make their first appearance, turn the sound down and talk disparagingly about them. Fun for all the family!)

The reason these managers/producers are so successful is that not only do they know their markets inside out, they know the people who control those markets — in fact, they probably have their home phone numbers. They supply easy-to-digest images with bland appeal, perfect for the watered-down media we're lumbered with. Is that the kind of success you're after? If you're reading *SOS*, I doubt it.

The perfect manager is someone very rich who cares about you and what you do, has tons of front and cast-iron balls, gets things done, is an excellent communicator, and has your total confidence. But perfection is pretty tough to find, so you'll probably have to compromise, or go for a loud-mouthed, self-opinionated, stroppy know-all with a bit of a track record — and before anyone asks, my answer is NO! SOS

Big George holds forth on the vexed question of management...

Signed In Blood

Some of the greatest artist/manager marriages have been secured on a handshake, whereas other partnerships have been based on detailed contracts incorporating numerous legal safeguards. Both types have been known to result in the legal profession getting richer. So where do you start?

Whichever type of contract you're going to put your name on first — a management agreement, a publishing deal, a record contract, a promotion contract — my advice is that before you sign anything you try to have a period where you and the other party work together, to see how things go. For example, with a record or publishing company, ask them to bankroll some recording time and see if you like the way they operate.

This could give you the opportunity to avoid some big mistakes. You might find, for example, that they're too 'hands-on' and want more input into your music than you can accept. However, there is also the risk that they might decide you're a bunch of hopeless time-wasters just as you decide that they're the perfect organisation to launch your career.

I know I sound like a marriage counsellor, but one premature signature can ruin your career before it starts. Be careful out there.

So Wotcha Wanna Know?

I'm sitting here in the penthouse suite at *SOS* Towers just waiting for your email to arrive (at big.george@sospubs.co.uk) and point me in the direction of a musical injustice to right. If you're not on the Internet (then you really *are* behind the times, aren't you?), a snail-mail letter will also reach me here at *SOS*.

For access to the majority of my previous rants in the magazine, visit my web site (www.biggeorge.co.uk), and for details of my forthcoming seminar tour, write to: Big George, PO Box 7094, Kiln Farm, MK11 1LL.

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Multimedia Mix-Up

Zero-G clarify multimedia sample CD usage

I'd like to thank Paul Farrer for the review of the Zero G *Seismic Frequencies* sample CD in the January 2001 issue of *SOS*. I was, however, concerned to read the incorrect comments in his final paragraph regarding the licensing arrangements for samples when used in multimedia applications. Paul said: "At the back of the manual, Zero G are quite specific about what you can and can't use their sound libraries for in a multimedia capacity. They state that use in 'applications such as sound effects, icon sounds, ambiences, game noises, etc, is *not* allowed'. Thus leaving you to use all of these sounds in a purely 'musical context' — surely something that at least a third of the sounds on this disc were never designed to do..."

In fact, if users want to use the sounds on the CD commercially in games, for web sites, and so on, all they have to do is contact us to get an additional low-cost multimedia licence. The contact details are given for this purpose, and the situation is clearly explained in the 'frequently asked questions' section on the penultimate page of the CD booklet. The following notice also appears on the back inlay of the CD: "Use of the included sound samples in isolation, such as in video game soundtracks or web sites or library music clips (where they appear in isolation or as sound effects) is not permitted without first obtaining a Multimedia Licence from Zero G."

Seismic Frequencies, like many other sample CDs, can be used for multimedia work if an inexpensive licence is obtained.

I agree that, in the case of this particular product, it might have been better to point out *first* that usage is permitted with an additional multimedia licence, and then point out that use within musical compositions is free, but nevertheless the wording was there. Of course, I do understand that the thought of an additional licence may be off-putting to some users, who are worried that it may be expensive. But in fact we would always set the fee at a level that the particular user would regard as reasonable in the light of the money that they would be about to make by using the sounds in their commercial project. For example, for sample usage on personal web sites, the licence would in most cases be free, and even use as a sting by a television or radio station would cost no more than £100 to license.

The problem for Zero G is that the *SOS* review has now effectively stated that this product *cannot* be used in multimedia applications, which is not the case. Is there any possibility that the next issue of *SOS* could set the record straight?

While you're at it, perhaps you could clarify exactly what the CD scored, as we noticed that the *SOS* web site version of the review gave the CD four out of five, while the paper edition of the mag shows a rating of three.

Ed Stratton
Zero G

Paul Farrer replies: *Thanks for your comments about the* Seismic Frequencies *review. Firstly, I feel that clarification of the legal do's and don'ts for this CD in particular would be welcome.*

The details of what you can and can't do with samples from a sample CD often vary between different manufacturers' soundware products, but most programmers, DJs and other conventional sample-CD users would, I hope, understand and respect the basic rules for using sample libraries. The common-sense policy of not allowing the copying, lending or repackaging of sounds is a perfectly valid way of protecting sound designers' work and should, of course, be upheld and enforced. I also think that asking that sounds be used in a 'musical context' is also entirely valid for most of Zero G's releases, but Seismic Frequencies *is slightly different, falling as it does somewhere between sample CD, sound effects library and multimedia sonic toolkit!*

As always, you have stated in your FAQs that for any multimedia application it's best that users contact Zero G, as well as pointing out that those using the sounds in a non-musical context may require an additional licence. This is fair enough, but I feel that in the case of Seismic Frequencies, *where this information is particularly relevant, Zero G really could have made it much clearer and more explicit. It would have been an idea to include these points in both the CD booklet and on the rear of the CD case (perhaps even mentioning it in any advertising), rather than making them halfway down a list of Frequently Asked Questions. Incidentally, the FAQ section is one that will be very familiar to regular Zero G sample CD users and therefore, ironically, it has a fair chance of being overlooked.*

With regard to the review itself, I would like to re-state how much I enjoyed Seismic Frequencies, *and emphasise that I feel it represents a valuable resource for useful and inspiring loops, FX and ambiences. The star rating for the original review was, in fact, four stars (as it correctly appeared on the web site) and* not *three stars. Please accept our apologies for the mistake.*

A Cracking Story

Are alleged bugs due to pirate software?

I was interested to read the letter headed 'Is it Magic?' in the January issue of *Sound On Sound*, concerning alleged 'bugs' in Emagic *Logic Audio* and the *EXS24* sampler, as discussed on the mailing list of the *Logic* Users Group.

It is perhaps worth pointing out that many of the 'bugs' that users were reporting on this group recently turned out to be due to the program not recognising the dongle. To put it bluntly, those reporting the 'bugs' may have been using 'cracked' copies.

I'm not saying that the program is without its faults, but rest assured that there are very many legitimate users, employing the software daily, for whom it is very much a way of life. We get work done, and we make a living! The *EXS24* and the *ES1* synthesizer are wonderful add-ons to a terrific tool.

Mark Ayres
Composer/Sound Designer

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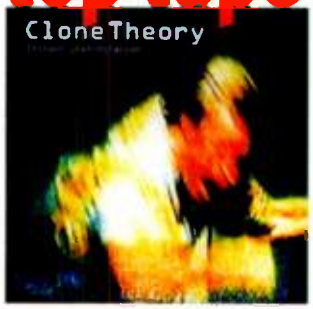

Clone Theory

Recording Venue: Home.
Recording Equipment: Apple G3 computer running Emagic *Logic Audio Platinum* sequencer, Steinberg *ReCycle* loop processor, BIAS *Peak* and Emagic *Sound Diver* editors, Emu E6400 sampler, two Yamaha O1V desks with Pro Tools ADAT Bridge, JVC hi-fi amp, Yamaha NS10 monitors, Shure SM58 and Rode NT1 microphones.

Geoff Southall used to work as an assistant engineer in a studio which unfortunately closed down. On a more positive note, when one of the studio's owners went away for six months to work, Geoff and his musical pals were allowed to borrow the equipment. Clone Theory is the result.

Geoff doesn't have a fixed working method when writing and recording. A creative idea might start from a loop, a collection of samples, or multi-layered patterns on a sequencer. Geoff also plays the drums, and these were set up in the narrow corridor leading to the toilet next to the studio, with just a Rode NT1 overhead above the snare. In order to even up levels and achieve maximum punch, this was treated to heavy compression using a *Logic* plug-in. The live kit drumming was then sampled for two of the songs and had other samples overlaid on it. Original loops always impress me these days, as it's just so easy to use someone else's work. As it happens, both mixes that use the original loops are very good, too. On other tracks, Geoff uses real drum and percussion overdubs effectively alongside treated loops from sample CDs.

There's yet more innovative use of sound on 'Phone Sex', which takes sounds sampled from an old Atari games console and tweaks them with the filters of the Emu E6400 sampler until they squeak and squelch in the appropriate places. Despite being fairly sparse, this sub-bass driven song works well, and develops nicely with the aid of some real drum and percussion loops towards the end of the piece.

The mixing is of a high standard throughout, but could have done with a bit more warmth in the bass here and there. I think that's probably the result of mixing on NS10s, which don't make it easy to assess the amount of bass accurately. After having had a good listen, I feel that any problems of this nature could easily be sorted in post-production, without any need to remix.

One track that could do with such post-production attention is the third, 'Crashers', which is nevertheless one of my favourites, and not only for its wonderful overdriven bass riff. Snippets of recorded telephone conversations from friends have been used and have come out remarkably free of noise. The humour in the piece (and throughout the album) is well handled, using appropriate samples and various live vocal sideswipes (like the obvious one at Prince in the song 'Instant Gratification'). It's good stuff and can be found at www.clonetheory.go.to. ■

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. Please enclose a band/artist photograph and/or demo artwork (which we may use to illustrate your demo review). Including contact information, such as a telephone number, web site URL or email adress, will enable anyone who is interested in your material to contact you.

The Red Light Disco

Recording Venue: Chapter Road Studios.
Recording Equipment: Roland VS1680 digital personal studio, Neumann TLM103 microphone.

The Red Light Disco's fun CD sampler features three songs recorded and produced by Miles Landesman and Elan Polushko, all sung by different female vocalists.

First up is 'Sexy and Blue', with singer/songwriter Bic Brack. The production takes the lighter elements of the American punk sound and puts a spoken vocal across the verse, moving to sung vocals for the choruses. These are mixed with a more modern breakbeat and a rock 'n' roll bass line, giving the track an up-to-date 'bubblegum pop' sound. Bic Brack's breathy excitement is emphasised by the use of a decent microphone and some heavy compression, and the instrumentation keeps well out of the way of the soft vocal frequencies. On decent studio monitors some compression dip and sibilance is audible, but it's something that would be lost on hi-fi speakers, and it's part of the modern pop vocal sound anyway.

Rachel Morris, of London indie band Hopper, sings the second (and definitely British punk-influenced) song, 'Washing Machine'. The programmed drums are a little stiff, but are definitely helped out by the gravelly guitar and energetic bass lines. In fact, the backing sounds as though it's overloading, or on the verge of it, but this could just be an impression created by the grainy snare, gated reverb and overdriven guitar sound. A combination of sounds like these can tend to blur a mix, but in this ▶

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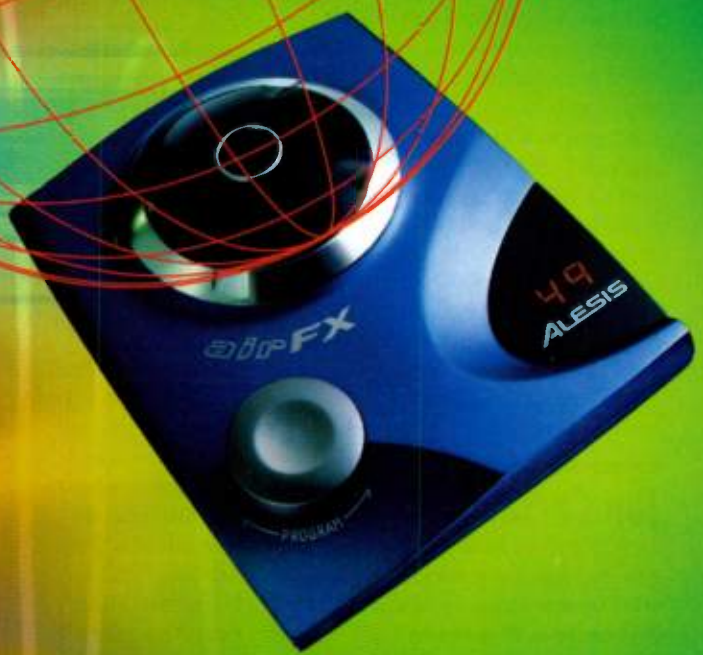

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ALESIS

The main demos featured this month can be heard in both RealAudio and MP3 format at www.sound-on-sound.com/sos/feb01/demodoc.htm

case the vocals don't seem to suffer and are clear enough.

The final song features soul singer Andrea Miller and, as you'd expect, is the ballad of the CD. I'd say more thought has gone into the arrangement of this track, with strings, backing vocals and guitar power-chords all featuring on the moody chorus.

I particularly like the weighty bass sound which occupies the forefront of the mix without dominating, but there are other sounds worthy of note too, such as the slightly overdriven electric piano on the intro. Treated to echo, this atmospheric piano sound drops back when the bass begins, and I like the unexpected change in mood and dynamic that results from this simple ploy. Andrea's vocal has bags of presence and has probably been equalised to compensate for the treble loss from so much fast-attack compression. However, this treatment gives the vocal a hell of a lot of energy and seems pretty fashionable at the moment. ■

Jon Carter

Recording Venue: Home.
Recording Equipment: Yamaha MT8X cassette 8-track, Apple Mac 7500 computer, PC, Steinberg *Cubase VST*, Emu APS soundcard, Boss VF1 guitar processor, Spirit Folio mixer, TDL RTL2 and Yamaha NS10 monitors.

Jon is a songwriter based in Devon. In common with many other working dads, his days of gigging have been curtailed by the constraints of job and family life, but he does manage to find enough time for recording at home. Some of these tracks were recorded using a Yamaha MT8X cassette-based recorder, some

with an Apple Mac running *Cubase VST*, but the system he's finally upgraded to is a PC running *Cubase VST*.

It's obvious that Jon has a good grasp of pop/rock arrangement from the opening song, 'Say Anything', which was, incidentally, recorded using the PC. The mix balances are good, the playing is solid, and Jon makes good use of the effects generated by the Boss VF1 guitar processor. Tremolo, echo and chorus are all in evidence, creating a nicely textured guitar arrangement. The vocals are strong, too, recorded with the Shure SM58. Overall, this is a very clean recording that I found benefits from a little valve compression, to warm up the sound a bit, and a mild mid-frequency cut at 1kHz.

The second song was recorded on the Yamaha cassette multitrack and, as you might expect, there's tape noise on the sections where the acoustic guitar is exposed. However, it's still an exceptionally good recording and I definitely prefer the bass-end warmth of the mix. This is something that could be achieved on the PC with a front-end valve preamp stage of some kind, preferably featuring EQ or compression. This track also sounds more compressed, which could be a side-effect of a noise reduction system such as dbx. The general definition of instruments within the mix, which tend to blend a bit more than in modern productions, is compromised, and it also sounds 'smaller' than the other mixes.

Contrasting the DI'd Ovation acoustic sound on the previous (analogue-recorded) track and one recorded with the Apple Mac setup is a real eye-opener. On 'Hand in Hand', Jon has double-tracked the guitar and panned the tracks hard left and right. The improvement in clarity is most noticeable. It also seems to me that the bass end is fractionally better on the Mac mixes than the PC ones, but this could just be down to how Jon's chosen to use the bass on the respective productions.

Although a little derivative musically (showing a definite U2 influence), this demo is technically very good indeed, and hopefully Jon will get some success with publishers. Hear it at www.mp3.com/joncarter. ■

Voltage Controlled Man

Recording Venue: Home.
Recording Equipment: Pentium III PC, Creamware Pulsar recording and synthesis system, Emagic *Logic Audio Platinum* sequencer, Emu Proteus 2000 sound module, IK Multimedia *T-Racks* mastering software, Ahead *Nero* CD-burning software, Yamaha CD burner.

Henrik Spoov is the VCM in question and is currently studying for an HND in Music and Audio Technology at Greenock in Scotland. His compositions have become more 'soundtrack' in style since I last reviewed his demos, and show a better technical grasp of EQ and effects. Henrik's

method of recording begins with sequencing, then audio recording into *Logic Audio Platinum*. He then mixes using plug-ins and bounces the tracks as WAV files. Then he uses *T-Racks* for mastering.

The music of David Arnold has had some influence on Henrik, as the 'Bond Movie' style of 'Legion' demonstrates, with strings over beats and growling bass synth. I'd actually like to hear the strings a little louder in the mix. I know that David Arnold likes to mix real and synthesized strings, and although Henrik's budget isn't going to stretch to using a real orchestra, it might be an idea to fatten up the Proteus string sounds with something a little more analogue-sounding for this track. Otherwise it's a good mix, which only falls down on the final rather weak cymbal crash. An orchestral strike, or use of heavy percussion such as Timpani under the cymbal, would have given the track a weightier finale more befitting the compositional style.

Henrik's second piece is more Indiana Jones than James Bond, and the Eastern melody line (played on strings) certainly lends itself to that feel. The groove seems too modern for this more

Doctor's Advice: Heavy Vocal Compression & Headphone Mixes

Compression is a process that's often misunderstood, because it's not as obvious to the listener as delay effects like chorus, reverb and echo. Yet once you tune your ear into what heavy compression sounds like, you'll start to hear it on loads of lead vocal recordings — and it's there on merit, because it can add energy, punch and consistency of signal level to a voice that's high in the mix.

Recently asked to work on some presets for a prototype valve compressor, I was surprised at how far I had to push levels, lower thresholds and increase ratios to achieve the 'Sharleen Spiteri' (Texas) sound. But the female vocalist helping me test out the unit felt really inspired when she heard her compressed voice coming back through the cans — it just brought out all the nuances of expression and breathy presence which seem to be a requirement for female vocals these days.

I confess that I'd hesitate to record with that amount of compression on a rushed session, and would probably save it till the mix, but it made me reassess the cans mixes I've been giving to vocalists. After all, you can set up a vocal compressor just for the headphone mix, without recording the compressed voice, if it helps the vocalist deliver a better performance. The compressor settings can then be noted and used for the vocal channel on mixdown.

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STORM

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▶ classic style of movie soundtrack, probably due to the trance-dance bass and drum track. However, it wouldn't be out of place in films such as *The Beach*, *The Fifth Element* or *The Mummy*. As a piece of music, it stands up well, but I'm a little worried by the choice of reverb. I believe Henrik is going for the sort of expansive concert hall you sometimes hear used on strings in movie soundtracks, and this doesn't sound quite right. A longer decay time, a less metallic reverb sound (an EQ cut of a few dBs at 2kHz helps both reverb and strings) and a longer pre-delay time would be a better choice, I believe.

The final track I listened to was 'Apache' which, even though it's not a cover of the old Shadows guitar instrumental, does indeed feature guitar. Overdriven, chorused and echoed, it sails across the tom-based rhythm track nicely but lacks presence. Some upper-mid boost on the guitar improves the sound, although it doesn't really seem to lend itself to a Native American Indian theme until the 'howl' of the pitch-bent drop notes sneaks in, coyote style. I think I'd have made a little more of that, and also looked harder at source material for Native American Indian music as it's sounding just a bit close to the Middle East for comfort. ■

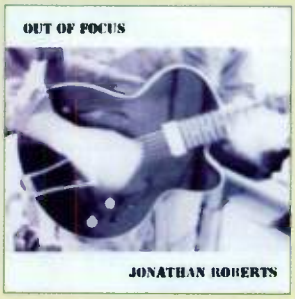
QUICKIES

Rick Guard

Rick's gone for the modern pop production sound on this one, with a string arrangement and tasty groove which place it firmly in Robbie Williams territory. Add to this some heavy compression on the vocals and a post-production EQ with mid-frequency cut and presence boost, and the overall impression is that he's pushing for the commercial end of the market. The catchy opening song ('Superhero') has single written all over it, the vocals are very well performed, and the programming (using an Ensoniq ASR10 sampler and sequencer) is just right for the material. Two further songs are featured on this CD, produced by Rick and writing partner Phil Rice, and both are good, especially the final cut, 'Home', which is another potential single. ■

Jonathan Roberts

Country rock has got a big following, and Jonathan's CD is aimed directly at this market. He takes full advantage of the sequencing power of *Logic* to put the drum parts together, and has made a good job of it, after many hours struggling with the limitations of triggered drums! Guitars are recorded using a Line 6 Pod amp simulator, and have a suitably twangy sound — he's probably been using the Fender amp simulations. As for the mixing, it varies from bass heavy to being a little hard in the mid band of frequencies. The opening track is a little boomy at 100Hz, probably because of the rounded bass guitar sound. Heavier compression on the bass during recording would have helped prevent the boominess, but it can be rescued by slight bass roll-off at the above-mentioned frequency in post-production. The second song has a hard fiddle sound, giving the general impression that the mix sounds hard. Some cut at 5kHz softens the fiddle sound a little and makes it sit better in the mix, too. Finally, all the mixes could do with a few dBs of presence above 10kHz. Check these demos out by visiting www.2Jayrecords.fsnet.co.uk. ■



Mark Salveta

Mark's demos have been reviewed before in *SOS*, but I'm pleased to see it hasn't put him off recording for good! On this 10-track CD the songwriting has improved, along with much of the recording. I noticed that vocal levels vary in the mixes from quite low ('Spaceman') to just right ('Sleep'), and that some of the instrument balances suffer from the same problem. The bass appears to be overloaded on one track, for example ('Only Love Stays'), and the guitar harmonics at the start are far too loud. Yet in general this album has a lovely, gentle feel, created by

the acoustic guitar-led arrangements, sensitive drum programming and keyboard playing. Mark obviously struggles with pitch, but otherwise has a relaxed vocal style which suits the material well. I enjoyed most of the tracks on the CD. ■

Man Mountain

Droitwich-based Max Ward wrote and produced this demo, which he describes as "the more alternative side of Drum & Bass and Breakbeat". Some of his guitar-playing background comes out on the tracks in the choice of riffs, and also some very heavily manipulated guitar samples. Even so, the mix contains many other sounds, from brass stabs to vocals, which are cleverly combined and can only really be appreciated on more than one listen. Sonically, the mixes are heavy in the upper mid-frequency area, where the busy hi-hat patterns tend to dominate the production. This is particularly noticeable on the sparser third mix, 'Swing For You', which also lacks warmth in the bass–frequency area. For the fourth and, in my opinion, best mix, a

clever conga rhythm is slowly and effectively merged with a kit breakbeat, itself reliant on a modulated snare pattern. Here soft swelling synth chords work in tandem with a jazz guitar riff in octaves, while a polyrhythmic guitar part that Bob Fripp could have written moves seamlessly in and out of the mix. The track is also instrumentally well balanced, with just the right amount of repetition and dynamic variation. ■

Leon

An octave-bouncing bass line (heavily reverbed) and some dry, low-bandwidth drum sounds give a retro sound to the dance track which kicks off this CD. Yet it's more of a good idea than a developed arrangement, with a catchy little melody played on echoed brass and a decent mix balance. There are no drops to bass

or drum breaks, or indeed any of the expected lifts in dynamics using the usual devices — multiple triggered snare, slow-attack or filter-swept chords. I suspect Leon is just poking his toe in the swirling stream of the dance demo with this one. ■

Clembo

This is guitarist Simon Paul Clements' (Clembo to his mates) first CD, and he suggested three tracks for me to concentrate on. In such a short review I can only say that the songwriting is fine but the heavy guitar-based production lacks real power and drive. It's obvious on all three tracks that the level of the bass guitar is too low in the mix, and without it there's no real energy in the mixes. The third song, 'Brilliant Sun', has a better balance than the other two, with more emphasis on the vocal, which tends to get lost on some of the other songs. A better microphone would help (Simon's got one earmarked as his next purchase), and I'd also drive

the valve processors harder on the vocal signal, to squeeze more energy into the sound. With more compression and EQ presence, the singing is less likely to sink into the mix, as it occasionally does at the moment. ■

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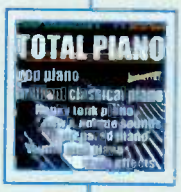

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You've heard the demos.....you've been waiting and waiting.....Spectrasonics is very happy to announce that the eagerly anticipated follow-up to Symphony of Voices is now available! After 4 years of intense worldwide recording and editing, the Vocal Planet sample library has now grown to an epic 6 CD-Roms that features both multisamples and phrases. An awesome variety of authentic male and female singers is presented in different keys, recorded dry for maximum flexibility. These are incredible one-of-a-kind sounds. Best of all, the samples have all been pre-cleared for your musical use without any additional licensing fees! The Main Categories on Vocal Planet: Gospel, Jazz/Blues, World, R'n'B/Dance, Vocal FX and much, much more!

Akai/Emu, Roland or Kurzweil CD-Rom Set (Includes Data CD) - £299.00
3-CD Audio Set £99.00 - selected phrases
***note: CD-Roms contain more than twice the material as on the Audio CD version.**

ETHNO TECHNO (ILIO)

Produced for ILIO by Eric Persing, this is Bashiri's first sample project since his ground-breaking Supreme Beats percussion library. With an eye toward innovating completely unique grooves, Ethno Techno features hundreds of astonishing loops from the mind of one of the world's masters of timing and feel. One of the great features of this collection is its use of wildly inventive hand-made instruments like the Kissing Fish, Double Drink, Tributaries, Galaxy, and Satellite Flashdance. Other off-the-wall sounds include Pipes, Toy Cow, Metal Sheet, and Garbage Can. Bashiri and his friends (including a monster player from STOMP) turn these objects into sonic dynamite. Combined with ethnic instruments like Tam Tam, Sabar, Mini Djembe, Dun Dun and many others, Ethno Techno is an explosion of metallic impact and strenuous playing.The grooves are as unique as the instruments.

2-CD Audio (without Groove Control™)- £79.95
Multi CD-Rom Akai/Emu, Roland or Kurzweil (includes data CD) - £199.00

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Akai, Emu, Roland, Giga, Kurz, S/cell - £299

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The definitive multi sampled brass library. "This is an impressive library, whose attacks raise the standard of professional sampling..... the recording quality is superb throughout. Just the thing for any samplist who wants to put some polish on his brass!" SOS

Akai S1000, S5/6000 or Gigasampler CD-Roms - £429.00

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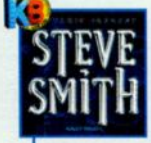
Akai S3000, Emu EOS, Roland or Kurzweil CD-Rom - £119

STEVE SMITH RHYTHMIC JOURNEY (EAST WEST)



As many of you are aware, Steve Smith is one of the world's most revered drummers. His drumming was heard on such hit songs as "Don't Stop Believin'" and "Separate Ways." He even played drums on Bryan Adams smash "Heaven." Power on your sampler and get ready, as the journey has only just begun.

Audio CD + Wav - £59.95
Akai CD-ROM - £199.00

PERCUSSIVE ADVENTURES (EAST WEST)

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2 CD-Audio - £99 or Akai S1000 CD-Roms - £229

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22. REGGAE CONNECTION.
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net notes

An ADSL telephone line can improve the speed and convenience of Internet access enormously — and it needn't cost the earth. **Dave Shapton** passes on his experiences of the new technology.

I can hardly believe it — I've got ADSL (Asymmetric Digital Subscriber Line) at last. That's the good news. The bad news is that it's at the place where I work, so I have trivia like 'earning a living' to get in the way of playing with it. (Luckily, we are a digital media company and I have to do a fair bit of web browsing anyway.) The biggest surprise of all is that BT installed our ADSL connection on time. We applied for our connection on the day ADSL was announced and had it on the first day it was available anywhere in London.

A Fast Line

We opted for the 512Kbit per second connection because that's what most people will end up with, despite earlier suggestions, from BT and others, that 2Mbit/sec would be commonplace for home users. Still, even that's nearly 10 times better than the (at best) 56Kbit/sec that most of us still have to put up with. It's actually no bad thing that we only have 512Kbit/sec Internet access, because we do a lot of video and audio streaming tests on behalf of clients, and it gives us a chance to see what sort of quality people can realistically expect with their 'broadband' connections. (It's a bit like using Yamaha NS10s instead of monitor speakers the size of a wardrobe.) Oh, and it's cheaper as well.

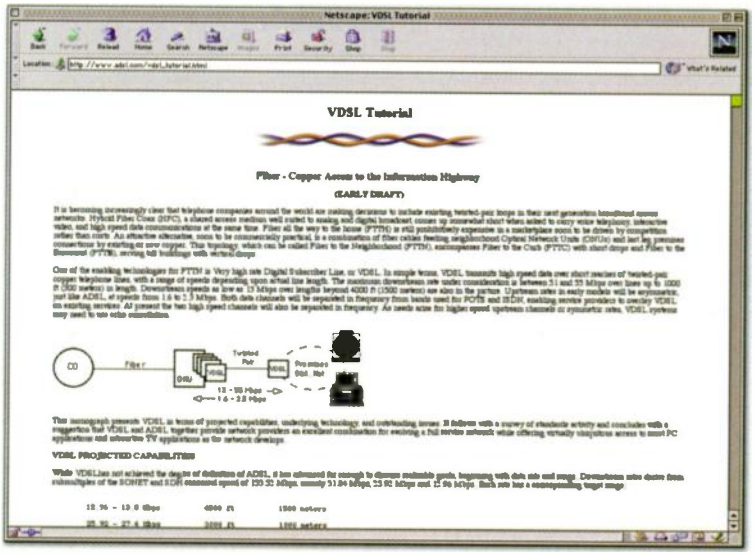
What's it like using ADSL? Brilliant — with qualifications. What's good is that it's a permanent connection: you're always connected. Always. I have to keep repeating it because I still can't believe it. No more waiting for dodgy dial-up connections. When you've got ADSL your browser just becomes another icon, openable at any time.

Downloads are simply stunning. What used to be a chore to be actively avoided because it was so painfully slow — and expensive, too — has become a fun activity. Now I search out big downloads so that I can marvel at the download speeds. On a good day with my modem I could manage download speeds in the region of 3-5Kbytes/sec. Now I routinely get speeds of 30 to 40Kbytes/sec, and what a difference it makes. You don't even hesitate to download the biggest files, because they don't take long anyway and you're not paying by the minute. If you were ever tempted to download MP3 files, ADSL would allow this to be done faster than real time. In other words, a five-minute track would take less than five minutes to download.

Even the most complex web pages flash up in an instant. Flash animations really work. Streamed music sounds fantastic. Streamed video looks — well, it looks better. There's still a long way to go with streamed video under about 750Kbits/sec.

What's not as good as you'd expect is that it still takes time to get to web pages, once you've entered the address in your web browser. But you have to realise that, however fast your connection to the Internet, the web itself still works the way it always has. Which means that every URL you put into your browser has to be sent to a domain name server for translation into a numerical Internet address, the unique number that every individually addressable web-connected device has. This, as well as the time taken by the web server to respond to your request, can make the process of web browsing using ADSL seem, at times, no faster than using a modem. You just have to accept that having a faster connection makes the difference.

Remarkably, the fact that there are over 20 people on our network, sharing the single ADSL connection, doesn't seem to slow it down at all. I suspect that the majority of our network users are looking at conventional HTML pages, which are small in data terms, and of course while people are reading them there is no data activity at all. If everyone were to watch a video stream at the same time, however, everything would slow to a crawl.



Find everything you ever wanted to know about Very-high-speed Digital Subscriber Lines at the DSL Forum.

There have been times, though, when it hasn't worked at all. We went for a week without our high-speed connection and it was agony to have to use ISDN again. This kind of unreliability is a pretty common story, I've heard, and of course it's easy to blame BT. However, to be fair, ▶ to the Internet can reveal just how slow some aspects of it still are.

Another benefit of ADSL is that it's saved the company a fortune in comparison with our ISDN dial-up costs. One way or another, there's always someone connected to the Internet at our place, and it's the fact that we just pay one monthly sum instead of a 'per call' charge that

Wired For The Web: Cable Internet

An alternative way of accessing the Internet, for those of us with cable, is using a cable modem. The sort of performance you can expect is likely to be around the lower end of the ADSL range, at about 512Kbits/sec. This is plenty fast enough for conventional browsing and excellent for 'web quality' video. Like BT's rival technology, it's an 'always on' connection. What remains to be seen is how well the service will stand up to heavy use: your connection speed is not guaranteed and will depend on the extent to which you have to share bandwidth with other users.

Still, I reckon cable is a good bet, not least because I think it's likely to be cheaper than ADSL, although you will have to buy or rent your cable modem. Expect prices to be around £150, or £5 per month.

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This month sees the arrival of two exciting new control surfaces for Digidesign's new Pro Tools 5.1.

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Edit Pack is a new addition to Digidesign Pro Control that gives you motorised surround joystick panners, high resolution ppm metering, a Qwerty keyboard and trackball. Edit Pack gives a Pro Tools and Pro Control system a level of control and metering never acheived before at this price point. If you are using, or considering using Pro Tools for surround sound, in post production or for serious music applications this is the controller you need.

Edit Pack is on demonstration in our West London demo suite, with a 5.1 Dynaudio Surround System, Apogee AD8000, + expanded MixPlus system. Call to book a demonstration.

Call us after January 18th to find out about another exciting new control surface for Pro Tools from Digidesign and another of Digital Village's favorite manufacturers.

New Pro Tools Plug In Power

Three new Plug Ins from Digidesign - **Orange Vocoder, Echo Farm** and the world class **Reverb One** - are on demonstration at Digital Village throughout this month. Digital Village Pro Tools Demo Suites have all of the leading TDM and RTAS plug ins on demonstration. Call to arrange a demonstration, or to request plug in information and a time limited demonstration CD.

Digital Village In Post Production

Digital Village supplies a growing number of Pro Tools systems to the Post Production market. Call for advice and a demo of Digidesign, Syncro Arts and Gallery Software for Post Production.

Digidesign Demo Days at Digital Village

Digidesign Representative Nathan Eames will be joining our product specialists for special Pro Tools Plug In and 5.1 Preview days on the following dates. Call to book your place.

North London - Monday 5th February 2001, 2-6pm
West London - Tuesday 6th February 2001, 2-6pm
Bristol - Thursday 8th February 2001, 2-6pm
South London - Monday 26th February 2001, 2-6pm

Birmingham - Wed 21st Feb: Digital Village Launch of the **Control 24** 3-5pm and 7-9pm. **Call for details.**

North London	West London	South London	Bristol
Gavin Beckwith	Chris Bolitho	Graham Harrison	Paul Wyatt
gavinbeckwith@digitalvillage.co.uk	cbolitho@digitalvillage.co.uk	grahamh@digitalvillage.co.uk	paulwyatt@digitalvillage.co.uk
020 8440 3440	020 8992 5592	020 8407 8444	0117 946 7700

BT is going through its biggest period of change ever, and I think the occasional slip-up, especially with an unproven technology like ADSL, is to be expected and is to some extent forgivable, however annoying.

So ADSL is a real option now, and it's being slowly rolled out. It's not cheap, but at between £20 and £40 a month it's certainly worth it if you've got more than a passing interest in the Internet.

A Very Very Fast Line

Somewhat surprisingly, ADSL is nothing more than a transitional technology. Waiting around the corner is VDSL (Very-high-speed Digital Subscriber Line). It's a version of DSL that (wait for it) works at a very high speed. How high? Up to an incredible 60 MegaBits/sec. That's 10 times the fastest version of DSL, and 40 times faster than the version of DSL that most people will get in their homes. In fact, it's approaching the speed hard disks used to work at a few years ago. (If you want more facts than you'll probably ever need about VDSL, go and have a look at www.adsl.com/vdsl_tutorial.html. It's worth reading, not least for the reference to that quaintly traditional American unit of measurement, the KiloFoot.)

Do we really need these speeds? Not if we're only web browsing. As I mentioned above, HTML doesn't need anything like this bandwidth. Proper TV viewing possibly does, though.

I've heard some interesting claims from Microsoft about the quality of their new Windows Media 7 (WM7) video encoder. It's part of the new suite of video and audio encoding algorithms released at the same time as Windows Media Player 7, and the video part actually uses an "enhancement" (Microsoft's word!) of the MPEG4 video codec. Before I say anything else, I want to say that it certainly looks very good, given the amount of compression, but it equally certainly isn't what Microsoft claim — which is that, at 750Kbits/sec, it is "near DVD" quality. If it's near DVD quality at that rate, I'm a near ballet dancer. You can certainly get pretty good, watchable video at around 750Kbits/sec, but it's only going to be between VHS and SVHS in quality.

Judge for yourself by looking at www.microsoft.com/windowsmedia and downloading some of the examples. (Note that they have used some very flattering images, which would look good at almost any data rate.) Microsoft also has some public domain competition, in the form of DIVX, which is claiming to be the "MP3 of video". Like the Microsoft codec, it's based on the video codec of MPEG4. There's more information about it at divx.ctw.cc/

What the 'on demand' video industry would really like is the ability to pipe MPEG2 down the line. MPEG2, which is what's used for DVD, has a data rate of between 4 and 11 Mbits/sec. A rate of 8Mbits/sec is good for almost everything but explosions and car chases, but that's way above what even the best implementation of ADSL can manage, especially when you consider that the stated raw bandwidth is almost never available because of transactional overheads and Internet bottlenecks.

True DVD quality and High Definition TV will need something much faster than ADSL, which is where VDSL fits in. The big fly in the ointment is that the faster the data link via standard copper wires, the shorter the distance over which it works. Wires, after all, work like aerials. Put radio frequency signals into them and they radiate!

The ultimate link to the Internet is fibre-optical technology. We'll just have to wait for that, but when we get it I don't think we'll need to have any conversations about bandwidth at all. SOS

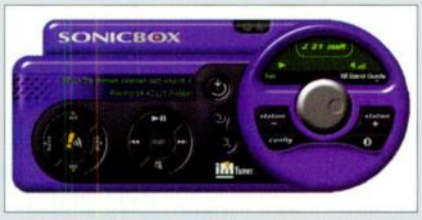
Radio Head

Internet radio has already been written about in Net Notes, but there are sone new developments that could alter the way we listen to radio on the Internet.

I've always loved radio. As a child I used to collect old valve radios and go in search of exotic foreign stations on the short-wave Broadcast bands. I'd fall asleep in the dim glow of my Grundig (with '3D sound', whatever that was) and dream of visiting Tirana, in the Marxist Leninist People's republic of Albania. If you don't have a short-wave radio, go to www.intervalsignals.com/vintage.htm to hear the interval signal for Radio Tirana. It's the strangest and possibly the most spine-tingling sound you'll have heard for a long time.

What the Internet can't bring you is the sound of the ever-shifting ionospheric manipulation of radio signals, making already exotic, distant stations sound even more exciting and mysterious. In a way, the atmosphere is like a global analogue synthesizer. All the effects are there: phasing, LFOs, ring modulation, white noise, and, of course, distortion.

That's what radio was like in the last century. www.sonicbox.com shows us what it's going to be like in this one. Sonicbox have dispensed with the notion of a 'multi' media player and have created what looks just like a real radio — with knobs. The on-screen version sports controls for volume and station selection, is very easy to use and has a good range of stations on-tap. It's optimised for broadband use but is perfectly OK with a 56Kb/s modem, as long as you don't mind AM-quality radio. Judging from the Sonicbox user settings, the site appears to use both Real Audio and Windows Media audio, whereas most radio stations on the Internet use one or other of these formats.



Sonicbox's Internet radio interface: radio for the 21st century?

Sonicbox describe their version of Internet radio as the 'iM' band, as opposed to AM or FM. It's a neat idea, because it conceals the fact that what you're actually using is the Internet. To allow you to enhance the sensation that you're using a radio and not a computer, SonicBox have released hardware that lets you control the tuning on your computer remotely — for more details, look at their web site.

Yet another approach is taken by Kerbango (www.kerbango.com). They've made a stand-alone Internet radio that's fashionably retro-styled, attractive and, I think, odd in equal measures. It works as a normal AM/FM radio, as well as having Internet functionality. I'm really excited about this product, and not just because I really love Internet radio. It's because it's the first genuinely useful Internet appliance that I've seen. It doesn't try to be a personal organiser, mobile phone, satellite navigation unit, or a million other things. It's just a radio. But it's a radio that lets you listen in stereo to samba music from Venezuela, if that's your bag.

Get the best of both worlds with Kerbango's Internet radio, which also functions as a normal AM/FM radio.

The short-wave bands have been thinning out since the end of the Cold War, and the Internet could kill them off completely. That's a big loss. But what we've gained is the ability to tap into the rich diet of local stations that we could never get on the conventional radio bands. If you like world music, you'll love Internet Radio.

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What the Reviews Say

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atari notes

Derek Johnson explores a way of creating exotic tunings with your Atari, and recommends a fresh source of shareware and freeware.

The ingenious uses that Atari owners find for their aged machines quite often astounds me. A German musician going by the name of Mad Harry, for example, has produced the innocuously-named *MIDI Enhancer*, whose title provides no real clues as to what it actually does. Read on...

Artistic Temperaments

There won't be many of you who'll want what *MIDI Enhancer* offers, but for those who do, it's a gem. Essentially, it enables you to play non-equal-tempered music on any MIDI synth that can operate in Poly mode, and on GS-compatible (Roland's extension of General MIDI) instruments. When I last gave a brief mention to the software it was at v1.4, and though an interesting tool it was a little baffling in presentation. The recent v2.0 adds more facilities and has an improved, more sleek user interface. It's possible to customise the 'scales' output by the program, but there's a collection of presets with it that includes Meantone, Arabian, Pythagorean and Natural scales. It's even possible to change scales while playing.

In order to create an alternate tuning, *MIDI Enhancer* requires two input sources, so your controller keyboard needs to be able to transmit data on two MIDI channels at once, with the keyboard split, or you need two MIDI controllers merged to the Atari's MIDI In. The retuning of transformed notes is achieved in one of two ways. First of all, *MIDI Enhancer* can use pitch-bend data. The target sound source needs to be 16-part multitimbral with the same sound assigned to all 16 parts — though interesting hocket-like effects can be created if you choose different sounds and octave values for each part. The software offsets input notes by as much pitch-bend as is required to bring a note up or down to the required pitch for the chosen scale. The second method works only with GS-compatible sound sources, which can respond to so-called 'Scale Tune' messages over MIDI. This method has the advantage of determining the pitch offsets of each note in a chromatic octave with just one MIDI message.

Beyond the call of duty, the software even offers additional features, such as velocity and program change remapping, and the ability to transmit MIDI data strings, the latter being transmitted whenever you start *MIDI Enhancer*.

While *MIDI Enhancer* is an interesting real-time performance tool, and a good way to explore alternate tuning systems, the only way you'll be able to use its output in a sequence is if you have a second sequencer — whether hardware or a software sequencer running on another computer. The program is compatible with all varieties of TOS, including Atari ST(e), TT, Falcon, Hades and Milan; it's been tested with TOS 4.04 and *MagiC 6* on a Falcon 030 and even on an *ST Emulator Gold* v1.6 running under Windows 98 on a PC (although MIDI I/O apparently isn't yet supported by this ST emulator). And as for price, that'll be nul pounds to you, squire!

W http://members.tripod.de/Rieder/midihnc.htm

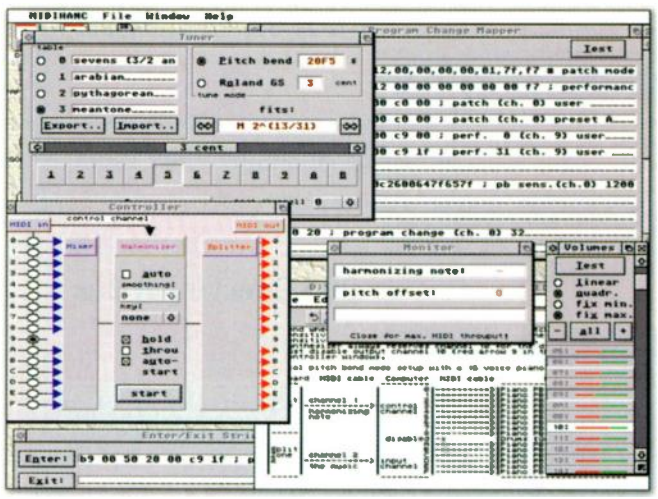
Tales From The Crypt

Some of you may remember the *Crawly Crypt* two-volume CD-ROM software collection that was around a few years ago. It brought together all manner of Atari and Falcon public domain and shareware software (with many STe- and TT-specific programs), clip art and demos in a pair of convenient discs. The discs are still very much with us, but the developers have also put the whole lot on-line. Go and have a browse, and if you find yourself spending a lot of time downloading all the goodies — every kind of software is covered — you can buy the CD collection on-line. There are two choices: first, the complete *Crawly Crypt Archives* on one CD, with everything compressed, at US$9.95. Alternatively, you can buy the collection in the original two, mostly uncompressed, volumes for US$9.95 each. Shipping is US$2 per disc to North America, US$3 per disc to the rest of the world.

The same web site where *Crawly Crypt* can be found is also hosting the *Moving Pixels Collection*, a CD-ROM full of games, demos and utilities. There's nothing strictly musical here, but it does bring all the software from the Moving Pixels software house together in one disc. In the case of *MPC*, only a selection of the content is available for free downloading; the full collection, with every program uncompressed and complete with source code, can be purchased on one US$9.95 CD-ROM. Many programs will actually run direct from the CD.

W www.spythis.com/cca/index.html

W www.spythis.com/mpc/



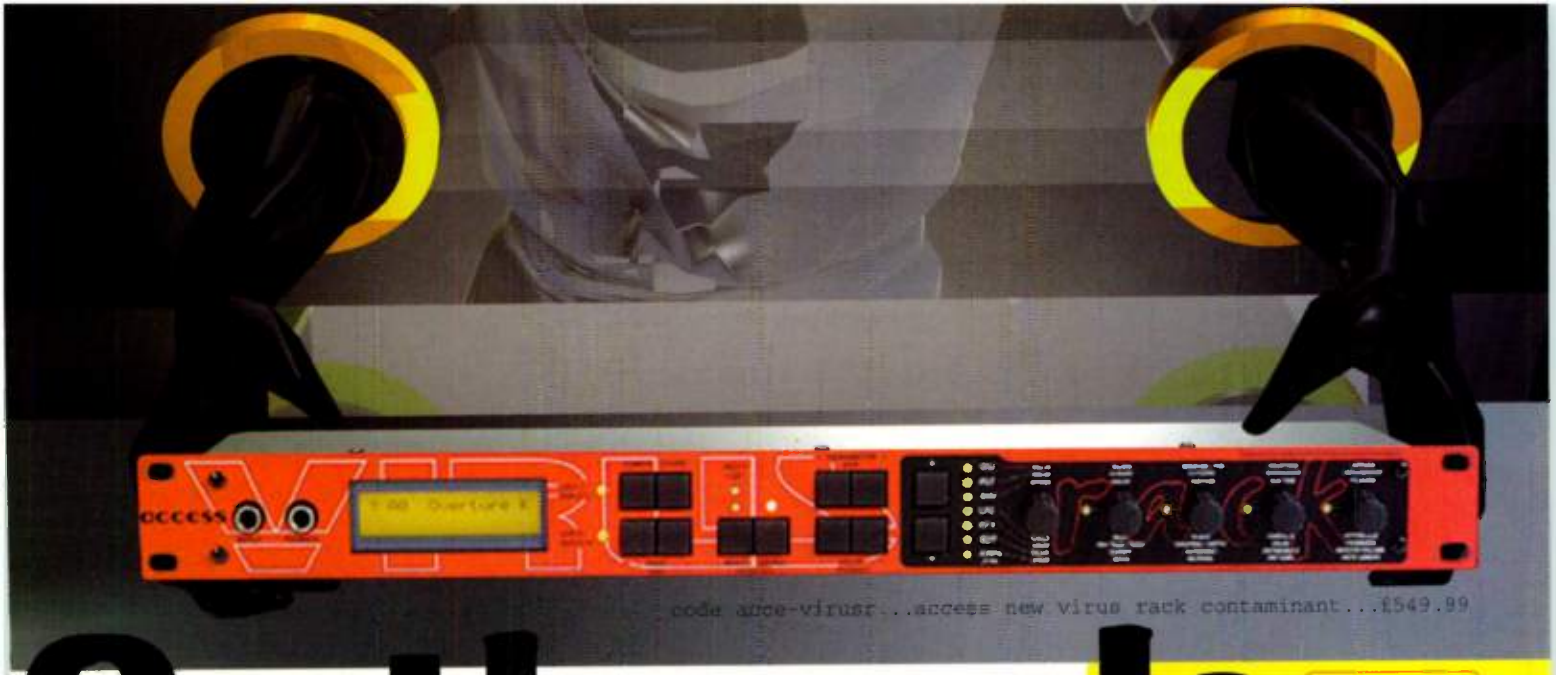
MIDI Enhancer's improved layout and extra features are evident from this busy screen.

Compose Yourself

Famed algorithmic composition tool *M* has been available as a free download for some time now (we last examined it in May 2000) but for the most part users were left to figure it out for themselves. Not any more: the docs for the Atari version have been made available in TXT format by Joel Chabade (currently of the Electronic Music Foundation — www.emf.org — but latterly founder of Intelligent Music, *M*'s original publisher). They can be downloaded from http://sites.netscape.net/timconrardy/m.htm, and are contained in a 40kB Zip file which un-Zips into several text files, one for each chapter.

Joy To The (Atari) World

When we had a look at Harry Koopman's nifty *MIDIJoy* mouse-based MIDI controller in November 2000, it wouldn't run on TTs or Falcons. That's now changed, with a new recompiled version. The manual has also been updated, to take account of the changes. It can be downloaded from http://sites.netscape.net/timconrardy/midijoy.htm, or direct from Harry's new *MIDIJoy* page. Surf on over to http://members.tripodnet.nl/hkoopman/midijoy.html. The package still comes in three Zipped parts: the program plus docs; extra data files; and an as-yet unfinished English HTML manual, for viewing in any web browser.



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But if keyboards are your bag, then check out the new Virus Indigo, which has to be one of the most desirable products on the market of any kind. With it's three octave velocity sensitive keyboard, and the classic Virus interface, this is a true performance instrument, but with the power and flexibility to live at the heart of your studio - 16 part multitimbrality, 24 note polyphony and 6 individual outputs make sure of that. Of course the original Virus B and Virus keyboard are still available, and now with the full benefit of Version 4 software.

Version 4 Virus software now includes a 100 destination modulation matrix, groove delay, surround sound, and DirectFX - use your Virus as a stand-alone FX unit retaining full polyphony!

All oscillators, arpeggiator tempos, LFOs, effects and delay times can be clocked to MIDI. There are 16 arpeggiator modes, so one for each voice. Simply send MIDI clock!

Each voice has 4 oscillators (3 main and 1 sub) for real analog fatness. The oscillators have 62 spectral wave patterns, so you're not limited to just square or sawtooth.

The Virus can run 82(!) simultaneous effects, such as delay, multi-mode distortion, 6 stage retro-chorus, analog boost, reverb, and Bit-Fi variable bit reduction.

With stereo inputs, external signals can be passed through the Virus' engine for filtering, effects, modulation, and a fantastic envelope follower which can be assigned to any sound.

Dual multi-mode filters per voice - band-reject, high, low, or band-pass filters can be arranged in series, parallel, or split on each voice to shape your own sound.

Variable band vocoder (1 to 32 bands) gives effects between subtle tone touching, and screaming 70's style robot madness. No other vocoder has this much control.

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Sounds the business - FM '00
Sounds unique - FM '00
Overflowing with character - FM '00
A very distinctive sound - Sound On Sound '98
The Virus can generate speaker shattering bass - SOS '00

Quite simply, this is the best digital filter I have heard - SOS '98
Beautifully implemented filters - SOS '98
Incredibly successful - the filters are superb - SOS '98

The vocoder is comprehensive and sounds great - SOS '00
The Retro Phaser is a cracker - SOS '00
The stereo delay is an excellent effect - SOS '00

Polyphonic synth voices, effects and percussive/sequencer patches were acheivable with ease - SOS '98
No other instrument could have acheived the same results with so little fuss - SOS '98

A beautifully crafted instrument - SOS '98
First class construction - SOS '98

If you're shopping for a new virtual analog synth, you'll be sick if you don't check out the Virus - SOS '00
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Larry Seyer's Upright Acoustic Bass

(GIGASAMPLER FORMAT CD-ROM)

The upright acoustic bass is capable of such a wide range of sounds that it not only appears in most orchestral music but also in many modern genres, from traditional jazz to music by Roni Size and Reprazent. Larry Seyer's *Upright Acoustic Bass* is intended as a jazz library, and it therefore dispenses with bowed sounds to explore the possibilities of the plucked instrument — in this case a classical Italian style three-quarter-size bass made in Pisa in 1817 by one Giuseppe Del Serra.

The recordings are all in stereo, and each sustained string was recorded chromatically (a different sample for each semitone of each string) at four different velocities. No looping was used — each note was recorded until its natural decay faded to silence. The CD-ROM contains seven different instruments in all (a total of some 566Mb of data), and although all use the same basic samples they are enhanced in differing ways for both tone and performance. Optimal Upright Bass, Switchable-Positions Bass, and First Position Bass are all intended to be played from an 88-note keyboard, although you can get away with the more common 61-note variety at the expense of some real-time expression possibilities.

Optimal Upright Bass is a carefully enhanced instrument with hand-picked notes carefully remapped to cut through a mix, and offers a host of playing styles. The main sustained notes run from B1 to D4, and these are wonderfully expressive, with a rich, fruity resonance and rounded lows. Transitions are very smooth between both notes and the four velocity layers, and at higher velocities you can really dig in and get lots of twang and fingerboard noise. A masterstroke is the mapping of body resonance to the mod wheel, which is triggered on note release so that it doesn't 'choke'. The amount can be varied from a rich 'afterglow' that adds greatly to the realism, to fully off for a dry sound.

The G#1 and A#1 keys switch between the sustained notes and harmonics, while aftertouch adds a realistic vibrato. For added expression, the sustain pedal switches to finger-damped resonance X-notes, while notes A0 to G1 play the open string X-notes. The top 33 notes of the keyboard give recorded slides starting at any note, at a fast or slow speed, determined by a breath controller, and either up or down depending on the value of a Foot Controller (04). Unlike using the pitch-bend wheel, these don't compromise the formants of the instrument; the sound remains true throughout.

The Switchable-Positions Upright Bass dispenses with the harmonics and resonance X-notes to provide the ultimate in string control — notes F1, G1, A1, and B1 expose the entire range of the E, A, D, and G strings in real time, so that you can play anywhere from the normal to extreme ranges of each individual string.

First Position Upright Bass works exactly like the Optimal version, except that the sustain notes are left mapped to their original first playing positions, giving a darker and more mellow tone. The final four instruments separate out the individual E, A, D, and G strings, and are specially designed for use as one instrument per string with a suitable MIDI guitar controller. No slides are provided, since these will be played directly.

All seven instruments sound wonderful, and are capable of a huge range of expression and playing styles. In the hands of an experienced MIDI musician they will provide plucked acoustic bass second in feel only to hiring the real thing. *Martin Walker*

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Chronic Horns Volume 2

(AUDIO 2-CD SET)

Chronic Horns Volume 2 is a remarkable and meticulously produced three-CD set featuring a five-piece brass section comprising trumpets, trombone, sax and baritone sax. Disc One consists of every chord you can think of, presented across 99 tracks as a full brass-section stab, a swell, a sustained chord, and a fall. Each chord (major, minor, dominant 7th, diminished and augmented) is presented in all of these guises, which makes building realistic brass parts an exact and ultimately rewarding (if slightly time-consuming) process. It's a great asset to have a well-presented and flexible arsenal of sounds like these in your sample library, and the supplied set of chords should work almost anywhere.

Disc Two features brass-section riffs and licks in various styles. With each set the riff is played in two keys (G major and C major, for example), and there are usually a couple of alternative riffs in the same tempo range on following tracks. Style-wise, this disc covers an impressive range of genres, from big-band swing, through '70s funk, to steamy latin sambas and credible Ska playing. There are a couple of mercifully short Blues Brothers tributes but I'm willing to forgive those — on the grounds that, as a group, these five musicians really know how to blow!

The tail end of Disc Two and all of Disc Three are given over to the solo instruments themselves. For each instrument there's a host of riffs and licks, performed within specific tempo sets and in specific keys. No trying to make square pegs fit into round holes here — instead this set offers easy-to-follow, well laid-out material and inspirational performances that just keep on going. On the downside, the trumpet and trombone are given disproportionately more track space than either of the saxes.

The quality of the soloing is superb across the board, and because the makers have taken a traditional approach (as opposed to, say, the kind of cheesy solos that might have appeared on bad '80s records) *Chronic Horns* has a solid and eminently musical feel that shines through in nearly every track. ▶

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JUST LISTEN.

The recording quality is fine throughout, and all the sounds are presented dry. Good use of the stereo field creates the image of a bunch of musicians simply jamming along gathered round the microphones, as opposed to the sterile and over-processed studio sound that can often spoil the feel of live brass-section recordings.

To conclude, *Chronic Horns 2* offers a traditional slice of brass-section playing that gives you an accurate set of chord and unison recordings, as well as killer riffs guaranteed to put a smile on your face. *Paul Farrer*

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Vocal Planet

(5-DISC CD-ROM SET PLUS DATA CD)

The last major work from Spectrasonics was *Symphony Of Voices*, a *tour de force* of choral multisamples and vocal phrases. It was a hard act to follow, but *Vocal Planet* (which perfectly compliments *SOV*) is, if anything, an even grander project, comprising five themed CD-ROMs (Roland, Akai, Emu, Samplecell and Kurzweil formats) covering every vocal style from Tibetan throat singing to doo-wop.

Produced by Eric Persing and Roby Duke, *Vocal Planet* features both multisamples and phrases and claims to include over 12,000 samples, all recorded dry for maximum flexibility. Some of the vocal sounds have been fashioned into loops, and in those cases 'Groove Control' is available, allowing the loop tempo to be changed without affecting either pitch or sound quality. Perhaps the best way to explore this impressive collection is just to go through the five discs. A sixth disc contains Mac/Windows Groove Control Data (for the 175 sample loops) plus a Soundfinder system that helps the user navigate through the more than eight hours of audio material this set contains.

The 'Gospel' disc features a very good black gospel choir, plus an urban youth choir. This section comprises both multisamples and complete phrases: shouts, hums, and all the other vocal flourishes associated with this genre. It's a bit of a specialised area, especially in the UK, where such music is less mainstream than in the US, but if you're into doing a Blues Brothers recreation, this is where to come for all those nice finishing touches.

'Jazz/Blues' is a very varied disc, with lots of jazz phrases, including multi-sampled 'doos', 'dahs', and effects from male and female singers. There are also bass vocal phrases and multisampled sung chords. The blues content of this disc sounds absolutely authentic and claims to hail from genuine Mississippi delta blues men. There are enough atmospheric phrases to create complete blues songs, if you so wish. This is real 'front porch' stuff, and goes far beyond 'I woke up this morning'!

The 'World' disc contains some real gems, in particular a Himalayan girl singer. There are the Tuvan throat singers who can apparently sing multiple notes, and sound not unlike people who've swallowed didgeridoos, and also a whole raft of South American stuff. I have to admit that the Native American Indian chants made me smile. I was once asked to help produce some library music and needed North American Indian chanting over an Apache-style drum beat. In the end, my co-conspirator and I chanted the part ourselves — we just made it up — and this set of samples sounds almost exactly like our end result.

Other samples come from the Balkans and Africa, and Nordic folk song even gets a look in, but the Bavarian country yodellers have a lot to answer for! In mitigation, there are some lovely Gaelic and Celtic folk songs, though (as with all phrase-based sample sets) you're limited to permutations of the original song.

The 'R&B/Dance' disc is definitely not R&B in the 'Route 66' sense of the word but something rather more 'street'. On this disc you'll discover moody R&B phrases from LA session singers in a number of contemporary styles, including doo-wop and hip-hop, DJ rantings and acappella groups. You'll also find a large number of human percussion grooves for those days when your drum machine doesn't quite cut it. The use of Groove Control means that these loops can be adapted to fit the tempo of your song if you use the accompanying MIDI files to trigger the loop elements.

Next in line is the 'Vocal FX' CD. When singers run out of of words, they create — well, mouth-generated effects really. Mad noises, heavy breathing, drones, animal impressions... There are lots more vocal percussion samples here, plus some processed vocal sounds. You probably wouldn't make a complete track using these effects (other than, perhaps, the loops) but they do provide some interesting punctuation.

This is no ordinary set of samples. The amount of work that has gone into its creation is enormous, and meticulous standards have been maintained throughout. The '50s doo-wop vocal ensembles are wonderful, the ethnic examples haunting, and the blues so down and dirty that you can almost smell the sawdust. The sheer amount of material is breathtaking, to the extent that there may be a case for making these CD-ROMs available individually. Having said that, the price, for so much material, is surprisingly modest. This has to be the *Encyclopaedia Britannica* of vocal samples! (A three-disc audio set of selected phrases is also available). *Paul White*

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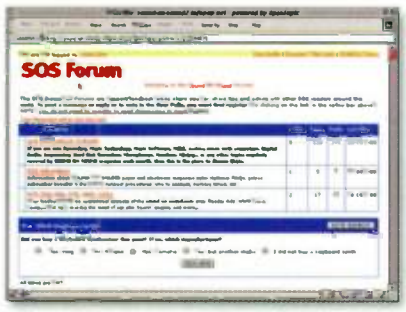

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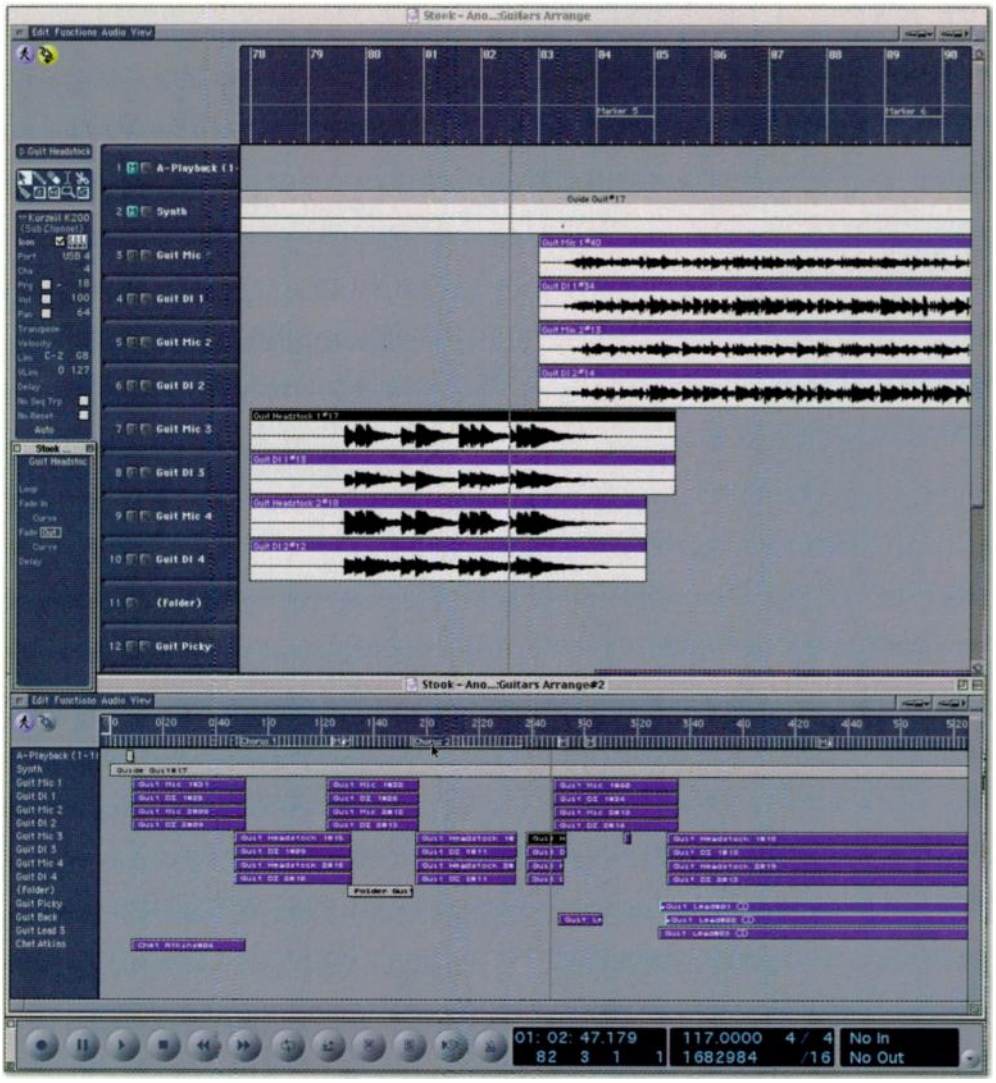
logic notes

This month, we look at using folders and screensets, as well as showing that the Score window needn't be a no-go area for guitarists.



The screenshot above shows two Arrange windows, the upper zoomed in to show waveform details and the lower zoomed out to show an overview of the whole project. If the windows are linked using Contents Catch, the upper view will always show any object selected in the lower, removing the need for manual scrolling.

There are a number of features within Emagic's *Logic* which most people don't use, even though they know they exist — it can often be difficult to visualise how these features are useful in practice. Such is the case with folders, linked windows and screensets, so here are a few examples that serve to show how powerful these three facilities can be.

Fun With Folders

A folder allows you to group different Arrange-window objects onto one track, while retaining individual control over each constituent element. You can pack as many objects into a folder as you like, by highlighting them and then selecting Pack Folder from the Functions menu. Double-clicking any folder displays its contents exactly as they would look if they were still in the Arrange window — effectively making a folder 'an arrangement within an arrangement'.

One use for folders is to save space within the main Arrange window, therefore saving a lot of scrolling around. This is particularly the case when you have multiple takes of a part which you want to have access to, but which you also don't want eating up the Arrange window's 'real estate'. Packing all these takes into a folder can be an ideal solution.

Another time when folders are really handy is in simplifying the process of editing. If you've just created the perfect vocal comp, with dozens of tiny pieces of audio edited together, and then find that you want to copy it elsewhere, it will often be a hassle having to select all the little fragments before you do the edit. However, pack them all into a folder and editing becomes as easy as with a single segment of audio or MIDI. What's more, you can edit the folder itself within the Arrange view, in exactly the same way you edit Audio and MIDI objects — every edit you do on a folder is duplicated on its contents. This is great if you have multiple drum tracks which you want to edit as a unit, for example.

Being able to quickly control a large number of different Audio regions simultaneously is one of the most powerful aspects of folders. For example, if you place a number of parts into a folder, each of which has its Parameters box set to loop, these components will only loop for the duration of the folder object. Alternatively, if you have a sound effect that lasts for a half a bar, but which you want to set to loop only every bar, you can simply put it in a bar-long looping folder.

Linking Windows

Folders when used in isolation are very useful tools, but they really come into their own when used in conjunction with linked windows. To illustrate how this works, let's work through an example. Open two arrange ▶

Logic Mailing List

Mailing lists can be an extremely useful resource in any field, and the *Logic* users list at www.egroups.com/subscribe/logic-users is no exception. In fact, this forum is a particularly active one, with a few thousand mails per month — fortunately there is an option to receive mails in digest format if you wish. Once subscribed to the list you will be in communication with experienced logic users from all over the world, plus a few of Emagic's own developers, and it's always my first port of call if I have any problems. There'll usually be *somebody* else who's been in your situation before you, and who's found a fix or workaround. *Ab Wilson*

E. & O.E.

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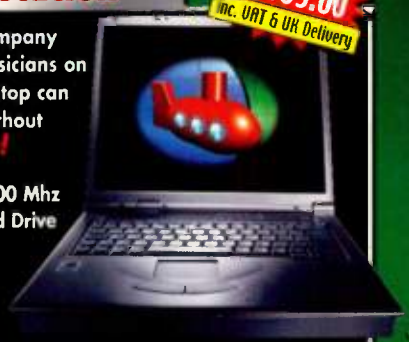

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The top left corner of a *Logic* window in Contents Catch mode.

windows, setting them up one above the other so that the top one occupies about three quarters of the screen and the lower one takes up the other quarter — maybe set aside some space for a transport bar at the bottom as well. Zoom the bottom window out to show the full length of the song and all the tracks. Zoom the top one in to show a level of detail that will be most useful to you. In the top window activate the Contents Catch mode — click on the little 'walking man' icon then double-click on the chain icon until a little arrowhead appears on the bottom link of the chain.

What you've now effectively done is set up the top window as a real-time 'magnifying glass'. If you select a part in the bottom window, the top will show it in close up, and when you move the song position in the bottom window the top window will scroll to the right place. The screenshot on page 244 shows this setup in action and it saves a huge amount of zooming and scrolling when handling large arrangements. Try it — you'll soon be hooked.

And there's more! Since the top window is set to Contents Catch mode, if you select a part in the bottom window which is a folder, the top window will show its contents. This lets you keep your main arrangement tidy while maintaining instant access to any packed parts. It also makes it easy to drag parts into and out of folders, simply by dragging from one window to the other. This is a real case of synergy — folders help the linked windows work better and linked windows help you work with folders better.

Surfing The Screensets

Wouldn't it be nice if we could zoom into MIDI and audio parts as easily as we now can with folders? If you have to keep opening editor windows, resizing them, and setting up link options, this can really interrupt the creative flow. Fortunately, Emagic have thought of this, and have provided the ability to create screensets to deal with this.

A screenset not only stores the arrangement of windows on the screen, but also all of their associated linking and zoom settings. There are 90 screensets available in all, and you can assign each of the nine most useful ones to nine keys of the numeric keypad, for instant recall. The number of the currently selected screenset appears in the main menu bar. There is a facility to lock a screenset using the Screensets submenu within the main Windows menu, and this avoids you making any changes to it unintentionally — a little black dot appears next to the current screenset number.

Returning to our dual Arrange window setup, make a note of the current screenset number and make sure it isn't locked. Now make a copy of this screenset using the Copy Screenset option in the Screensets submenu. Finally, select a different screenset by pressing a numeric key and select Paste Screenset from the same submenu. You should now have an exact copy of the previous setup.

The '•1' on the main menu bar shows that screenset number one is currently active and that it is 'locked' so that it cannot be altered.

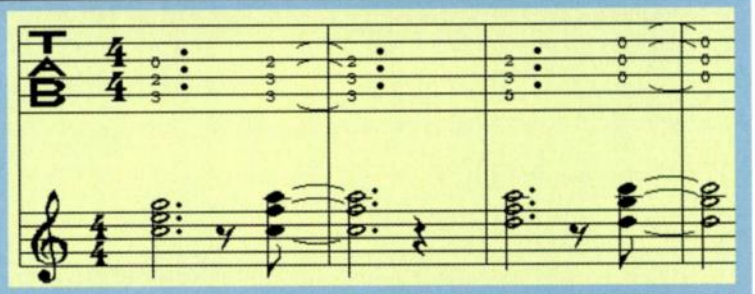
Close the top Arrange window and open a Matrix Editor in its place. Set this window and the lower Arrange window to Catch Contents mode, and then switch back to your original screenset again. Click on a folder in the lower window, and then a part within that folder in the upper window, and then switch to the screenset with the Matrix Editor again. This screenset will now show the contents of the selected folder in the lower window, while the top window will show the contents of the selected part within this folder in a matrix window. What you've now done is define three different levels of view detail which you can switch between using single keystrokes. In the first screenset you have views of your overall arrangement and of the detail within it, whereas in the second screenset you see the details of the arrangement together with the contents of the selected part.

What this means in practical terms is that you need never zoom a window again — screensets make many things extremely easy and quick, and this is the essence of *Logic* for me. The program doesn't necessarily work how you'd initially expect — thinking in terms of linked windows and screensets is a paradigm shift for anyone who has worked with most other sequencers — but the design allows a great deal of speed to be acquired once you've figured out how to see the program from a 'designer's eye view'. *Ab Wilson* SOS

Fretting Over Notation

If, like me, you are a guitar player who struggles with standard notation but can make a half-decent stab at reading guitar tablature, then *Logic*'s scoring functions are well worth experimenting with. The Score window allows you not only to display a MIDI sequence in traditional classical score notation, but also to display it in guitar tab format. There are two obvious applications for tab-reading guitarists: firstly, and most obviously, it provides a means to learn to play MIDI parts on your guitar; and secondly, it allows any guitarist who wants to improve his reading of classical notation a useful way to practice.

A good way to set up the Score window for these two applications is to show your selected MIDI part as both standard notation and as guitar tab. This dual-mode display is called up by selecting Guitar Mix in the Style field of the Score window's Parameters box. Once this is done, you can also further configure the display for ease of reading: *Logic* includes a wide range of options — for example, in the Score Styles dialogue box (accessed via the Layout menu) you can choose to hide Rests and Stems, both of which help clean up the tab display and make it more readable. A second setting worth experimenting with is the Qua field in the Parameters box. This is a display setting only, and it is worth quantising quite hard, otherwise it is possible to end up with all sorts of dotted notes and rests — indeed, most published scores are 'cleaned' in this fashion to make them easier for the reader to follow. *John Walden*



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AN INTRODUCTION TO *CUBASE*'S STUDIO MODULE

The Studio Module allows PC and Atari users to select configurations and patch names for their synths within *Cubase*. **Paul Nagle** guides you through the basics of creating a Studio Module setup.

Create Your Own Drivers with *DMaker*

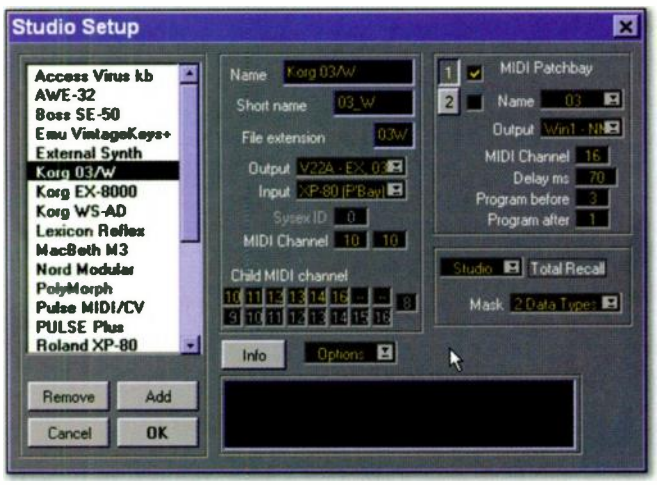
What if you have a synth which is not currently supported by the Studio Module? Well, included on the *Cubase* CD is a program called *DMaker* which is used to create drivers. Many people have complained that *DMaker* is too complicated but, in reality, it's the variety and complexity of synthesizer SysEx data that makes it a tough nut to crack. Few people understand SysEx well enough to create a driver themselves and, since each synth has its own data format, patch name location within the data, and so on, each driver must be approached seperately. Explainging *DMaker* would take an article (or two) by itself. All I'll say here is that if you are really confident, the source of all the existing drivers is on the *Cubase* CD and, by studying the driver of a synth as similar as possible to yours, you might start to understand how *DMaker* works. Good luck!

The Studio Module was developed for *Cubase* back in its Atari ST days and has survived, little changed in functionality, in the PC version. On the Mac, however, the Studio Module was effectively (or ineffectively) replaced by Opcode's Open MIDI System, so the only part of this month's *Cubase Notes* relevant to Mac users will be the last section, where I'll discuss the new method of selecting patches — scripting — that was introduced with *VST* 5 on Mac and PC.

The Studio Module's job is to receive System Exclusive data from a wide range of MIDI equipment such as synths and effects units, store this data, and retransmit it when necessary. It can extract user patch names and display them, to allow easy patch selection within *Cubase*, and it is shipped with many (user-tailorable) lists of ROM and expansion board preset names for popular synths. Despite being simple in purpose, the Studio Module is an area of *Cubase* that leaves many a brow furrowed. As it (usually) requires two-way communication with MIDI devices, even a modest setup can result in a complex nest of MIDI leads connected to your computer via switching units, multi-port interfaces or patchbays. My only advice in this area is to be meticulous, label your leads and plan things out on paper. Almost all problems with the Studio Module are related to MIDI interfacing errors.

Modules

In terms of *Cubase* as a whole, modules are 'optional extras' — parts of the program you can choose to activate if you want. The Modules Setup menu lists all kinds of goodies: the arpeggiator, SysEx editor, AVI player, SMPTE display and more. Two settings, Active and Preload, determine whether each module should be activated for the current session or automatically each time *Cubase* loads. Find Studio Module in the list and set both Active and Preload to Yes. Now, assuming this is the first time you've used it, you must start by supplying some information about your gear.



A completed Studio Module setup in *Cubase* on the PC.

First, you need to tell the Studio Module which devices you have in your studio. Select Studio Module from *Cubase*'s Modules menu and choose its Setup option. The setup screen (the screenshot, left, shows a completed setup) looks pretty confusing at first, but it isn't so bad. As an example, let's assume our studio has a Roland XP80 workstation. To tell the Studio Module about this instrument, first click Add and navigate to the Library folder of your *Cubase* CD. This folder contains a subfolder called StudioModuleDrivers, which contains the drivers for all supported instruments. Now plunge into the folder named Roland, select XP80.DEV and click OK, and this instrument should now appear in your instrument list. (You may overtype the device name field if you wish; this name is what appears within *Cubase* when you select an instrument.)

The next bit is important: you must tell the Studio Module which MIDI connections to make to communicate with the synth. Do this using the pull-down menus in the center of the Setup screen labelled Output and Input. One tip I'd recommend is to use the *SetupMME* program, which is installed along with *Cubase* to name each MIDI port according to the synths that are connected to it. Subsequent MIDI In/Out selection within *Cubase* becomes very easy if you do this.

Next, specify the MIDI channel(s) your synth will use, any device ID information necessary and you're almost done. If you are unsure of the device ID for your synth (your synth manual may refer to this as the 'SysEx ID'), try leaving it at the default setting.

MIDI patchbays can be useful for organising a growing hoard of MIDI gear, and if the instrument you just added is connected to one, there's an extra step to perform now. In the Setup option's Patchbay box, type in the program number *Cubase* should send (to the patchbay) so that two-way MIDI communication is established. You should also enter a program number which will re-establish 'normal' connections after any SysEx dump has taken place. Typically this would be the connection of your master keyboard to one of the MIDI inputs of the system. The Studio Module supports two patchbays simultaneously. If one or both of yours cannot switch connections via MIDI program changes, set the MIDI channel box to 'Man' and you will be prompted to make the switch yourself when necessary.

Beneath the MIDI Patchbay box is smaller box with just two pull-down menus: Total Recall and Mask. The former is a name field you can use to categorise your data dumps, while the latter lists the available data types for the currently selected device. The XP80, for instance, has Patches, Performances, Rhythm and System data types as Mask entries. Ensure all these are ticked

and create a Total Recall definition called 'All'. As you add new instruments, make sure all their data types are also ticked.

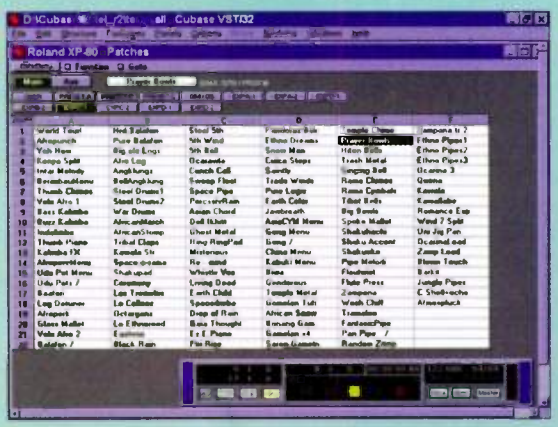
Congratulations, you've just assembled a complete Studio backup (and restoration) tool! If you prefer to work at patch level, you might create a second Total Recall definition just for patches. This will be far quicker in use because it gathers less data. If you edit sounds a lot, you'll probably find this more streamlined Recall very handy.

Using A Studio Module Setup

OK, having set things up, it's time to test communication by sucking some patch data from your synths. There are several ways to do this; I'd suggest opening the Modules menu, selecting Studio Module and then choosing Total Receive. You'll be asked which type of dump to retrieve, which is where our Total Recall names come into play. Select All, and the Studio Module will request a filename to use when storing ▶

Saving/Loading Name Files

A question I'm asked quite often is "I have an expansion board in my JV1080. How do I get its names into the Studio Module?" and this time choose Load Names. Load in the file you just saved, and all the names should now be correctly entered into



You can even get patch names from ROM expansion boards into the Studio Module.

If you look at the screenshot above, you can see that selection of ROM sounds is an important part of the Studio Module's agenda — so how *do* you load names of your own into it? Don't worry, it's pretty easy. First, back up your synth's internal sounds. Then use the synth's own copy function to copy the sounds from the expansion slot or ROM card to internal memory. Next, receive this data into the Studio Module by clicking Data Dump/MIDI/ Receive. In the Studio Module's Patch Selection screen, click Function and then Save/Update Names. Type a filename and save the patch names. Next comes the clever part: click the appropriate expansion slot within the Studio Module's Patches display, click Function the driver. Repeat this for as many expansion cards or ROM banks as you have. When you've finished, choose Save/Update Names from the Function menu, and this time take the Update option to update your version of the driver. It should now contain appropriate names in the locations that match your synth's expansion board patches. When you have everything set up as you want it, save your default song and (this is very important!) back up both *Cubase*'s def.all song and studio.dat folder. In fact, back them up twice. Or more. That way, if you need to ever reinstall *Cubase*, you can simply copy these back into the *Cubase* directory and *Cubase* will look and behave as it always did.

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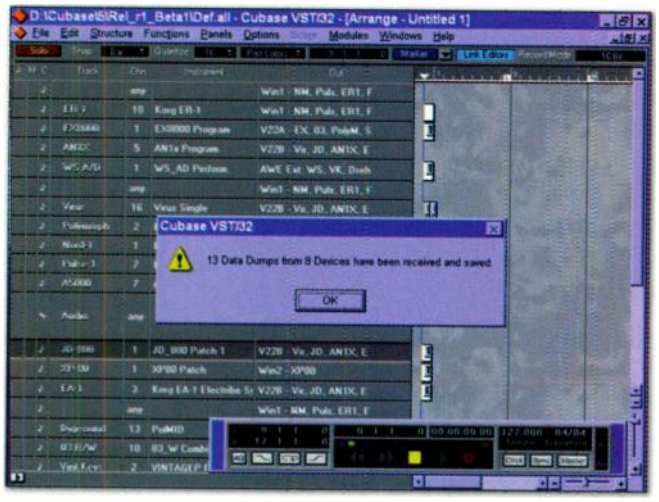
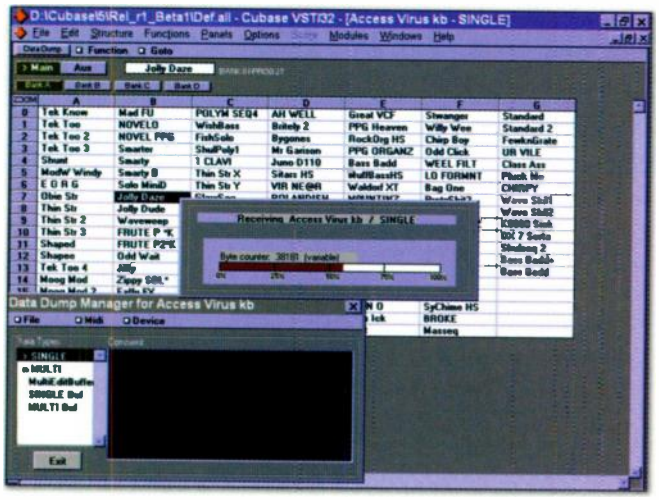


The Studio Module 'sucks' patch names and data from your synths and stores them, allowing you to change patches from within *Cubase*.



Updating the patch data for a single instrument within the Studio Module.

▶ the data. Enter something meaningful and it should begin grabbing data from each of your synths in turn, storing the resulting file with an MEM file extension. The results should look something like the topmost screenshot. If everything is connected properly and the data is retrieved successfully, clicking on a track's patch name field should cause a box listing all your patches to appear. Good, eh?

You may wish to associate a particular patch or performance dump with a song. Let's suppose the song is called Wibble.all. Simply save the Total patch dump as Wibble.mem in the same directory as the song, and when you next load Wibble.all, *Cubase* will ask if it should load just the patch names or load the names *and* transmit the SysEx data to all devices. It's clever enough to recognise that a dump called def.mem (*Cubase*'s default song is def.all) in the *Cubase* directory should always be 'names only', so it won't ask this question each time the default song loads. Finally, in the Data Dump Manager (see screenshot, above), you can load and save data from individual instruments rather than the entire studio. The data format is actually identical to that of the MEM-format dumps. In the Data Dump Manager you may see an 'n' next to items in the Data Type list. This means that names are currently loaded into the Studio Module's memory but not the actual patch data. A '>' sign indicates that names and data are held in memory and can, if necessary, be transmitted to the synth.

Generic Drivers

If no Studio Module driver exists for a particular piece of your gear and you don't fancy tackling the *DMaker* tool to create one (see *DMaker* box on page 248), *Cubase* provides alternate methods of patch selection and data gathering. Housed within the the Library section of the *Cubase* CD are several general-purpose Studio Module drivers. Of these, 'Any_Dump' is intended as a receiver of SysEx data in cases where no specific driver exists. It happily receives any data you throw at it, storing it along with data from your other instruments. The Studio Module neither knows nor cares about the data format or the byte count in a dump of this type. A slightly more sophisticated driver, 'Generic', allows you to code a SysEx string (you'll have to work it out from your synth's manual) which is sent to your instrument as a request to spill out its patches. With this driver, you specify how many bytes the dump should be and *Cubase* treats it almost like a proper driver. The main limitation with the Generic driver is that no patch names can be automatically extracted. Finally, the List Driver provides straightforward name boxes for easy patch selection. Overtype the names as you want, then use the Function/SaveNames to update your copy of the driver (see Saving/Loading Name Files box on page 249).

Patch Name Scripting

VST 5.0 introduced a new feature called Patch Name Scripting, which is designed to be easier to use than the List Driver. A Patch Script is a basic text file, which can be created with any text editor. If you want to use a Script file instead of a Studio Module driver, use the 'Setup Instruments' option when selecting an instrument for a track (see screenshot, below) and specify that the source is a Script file. These reside in the *Cubase* directory, in a folder called Scripts. If there is no script for the instrument you want, make up your own based on an existing example.

If you really want to, you can use program and bank change numbers instead of patch names, but I'm willing to bet that once you're used to the convenience of the Studio Module, you'll turn your nose up at any other method of patch selection. For me, this sets *Cubase* apart from all the other sequencers I've tried and I find it invaluable for quickly collecting and saving the correct sounds for each song. The Studio Module is a large topic, and I can't cover every aspect of it here — but fortunately it occupies about 100 pages of the electronic documentation, and this is definitely worth reading! SOS

Patch Name Scripting is a new alternative to the Studio Module.

Other Functions

The Studio Module is also handy for renaming patches in your synth. Hold down Alt and double-click a patch name, and you can then overtype it. Hold down Ctrl and click, and the patch will be sent to the synth. This is probably easier than naming patches on the synth itself. Even with devices such as the Waldorf Pulse and Korg DW8000, which have no names on board, you can give their patches names for convenience using this method if you wish. A Find command on the Function menu is useful to perform a patch name search through your banks.

Several Studio Module drivers include a Macro Editor, which typically consists of a few on-screen sliders designed to tweak some aspects of the patch. If a Macro Editor exists for your instrument, it is opened by double-clicking a patch name.

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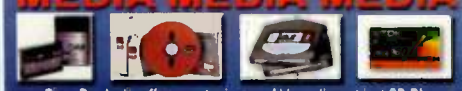

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apple notes

This month **Paul Wiffen** takes up residence as *SOS*'s Apple expert. After relating his own Mac history, he turns Agony Uncle and addresses a few readers' problems...

Welcome to my first column. I am delighted to be receiving the Apple Notes baton from Vic Lennard (whose other commitments mean that he is having to step down), and not just because my old flatmate Ian Gilby, now publisher of this august title, has asked me to. Ever since the first Mac Plus came into my life, some 15 years ago, Apple computers have been a major part of my creative processes. First I used them as journalistic writing tools. Then came the revolution of on-screen (if still offline) sound design, with the likes of the original Digidesign *Sound Designer* hooked up to the Emu Emulator II sampler. Those with long memories will remember that I used to write the Atari Notes column, and though I stuck with Atari for sequencing until *VST* came along (bringing to the Mac the same degree of built-in audio capability that *Cubase Audio Falcon* offered), the Mac was my main loop processor long before that. I first used Blank Software's *Alchemy* for the task, and later Steinberg's *ReCycle*.

Wholly Apple

The Mac is now the beginning, middle and end of all my music production. I haven't used a hardware synth or sampler for over two years, since I first saw Bitheadz' *Retro* and *Unity* running on the Power Macs. And the sheer convenience of VST Instruments running inside sequencer songs is streamlining the MIDI side of things to an unbelievable level. VST instruments such as the Waldorf *PPG Wave*, GST *Mellotron* and Native Instruments *B4* also fulfil my need for antique timbres. The last I loved so much that, Victor Kiam-style, I took on its UK distribution. The unparalleled breadth and quality of effects from modern software plug-ins and PCI hardware means that the Mac now does all my effects processing, even acting as my guitar processor, with Steinberg's *RedVolvelt* and the Dsound *Stomp'n'FX*. It was the 'mastering stage' programs that I felt were lacking for us Mac aficionados (where was our version of *WaveLab*, Steinberg?) until the recent advent of TC Works' *Spark* and IK MultiMedia's *T-Racks*.

In my more general *SOS* articles, I've often (frustratingly) had to bear in mind that some of our less privileged brethren are forced by poverty, miserliness or plain pig-headedness to use the compromise hardware and software foisted upon the world by the Wintel conspiracy. So I look forward to being able to trot out this kind of smug, biased observation in the relative safety of Apple Notes, knowing that I'm preaching to the converted. (The last time something like that slipped into my writing, the postman nearly collapsed with exhaustion from carrying the hate mail.) Not that everything is perfect in Appleville, of course, as those who have been following my recent series on the new Macs will know. But, as I said in my mLAN series (see *SOS* August-November 2000), I feel FireWire will offer a genuine way around the I/O issues that currently plague us.

I don't agree with every decision that Steve Jobs has made since his return — you should hear my language every time I want to put a 20K driver from floppy onto a new Mac during an installation. However, I'm glad that he has turned around Apple's fortunes and saved the company from probable extinction. If fruitgum-flavoured computers are what it takes to save my platform of choice from following Atari into oblivion, so be it. Indeed, I have been delighted at the number of women friends who have finally bought a computer because they were able to pick the colour of their iMac (even if I am only prepared to use the black or white — sorry, Graphite or Snow — ones myself, because they are the only ones that match my wardrobe). They say imitation is the sincerest form of flattery and I'm highly amused by the bits of brightly-coloured plastic hastily glued on to the newer PC chassis in an attempt to appeal to the fashion-conscious. If only their imitations went beyond the cosmetic, they might get somewhere!

I think we're at a very exciting time for Apple-based musicians. The power available for plug-ins in a multi-processor G4, the possibilities for MIDI and multi-channel audio support from within OSX, and even the sheer practicality of the silent running of the G4 Cube, bode well for the future.

First Contact

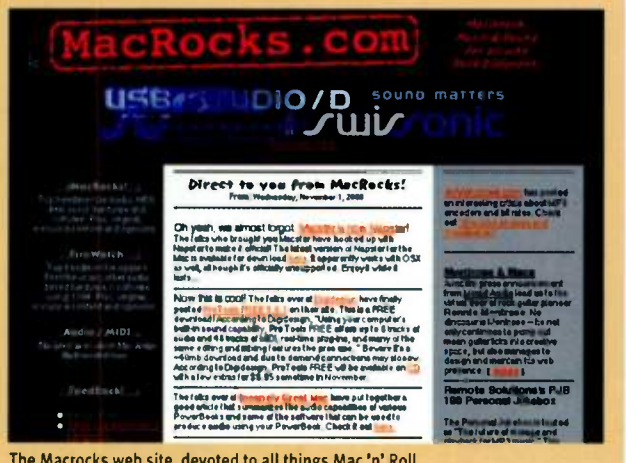
I would really like Apple Notes to become as interactive as possible (let's revive that flagging buzzword). I am sure that there are many of you out there who know as much as I do (or more) about making music on the Mac, and any experiences, good or bad, that you care to share with your fellow readers will be most welcome. Where my humble skills will allow me to act as a sort of virtual Agony Uncle, I'm happy to dispense advice, with the usual warning that no two computers ▶

Cool Sites

Each month I'll try and share with you any web sites I have come across, during my new ISDN-liberated surfing, which are of particular interest to musical Mac users. To kick off, I thought I would mention a couple of general sites you might want to add to your 'Favourites' list for regular visitation.

• www.macmusic.org
This is a good European-based site (from Switzerland, I seem to remember, which has the highest *per capita* Mac ownership in the world). It's presented in English and French and prides itself on being first with the news. The site had daily updates from the Apple Expo in Paris, including a favourable report on a state-of-the-union music presentation (see picture) by Christophe Martin de Montagu, Apple Europe's music liason, and one Paul Wiffen, a UK-based know-it-all demoing the latest virtual synths. For more pictures, go to www.macmusic.org/fr/news/nefAE2000photo.shtml#musique

• www.macrocks.com
If you like your news a little more rock 'n' roll (occasionally almost Spinal Tap), this US-based site can't be beaten. It was one of the first to bang the FireWire drum and recently has covered the increasing resources for heavy metal-style guitarists on the Mac. Hello Cleveland!



The Macrocks web site, devoted to all things Mac 'n' Roll.

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ever behave in exactly the same way, even under laboratory conditions, let alone in the field. My thanks to all those who have already unwittingly got in touch with me through the re-direction of the Apple Notes email address (applenotes@sospubs.co.uk). Now you know that I am on the other end of it, please continue to use it to share your successes and frustrations with your fellow users, or just disagree with me if anything I say doesn't square with your experiences.

After reading the first instalments of my articles on using the new Macs for music (see the November and December issues of *SOS*), David Knopfler wrote: "I am most grateful for what is clearly very useful guidance, but have to say I didn't feel reassured at the prospect of making the upgrade to a 450 dual-processor G4, which would probably be my machine of choice."

I find the prospect of the dual-processor Macs mouthwatering, especially as Steinberg and Emagic now both have multi-processor awareness. However, there's always a danger of compatibility problems with something as radical as dual processors, although when OSX comes along, it is supposed to arbitrate over which processor does what for all applications. When I discovered I was taking over Apple Notes, I began trying to obtain a dual-processor machine, with a view to evaluating exactly what runs and what performs better — and by how much. David continues: "I'm surprised that no Firewire MIDI interfaces have been developed and that so many manufacturers are still allegedly dishing out 68K code."

Before we all end up in court, David, I feel I should clarify the situation. First of all, the only 68K code I'm aware of that's currently being used is in OMS, the Opcode MIDI system, which, sadly, has had no new development since Gibson effectively 'mothballed' Opcode after purchasing them. The manufacturers who are releasing USB MIDI interfaces are almost certainly creating their OMS drivers in native code, but they can't do much about the core of the program, which is now well past its sell-by date. As no-one has paid anything much for OMS for several years now, we cannot really complain that anyone is ripping us off. Of course, OMS's shortcomings mean that USB has acquired a reputation for being unreliable with MIDI, which I am not certain it deserves (or certainly has to share with OMS, at the very least).

This situation may go some way to explaining why there are no FireWire MIDI interfaces as yet (although Yamaha's mLAN8P is very close). In the absence of another 'global' device such as OMS to allow these interfaces to be hooked into the numerous sequencing products out there, OMS would probably have been the only choice for making FireWire MIDI interfaces universally compatible. If manufacturers had already followed this route, I suspect we would now be viewing FireWire with the same suspicion as USB. Waiting until mLAN has established itself as a standard, preferably with support from within MacOS, means that FireWire MIDI interfacing stands a much better chance of a smooth, trouble-free introduction.

The dual-processor G4: especially tempting now that its capabilities are being exploited by major music software houses.

A Bit Scuzzy

Dave at Eastside Studio has emailed a request for an article on SCSI. He says: "I've just bought an external drive for audio but I find I'm quite confused about SCSI, even after having read up on it. Is SCSI 1 the same as original SCSI? Is SCSI 2 the same as Ultra 2? If a SCSI card can handle three SCSI protocols, then surely — unless you buy the fastest drive it can handle — you're not getting your money's worth as far as 'Mbs per second' is concerned? Particularly if you're buying over the Internet, you need to know exactly what you want."

Dave is right when he says that a whole article on the various flavours of SCSI is required (and I will start researching this straight away). In the meantime, I can briefly answer his specific questions and give a few guidelines for those of you contemplating a similar purchase.

The different variations on the SCSI theme which Dave mentions *are* confusing — and he hasn't even touched on the thorny issue of wide (16-bit) and narrow (8-bit). SCSI 1 is indeed what we all used to know as plain old vanilla-flavoured SCSI, but SCSI 2 is definitely not the same thing as Ultra SCSI 2. SCSI 2 followed SCSI 1 and was succeeded by SCSI 3 but Ultra SCSI and Ultra 2 are much more recent developments. Like most modern Ultra 2 SCSI cards, the ATTO ExpressPCI Ultra 2 SCSI adaptor, in the Magma chassis I reviewed in the January issue of *SOS*, will actually handle all five standards, not just three. But Dave is right in saying that to get the absolute best out of the card you have, you need to use a drive conforming to the most recent standard it supports. I'm a bit rusty on the actual maximum transfer rates which can be achieved with each flavour of SCSI, but I will bone up on this stuff when I write the article Dave has asked for. In the meantime, you can pretty much rest assured that any current drive you buy will provide track counts undreamed of even a couple of years ago. However, if you plan to use a QuickTime-nested format (like that of the Miro Motion DC20 I use) for a movie inside your sequencer alongside 96 tracks of audio, you would still be well advised to make sure that both your SCSI card and hard drives are Ultra 2.

As far as buying computer equipment over the Internet is concerned, I think anything that might involve compatibility issues, such as interface standards and transfer rates, is still best bought from a local knowledge-based music dealer who knows what hard disk recording is and can test the product for your intended application. You might save a few quid by buying from web suppliers, but you'll find them unconcerned about your inability to get the number of tracks of audio and video you want. Even if they agree to do an exchange, you may find any money you saved swallowed up in return carriage, as the margins these people work on are wafer-thin. Also, by the time you have the right product you could have wasted several weeks of working time in swapping units back and forth. Save your Internet purchases for software and hardware products which are easily identified as appropriate for the use you have in mind.

Coming Soon...

Next month, I hope to cram Apple Notes brimful of exciting developments, by testing the Internet as a journalistic tool and filing my copy via email from the first day of the MacWorld show in San Francisco. This is stretching deadlines to breaking point, so let's hope my email doesn't go three times around the world before arriving in Cambridge. Rumoured launches so far include a G4 PowerBook and a full public release of OSX, including built-in mLAN support — but only time will tell. SOS

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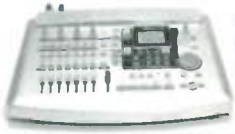

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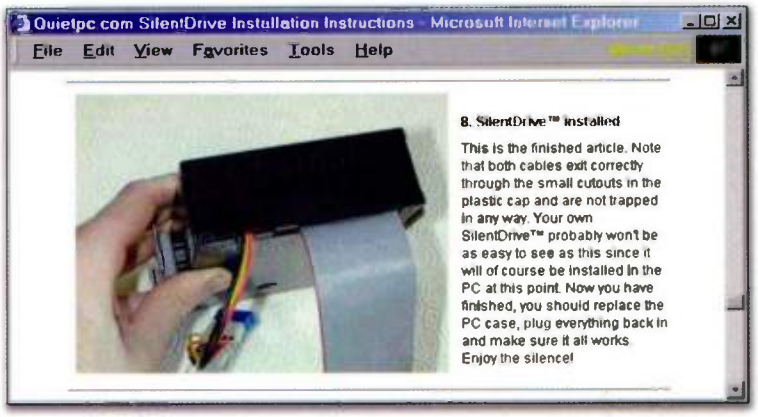
PC notes

Martin Walker buys a new quiet hard drive for audio and looks into ways to eradicate any remaining noise, for a silent PC.



Fitting a SilentDrive sleeve should banish your hard drive noise for ever and is simplicity itself, thanks to Quiet PC's step-by-step installation instructions.

My main audio drive finally ran out of space this month, so it was time to invest in a larger model. You might laugh when I admit to the 4.5Gb capacity of my existing drive, but this has been quite large enough for my audio projects over the last two years, and it's only due to the recent influx of *GigaStudio* samples that my situation has changed. The current 10,000rpm Fujitsu SCSI drive has provided excellent performance and reliability since I bought it in August 1998, but a lot has altered since then. Drives of 80Gb or more can now be bought for under £300, and the performance of EIDE drives has become so good that many PC suppliers no longer even display SCSI ones in their catalogues.

I'd already experienced this improved performance for myself when reviewing the Millennium Music Software PC in *SOS* September 2000. Using the *DskBench* utility, I established that its 7200rpm Seagate Barracuda drive had a sustained transfer rate of 28Mb/second, compared with the 15Mb/second of my 10,000rpm SCSI drive. It was also considerably quieter, partly due to the slower spindle speed, but also because acoustic noise levels have dropped significantly across the board in the last couple of years. Although drive manufacturers are still developing bigger and faster drives, the 20Gb models in the average PC are already fast enough and big enough to last most users the lifetime of the PC. Given that many mainstream PC users are now looking for quieter models, drive manufacturers are paying more attention to this design consideration.

Another factor that can affect acoustic noise is the operational temperature of the drive. My 10,000rpm SCSI model runs almost too hot to touch, and although this kind of temperature is quite safe in the case of most drives, the constantly generated heat must be removed from the PC case using fans. If manufacturers choose drives that run quite cool, they can also use slower and quieter case fans. Sadly, the very fastest drives still tend to be the noisiest and hottest, so musicians must make a trade-off between performance and acoustic noise.

Given the recent improvements in EIDE performance, I decided to look for a 30Gb 7200rpm EIDE drive that was fairly fast, yet reasonably quiet and cool at the same time. I ended up buying a 30Gb Seagate Barracuda ST330630A model for £129 — less than half what I paid for the SCSI drive two years ago. That's progress for you!

The other main contender was IBM's Deskstar 75GXP. This is a slightly faster performer, but its UDMA100 interface really needs at least an UDMA66-equipped motherboard for best results, and mine's still UDMA33. I knew that Seagate had a utility to run the Barracuda model in UDMA33 mode with identical performance, and this seemed a safer option in my case. If your objective is the quietest drive, Fujitsu's MPF-AH series use fluid bearing motors and are generally regarded as the quietest around at the moment, but are slightly slower and, for some reason, rather harder to source from suppliers.

Mounting Noise

Although noise levels from hard drives have reduced in general over the last couple of years, and special low-noise models like the above-mentioned Fujitsus are available, most musicians would still prefer total silence in the studio. So since I wrote my feature on Acoustic Noise Reduction in *SOS* January 2000, I've been delving a little deeper into the specific issue of hard drive noise.

Such noise has two components: the idle noise of the motor when it's not being used, and the seek noise of the read/write heads when the drive is being accessed. The idle noise of most modern drives is now barely detectable above that of cooling fans — even quiet ones — but seek noises are normally considerably louder, as well as more intrusive. The many computer users now looking for quiet drives get very confused by the advice given by other users on Internet forums. Often the same model will be reported by one user as very quiet, and by another as having an annoying whine and intrusive seek noise.

While there will be small differences in noise between different samples of the same drive, the main reason for such conflicting reports is drive mounting. Most disk drives would be blissfully quiet when idling if they were placed on a cushion, because the only noise would be airborne. However, once clamped to the PC chassis they become much noisier, since the chassis amplifies the drive vibrations and acts like a loudspeaker — a phenomenon known as structure-borne noise, which varies significantly between different PC cases. The majority of cases are made from sheet metal and sound like a drum when tapped. Although you can damp their panels internally, a much better solution is to buy one of the latest coloured polycarbonate cases, which not only tend to be thicker, but are also more solid. Such cases provide greater attenuation of both airborne and structure-borne sounds from drives and cooling fans.

An even better solution would seem to be isolating the drive from the PC case, using some sort of suspension mount, such as the NoVibes ones from Noise Control (www.noisecontrol.de) that I mentioned in *SOS* January 2000. Once a drive is isolated, ▶

Tiny Tips

Last month's arrival of *Wavelab* 3.03 must have been a happy event for users of the program, but some of them may by now have discovered that many of their existing preset collections have disappeared from view. Luckily I've managed to trace both the cause of this phenomenon and a temporary solution. The problem is that when searching for the relevant SET file in the *Wavelab* System\Plugins folder, *Wavelab* 3.03 mistakenly replaces any underscore symbols with spaces, and so can't find the correct file. The solution is to carefully replace any underscore symbols in each file name with exactly the same number of spaces. As soon as you do this, your presets will reappear.

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▶ the only remaining noise is airborne, resulting in a typical noise-level reduction of around 5dBA. However, the latest evidence seems to suggest that allowing drives to 'float' in a suspension mount can increase seek times, because the heads take longer to settle into their final position. Seagate have investigated, and have established that short random writes could be significantly slowed down, but that read throughput is unaffected.

Fortunately, there are far more reads than writes in typical PC operation. Even products (such as *GigaSampler*) that rely on lots of seeks to stream voice data direct from the drive shouldn't suffer.

If your case is of the sheet-metal variety, the SilentDrive sleeve (available in the UK for £24 from www.quietpc.com — see PC Notes October 2000) will provide some reduction in structure-borne noise, but also a considerable reduction in airborne noise. Although, strictly speaking, 5400rpm drives are the fastest that can be sleeved, the lower temperatures of most of today's 7200rpm drives mean that these won't overheat inside the sleeve either. My PC is now completely non-SCSI, and each of my two EIDE drives is mounted in its own SilentDrive sleeve, bringing the acoustic noise down to a whisper that can scarcely be heard from the other side of the room.

I've mentioned these two noise-reducing products again because drive manufacturers are now admitting that while huge progress has been made in reducing airborne noise, the dominating factor is now structure-borne noise. Some form of isolator mounting seems to be the only way to remove this contribution. You can also make DIY isolator mounts for fans, using rubber washers or even a piece of old rubber glove between the fan and the case. SOS

PC Snippets

• Bernard Chavonnet's *CDxtract* sample-conversion utility for Windows 95/98 and NT has reached version 3.4. As before, it can read SoundFonts and SampleCell/PC files on DOS-formatted drives, as well as a comprehensive selection of proprietary non-DOS formats on CD-ROM, Zip, Jaz, and hard disk — including Akai S1000/S3000, Roland S7xx, and SampleCell/PC files. Samples can then be saved in WAV, AIFF, or MP3 formats, and Programs can be saved, along with their respective samples, in SoundFont, Mesa, S5000/S6000, Reaktor, Pulsar, or GigaSampler formats.

New in this version is read support for the Emu EOS format (E4, E4k, E64, E64000, Esynth and Ultra products), Kurzweil K2000 and K2500 banks, and conversion to Emagic's EXS24 format. I recently used *CDxtract* to rescue data from some ailing 270Mb Syquest cartridges formatted by my Akai sampler. At just 79 Euros (£48.20), the full version is extremely good value for money.

W www.cdxtract.com

• I first mentioned the *VAC* (Virtual Audio Cable) utility in *SOS* September 2000 as an audio equivalent to Hubi's *LoopBack*. This software is now up to version 2.05, with better DirectSound performance, along with a new maximum of 64 virtual cables. It's a free update to existing users.

W www.ntonyx.com

• Microsoft have released DirectX version 8.0 as a free download. Direct3D and DirectDraw have improved performance and added new features for more graphic photo-realism, while enhancements to DirectInput should benefit multi-player games. On the audio side, DirectShow now has support for reading and writing WMA and WMV (Windows Media Audio and Video), a new consolidated DirectSound and DirectMusic interface that should simplify software development; in addition, DLS2 audio synthesis should improve DirectMusic sound quality.

These improvements will be of far more interest to games players than musicians, and performance with existing applications seems to be much the same as with DirectX 7.0. I'm always wary of making such low-level changes to Windows unless there's some real gain to be achieved, and Steinberg have already gone on record saying that "Some users have experienced incompatibilities between *Cubase* and the newly released Microsoft DirectX 8. For now we recommend to use DirectX 7.0a instead." You have been warned.

W www.microsoft.com

• Talking of Microsoft, I mentioned in December's PC notes that real-mode DOS support is not available in the Windows Millennium Edition, which could cause problems for those who want to flash a BIOS update, or format a hard drive direct from DOS. One answer comes from the Overclockers Australia web site, where an enterprising programmer has created a freeware *DOS Fix* utility. This might be a life-saver for some users, but since it replaces a few system files with modified ones, do be careful to back up your data first, in case anything goes wrong.

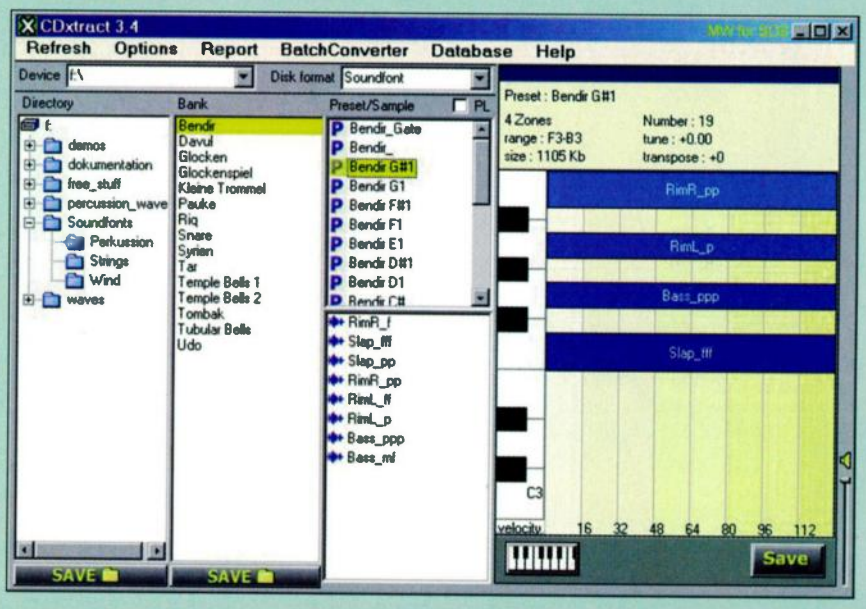
W www.overclockers.com.au/techstuff/a_dos_me/dosfixme.exe

• Steinberg have just released *Nuendo* 1.5 for PC and now Mac OS9/OSX. Both versions feature support for ASIO 2.0, which means that VST Instruments can now be used, along with tempo-based REX files. The Edit History function has been greatly improved, and for the pro audio and post-production engineer many new audio editing features have been introduced, while Quicktime and DirectShow video support has been added. ASIO Direct I/O drivers are now available for Digidesign hardware (to make transferring from Pro Tools even easier!), and Yamaha's mLAN protocol is now supported for up to 256 MIDI and 100 audio channels through a single cable. The update is free to existing owners.

W www.steinberguk.com

• Native Instruments have certainly been busy, judging by the number of downloadable updates that have just appeared on their web site. The *Reaktor* modular software instrument is up to version 2.3.3, with new MIDI input filtering and improvements for Emagic *Logic* users — they now have a workaround for using Program Changes and MIDI controllers with *Reaktor* automation. The new *Pro-52* version 2.1 software synth and *B4* version 1.1 virtual organ now consume less CPU power and RAM, and have much more comprehensive keyboard shortcuts.

W www.native-instruments.com



The latest *CDxtract* (version 3.4) reads Emu and Kurzweil formats, and can convert to Emagic's new EXS24 format too.

Hands-on MIDI control

C16 is a versatile multipurpose slider control panel for use with a wide range of MIDI gear.

Within a compact 210 x 135 x 55 mm, ***C16*** fits sixteen 60mm sliders and a mains power supply.

C16 has 100 internal *Targets* (profiles), of which 98 are presets and 2 user-programmable. The 98 presets cover a wide variety of applications.

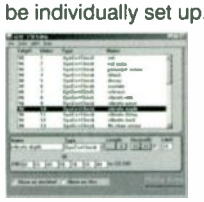
GM, GS, and XG editing: It is possible to continuously edit the typical parameters found on GM-compliant synths and modules, for example, filter cutoff and resonance, attack, decay and release, and the LFO. ***C16*** also supports editing the parameters of effects found within most GS and XG synths. There is also support for tweaking GM drum kits.

All 128 MIDI controllers can be produced. ***C16*** can generate Channel Aftertouch which many keyboards lack, and many modules respond to. Pitch bend can also be produced. All these messages can be sent on any MIDI channel.

Quick Mixer: With this *Target* the MIDI channel is the same as the slider number. The MIDI channel switch is then used to select volume, pan, reverb send, chorus send, variation effect send, balance or expression. In this way, ***C16*** becomes a handy virtual MIDI mixing desk.

Not all synths are GM-compliant, so ***C16*** has special preset *Targets* for many popular models. These can control the synth's most useful parameters via *System Exclusive*, *NRPN*, or whatever MIDI messages they need. When appropriate, the MIDI channel switch selects the device ID.

If the MIDI messages you require are not available from a preset *Target*, two *Target* locations (98 and 99) allow each of the sliders to be individually set up. Rather than cram such powerful programmability into an awkward user interface, we provide an easy-to-use computer application (available for free download from our website – a *Windows®* version is already there, and a *Mac* version is imminent). If you prefer, a collection of ready-made User *Targets* are also available for free download from our website (www.philrees.co.uk).



Having 98 presets makes using ***C16*** quick and painless, so you can get a lot out of it straight out of the box; no fiddly setting-up is required. However, users who want to get more out of ***C16*** can do so with the User *Targets* 98 and 99.

C16 has an internal merging feature, so integrating it into a MIDI set up is easy. There's space on the front panel to name the sliders.

_C16_ MIDI Control Unit £148.75

Amazing MIDI to CV

The low-cost ***Little MCV*** lets your MIDI system control your classic analogue synths.

This versatile interface unit can generate 'one volt per octave' (logarithmic) or 'volts per hertz' (linear) control voltages.

The gate output can be set to five volts positive, ten volts positive or S-trig.

High resolution sixteen-bit conversion allows accurate pitch across the full 128 note MIDI range with smooth LFO modulation, Pitch bend and portamento.

A rotary switch lets you select MIDI channel.

There are MIDI IN, CV OUT and GATE OUT sockets. The mains power supply is built-in.

Little MCV **MIDI to CV Converter.. £75.95**

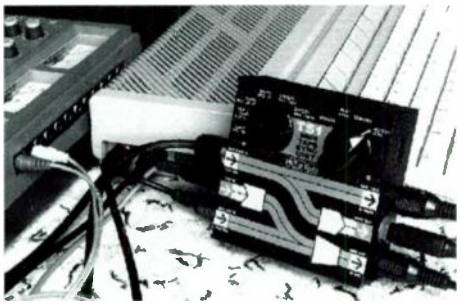
TS1 for SMPTE to MTC

The ***TS1*** will convert SMPTE Linear Time Code (LTC) to MIDI Time Code (MTC). It will also generate SMPTE LTC and MTC at the same time. The ***TS1*** can generate and recognise the usual four SMPTE frame-rate formats.

If your sequencer does not support MTC, you can equally well use the ***TS1*** by way of its proprietary Song Position Pointer/SRT format.

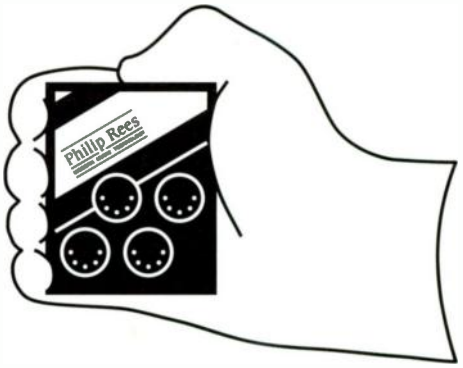
The ***TS1*** is ideal to use as a tape sync unit with any decent analogue multitrack tape machine. When you start, stop or shuttle your tape back and fore, ***TS1*** tells your MIDI sequencer to play in time, just as if your MIDI voices were extra tracks on the tape.

The ***TS1*** merges MIDI data received with its own sync data. You won't need to swap around the MIDI wiring, as ***TS1*** has four MIDI ports and automatic signal routing.



The ***TS1*** has a built-in mains power supply.

TS1 **MIDI Tape Sync Unit £99.00**



Functional simplicity

Big MIDI merge units

When you need to drive a single MIDI In port from many MIDI master devices at the same time, you can use our high-performance ***5M*** or ***9M*** merge boxes.

The ***5M*** has five MIDI inputs, while the ***9M*** has nine inputs. Each model has a single MIDI output, which carries the merged datastream.

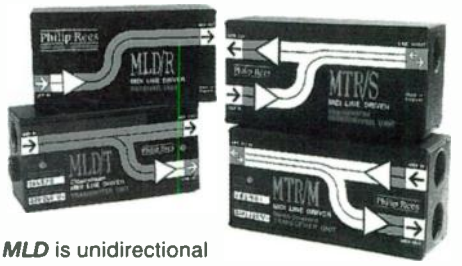
The advanced data handling features of ***5M*** and ***9M*** include intelligent interlocks on clocks and Pitch bend. They can readily handle all types of MIDI data, including MTC and *SysEx*.

These devices employ fast, sophisticated electronic hardware. They are supplied with external mains adaptors. The dimensions are 109mm x 109mm x 40mm.

5M **MIDI Merge Unit £125.95**
9M **MIDI Merge Unit £169.95**

MIDI line driver choice

These line driver systems overcome the 15m limit of standard MIDI hardware, by converting the signal to a differential (balanced) format.



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KORG PS3100

ps, i love you

KORG PS3100 POLYPHONIC SYNTHESIZER

It may not be well known, but it is sought-after. **Simon Lowther** relates the history and mystery of an early 48-note polyphonic analogue synth and its well-connected family.

Korg had yet to make their mark on the synthesizer big league when they launched the high-end, sophisticated 'PS'-series of polysynths in 1977. Though conceptually similar to the MS family of monosynths which followed, the PS-series is probably less well known today, but is seen by some analogue synth devotees in an almost mystical light.

When the PS-series synths were introduced, manufacturers were struggling to make polyphonic synthesis possible, let alone affordable, and polysynths were still few and far between. The most prominent were probably Moog's much-derided Polymoog, the well-respected Yamaha CS80, and Oberheim's SEM-based four- and eight-voice machines, though all of these machines were compromised in some way — the Polymoog wasn't even truly polyphonic. Synthesizers were laboriously put together from costly discrete components, rather than off-the-shelf oscillator and filter chips, so polyphonic instruments were not only expensive but also often short of desirable features. Unsurprisingly, then, there was much contemporary interest in the apparently feature-packed Korg PS-series.

Indeed, I was looking to buy my first synth when I first saw an advert for the PS3100. I had not heard of Korg, but the synth immediately grabbed my attention, looking like a modular Moog with a steeply rising control panel, walnut-effect trim, a 48-note keyboard with a nice action, and lots of knobs and jack sockets. The performance controls comprised an expensive-feeling metal non-sprung pitch-bend wheel (with the faintest ever centre detent) and a trigger button usually used for triggering such things as the onboard EGs. In total there were three synthesizers in the PS series (see 'Family Plans' box), along with some accessories, but since the PS3100 is what I have in front of me right now, that's the one I'll be focusing on.

Voice Architecture

The PS3100 and 3300 have built a fan base because they are intriguing and wonderfully quirky, but still highly usable, synthesizers. This is due in no small measure to their unusual architecture and some interesting variations Korg introduced on the normally accepted ways of doing things. (Korg also confused matters by using unorthodox terminology, which I'll try to clarify where possible, to describe familiar functions.)

Perhaps the most remarkable feature of the PS3100 is that each note on the keyboard has its own filter, envelope and share of a divide-down oscillator, making it a fully 48-note polyphonic synthesizer. There are also temperament controls at the left-hand side of the fascia, allowing you to tune all the C-sharps (or whatever) independently of the other notes, to make alternative scales. The manual explains the creation of mean-tone and just-intonation scales, as well as a heptatonal scale consisting of seven equal intervals.

Triangle, fixed pulse and square, PWM and saw waveforms are offered by the VCO, and pitch modulation is generated by the hardwired LFO1 (or Modulation Generator 1, in Korg-speak). However, the patch panel has a socket that allows you to access pitch from the envelopes or any other voltage source you can harness.

There's only one oscillator per note on the

Photo courtesy Korg Japan and Korg UK.

Family Plans

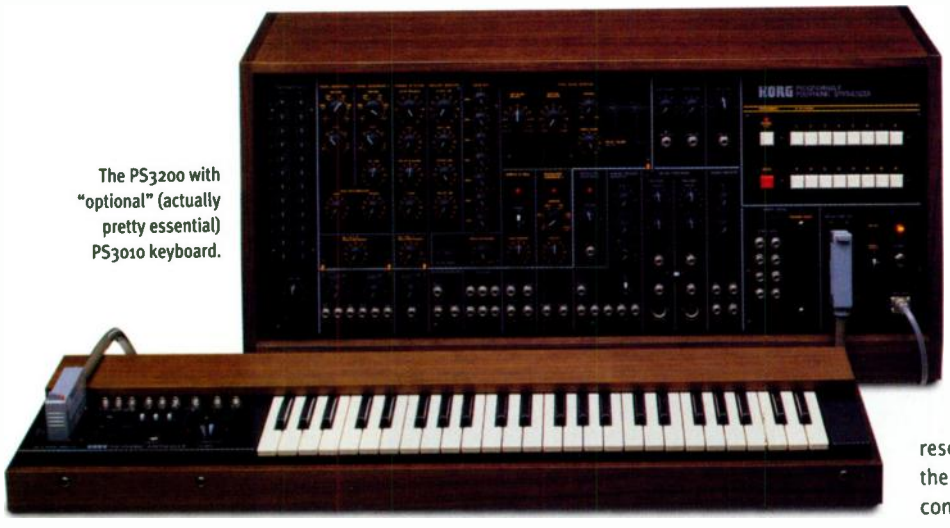
The PS3100 can be seen as the most 'basic' model of the PS range, which comprised three synths. The largest, the PS3300, is basically the same instrument as the PS3100, except that Korg took the simple but rather extreme step of putting three of them in one box, together with a nice mixer module. The only things not multiplied were the simple DAR General envelope (see main text), of which you still only get one, and the 'Ensemble' chorus, which went missing in action. The other physical difference is that the PS3300 has a detached keyboard, so it looks a little like a Moog modular. It's a total monster of a synthesizer by any standards, and weighs a trifling 36kg, plus 7kg for the keyboard!.

As the 3300 is three 3100s in a box, it might therefore be safe to assume that the final member of the family, the PS3200, is two PS3100s in a box, but this is not the case. The 3200 arrived a year or so after the others were released, in 1978, and is more like a two-VCO PS3100 with a 16-memory programmer. The latter features a novel system for editing previously stored sounds, whereby you pull the knobs so that they click outwards, before turning them to make your changes. Pushing the knobs back in stores the new settings. Even though it has two VCO banks and programmability, the PS3200 loses some of its shine when you discover a small graphic equaliser in place of the triple resonators of the PS3100/3300. It also suffers in the visual appeal stakes too, and has been described (quite accurately, I feel) as having the appearance of a storage heater.

The complete range of PS-series instruments and accessories also included:

- PS3010 keyboard — the catalogue says this is optional for the PS3200 and 3300, but I would say it's vital!
- PS3040 — dual foot-controller pedals.
- PS3050 — 48-pin parallel interface junction box for interfacing multiple PS synths, if you could afford it. Keith Emerson had a 3100/3300 combination.
- PS3060 — remote programmer for the PS3200.

3100, and no supporting sub-oscillator — which Korg must have considered a problem, as they added a switchable 'Ensemble' chorus circuit to beef up the sound. The larger PS3300, being effectively three PS3100s in one box, offers three oscillators per note, which means that there are three sets of tuning knobs (3x12) for modifying scales. Fortunately, the oscillators don't really drift in pitch — just as well, because tuning them all together can take quite a lot of fiddling. Since the pitches in a scale are linked, if one C-sharp goes AWOL, all the C-sharps go the same way!



The PS3200 with "optional" (actually pretty essential) PS3010 keyboard.

The PS-series VCF is a low-pass design with Cutoff Frequency and Peak controls, amongst others. The latter is known as resonance, or Q, to you and me (although Peak is actually not a bad name for a circuit that emphasises — or peaks up — the harmonics at the cutoff point!). Korg's literature claims it to be a 12dB/octave, two-pole design, but it sounds even weaker than that to my ears. This filter has to be the biggest disappointment on the PS-series synths, making it very difficult to produce classic big filter sweeps. On the plus side, however, modulation control of the filter is good. Both LFO and envelope modulation can be applied to filter cutoff (called 'Expand', for some unfathomable reason), and keyboard tracking of the VCF frequency and VCA gain are independently fully variable, both negatively and positively, across the keyboard. This facility is handy in the absence of touch response, as it can be used to emphasise either end of the keyboard. On the PS3300 it could also be used to create positional crossfades between layers.

There are two envelopes. The main Envelope Modifier has knobs for the attack, decay and sustain phases, with release time switchable between damped (no release), half-damped (half a second or so) and 'Release', which, as on a Minimoog, makes the release time equal the decay knob setting. The other envelope is called the 'General' envelope generator. All three PS-family members had only one of these — and I mean one only, not one per note. It's a DAR (delay/attack/release) envelope, with auto-trigger and invert polarity switches, and is hardwired to VCF cutoff by default. However, it could just as easily be connected to some other destination with a patch cord.

If you do use the General envelope rather than envelope 1 to control filter cutoff, some nifty playing is required to avoid held notes re-articulating each time you press a key. One nice feature of the General envelope, though, is that it can be triggered once a certain number of notes have been pressed. So you can, if you wish, introduce a filter swell on four-note chords but not on melody lines or triads, or bring in delayed vibrato on chords only. Used sparingly, this is a very effective performance technique.

Resonators

A module you don't come across very often outside esoteric modular systems is the three-peak voltage-controllable resonator, which greatly increases the PS-series synths' flexibility in creating timbres. This resonator boosts bands of frequencies over the range 100Hz-10kHz and features controls for bandwidth and frequency. It's a great tool for creating more realistic synthesized 'acoustic' instruments, and produces great electronic noises when you sweep the frequencies either manually or with an LFO, envelope or other modulation source. In fact, one could say that the sound of multiple-resonator sweeps is the PS-series' signature tone. If you haven't heard a multiple resonator before, think of it as a bit like a focused flanger or powerful EQ, but crisper and clearer. It's a shame you can't ▶

route external audio through the resonator, as this would surely make the 3100 very popular with modern dance producers.

Modulation Generators

The first of the 3100's two LFOs is called Modulation Generator 1 and offers a choice of four waveforms plus white or pink noise. It's a proper voltage-controlled LFO, with two associated jack sockets: one controls LFO speed and the other controls output amount via a dedicated VCA. MG2 is simpler, offering only a sine wave, and although it is hard-wired to the resonator frequency and PWM, it also has an output, so you can connect it elsewhere. Overall, the PS3100's modulation facilities are rather well developed for its time.

Characteristically for a 1970s instrument, the PS3100 features a sample and hold generator, which has its own separate clock generator. You can use it to sample envelope outputs for staircase glissando effects, or perhaps noise for random chaos — if you must!

As with any modular synth, the 3100 also boasts various 'utility' modules. These include two voltage processors, which can be used to modify input voltages — so that, for example, a signal that varies from +5 to -5V is restricted to the range +2 to +3V. The voltage processors can also be used to invert the input. Finally, there's an amplitude modulator which is useful for pseudo ring-modulation and tremolo sounds.

Patch Panel

The PS-series synths have an internal, hard-wired signal path, but — as you will have noticed by now — there are also a lot of jack sockets on the front panel. (These are conveniently kept away from the knobs as much as possible, so that you can get to the knobs without reaching through a mess of cables.) The patching options offered by these sockets increase the instrument's flexibility by allowing the default connections to be overridden with patch cords, allowing more unusual control and modulation routings to be used. For instance, it can be very useful to have voltage control of envelope attack and release or LFO1 frequency, as well as the more normal PWM, LFO amount, filter cutoff and so on. If there's a limitation to the system, it is that there are not as many controllers as some would like, and that you cannot change or break into the audio signal flow.

Sound Stuff?

One could be forgiven for thinking that a synth with divide-down tone-generator circuits and only one VCO per note might not sound very impressive. But actually the PS3100's VCOs sound rather good, boosted by the extra programming options provided by multiple LFOs, resonators and patchability — and, of course, no-one could complain about the 3300's complement of oscillators! The PS-series synths don't leap out with hard-edged, contemporary sounds, but rather excel at warmer, richer, more organic patches. In the hands of a skilled operator they have a distinctive character, especially when creating animated pads and washes using the filters, resonators and amplitude modulation. Nice woofy analogue basses are also possible. In spite of their complex appearance, the PS synths are pretty straightforward to use, but though the 3100 has the ability to generate some good sounds it's not as sonically versatile as you might think. Soaring Prophet- or Moog-style lead sounds do not easily fall out of a PS-series instrument.

Fashion Victim

I don't think the PS series was ever very fashionable in its production lifetime. The 3100 didn't even look trendy at its launch, with its sharply sloping panel and patch sockets. And its popularity was arguably hindered as much as it was helped by endorsements from prog-rock giants such as Keith Emerson, who were falling out of favour in the wake of new wave and electro-pop. The PS synths were soon eclipsed in the eyes of many buyers by Sequential's Prophet 5 which, although comparing poorly on polyphony and routing flexibility, offered the significant innovation of digital patch storage. The PS series was as different then as it is unique now, and I am sure this did not help its case. The family was

PS Users

- **3100. Keith Emerson, Ryuichi Sakamoto.**
- **3200: John Miles, Rick Wakeman, Tangerine Dream.**
- **3300: Coldcut, Vince Clarke, Keith Emerson, Jean-Michel Jarre, Vangelis, Karl Bartos of Kraftwerk.**

Karl Bartos, of Electrik Musik and formerly Kraftwerk, is just one of the famous fans of the powerful PS3300.

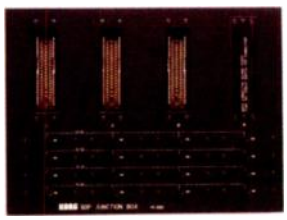
"The PS synths don't leap out with hard-edged, contemporary sounds, but rather excel at warmer, richer, more organic patches."

If you can afford it, the 3300 is arguably the most desirable of the PS synth family.

quietly dropped in 1980-81, and Korg settled into a more mainstream groove with the subsequent Poly 6/61 and DW synthesizers.

Today the place of the PS instruments is difficult to assess. They are undoubtedly quite unwieldy, and with the limited exception of the PS3200 (which features a 16-memory patch storage facility) they lack memories for the user's carefully crafted sounds. On the other hand, they do offer a lot of sound-mangling potential, the keyboard is very playable and you get lots of knobs to twiddle. If you want to incorporate one into a modern studio, Kenton Electronics provide a retrofit which gives MIDI In for note on/off messages and a discreet external box that sprouts patch socket outputs for velocity, pitch-bend, modulation, aftertouch, volume, and a couple of assignable controllers. All these can be connected by patch cords to whatever you want to control.

If you're thinking of buying a PS-series instrument today, the PS3300 must be the one to go for — a big, complex, multi-layered instrument with multiple VCFs and six LFOs. Its capabilities were unprecedented in 1978, and even Bob



The PS3040 dual control pedal and 3050 junction box for connecting several PS synths together.

Moog reportedly rated it very highly at the time. By comparison, the PS3200 has a traditional analogue synth configuration that would be considered relatively mainstream these days, and the PS3100 suffers from not having two VCO banks to put through its resonators.

Korg have recently returned to the world of 'analogue' polysynths with their MS2000. Although this new instrument clearly owes a visual debt to the PS-series synths, it has different features and a different sonic character. There is no doubt that today's technology and design has caught up with what, at the time of the PS-series, were advanced modulation routings on a mass-produced instrument, and what would have been pretty unique when the series was in production is probably today regarded as normal. Nevertheless, these grand old instruments do things in a different way, are creative and fun, and can certainly produce the goods. SOS

PS. How Much Do They Cost?

Sadly, all the members of the Korg PS family are relatively rare, and supply will probably always be exceeded by demand. If you decide you do want one, finding it could be tricky. A scan through copies of *SOS* shows one specialist dealer with a 'Price On Application' listing. They do sometimes turn up in Pete Forrest's VEMIA auctions (www.vemia.co.uk/), but I can only rarely recall seeing a PS synth in SOS reader ads in the past.

Model	*List price (1979)*	*Approx value today (good condition)*
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PS3200	£3300	£1500-2000
PS3300	£5837	£4000 upwards (gulp!)

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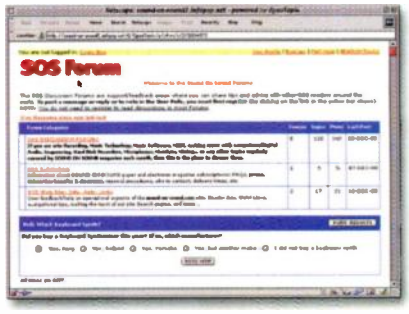

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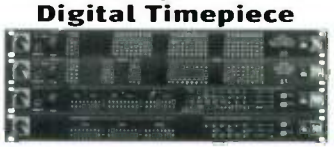

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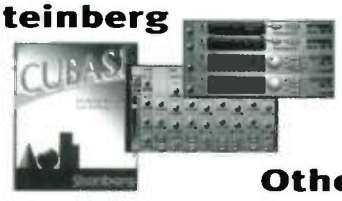

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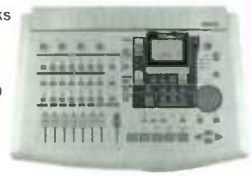

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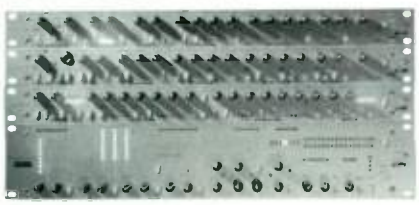

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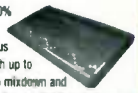

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The first edition of Effects and Processors was first published around a decade ago and was adopted by recording and music technology courses in colleges around the world. Almost double the size of the original, this completely updated edition brings the subject right up to date by describing the operation and applications of analogue, digital and software plug-in effects and processors. In easy to understand English, the book describes how these devices work, how to connect them to your system and how to use them in a creative context to enhance your music.

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Originally available as two separate volumes (Creative Recording II and III), this updated work explains how the different types of microphones work and how to pick the right one for the task in hand. There's advice on miking just about anything from a solo vocalist to a full drum kit as well as a thoroughly practical section on soundproofing your studio and improving the acoustic performance of your mixing area. The subjects are explored with the minimum of jargon and inexpensive DIY solutions are provided to a number of studio problems.

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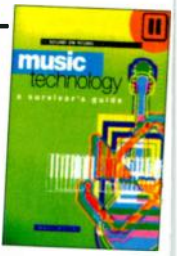

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Music Technology — A Survivor's Guide highlights common problems in recording and mixing music, addresses equipment dilemmas and offers troubleshooting advice. Most importantly it provides answers. Whether it's the debate on MIDI recording versus conventional multitracking, the basics of soundproofing, how to rescue an unsatisfactory mix, how to put together an accurate monitoring system or how to organise a recording session! this is the book for you. It also provides an overview of equipment types: for example, the pros and cons of hard disk recording compared to analogue, and the various types of studio outboard equipment. Featuring an exhaustive 50 page glossary and clear diagrams throughout, the *Survivor's Guide* is guaranteed to keep any music technologist on the right track. 329 pages

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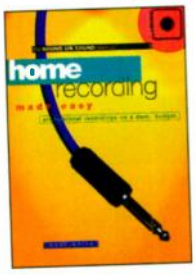

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Author Paul White

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Desktop Digital Studio is a step-by-step guide to setting up a digital recording environment capable of computer-based MIDI sequencing, audio recording and editing, sound synthesis and effects processing. Containing a full glossary of terms and easy-to-follow diagrams, it offers the soundest advice money can buy, for beginners and intermediates alike. 240 pages.

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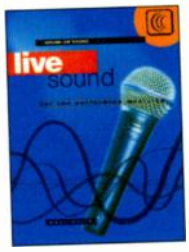

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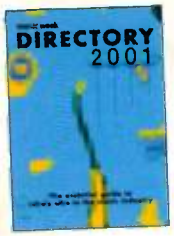

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by Will Ashurst

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by Will Ashurst

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by Duncan R Fry

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RUNNING A BAND AS A BUSINESS

by Ian Edwards, Bruce Dickinson and Phil Brookes

Serious about music? Serious about making a living from music? Whether you are playing Wembley Stadium or the Kings Head, this book gives you the inside information on how to run a money-making band. It covers choosing band members and the band name, deciding on the direction of the project, establishing the business structure, and getting the right management in place. Once you have the framework, you can start creating press interest both locally and at national music press level, we point you in the right direction. Don't forget your fans – look after them and they'll look after you. Love it or hate it, touring is a must for any band – make sure you do it right and it'll work for you. You'll also find out about merchandising, from band T-shirts to tapes and CDs and we make sure you get the legalities right with a chapter on contracts – how to use them, and rip-offs – how to avoid them. Complete with major name interviews with Kevin Nixon (Kula Shaker, Hit and Run) Gizz from Prodigy and Skunk Anansie's Ace and Rich, this is your how-to manual for band success!

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THE STUDIO IN A BOX

by Mark Wherry. The Studio in a Box is a concise guide to music recording using a PC, and though it only extends to 100 pages with illustrations comprising mainly monochrome screen shots, it's actually very useful and surprisingly up to date. If you're confused as to what MIDI/Audio sequencers do, where soundcards fit into the picture or you don't know your ASIO driver from your VST plug-in, this book will put you straight. It covers computer hardware, provides details on numerous sound cards, MIDI interfaces and software plug-ins and examines both Emagic and Steinberg sequencing software. Also included in the whirlwind tour are software synths, audio CD burning and even music for the Internet.

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by Peter Gorges. Clavia's recent Nord Modular synth brought the concept of the freely interconnectable modular synth right up to date, but just as with the monstrous monophonic analogue beasties of the '70s, you need to know what you're doing if you're to get any usable sounds out of the instrument — or indeed any sound at all. And that's where this guide comes in, offering a comprehensive overview of both the general theory of modular synthesis and its specific implementation in the PC-based front end of the Nord Modular. Logically arranged and chock-full of practical examples to drive home the theory, this is a must-have for Nord Modular owners. Written in an open and engaging style by Nord fanatic Peter Gorges, this one comes highly recommended by *SOS*.

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by Udo Weyers.

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Wizoo Guide: Cubase VST Mac

by Ralf Kleinermanns

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Wizoo Guide: The Perfect Music PC

Author Rainer Hain

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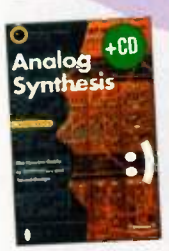

Wizoo Guide: Analog Synthesis

by Reinhard Schmitz

This book explains essential terms such as oscillators, filters and envelopes and how to analyse synthesizer sounds, modify them and create your own. Audio examples accompany the explanations of all operations to illustrate exactly what you are doing. Includes Audio CD with demos (Multimoog, OB-Xa, Nord Modular etc).

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by Dave Bellingham/Peter Gorges.

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by Len Sasso.

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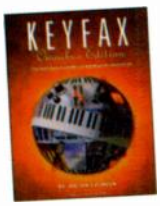

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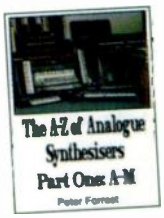

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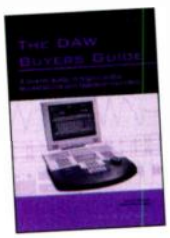

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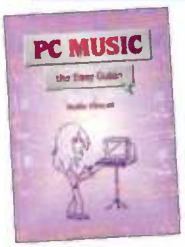

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EMU MORPHEUS, £350 ono; Allen & Heath GS1 16:8:2 mixer plus meterbridge, boxed as new, £350 or swap both for Roland JP8000 or Korg Z1. ☎ 01292 316608 (Troon).

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FATAR STUDIO 2001 fully-featured hi-spec weighted studio motherboard, latest software version, recently serviced, case, £550. ☎ Steve 01423 567587 or email goldman_dan@hotmail.com (Harrogate, Yorkshire).

HAMMOND T500 tonewheel, variable distortion, storming rock organ sounds, bench and original valve leslie 147, both in very good condition, will sell or exchange for modern synths. ☎ 01639 768103 (South Wales).

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KORG N364 synth, four outputs, great sounds, 1980 synth-disk included, bargain, £285. ☎ Bob 01923 445387 (Watford, Herts).

KORG PROPHECY, manuals, £300; Emu ESi4000, manuals, Zip drive, CD-ROM drive, 32Mb of RAM plus some sample CDs, £400. ☎ 01832 275725 (Peterborough).

KORG TRINITY, in absolutely mint condition, never used, together with all manuals, MIDI cables and an optional 60 Watt active monitor, £750. ☎ Chris 01386 423714 or email cjcox@freeuk.com (Evesham, Worcestershire).

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KORG WAVESTATION SR rack version, excellent condition, boxed with manuals, 550 sounds, £299. ☎ 020 7515 1587 (London).

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OBERHEIM MATRIX 1000, good condition, for sale or will swap for Korg M1, £250. ☎ Paul 01623 454888 (Sutton-in-Ashfield, Nottinghamshire).

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ROLAND JV30 multitimbral synth, 61 keys, mint condition, home use only, manuals, £200; Evolution EVS1 multitimbral rack-synth, several synthesis methods, manual, £80. ☎ 0161 8617261 (Manchester).

ROLAND JV1080, sound module, excellent condition, boxed with manuals, no offers, £450. ☎ 079 7035 5043 or email s.sampat@btinternet.com (Southall, Middlesex).

ROLAND JX8P synth and M1 memory cards MCS03 and MPC03, £250 for the lot. ☎ Derek 020 8838 3327 (Harlesden).

ROLAND MKS20, £165; Cheetah MS6, £149; Casio CSM1, £35; Casio RZ1, £89; Dance and Brass card sets. ☎ 01708 250846 (Essex).

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ROLAND SH101, excellent condition in grey, with extra Kenton filter and modulation inputs for CV/gate, £350. ☎ Simon 079 7121 0552 or email deanstead@hotmail.com (Doncaster, South Yorks).

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YAMAHA RM1X, barely used, boxed, £330; Red Sound Darkstar, early model, serial number #152, £240; both boxed with manuals. ☎ James 01303 240316 (Kent).

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ALESIS ADAT v4.03, low hours use since service, two available, £495, Klark Teknik DN780, reverb, classic sound, remote, MIDI, cost £3500 new but will sell for £495. ☎ 01684 772664 (Tewkesbury).

AUDIO TECHNICA AT4033 four months old, £140. ☎ Ben 0800 389 3393 or email ben@virtu.com.net (Goring-on-Thames, Oxfordshire).

BEHRINGER MX3282A, live desk, 32-inputs, sweepable EQ, 8 aux, mic and line inserts, ultra-low noise, new in box, worth £1030, will accept reasonable offers. ☎ Toni 01978 852194 (North Wales).

BEHRINGER MX8000, 24-channel, eight-group desk and meterbridge with Fostex, D90 hard disk recorder, 2.6Gb drive, remote extension cable and loom, £1500 ovno. ☎ 01803 864286 (Devon).

BEHRINGER ULTRAFEX II, exciter/stereo enhancer/bass enhancer, £50, 20U studio rack, Quik Lok RS654, £30; Casio MP3 watch, 32Mb, £120. ☎ Carl 024 7639 5210 (Nuneaton).

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FOSTEX DMT8VL digital multitracker, good condition, quick sale, £450. ☎ 01702 257033/079 4466 1459 (Essex).

FOSTEX DMT8VL hard disk recorder with optical I/O two hard drives, still boxed with manual, hardly used, must sell soon, bargin for first digital eight-track, £325. ☎ Steve 01707 886480 (Welwyn Garden City, Herts).

FOSTEX E16 multitrack tape recorder, not many good ones left, this is a high-quality machine in excellent condition, cable, loom and tapes included, £700. ☎ Geoff. ☎ 01732 453300 (Kent).

FOSTEX FD8 eight-track recorder with hard drive, used only once, make me an offer. ☎ Rob 079 4124 2168 (Surrey).

FOSTEX E16 half-inch analogue 16-track machine, 4050 autolocator with timecode, reliable, very good condition, excellent sound, £595 ono. ☎ Laurie 01522 809241 (Lincoln).

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MUTRONICS MUTATOR stereo filter with MIDI control, found in most top studios, no other filter comes close, great condition, boxed with manuals, £400. ☎ Darren 01494 672917 or email darrengoldie@hotmail.com (Beaconsfield, Bucks).

NEUMANN U87, in excellent condition, original box with cradle and popshield, £695. ☎ Stan 020 7738 2818 or email stan@stanw.demon.co.uk (London, Battersea).

ROLAND VS840 workstation, hardly used, £400 plus video. ☎ 01246 811234 (Near Chesterfield).

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ROLAND VS880, V-Expanded, 1.4Gb, 8-track hard disk recorder, as new, £500; Emu Emax II sampler keyboard, perfect condition and great filters, £275. ☎ 020 7229 6520 (London).

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STUDER B67 two-track tape, 15, 7.5 and 3.75 IPS, balanced in/out, monitor, but no meters, ex BBC, recently serviced, trolley, pictures available, £120. ☎ 0161 848 9756 or email lyn@lento.freeserve.co.uk (Manchester).

SUGDEN A25B amplifier, excellent detail and imaging, 25 Watts per channel, good condition, first to hear will buy, £159. ☎ Joe 01728 652220 or email joe@omnis.net (Halesworth, Suffolk).

TASCAM 238S eight-track, Dolby S, immaculate, boxed, £250; JL Cooper PPS2 MTC/SMPTE box, offers. ☎ Justin 01582 458434 (Luton).

TASCAM DA88, £950; DA38, £700, remote control, £200; Tascam 24-channel mixer, £1000. ☎ 079 4765 0763 (Birmingham).

TASCAM MSR24S, one-inch tape machine, complete with pro trolley and looms, low use heads, in good condition, £800 ono. ☎ Neil (after 5.30 pm) 01773 540234 (Derbyshire).

TC ELECTRONIC FINALIZER EXPRESS Pro multi-band compressor/limiter, as new condition, easy to setup and get results, no-longer required due to studio upgrade, £580. ☎ 077 1289 1015 or email mike@kamarecords.com (Reading).

TC ELECTRONIC FIREWORX, boxed with manual, as new, £1150 ono. ☎ 020 8567 8596 (London).

TC ELECTRONIC FIREWORX, £900; Fostex DMT8VL, eight-track hard disk recorder/mixer, £350; both in new condition. ☎ John 01733 893262 (Peterborough).

TEAC A3440 quarter-inch four-track, in excellent condition, hardly used, £300 ono. ☎ Dave 01698 854286 (Cambridge).

TL AUDIO IVORY four-channel preamp, boxed and in mint condition, £295. ☎ 01326 316519 or email kensey2@totalise.co.uk (Falmouth, Cornwall).

YAMAHA NS10M monitors, £175; Nomad Bassman preamp, £100; Drawmer LX20 compressor, £100; all in excellent condition, home use only. ☎ Keith 01780 753900 (Lincs).

YAMAHA NS1000M monitor speakers, ideal for studio or home use, good condition, £595. ☎ 020 7731 4004/079 5630 3909 (London).

YAMAHA 03D digital mixer, boxed, includes ADAT sync card, £1500. ☎ 020 7359 7825 (London).

YAMAHA RM800 mixer, 24:8:2, mint condition, two-year old, very comprehensive specs and great sound but need space, £400. ☎ Yannick 020 7272 5104/079 5820 4103 (London).

samplers

AKAI MPC60, as new, home use only, v2.12, eight outs, SMPTE, manuals, best offers. ☎ Manuel 0039 81 837 5157 or email manuelzorne@hotmail.com (Italy).

AKAI S900 sampler, £300 ono; Alesis Quadraverb plus multi-effects, £200 ono; Korg 01/W FD workstation, £550 ono; Alesis HR16B, drum machine, £125 ono; Ensoniq ESQ1 analogue synth, £250 ono. ☎ 0141 638 9590 (Glasgow).

AKAI S950, Spirit Studio 16:8:2, Drawmer DS201 gate, Roland Juno 106, Yamaha AN1X, TL Audio EQ1 valve parametric EQ, Alesis MIDIverb II, Frontline X8 mixer, best offers secures, all as new. ☎ 0113 240 1772 (Leeds).

AKAI S3000XL sampler, 32Mb, excellent condition, boxed with manual, £700 ono. ☎ 079 6859 1179 (London).

EMU 5000 ULTRA, boxed, as new, mint, has not been used yet, call for more details, £800. ☎ 070 1071 7136 (East Grinstead, Sussex).

EMU E4XT ULTRA with analogue and dance boards, CD-ROM drive and CDs, absolute monster of a sampler, one owner, mint condition, £1800. ☎ Leroy 077 2084 5114 (Burton On Trent, Staffs).

YAMAHA A3000 v2 sampler, AIEB1 expansion, 64Mb, excellent condition, boxed, Zip drive, six Zip disks, SCSI, cables, £600. ☎ 01923 826932 (London).

ZOOM SAMPLETRAK ST224, excellent little sampler with effects, as new, includes CD-ROM, original packing, manual, £125. ☎ Nurudin 01470 562373 or email nurudin@peatbog-faeries.com (Portree, Isle Of Skye).

sequencer

ALESIS MMT8, mint condition, home use only, manual and power supply, £80 plus p&p. ☎ Tris 079 0959 6533 or email tristanmarkey@hotmail.com (Nottingham).

ROLAND CSQ600 classic analogue sequencer, ideal for use with any analogue synth with CV in/out, £60. ☎ Jamie 0121 471 1560 or email jamie-b@ntlworld.com (Birmingham).

ROLAND MC50 with enhanced ROM, ideal for live use and does not have failings of computer-based sequencers, £170. ☎ 0131 228 2741 or email rrs@holyrood.ed.ac.uk (Edinburgh).

ROLAND MC303 Groove Box, top sounds for virtually any dance tunes, good condition, everyone needs one of these, need the cash, £195 ono. ☎ Gaz 077 7639 6126 or email Rezzor101@catstudios.fsnet.co.uk (Doncaster, South Yorkshire).

YAMAHA QX5, eight-track sequencer, 20,000-note capacity, manual, £40. ☎ Robert 01223 515519 or email rhanchet@email.com (Cambridge).

YAMAHA QY70, power supply, PC software, as new, in box, manuals, £250 ono. ☎ 01277 658670 (Essex).

drum machines

YAMAHA RM1X, £300; Roland VM3100, £300; Korg Z1, £700. ☎ 01223 316091 (Beds).

personnel

COMPOSERS REQUIRED for TV and game composition, classical and modern most welcome. ☎ 020 8303 6977 (Kent).

EDITOR/SOUND ENGINEER available *Pro Tools v5/Emagic Logic 4* with studio, prefer dance, theatre and sound-art music, cheap because I love my job. Female friendly. ☎ 020 7738 2818 or email stan@stanw.demon.co.uk (London, Battersea).

EXPERIENCED GUITARIST available for recording and gigging, will work for free on the right project, I can travel and I have my own equipment. ☎ Greg 01302 533809 or email greg.roberts1@ntlworld.com (Doncaster).

FEMALE VOCALIST wanted, to work with established writer/producer with own studio on collaborative dance-orientated studio projects, must want to be creative. ☎ Kevin Pawsey 01276 506821 or email kjpawsey@ntlworld.com (Camberley, Surrey).

PRO FEMALE vocalist looking to work with pro DJs into a kicking live vibe, can also provide percussion. ☎ 020 8398 6275 (Surrey).

VERY EXPERIENCED DANCE PRODUCER with amazing analogue/digital studio available for production, mixing and remixing work, based in London. £100 per day. ☎ 020 7274 3836 (London).

computers/software

APPLE MAC 7600 plus 15-inch monitor, keyboard, mouse, and Apple multi-media speakers, Zip drive, and Emagic *Logic Audio, v2.5*, serial and USB connections, £525. ☎ 01865 776587 (Oxford, Oxon).

APPLE MAC PERFORMA 5400/1600 15-inch monitor, 74Mb memory, 1.6Gb hard disk, Steinberg *Cubase VST, Timebandit, Recycle, Rebirth*, CD-ROM drive, floppy, modem, all in excellent condition, hardly used, only £240. ☎ James 01908 220292 (Bucks).

APPLE MAC POWERBOOK Duo 230 18Mb RAM, 80Mb hard drive, comes with battery, PSU, 14.4 Modem, ext floppy, Steinberg *Cubase* and MIDI interface, good condition, £160. ☎ 078 9994 7665 or email g0atee@lineone.net (West Yorks).

ATARI STE, 2.5Mb, 520K, STFM, 1Mb, SM124 monitor, original *Cubase v3, Notator* and *Score Edit*, with dongles, Onstage MIDI-file player, accessories, £200. ☎ 01244 821276 (North Wales).

CREAMWARE PULSAR, ten-months old, excellent condition, with box, manuals and latest software, on-board synths and effects, 20 in and outputs with ADAT, £550 ono. ☎ Alex 079 7025 6112 (Torquay).

DIGIDESIGN SAMPLE CELL 2 PC ISA card, 8Mb, expandable to 32Mb, manuals and original disks, jack loom, £250 ono. ☎ 079 5668 5234/020 7272 5042 (London).

STEINBERG SMP24 MIDI/SMPTE two in/four out interface for Atari and *Cubase*, £100; Atari 1040 STE, *Cubase v3.01*, dongle, manual, £125 or £200 complete. ☎ 01684 772604/079 7478 8028 (Gloucestershire).

YAMAHA SW1000XG and PLG100VL, 20-bit AD/DA, 64-note polyphony, 32-part multitimbral, six 24-bit effects processors, 46 drum kits, 1267 instrument voices, low-latency ASIO drivers, Yamaha MU100 engine, boxed as new, includes MIDI and audio cables, all for £250. ☎ Vedad 079 74528661/020 7366 6493 (London).

miscellaneous

AKAI ME25S 1U MIDI note-splitter, makes a mother keyboard out of any MIDI keyboard or MIDI piano, £50. ☎ 078 0258 3242 (Newcastle-Upon-Tyne).

AKAI ME80, programmable MIDI patch unit, 999 memories eight in/ten out capacity, full LED status display, as new, £80. ☎ Dominic 01502 678246 or email dominic@altoona.fsnet.co.uk (Beccles, Norfolk).

DENON DCD425 CD player excellent condition, £69. ☎ 01276 506821 or email kjpawsey@ntlworld.com (Camberley, Surrey).

GIBSON DOUBLE neck guitar copy, 6/12 string, black hard case, looks and plays great, £275. ☎ Justin 01582 458434 (Luton).

PEARL MASTERS custom drums, black-lacquer mist finish, maple shell, bass 20 x 16, all sealed, tom 10 x 10 optimount suspension system, tom 10 x 12 optimount suspension system, new TH100 tom holders, floor tom 12 x 14, air suspension legs, Pearl snare soprano brass shell, 13 x 3, all with hardware cases. Gibraltar rack, eight clamps and fur-lined cases. ☎ 020 8778 5354 (London).

PEAVEY MIDI MASTER II 8 x 8 MIDI patchbay, £120; Art Multiverb LT, £70; Korg DTR2 rack tuner, £70. ☎ 0161 720 9816/079 4484 9749 (Lancs).

YAMAHA P4500 amp, two 680-Watt, 4-Ohm channels, £350. ☎ Peter (day/evening) 01202 827118/886632 (Dorset).

wanted

ALESIS D4 or D5 wanted, cash waiting, no silly prices please. London area only. ☎ Dave 020 833 8065 or email dave@ubermusik.co.uk (London).

ANY ROLAND JV modules wanted, 1080 or 2080, must be in mint condition, cash waiting, Korg Trinity rack also wanted. ☎ 01933 275981 (Northants).

ATC speakers wanted, models SCM150, SCM100, SCM50, SCM50 ASLSC Pro (centre speaker), SCM10 1/15 (sub woofer), SCM20, SCM10. ☎ 020 7736 1473/079 5630 3909 (London).

DOD FX25 needed for bass guitar setup. ☎ Niall 077 7623 3708 or email Gizard_alien@hotmail.com (Kendal, Cumbria).

EVOLUTION EVS1, cash waiting for sensible price, nice if boxed with manual, nicer if it's near Oxford area. chris.crossley@metrics.co.uk. ☎ Chris (daytime) 01865 261803 (Oxford).

FOSTEX FD8 multitrack unit, must have at least a 6.4Gb hard drive, be in perfect working order, and come with instruction manuals. Local calls please. ☎ 01323 891434 (East Sussex).

FOSTEX R8 extension lead wanted, I am looking for the extension lead for the remote control of the R8. ☎ Richard 079 722 8053 or email unfamiliar_1999@yahoo.com (Nottingham).

KORG D16, must be complete and in good condition. ☎ Ben Scammell 0117 974 2817 Email bens@cymap.com (Bristol, Avon).

LEXICON MPX1 wanted, cash waiting. ☎ 079 4962 6189 or email niels.corfield@tvu.ac.uk (London).

PPG OR SEQUENTIAL PROPHETS wanted, broken or working, anything considered, cash waiting. ☎ 079 4127 2944 (Northants).

ROLAND JV1080 sound module wanted, cash waiting for best offer, expansion cards a bonus, will collect if reasonable. ☎ Joe 01273 812495 or email joeseward1@hotmail.com (Lewes, East Sussex).

ROLAND TR909 in excellent condition, will pay up to £500. ☎ 01946 773923 or email nick_smith@altavista.net (Cumbria).

SPIRIT 328 digital desk, cash waiting. ☎ Mark 0151 678 0435 or email haymere@btinternet.com (Wirral, Merseyside).

STEINWAY PIANO wanted, in any condition. ☎ 0117 946 5451 (Bristol).

YAMAHA DX7 wanted in exchange for my Korg DS8 and Roland D10 (both in excellent condition), DX7 must be in good condition. ☎ Carl 01305 259226 or email carlybabe01@excite.co.uk (Dorchester, Dorset).

YAMAHA 03D digital mixer wanted. ☎ Tony 01753 871844 (New Malden).

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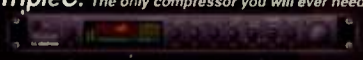

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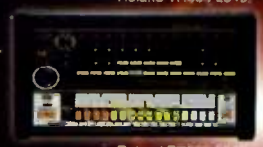

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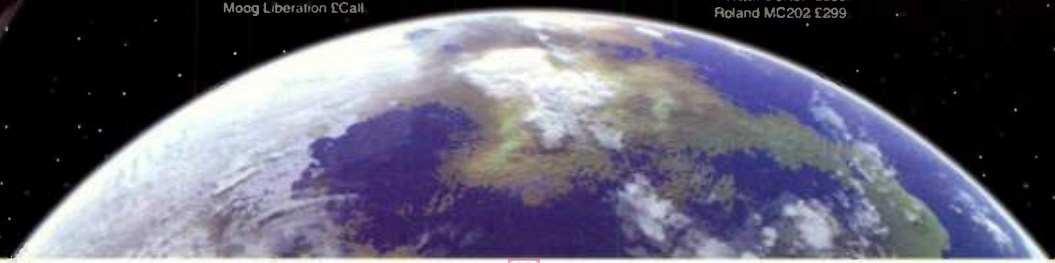

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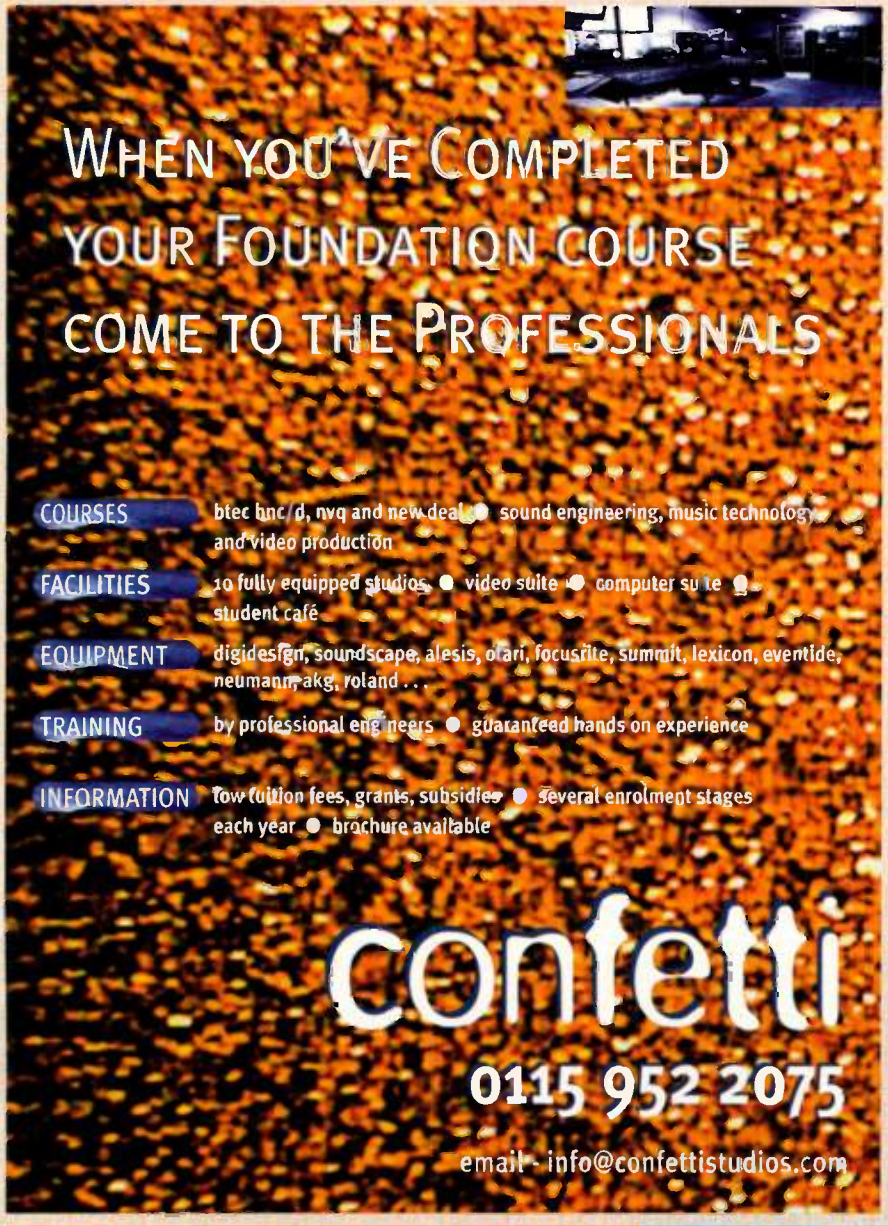
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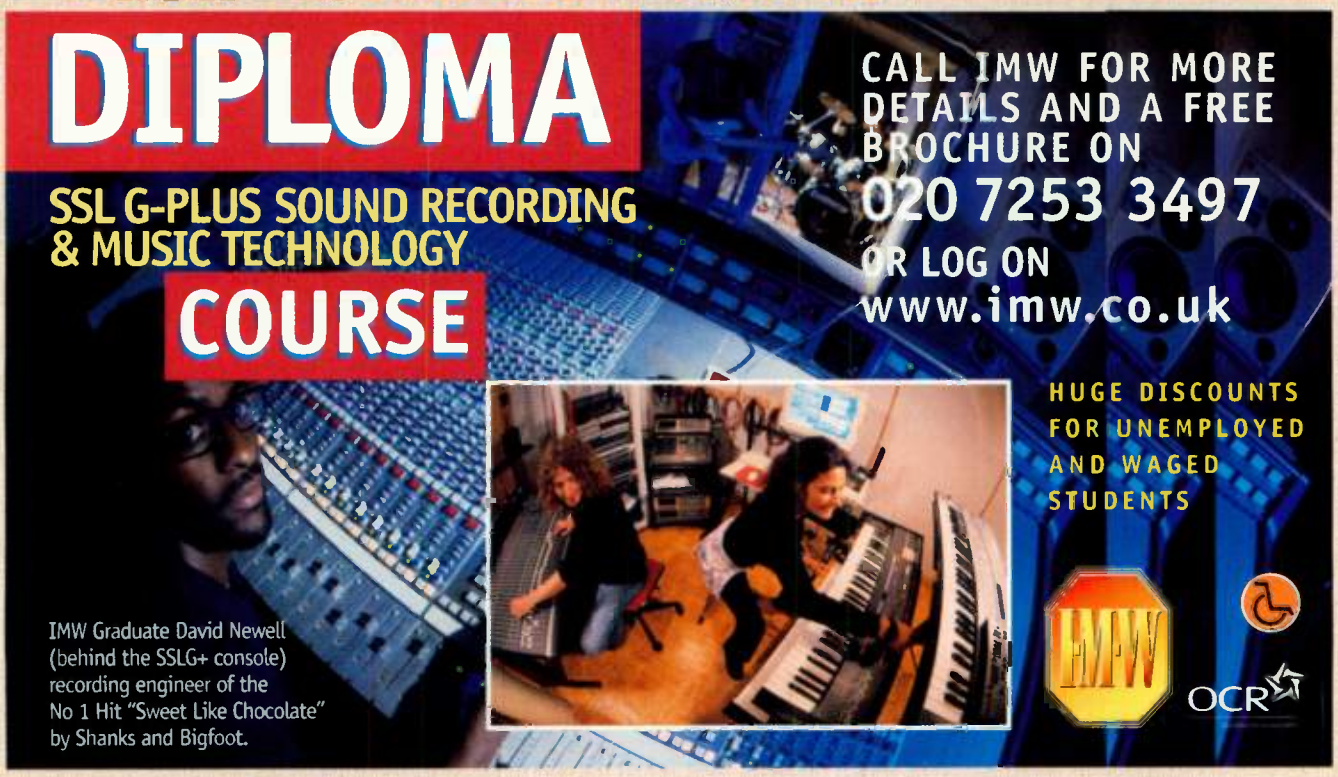
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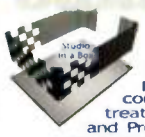

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Leading producer **Steve Levine** recently discovered that a fake Steve Levine has been masquerading as the real thing, to secure work under false pretences. Read on for the rest of this amazing story...

There have been times, during my years of producing records, when two or three great projects have come along at once. All the ticks are in the boxes but you know you can't physically do every project. On occasions like these I've wished I could be cloned, like Michael Keaton in the film *Multiplicity*! But, as we're often told when we're young, you should be careful what you wish for — it might come true.

I'm writing this at the end of what has been one of the strangest and most surreal weeks I've ever experienced. I discovered, to my horror, that for the past year or so there has been another "Steve Levine", producing and setting up deals in the USA, mainly on the East coast, trading on my good name and reputation.

This situation was first brought to my attention by my manager, Stephen Budd. He had just received an email from an American lawyer and manager in New York, the representative of an artist who had signed a deal with the impostor's company. As the days progressed, a tangled web of deceit began to unfold. Apparently, while impersonating me, this charlatan (who, according to the lawyer, even wears a wig to look like me!) has managed to sign various artists to his production company. He claims to have an international production deal with Virgin Records, plus a studio in London (frighteningly close to the truth, by the way), and apparently almost sealed a deal for himself with MTV as a consultant — a deal I would actually like myself! He is currently in the process of setting up a charity concert event at the Lincoln Centre in New York. It's almost too far-fetched to believe.

And it raises several interesting points. Why didn't someone suss him out earlier? Just how powerful is a reputation? Who is this guy? How can I stop him? How do I rectify any damage that has been done to my image and career? Is he a crook, or just deranged? Stephen Budd and his lawyers are on to it!

The saddest thing is that in pursuing this charade he is destroying a new artist's career before it has even got off the ground — not to mention damaging my reputation as a professional producer.

In an industry fuelled by Chinese Whispers and innuendo, this whole episode does explain some odd meetings that I have had recently. One in particular comes to mind: after I met a particular manager he sent me a letter praising me for the direction I had come up with for his band, saying how impressed he was with my studio and my professionalism, and emphasising that he couldn't wait to start the project — I was, in fact, totally different to what he had been led to believe.

This obviously has very serious implications for me and for others. My work depends on trust and building good relationships with artists, managers and record companies. Having the odd hit from time to time also helps. But as no producer can have a 100 percent success rate, developing trust and a reputation over time is very important. These are things I've worked to build for over 20 years and am very proud of — but they can be destroyed in an instant.

In this age of cyberspace, where you can use email and the Internet to make contact and exchange ideas without ever physically meeting, it's possible to have a virtual relationship with anyone and never come face to face with them. In addition, CVs, biographies and discographies are all in the public domain — that's how we get new work — so it's relatively easy for someone to use the information they contain for their own ends. Impersonating producers, I hope, is quite rare, but unless we all check our facts and do some research before we hire someone, we could be fooled by any old smooth operator. SOS

If you want to contact me, my management representation is Stephen Budd Management: telephone 0207 916 3303; email info@record-producers.com; web site www.record-producers.com. My personal web site is at www.stevelevine.co.uk.

About The Author

Steve Levine's extensive list of production credits includes work with The Clash, Culture Club, The Beach Boys, China Crisis, Louise, The Creatures, Westworld, Ultra, 911 and Honeyz (see *SOS* December 1998 for a feature on the last). He's been the BPI Producer of the Year and has received a Grammy award for his work with Denice Williams. His 1999 Kings Singers album was nominated for the Grammy for best classical crossover album.

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. 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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