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■ Digidesign Soft Sample Cell Soft sampler for Pro Tools ■ David Vorhaus Synth pioneer ■ SPL Kultube Voice channel  
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# Babel Revisited

**"N**ow that CD-R has finally become affordable, and DAT has settled down as a tolerable — if not exactly ideal — mastering medium, the industry is talking about DVD (Digital Versatile Disc), 24-bit recording, and possibly 96 or even 192kHz sampling rates. Just as everything was starting to look settled, it seems as though the Tower of Babel is going to be taken up to the next level." I wrote those words in my October 1997 Leader column, and over the past four years that tower has just continued to grow, albeit with some key bricks still missing. For example, parts of the industry are still pushing 5.1 surround for all they're worth, but it still isn't clear whether DVDA (DVD Audio), SACD (Super Audio CD) or DTS (Digital Theatre Systems) is going to be the audio format of choice. Even if it had been decided, it wouldn't help the project-studio owner much, as there's little or no authoring/burning software for these formats that's accessible to the typical home-studio owner, though it looks as though DTS may turn out to be the most project studio-friendly of the bunch.

Even the professionals are having problems, as I discovered at a recent mastering seminar in New York, where it was pointed out that because of the highly secretive, proprietary anti-piracy encryption system used to make SACD discs, studios and mastering houses are unable to provide one-off listening copies for clients. I don't know about you, but I'd be a little bit nervous about using a system where the first time you hear whether the mastering is right or not is when 10,000 discs come back from the pressing plant!

It's interesting to find out what the manufacturers of outboard equipment feel about surround, because I've spoken to

quite a few of them in the quest for an affordable surround monitor control box (effectively a 5.1 volume control). When I asked one leading British company what their customers were asking for by way of surround equipment, I was told "They're not!" Certainly, the record companies don't seem to be falling over themselves to kick-start the surround audio revolution, as they seem to be archiving most surround mixes, rather than releasing them. Yet at the mastering seminar mentioned earlier, the consensus was that all serious professional studios had to be able to handle all flavours of surround, and one of the panel (who also represented a major loudspeaker manufacturer) implied that the change to 7.1 was imminent, so we might as well gear up for that in the first place! You may dismiss this as a cynical ploy to sell more speakers, but a more serious concern is that surround mastering takes far longer than stereo CD mastering, and so can be very expensive. For example, a typical surround album project at 24-bit/96kHz could start out with several tens of Gigabytes of source files, and because surround discs can also include text and multimedia elements, all these need to be available and individually verified before any mastering work can take place.

I guess the point of these observations is that if we are going to get behind surround sound and help drive the industry to its next level, we're going to need the right tools at the right price. So far, everything seems to involve either serious compromise or great expense, and while that might be fine for the relatively few facilities that are still managing to survive in the professional marketplace, it won't cut it at project-studio level. And if I understand today's market correctly, that's where the majority of the cash is changing hands. **SOS**

**Paul White** *Editor*

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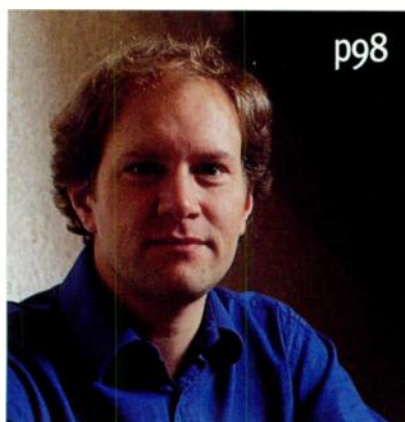
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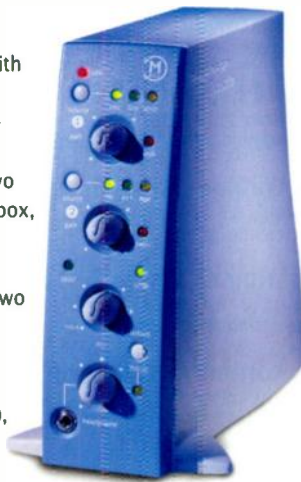
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## Digidesign Mbox audio interface with Focusrite mic preamps in plug-n-play solution

**C**oupling a high quality mic preamp with a soundcard is a common way for computer-based musicians to get the optimum quality of signal into their audio sequencing environment. But why have two boxes when Digidesign's latest release, Mbox, will do the entire job for you? Offering a "pristine 24-bit signal path from input to output", Mbox (£445 MSRP) incorporates two analogue inputs/outputs equipped with Focusrite mic preamps, plus 24-bit stereo S/PDIF digital out and two analogue TRS inserts (for routing to external processors), all in a rather fetching blue case. Mbox, which is powered from the USB connection, offers 48V phantom power for microphones, and is equipped with two gain controls and peak LED metering. The headphone out has a dedicated volume control and zero-latency monitoring is assured. Bundled with Mbox is *Pro Tools Le* for a full plug-n-play recording solution.



**W** [www.digidesign.com/mbox](http://www.digidesign.com/mbox)

## VST System Link: new Steinberg technology links multiple computers for greater power

**J**ust as this issue went to press, intriguing news reached us from Steinberg about a music networking technology they are calling VST System Link. Details are sketchy, but it's claimed that "a simple digital audio cable" is used to connect two or more computers together, effectively allowing the CPU resources, memory and hard drive space of several (legacy) computers to be pooled in one system. You might, for instance, use one machine for multitrack audio recording, a second for VST effects plug-ins, a third for virtual instruments, and even a

fourth for video editing: Steinberg say that there is no limit on the number of machines that can be connected. What's more, System Link apparently permits Macs and PCs to be connected freely, allows multiple users to work simultaneously on the machines within a linked network, and works with both *Cubase VST* and *Nuendo*. System Link is planned for release in the first quarter of 2002, and if it works as advertised, should prove very interesting indeed. So don't throw away that old computer just yet!

**W** [www.steinberg.net](http://www.steinberg.net)

## MOTU 896 audio interface offers Firewire plus 96kHz sample rate

**M**ark Of The Unicorn's range of audio interfaces grew by one at the recent AES show in New York, with the launch of the Firewire-equipped 896. Besides its Firewire interface, which does away with the need for a PCI card in the host computer, a major selling point is that the 896 operates at 96kHz. Otherwise, it offers a similar feature set to previous MOTU audio devices. A total of 18 channels of audio I/O is provided, configured as eight channels of 24-bit analogue, eight channels of ADAT digital and two channels of AES-EBU digital; word clock and nine-pin ADAT sync connections are also provided. The analogue inputs are configured as eight mic preamps (with Neutrik XLR/TRS combi-jacks), each with individually switchable phantom power and trim controls. More I/O can be added by daisy-chaining up to four 896 units, making a total of 72 bi-directional audio channels. MOTU's 'CueMix Plus' no-latency monitoring of live input (with separate front-panel-monitored input-signal volume control) is implemented on the 896. Control-room monitors can be interfaced with the 896's ALR monitor outputs.

The 896 is supplied with a complete set of drivers for use with all the major audio packages on both Mac and PC, though the package also includes MOTU's *AudioDesk* multitrack audio recording package (for Mac only).



And that's not all from MOTU: we ran a review of version 3 of their flagship *Digital Performer* MIDI + Audio sequencing software in November of last year, and there's already been a v3.1 update. All aspects of the program have been beefed up even further, with particularly notable new features including unlimited multiple Undo with history window and branching Undo histories, built-in waveform editing of surround audio files, lots of extra keyboard shortcuts, and enhanced MIDI quantisation.

In addition, *Digital Performer* v3.1 now features *Acid*-like loop-based music tools for both audio and MIDI data, and the ability to audition and import REX 2.0 files generated by Propellerhead's

*Recycle* v2.0 loop-editing software. Once imported, the loops easily expand and contract to conform to *DP* tempo changes. There are plenty of new film and video post-production features, too, and *DP* v3.1 can now play back digital video via Firewire.

*DP* v3.1 will be available soon, if it's not out by the time you read this, and will be a free update for all v3 owners.

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## New Midiman controllers released

**A**t present, we're still waiting for Midiman's intriguing USB-equipped Surface One 'virtual control surface' for MIDI and virtual instruments, announced at trade shows early in 2001. If we're lucky, it may have shown up by the time this news is in print. However, the company *have* released the Oxygen 8, a cute miniature controller keyboard with eight assignable MIDI control knobs and a price of just £119 including VAT. This portable keyboard is



equipped with 25 keys — just over two octaves — plus pitch-bend and mod wheels, and one assignable slider. It interfaces with computers via USB, and also functions as a simple one-in/one-out MIDI interface. Power for the Oxygen 8 can come from the USB connection, six AA batteries, or

the bundled mains PSU.

The imminent Surface One features 16 knobs, eight buttons and eight fibre optic-equipped pressure- and direction-sensitive strips, all of which are configurable to

transmit the MIDI data you require, to software or real-world synths, virtual mixers, or any MIDI-equipped device. Midiman even note that the Surface One could be used as an input device for graphics and animation software. For use

with a computer, Surface 8 connects via USB, and in this mode behaves as a two-in/two-out MIDI interface for your computer; it can also operate as a stand-alone controller for hardware MIDI instruments.

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## Tascam digital DJ desk offers sampling and effects



**T**ascam's digital mixing expertise has been passed down to their DJ products division, and squeezed into the new X9 four-channel DJ mixer. This digital device is equipped with 24-bit A-D converters on its four sets of analogue inputs. All have phono connectors and can operate at phono or line level, so turntables, cassette decks and the analogue outs of CD players can be accommodated. If your CD player has a digital out, the X9 can handle this too, via its digital inputs. A balanced mic input is provided, as are balanced and unbalanced analogue outs, while a digital output lets you make direct digital recordings of your work.

The X9 also features dual samplers, with looping and reverse playback, plus pitch and level control. Also specified are recallable three-band sweep EQ (with 100 programs) and two effects processors. The latter offer reverb, delay, echo, flanging, auto-panning, pitch control and more, and are assignable to all input channels and samples. A wide range of routing, fader control and monitoring options is provided, to suit a variety of DJ applications: these include pre-master 'booth monitor' control with independent level adjustment, adjustable fader curve, fader reverse and adjustable crossfader curve. Two assignable footswitches provide control over mix functions while your hands are otherwise occupied.

Also new from Tascam is the CDRW402 dual CD Recorder/Duplicator. Simply put, the machine combines a CD player and CD recorder/rewriter in a 3U rack package, complete with wired remote — and you don't have to stick with the blank CDs dedicated to music use, as ordinary computer blanks can be used. Other 'pro' features include digital gain control for adjusting levels from the playback CD to the record CD, pitch control, digital fade, a scrub function to allow cue points to be set up with single-frame accuracy, and two locate points. The normal range of CD playback options is provided, and the rear panel allows for almost any connection eventuality: analogue audio can be piped in and out via phono sockets or balanced XLR connectors, and digital is represented by both phono and optical connectors.

**T** Tascam UK Brochure Hotline  
+44 (0)1923 438888.  
**W** [www.tascam.co.uk](http://www.tascam.co.uk)

## Unity 3 shrouded in mystery...

It's all surrounded in mystery at the moment, but Bitheadz have been dropping big hints about a forthcoming product, a piece of software to be called *Unity 3*. The hints seem to indicate that the software will be more than a straightforward v3 upgrade to their existing *Unity DS1* sampling package, instead morphing into more of a general-purpose digital music studio. New features that have been revealed include the ability to play samples from RAM while at the same time streaming samples from hard disk, getting around computer RAM limitations. In addition, *Unity* Programs and Banks can be loaded on the fly from a new Banks Management window, and Banks will not have to be located in a main folder, but can be accessed from anywhere — including removable media — during a session. Effects routing will be enhanced, and a new range of effects and synthesis plug-ins introduced. The new program seems to merge elements of *Unity DS1* with the analogue synth emulator *Retro ASI*, and patches from both

programs will be splittable and layerable in a new kind of performance, called an Instrument. Samples from Bitheadz' *Phrazer* loop composition software can also be imported, and exported, without the need for conversion. Compatibility with sequencing software will be enhanced, with the option of working in MAS, VST, RTAS or DirectConnect environments offered. Mac users will also be pleased to see compatibility with Mac OS X.

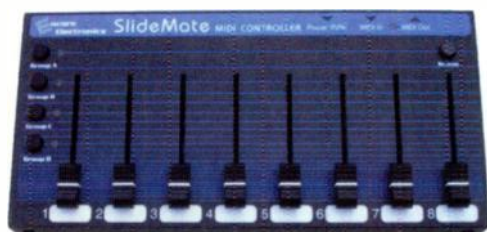
Incidentally, *Phrazer* (reviewed *SOS* April 2001) is currently standing at v1.02. New features include QuickTime movie support, improved tempo calculation for setting tempo based on sample length, Roland PC300 USB MIDI keyboard support, *Acid 2.0*-format support, and improved FreeMIDI synchronisation. The update is downloadable from the Bitheadz web site.

**T** Unity Audio +44 (0)1440 785843.  
**F** +44 (0)1440 785845.  
**W** [www.unityaudio.co.uk](http://www.unityaudio.co.uk)  
**W** [www.bitheadz.com](http://www.bitheadz.com)



## Compact SlideMate provides access to 120 controllers

**W**e've never had so much choice when it comes to hardware MIDI controllers, from simple devices with a few knobs to heavyweight products with 16 faders and more. Somewhere in the middle of the market you'll find Encore Electronics' US\$249 SlideMate, an eight-fader device with a handful of buttons that allow these faders to be switched in 15 banks, allowing fairly quick access to up to 120 fader/controller pairings.



Each fader can, as expected, be assigned to any MIDI channel and can be programmed (from a Mac or Windows application) to generate SysEx data, Continuous

Controller information or NRPN/NPN messages. The SlideMate makes a good companion to computer-based virtual synths and mixers, and can provide extra controls for hardware MIDI devices that are lacking in that department. Support for many devices is provided with the supplied editor application.

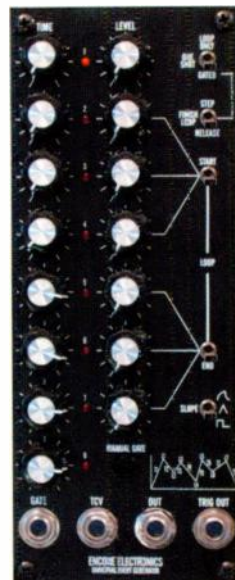
Encore also manufacture the Universal Event Generator, a module that, for US\$289, offers a variety of CV-based envelope,

LFO or step-sequencer functions. It's been designed to match Synthesis Technology's MOTM (Mother Of All Modulators) system — see [www.synthtech.com](http://www.synthtech.com) — but may well be compatible with other analogue modular synth systems. Eight stages are provided, with adjustable time and level for each stage, and each has an LED which is pulse-width modulated to indicate the relative voltage output for that stage. The envelope can be triggered in three ways (loop, one-shot or gated), and the output waveform can have one of three slopes — linear, log or step. Four quarter-inch jacks allow the UEG to be interfaced with other modules: these are a gate input, a 'time control' voltage input, a waveform (or CV) out, and a trigger out.

Encore still don't have any UK distribution, but they are able to supply direct to UK customers: contact them for shipping details. If you visit the Encore web site, you'll also find details of a number of European sources for their products.

**T** Encore Electronics +1 925 229 8875.

**W** [www.encoreelectronics.com](http://www.encoreelectronics.com)



## Nuendo firms up with hardware additions

**A** new addition to the family of hardware add-ons for Steinberg's *Nuendo* 'media production system' has been announced. Mounted in a 1U rackmounting package, the DD8 is a universal format converter offering conversion between ADAT, TDIF and AES-EBU digital signals. Eight channels of AES-EBU I/O can be accommodated, making the DD8 suitable as an AES-EBU front end for *Nuendo* users who require the facility. The unit also offers 24-bit sample-rate conversion, and functions as a digital patchbay and digital signal splitter. Other features include Intelligent Clock Control (ICC), SyncCheck, SyncAlign, Bitclock PLL and active jitter reduction. All of the *Nuendo* DD8's digital I/Os support 24-bit audio at rates from 44.1kHz to 96kHz.

And now to a new range of cross-platform *Nuendo* hardware which has been designed to allow the user to freely configure a system for desktop or laptop use, with a choice of digital and analogue connectivity. Audiolink 96, as the family is known, is a 24-bit multi-channel system that, not surprisingly, offers a

sampling rate of up to 96kHz. The first choice of component is determined by whether you require desktop or mobile use. For the former, you'd select the Audiolink 96 PCI, a host card that fits inside your computer. Laptop users would select the Audiolink 96 Mobile, a PCMCIA Type II card; this option apparently offers exactly the



same basic performance on a notebook that you would expect from a PCI card in a desktop. Whatever your choice, it uses a Firewire connector to interface with one of two breakout boxes. Of these, the Audiolink

96 Multiset provides eight analogue ins and outs, on balanced connectors with 24-bit/96kHz converters. It's also equipped with an ADAT I/O pair, S/PDIF I/O, an ADAT sync connector, word clock I/O, a headphone socket (which can also be used to feed control-room monitors), and MIDI I/O.

The Audiolink 96 Digiset is 100 percent digital and is equipped with three ADAT optical I/O pairs, ADAT Sync, S/PDIF I/O and word clock I/O, plus two sets of MIDI I/O. The one concession to analogue is in the dual headphone/line out connector, as featured on the Multiset. Further breakout boxes are planned, but currently the last member of the Audiolink family is the *TotalMix* audio routing software, which comes with any combination of Audiolink 96 interface card and I/O box. It can be used for real-time monitoring, mixing and submixing, as well as rerouting audio from external computers or other audio devices such as mixers, synthesizers and outboard effect equipment.

**T** Arbitr Music Technology +44 (0)20 8970 1909.

**F** +44 (0)20 8202 7076.

**W** [www.nuendo.com](http://www.nuendo.com)



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## AKG's blast from the recent past

It shouldn't be surprising that a mic manufacturer with AKG's history should be looking to their past classics for inspiration in their new mic designs. Such is the case with the new C451B, which offers a transducer design identical to that of their best-selling C451, AKG's first mass-produced transistorised mic. This mic was launched in 1969 but stayed in the catalogue in various forms until quite recently. The new mic offers the desirable sound of the original, but aims to eliminate its mechanical and electronic weak spots. For example, the transducer capsule is now permanently fixed to the body, in order to eliminate the mechanical drawbacks of the original's modular design. To the same end, the original screw-in pre-attenuation pads between the capsule and preamp have been replaced with a built-in 10dB/20dB pad switch. The new C451B also provides a switchable high-pass filter at 75Hz or 150Hz. An all-metal body provides protection from RF interference, and the mic is claimed to be rugged enough to give good results even under harsh conditions. It will operate on phantom power of between 12V and 48V, though an optional battery power-supply is available.



The other new launch from AKG, the C900, is a brand-new mic, a vocal condenser in AKG's Emotion Series, which otherwise consists of dynamic mics. The C900's transducer case is 24-carat gold plated, for corrosion and humidity protection, and the entire transducer element is mounted in a special elastic ring. Overall, the mic has been designed to be insensitive to handling noise, making handheld use a possibility.

**T** Arbiter Group +44 (0) 20 8970 1910.  
**F** +44 (0)20 8202 7076.  
**W** www.arbitergroup.com  
**W** www.akg-acoustics.com

## Analysar takes a close look at digital audio streams

A new device from Audio Digital Technology, the SDA11 serial digital analyser, has been designed to be a digital 'Swiss Army knife' for anyone working with digital audio. It's equipped with S/PDIF and AES-EBU ins and out, and provides a visual indication of a digital stream's sample rate, line errors and channel status. Three BNC output connectors can be interfaced to an oscilloscope to allow further investigation of data word length and jitter; word clock output is also possible from the incoming AES-S/PDIF signal. The SDA11 is battery powered, will accept sample rates of up to 96KHz at 24-bit, and will allow monitoring, via headphones or internal speaker, of the incoming AES-EBU or S/PDIF signal. For cases requiring a quick fix, the analyser can even be used to edit and re-transmit the channel status bits that can cause problems in communication.



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## Storm virtual studio in significant update

The v1.5.1 update for Arturia's *Storm* software studio, which we hinted at a couple of months ago, has been released; it's a free download, for registered users, from Arturia's web site. We reviewed the software back in October 2001, and one of the few negative comments we had about the software was the way in which the otherwise useful *Kepler* chord-change sequencing module couldn't be disengaged from the program. This oversight has been cleared up: it's now possible to disconnect *Kepler* from any or all modules in your *Storm* studio, so you're free to create melodic material without having it changed by *Kepler*. It's also now possible to erase all a module's patterns in one go — current users of *Storm* will be aware that modules come filled with factory patterns, a potentially useful feature for newcomers, but that each pattern formerly had to be initialised individually



before new patterns could be written.

Other enhancements include a rewritten audio engine: it's now possible to change audio and MIDI drivers without having to

return to the 'Studio Builder' screen, and individual outputs from the software can now be freely routed to your audio hardware's outputs, if available. The sequencer has been tweaked (pattern changes can be viewed and tags added to song sections), VST operation has been improved (and tested with *Cubase VST v5* and *Emagic's Logic Audio v4.7* on both Mac and PC), MIDI control has been added to the drum machines, and audio export is now reported to be faster, with a choice of compression rates when creating MP3 files. Windows

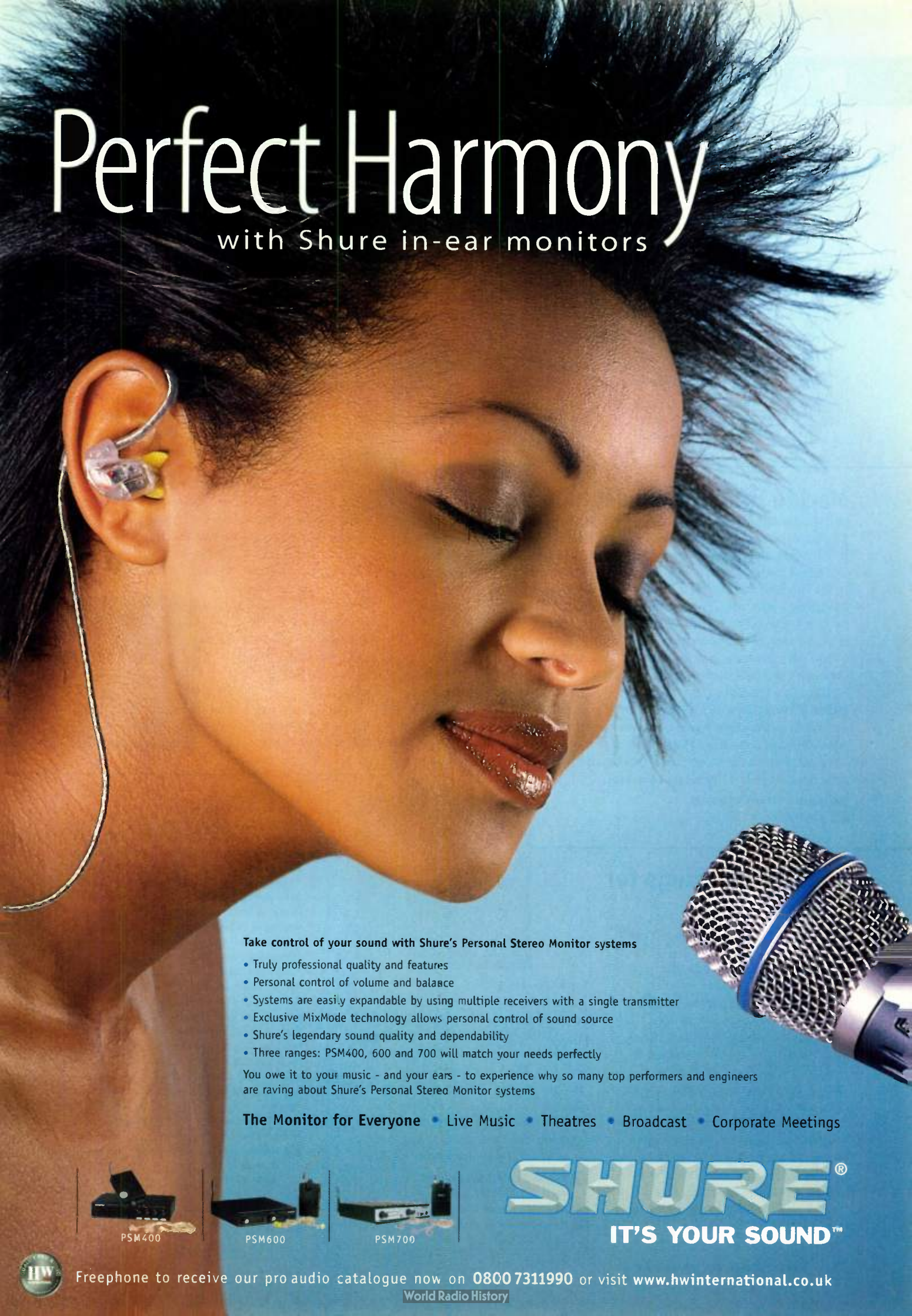
XP support for PC users has also been added. In addition, minor bug-fixes are reported, and the latest effects (vocoder and compressor) are included in the studio, so you don't have to download them separately.

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**W** www.turnkey.uk.com  
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## Soundelux recreate '50s favourite

**S**oundelux's Tube 47 ranks amongst the classic valve-based mics of the 1950s, and consequently is as hard to find (and expensive, when an example turns up) as others of that generation. The good news, then, is that the mic is making an appearance in the 21st century, as the Soundelux E47. The aim in reissuing this mic has been to emulate the desirable sonic signature of the vintage model while offering a lower noise floor, improved reliability, lower maintenance and a three-year warranty. The E47 is a variable-pattern mic perhaps best-suited to vocal and instrument applications, and joins other classic reissues in the Soundelux range.

**W** ASAP Europe +44 (0)20 7231 9661.  
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**T** www.asapeurope.com

## Mackie HR624 compact monitors

**M**ackie's established HR824 active monitor has been joined by a smaller sibling: the two-way, bi-amplified HR624. The new monitor is powered by the same amplification as the 824, providing 100W to the LF driver and 40W to the HF unit. Indeed, the HR624 also features the 824's HF transducer, cast-zinc waveguide and an integrated rear-firing passive radiator (to enhance bass response, down to 49Hz). The LF driver is a 170mm device, and both HF and LF drivers are magnetically shielded. Mackie claim a flat frequency response for the HR624, and see it being used in small studios, or as components of a surround monitoring system.

In order to build a complete Mackie surround system, you'd need a subwoofer, and coincidentally, that's just what Mackie have released. The HRS120 is a 400W active subwoofer, and is designed to complement either the HR824 or HR624, or any multi-channel monitoring system that requires a dedicated low-frequency channel. The new sub offers bass response down to at least 19Hz, and features a 305mm RCF Precision LF transducer with a four-inch voice coil and cast aluminium frame. Low-bass output is enhanced by an acoustically coupled 12-inch passive radiator.

**T** Mackie UK +44 (0) 1268 571212.  
**W** www.mackie.com

## Orchestral strings for Reason users

**P**ropellerhead's first big Refill package for their Reason virtual studio is, against all expectations, dedicated to orchestral strings. A Refill, as Reason users will know, is a custom studio configuration of samples and patches that any Reason user can load. Strings, as the collection has been dubbed, retails for £59, is available for Mac and PC versions of Reason, and shows off the fruits of two weeks of sampling 23 musicians at the Documentary Studio in Moscow. The results are divided into solo and ensemble 'patches' which can be loaded into the NN19 sample player, along with a big collection of Recycled phrases, for use in Reason's Dr REX loop module. REX-format loops can, of course, have their tempo and pitch changed to match a Reason song with few artefacts, and be

rearranged in real time.

The REX material is organised as 35 orchestral loops, 40 string quartet loops, 80 solo violin loops, 40 solo viola loops, 40 solo cello loops, 48 upright bass loops, and five harp loops. The NN19 instrument patch collection includes solo, ensemble tremolo, pizzicato and ensemble pizzicato variations for violin, viola, cello and bass, plus a cello/viola/violin ensemble and harp. Demos are available on the Propellerhead web site.

**T** Midiman UK +44 (0)871 717 7100.  
+44 (0)871 717 7101.  
**W** www.midiman.co.uk  
**W** www.propellerheads.se



## Steinberg's grand designs on the piano

**T**he latest virtual instrument to come from Steinberg is *The Grand*. Not surprisingly, this virtual concert acoustic piano simulation will integrate with any VST-compatible software environment, such as Steinberg's own Cubase VST family. The instrument was created in conjunction with Wizoo by sampling an acoustic grand and making sure that all sonic elements of the real thing were present: dynamic response, hammer action and string resonance, for example. The plug-in offers use of sustain and *sostenuto* pedals, along with customisable velocity curves.

Steinberg have also released a money-saving software bundle, for Mac or PC users: the *VST Edition* brings together a copy of the latest Cubase VST and HALion, the company's sampling VST instrument. Version 1.1 of HALion is bundled, offering import options for samples in Giga, Akai, Emu, WAV, AIFF, REX, SF2 and SDII (Mac only) formats. The *VST Edition* will retail for £399.99 including VAT, a saving of £100 over buying these items individually.

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+44 (0)20 8202 1199.  
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**W** www.steinberguk.com



## Windmill Lane: Business As Usual

Contrary to the article 'The Irish Connection' in the December Issue, we wish to make it clear that Dublin's Windmill Lane Recording Studio has not been sold to Biffco Productions and indeed is not for sale. The confusion may have been caused by Biffco renting studio space within the Windmill Lane complex. In fact, Windmill Lane is still very much open for business and happily accepting bookings as usual, under the continued ownership of Head Engineers Brian Masterson and Andrew Boland. They have recently completed the score for Neil Jordan's upcoming film *Double Down*. "This adds composer Elliot Goldenthal to an already long list, including Elmer Bernstein, Gabriel Yared and Carter Burwell", says Catherine Rutter, Studio Manager. Recent albums recorded in Windmill Lane Studios include REM, U2, The Cranberries, Westlife, Secret Garden and the eagerly awaited new solo album from Elvis Costello. Richard Cocciant, composer of *Notre Dame de Paris* is the current visitor to Windmill's Internationally renowned Neve Room, Studio One.

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## Four-channel audio interfacing for mobile computer musicians

**D**igigram's latest digital audio interface for laptops is the four-channel VXpocket 440. To be able to use the 440, your laptop needs a PCMCIA card slot, into which the card-format 440 fits, while a breakout cable provides all the connectivity. The cable is configured with four balanced analogue mic/line-level ins and four balanced analogue outs, all on XLR connectors, plus S/PDIF digital I/O and a connector for LTC (SMPTE) timecode input. There's even a mini-jack headphone socket. The 440 is compatible with Microsoft's WAVE protocol on PCs, and ASIO on both PCs and Macs, running at 24-bit. Sixteen-bit

performance is available with Apple's Sound Manager.

Meanwhile, the 440's stereo-only predecessor, the VXpocket, has been upgraded, to v2 status. A headphone socket has been incorporated into its new breakout cable, and the card comes bundled with Stage Research's *SFX* sound effects application. To recap on the spec, the VXpocket v2 has two balanced analogue mono inputs at mic/line level, and two balanced analogue outputs.

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## Modelled mic preamp from Dbx

**N**ot only does the new Dbx ProVocal Digital Vocal Strip offer a range of physically modelled microphone and preamp options, but the 1U rackmounting processor is equipped, as the name might suggest, with a 24-bit, 44.1/48kHz S/PDIF digital output. Augmenting the 18 mic and 10

preamp models are a compressor and de-esser, and effects treatments including chorus, flanger, delay, parametric EQ and reverb. The whole lot is under MIDI control and features a clearly labelled front panel, which also hosts phantom-powered XLR mic and jack instrument inputs. In addition, there's a balanced line input

jack on the rear, plus XLR and balanced line jack outputs. The recommended retail price is £479.95 including VAT.

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**W** www.arbitergroup.com  
**W** www.dbxpro.com

## On-line support available for registered Emagic users

It's already possible to get email and telephone support for Emagic's music software, but now the company have introduced the so-called 'InfoWeb' as a third option for getting help with technical problems. Registered customers can have round-the-clock access to a comprehensive database, filled with first-hand expert information — Emagic claim that you'll be able to find answers to almost every question about their products.

**W** www.emagic.de/english/support/infoweb/index.html

## New multicore cable from Piranha

Piranha Cables have expanded their range of pro audio products to include a range of multicore cables. The range is available in four, eight and 16 pairs, each one individually shielded with aluminium foil and individually jacketed within a strong, flexible outer PVC sleeve. Identification is aided by printed numbers running the entire length of inner cables. The multicore can be supplied as loose cables in any length, or made up to your spec using Neutrik stageboxes and Neutrik connectors.

**T** +44 (0)1435 868186.  
**W** www.piranhacables.co.uk

## TDK launch range of memory cards

Blank recording-media specialists TDK have launched a range of SmartMedia and CompactFlash memory cards, for use with digital cameras, Personal Digital Assistants, MP3 players, and so on — and many current synths and samplers. The range offers low power consumption, with 16, 32, 64 and 128Mb capacities in the SmartMedia format, and 32, 64, 128 and 256Mb CompactFlash cards.

**W** www.tdk-europe.com



## Free VST shell for Recycled loops

**B**itshift Audio is a new name to us, but they're presenting an interesting take on the VST Instrument format. Their *PhatMatik* allows users of VST 2.0-compatible software to play back the REX-format samples generated by Propellerhead's *Recycle* loop-manipulation software. With this combination, users can now put together loop-based productions directly in their digital audio workstation of choice, without having to switch between several different programs for loop production, MIDI and audio. Bitshift claim that *PhatMatik* is the first VST instrument that can extract the 'groove' information from a REX file and export it as a Standard MIDI File, allowing users to reconstruct the original groove in their MIDI-capable VST host without a REX authoring tool. Additionally, the plug-in provides the user with standard sample-manipulation tools such as ADSR amplitude envelope and two-pole resonant low-pass/high-pass filter. If you're not able to create your own REX files, you could access third-party commercial or free examples; Bitshift themselves will be posting a regularly updated selection on their web site.

Currently, *PhatMatik* is Windows-only, although a Mac version is being developed. And the best news is that the plug-in is downloadable for free!

**W** www.bitshiftaudio.com





## TC Works back Mac OS X with budget software

**M**ac OS X is increasingly being supported by developers of audio software, and TC Works are at the head of the pack. Their *Spark LE* real-time audio-editing application is now available for Mac OS X. The software is based on TC Works' flagship *Spark*, and comes with the same convenient browser view, with easy access to the project database, wave editor and playlist from one window. Sample rates of up to 192kHz can be handled, as can bit rates of up to 32-bit. The software comes with a collection of processing plug-ins, four of which can be used simultaneously, which includes an audio maximiser, a tempo delay, and a variety of EQs. Compatibility with VST-format plug-ins mean that more can be added, from commercial developers or free off the Internet. Audio editing can be non-destructive, and it's possible to create playlists, in Roxio's *Toast* format, including crossfades, for CD burning. QuickTime Movie support is offered, all major audio file formats are supported, and audio can be exported as MP3. *Spark LE* is available as a US\$49.95 download, but if even 50 dollars is too much, check out TC Works' free application *Spark ME*. This offers many of *Spark*'s editing facilities, *Toast* playlist export, QuickTime compatibility, and VST plug-in support.

**W** [www.tcworks.de](http://www.tcworks.de)

## Should musicians learn the 'pop music' way?

**D**r Lucy Green of the Institute of Education at the University of London thinks that music teachers should encourage their pupils to learn the way 'pop' musicians do. She has reached this conclusion following interviews with, and studies of, 14 pop musicians of varying ages, published as *How Popular Musicians Learn: A Way Ahead for Music Education*, published by Ashgate Press. She contrasts how self-taught musicians learn to play, improvise and compose (by initially copying favourite recordings and watching and imitating other musicians) with traditional classroom teaching, with its emphasis on notation, scales, correct position and regular enforced practice. The self-taught may play and practice more, because they really want to. Dr Green wants to encourage teachers to train their pupils' ears rather than their eyes, and place more emphasis on imitating real music rather than following instructions. Further, she notes that the self-taught easily adapt to conventional techniques later, after they have developed a relationship with music and their instrument. The book costs £32.50, and is available from the IOE bookshop, and SOS.

**T** Institute of Education Bookshop +44 (0)20 7612 6050.

**W** [www.ioe.ac.uk/media](http://www.ioe.ac.uk/media)

## Colne Community College launch arts and technology centre

**H**eavenly Media Services (formerly Heavenly Music) have announced the official launch of the Creative Arts and Technologies Training Centre at Colne Community College in Colchester, Essex. Heavenly have been running their 'Media Tech boot camps' for some time, and attendees have included school and college Music Technology department heads. The new centre will be an extension of this, at the College's fully equipped facility. Classes will be limited to six per group, and courses on offer include six-week beginner courses, one-day intensive training for intermediates, and teacher training for NOF and ICT educational requirements. Items used in training include Steinberg *Cubase VST*, *Wavelab* and *HALion*, M Audio sound cards, Yamaha and Edirol tone modules, various mixers and microphones. Workshops will be held on Saturdays between 9.30am and 5pm. Further Heavenly services include music technology system audits and consultancy, and the supply, installation and maintenance of music technology workstations, operating systems and software.

**T** Heavenly Media Services +44 (0)1255 821039.

**F** +44(0)870 831 5868.

**W** [www.heavenlymediaservices.com](http://www.heavenlymediaservices.com)

## Northbrook College buy AT mics

**T**he music technology department of the south coast's Northbrook College recently purchased 15 Audio Technica microphones. The college, which has sites and satellites in Worthing, Shoreham-by-Sea, Horsham, Brighton, Littlehampton and Bognor Regis, runs a series of higher education courses including a BTEC National Diploma in Popular Music and a National Diploma in Radio Presentation/Broadcast.

**W** [www.northbrook.ac.uk](http://www.northbrook.ac.uk)

**T** Audio Technica +44 (0)113 277 1441.

**W** [www.audio-technica.co.uk](http://www.audio-technica.co.uk)

## Upgraded music tech department available to blind and sighted students

**B**y the time you read this, the Royal National College for the Blind in Hereford will have launched their enhanced music technology department. It's a rather well-equipped multi-studio complex, developed and run in conjunction with Herefordshire College of Technology, where students from all over the UK and Ireland can work towards a BTEC National Diploma in Music Technology. To be brief, there are six studios, two post-production suites, 20 digital digital audio workstations, four portable workstations, and live performance facilities. Equipment to be found in the studios includes Tascam DA-series multitracks, Allen & Heath mixers, a Mackie D8b mixer and HDR24/96 digital multitrack, a Soundscape digital recording/editing system, Akai S5000 sampler, Steinberg *Cubase VST v5.1* and *Cakewalk* sequencing software, and more.

Though the majority of the department's students are blind or visually impaired, the recent development of the department has seen it open to sighted students. Their BTEC takes two years, generally starting in September, though the college is planning to offer rolling starts. The course, which expects entrants to generally have some prior experience in music or sound recording, aims to balance the practical and theoretical sides of the recording process, with the bulk of the course taking place in the studio environment.

**T** Royal National College for the Blind +44 (0)1432 265725.

**F** +44 (0)1432 353478.

**W** [www.rncb.ac.uk](http://www.rncb.ac.uk)





## An OASYS of free plug-ins!

**D**an Philips is a Korg R&D product manager who you may remember from the review of the OASYS PCI card (see SOS April 2000 or [www.sound-on-sound.com/sos/apr00/articles/korgoasys.htm](http://www.sound-on-sound.com/sos/apr00/articles/korgoasys.htm)). He's worked on the Wavestation and OASYS PCI, and is now also responsible for a collection of free plug-ins for the OASYS. The cross-platform suite consists of three plug-ins. First up, *O-Code* offers a pair of dual-mono input/stereo-out vocoders, one with 12 and the other with 16 bands. Both feature built-in noise generators, parametric EQ dedicated to the modulator input, continuously variable frequency and bandwidth for each modulator and carrier band, a variable-frequency high-pass band, and separate outputs for even and odd bands.

Just released are *O-Mod* and *Bit Bucket*. The six effects offered by *O-Mod* include combinations of modulatable eight-second delays, comb filters, multi-mode filters, high-pass/low-pass filters, pitch-shifters, complex LFOs, flexible routing, and MIDI synchronisation. Presets are supplied which show off what the combinations are capable of, including endless pitch-shift feedback loops, highly processed rhythmic multi-tap delays, and rich, swirling choruses.

The sound-mangling *Bit Bucket* offers compression, bit reduction, modulatable sample-rate reduction, and complex-tempo LFOs: as Dan says: "If you're looking for clean and smooth, look elsewhere!"

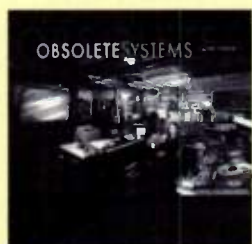
**W** [www.danphilips.com/oasys.htm](http://www.danphilips.com/oasys.htm)

## Retrospective e-music CD from Laurie Spiegel

New York-based electronic music artist Laurie Spiegel has filled SOS Atari Notes column inches in the past, due to the Atari version of her *Music Mouse* software instrument controller (also available for Mac). In her career, she's worked with many different hard- and software synthesis and electronic manipulation systems, but it's not always easy to hear the results. Happily, a retrospective CD of Laurie's works, entitled *Obsolete Systems*, has been released on the EMF label. Material ranges from 1970 to the mid-'80s, and synth anoraks will welcome the chance to hear the McLivier computer-controlled analogue synthesis system in action: Laurie is particularly adept with this instrument, and actually took over development of its software at one point. OS costs US\$16, plus postage.

**W** [www.emfmedia.org](http://www.emfmedia.org)

**W** [http://retlary.org/ls/obsolete\\_systems/](http://retlary.org/ls/obsolete_systems/)



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6/7 Mixers & Recording  
8/9 Outboard  
10 Monitors/Amps  
11 Headphones & Mics

Also see our 8 page brochure in this magazine  
1 Samplers  
23 Samplers & Accessories  
45 Sound Modules  
6/7 Keyboards  
8 Accessories

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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).

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

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## THE MUSEUM



Buy an ESI and we'll give you free time to grab sounds from our huge working analog museum (See Loopstation flyer for full details)

Turnkey continue to be the only realistic choice for Emu samplers with this incredible deal on the superb ESI2000, with 10 free CD ROMs in the box, plus an optional prefitted turbo expansion giving 10 outputs, S/PDIF digital i/o and 2x 24 bit FX processors!

The ESI2000 brings Emu sampling power and high spec to entry level prices. SCSI is fitted for external CD-ROM drives, computers or Iomega Zip and Jaz drives. For the ultimate convenience, you can retrofit an internal Zip drive in place of the floppy and Emu have a Turbo Zip Kit available

for this purpose. Memory can be expanded up to 128MB, and the sampler as a whole is 64 voice polyphonic with 16 part multitimbrality. It includes time stretching, EQ, compression, exciter, and the ability to merge two sounds into one new sound by a digital convolution process.

Editing of samples is easily accomplished with full auto and manual truncation tools, looping, crossfades, normalisation, and standard copy, paste, delete, insert actions. Emu's famous 6 pole resonant filters (36dB/oct) are available for each voice with 19 different types.

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EMU might be famous for sound but the ESI also boasts unparalleled features and ease of use:

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## 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).

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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.

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# Turnkey Deal Guide

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Post Code: .....  
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18 simultaneous inputs and outputs on dedicated external hardware, including two high quality mic pre-amps. Ships with Pro Tools 5.1 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.

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Digidesign ProTools 24 MixPlus, Apple G4/733 with 256MB RAM, 40Gb internal drive, Apple Studio 17 inch LCD monitor, CDRW, Atto SCSI Accelerator card, Seagate Cheetah 18Gb fast and wide (SCSI3) drive, 888/24 interface, this offer includes the following plug-ins free from Digidesign: Drawmer Dynamics, Focusrite D2, iLok USB Smart Key, Pitch Doctor, Access Virus, Line 6 Echo Farm, DPP1

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**£POA**  
CONTROL 24

RRP £14929  
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MIX PLUS BUNDLE

### DIGI 001 COMPUTER STUDIO

Digidesign's Pro Tools systems have remained out of reach for most budget studios, but their stylish new 24bit interface 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 punch in/out footswitch. The bundled software is the new Pro Tools 5.1 LE offering 24 track audio editing with RealTime Audio Suite plug-ins and MIDI sequencing.

001 FACTORY BUNDLE ALSO AVAILABLE

### MT4 MIDI INTERFACE

The MT4 is a small, yet perfectly formed, MIDI interface from Emagic designed for any USB equipped laptop, Powerbook or desktop computer. Two independent inputs and 4 independent 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 Universal B.

### AMT8 USB MIDI INTERFACE

MIDI interface with 8 MIDI in sockets and 8 MIDI out sockets giving you 128 channels to and from any computer with a USB port and suitable application. The AMT8 also features Emagic's stamped MIDI timing for ultimate tightness with compatible programs, and also supports MIDI Time Code.

### EMI 2/6 USB AUDIO INTERFACE

Emagic's multichannel interface connects via your computer's USB terminal and offers 2 analogue inputs and 6 analogue outputs, housing the jack sockets and the 24 bit converter hardware in this cute translucent plastic breakout box. Supported sample rates are 44.1kHz and 48kHz and the device usually includes a digital I/O in S/PDIF coaxial format. Low latency operation with Emagic's drivers makes the EMI2/6 ideal for soft synths and multitracking.

### UNITOR 8 MkII USB MIDI INTERFACE

Keeping it in the family Emagic can also offer you a full MIDI and synchronisation service with their 19" rackmount Unitor 8 interface. Full integration into Logic, Gold or Platinum providing 8 MIDI in and 8 MIDI out, SMPTE and LTC sync. Single MIDI port on the front of the unit for easy access. The first choice for Logic users and performs so well that users of other software should also take an interest.

### MIDISPORT 2x2 MIDI INTERFACE

The introduction of the new Apple range of iMac and G3 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 mid interface. Simple to install - just plug it in - and it works like a dream. But it's not only the Apple Mac that has benefited, the Midisport ships with Windows drivers too.

### 2408 MkII AUDIO INTERFACE

A complete hard disk recording solution based around the 1U rack audio interface which provides 8 channels of inputs and outputs on both ADAT and TDM digital formats, and its own analogue I/O using 24 bit converters, with a bonus front panel headphone jack. The 2408 MkII hardware includes a PCI card to attach to the Mac or PC host which runs MIDOTA's provided AudioDesk software. This brings you a complete 24 track audio workstation platform, for recording, editing and mixing with dozens of real-time plug-in effects including PureDSP pitch shift and time-stretching.

### SAC-2K ASSIGNABLE CONTROLLER

A sleek hardware interface with a 100mm motorized touch sensitive faders, scrub wheel, transport controls and big 8 digit LED readout for location points. Three blocks of 2 line LCD displays can be used to name the 31 segment LED rotary pots, and several built in templates exist for Pro Tools, Logic and Cubase applications. Multiple tracks and buses may be automated simultaneously for EQ, sends and return levels, fader moves, pans, location points, reverb, compressors, markers and much more. The SAC-2K can also act as a complete programming console for nearly every synth on the market. Puts you in control of your whole studio setup!

### MIDEX 8 USB MIDI INTERFACE

Steinberg's latest 8 in 8 out MIDI interface is the 1U rack MIDEX 8, which provides 128 independent MIDI channels and features easy plug & play USB operation. Steinberg's unique LTB™ Linear Time Base communication protocol. LTB™ delivers to sub-millisecond accuracy exactly when a MIDI event should leave the MIDEX 8. The responsibility of the MIDEX 8 unit is to send the event at the right moment, free from any further intervention of the computer's operating system. Additional MIDI Thru feature and MIDI cable checker.

### CREAMWARE PULSAR 2

- Software MIDI • audio music workstation
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- ADAT and S/PDIF digital plus analogue phones
- Uses 4 Share DSP chipset
- Pulsar 2 Plus also available only £839.99

### MIDIMAN MAC MAN

- 1 in 3 out MIDI interface for Apple Macintosh
- Serial Thru and GeoPort compatible
- Self or external powered
- LED data indicators

### 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

### 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

### MOTU MIDI EXPRESS XT USB

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

### ROLAND UA-3

- External USB audio interface for PC
- 2 ch analogue I/O on phones with mic / line level switching
- S/PDIF optical digital I/O
- 16 bit 44.1kHz converters
- Built in headphones amplifier

### STEINBERG MIDEX 3

- USB MIDI interface with LTB technology
- 1 in 3 out gives 48 MIDI channels
- Less than 1ms maximum delay per MIDI event
- MIDI cable test function
- Cables included

### 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
- 6 Ch version also available only £199

### KENTON CONTROL FREAK LIVE

- Assignable MIDI hardware controller
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### ADAPTEC SCSI CARDS

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- Range covers SCSI 2, 3, 50 pin, 68 pin adapters
- Includes EasyCD Creator software & CDR drivers

### MARIAN USB1

- External USB audio interface for laptop, PC
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- 2 analogue output jacks
- Stereo out & optical in
- No external PSU need in
- Approx cassette box size

### MIDIMAN PORTMAN PC/P

- Parallel port MIDI interface
- simple MIDI layout
- Rugged build quality
- Ideal for laptops and desktops

### MIDIMAN MIDISPORT 4X4

- 4 in 4 out MIDI interface (64 channels I/O)
- USB interface, ideal for newer Macs
- Plug and play compatible with Windows
- MIDI Thru bypass function

### MOTU FAST-LANE

- 32 channel USB MIDI interface
- Hot swappable and expandable with a hub
- 100% compatible with OS9 and Mac OS
- Range of colours

### MOTU MTP AV USB

- Versatile USB MIDI patchbay / interface
- Timecode synchroniser
- MTC, SMPTE, ADAT
- Digital audio / video sync via composite

### ROLAND UA-5

- Two channel full duplex USB audio interface
- 24 bit 96kHz converters
- Balanced XLR / TRS line mic / guitar high Z jacks
- S/PDIF optical & coaxial
- 1U half rack size case

### YAMAHA UX256

- 256 channel MIDI interface for USB equipped PC/Mac
- 6x MIDI in & 6x MIDI out sockets • 96 channels
- 2x 20 host serial ports capable of 80 ch each
- 1U half rack size case

### KEYFAX PHATBOY

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

### STEINBERG HOUSTON CONTROLLER

- MIDI/USB control surface for Cubase and Nuendo
- 8 touch sensitive faders
- 8 rotary encoders with LED surrounds
- Access to virtual all audio engine parameters

### YAMAHA CRW2100

- External SCSI CDRW
- 16x write speed for CDR
- 40x rewriting speed
- Huge 5MB buffer memory
- SCSI-8 50 pin connector







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## THE INDUSTRY STANDARD

Steinberg have written the UK's best selling music software since you can remember. The current Cubase V5 platform is the industry standard for music production.

### CUBASE VST V5



Cubase V5 is a complete recording, effects and MIDI sequencing environment, with up to 72 channels of 16 or 24 bit 48kHz, with four insert effects and eight aux sends per channel plus 8 global & 4 master insert effects, MIDI auto-mation etc. VST real-time plug-ins have revolutionised music production.

Vast range of effects, synthesizers etc.

### CUBASE VST SCORE



All the power of Cubase VST 5.0 with the addition of full music notation and printing, and the corresponding power to play parts into score via MIDI keyboard, and have the score translated into a MIDI sequence or vice versa. For the more serious musicians, or those who are classically trained but new to computer music sequencing, seeing a full music score on the screen is far easier to work from when composing or arranging, than a mere sequencer event editor list or a primitive piano roll type display. With 24 bit recording, VST host architecture and industry wide support, Cubase Score is an all-in-one recording, processing, mixing, sequencing, scoring and printing music solution.

### NEW STORM VIRTUAL STUDIO V1.5



A revolutionary completely modular virtual studio. Storm gives you a whole rack of professional composition tools including analogue synths, twin decks for mixing and scratching, samplers, beat boxes and with new modules downloadable off the internet possibilities are endless. When it's all up with real time effects and you have a fully configurable virtual studio. Use it stand alone, or as a VST instrument. New version 1.5 allows up to 12 modules simultaneously & new polyphonic synth!

### NEW EVERPACK

New from DUT, authors of such renowned TDM plug-ins as DSPdr and Dad Valve, a plug-in bundle aimed at users of Mac native audio software. The Everpack provides an unrivalled package of FIVE plug-ins which can be used with Cubase VST, MOTU MAS, Dig 001 or any program which supports the AudioSuite or Premiere platforms. These tools will be invaluable for mixing or mastering within any of the above environments.

### LOGIC SILVER



Very affordable entry level Logic Silver 4.7 gives you 24 audio tracks and 21 built in effects, with the usual comfortable interface. Supports VST plug-ins, MIDI symbols and offers sequencing, printing and extensive MIDI programming features. Great value for money!

### LOGIC GOLD



Gold Gold Version 4.7 offers 64 audio tracks with 34 plug-ins included and most of the features of the Platinum edition including scorewriting, and support for VST plug-ins, several instruments such as ES1, EV988 or EX324 and the live input effect mixing.

### LOGIC PLATINUM



Audio / MIDI sequencing with scorewriting and soft synth support. Version 4.7 handles up to 128 audio tracks at 24 bit 96kHz and includes 40 high quality Emagic plug-ins. You can mixdown to 8 channels for surround sound applications. Full parameter automation and live input objects allow it to work as a live effects box for you. A popular industry standard.

**"I found the staff dedicated, thorough and commendably clear in their ability to communicate and assist in all matters required."**  
M.V. (London)

### CUBASE VST 32



Improving Cubase to match to power of today's professional audio workstations, Steinberg have added support for 32 bit audio files and processing and up to 128 simultaneous channels of audio. The professional MIDI and music notation capabilities are retained, and VST/32 also brings the very useful inclusion of Apogee UV22 encoding for your final 16 bit master.

so you don't have to leave the software domain. It also features Rocket network integration so you can connect on-line to other Rocket powered studios and transfer audio files and even full projects with ease across the whole world!

### PRODUCER PAC



Steinberg's Producer Package gives you the tremendous power of Cubase VST32 together with Wavelab 2, their stereo audio file editor for total sound manipulation, plus two fantastic plug-ins - the Steinberg FreeRiter which is a phase linear 30 band stereo graphic equaliser with RTA spectral analysis, learning mode to derive the difference

between any two EQ signatures by listening to the files, and crossfade morphing between curves. Also you get Waves Renaissance Compressor, an excellent well designed plug-in to emulate the classic LA opto-electric leveling amplifiers.

### REAKTOR



Unparalleled for pure sound creation using synthesis, sampling and effects processing. Combining the power of both Generator and Transformer in a single dazzling package the potential of Reaktor is inexhaustible. Build your synths powered by samples, cross format flows with oscillators and modulators.

### B4 SOFTWARE ORGAN



Native Instruments' software synth models the famous Humberston B3 tonewood organ, including its valve amplification and rotary speaker cabinet, with 5 drawbars for each manual keyboard and 6 for pedals. Parameters such as key click, percussion, harmonic feedback and loudness robbing add a realistic dimension to your chops.

### 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's 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.



**BATTERY SOFT SAMPLER**  
32 bit sampler for drums, including 10 kits and 54 instruments with 121 velocity layers, tuning, volume envelope, pitch envelopes, bit reduction, shaper, FX Loop and 6 modulation inputs per instrument. Standalone or plug-in operation.

### SPEKTRAL DELAY EFFECTS PLUG-IN



Native Instruments' unique VST plug-in splits the audio signal into 160 discrete frequency bands using FFT processing and can independently adjust delay time and feedback for each one. Great for extreme modulations of the phase response.



**TRAKTOR DJ PRODUCTION**  
Two players for CD or MP3 with playlist library, DJ mixer, beat matching, digital scratcher, waveform display, cue section and filters. All software control knob movements can be recorded and final mixdowns can be stored in a dedicated WAV format.

### FM7 FM SOFT SYNTHESIZER



Native Instruments' first produced a softsynth that recreates the sounds of the classic Yamaha DX series and TX series, and is able to read any of their program data. It adds extra distortion and filtering capabilities and a highly graphic user interface.



**ABSYNTH SOFT SYNTH**  
A more general purpose "abstract synth" plug-in to model subtractive synthesis, FM or ring modulation using a modular approach with numerous filters, waveshapers and effects as building blocks. Up to 8 oscillators, and graphic wave drawing.

### APPLIED ACOUSTICS TASSMAN

Software synth for both analogue and acoustic modelling.  
Build virtual instruments from accurately modelled acoustic objects such as plates, strings, beams, tubes, materials and needs all of various sizes and materials.

### CELEMONY MELODYNE

Pitch shifting and time stretching for Mac.  
Mouse dragging of individual notes, with real-time instantiating.  
EQ pitch rhythm like a sequencer.  
Retune vocals, remove vibrato, import melodies.

### EMAGIC ESB TDM

Emagic System Bridge allows full integration of your native Logic plug-ins and soft synths within Digidesign's TDM environment.  
Ideal for using the EXS24 sampler with TDM.

### EMAGIC EVP73

VST soft synth designed to recreate the classic tones of the Fender Rhodes Stage Piano Mk II.  
Authentic user interface and 73 note polyphony.  
Decay / release controls.

### EMAGIC EXS 24

24bit virtual sampler for Emagic's Logic range.  
32 voices per EXS24.  
Use up to 16 at one time.  
Full automation.  
Supports Akai, S01, AIFX and Wave formats.

### GMEDIA M-TRON

Soft synth VST instrument: recreation of the vintage Mellotron keyboard - the first ever "sampler" which played back tapes with recordings of each note.  
M-Tron has 28 different "notes" or "programs".  
Authentic user controls.

### PASSPORT MASTER TRACKS PRO

64 Track MIDI Sequencer.  
Import & Export Standard MIDI Files.  
Cut, copy & paste sections of music with little mouse click commands.  
Sync to multimedia, video, tape, and more.

### PROSONIQ STUDIO SOFTWARE

Audio editing and DSP processing host for Mac.  
Allows you to chain native SonicWorx realtime plug-ins with any third party VST plug-in effects.  
Comes with comp, limit, deconvol, RTA, EQ, phase alignment, reorganization tools and many more.

### 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.

### SIBELIUS DUAL

Dual platform for Mac or Windows.  
The following music notation application.  
Easy on page editing and MIDI integration for keyboard input.  
Real-time playback.  
Severals MIDI files.  
Huge comprehensive features but easy to use.

### BLACK & WHITES SOFTWARE PIANO MODULE

A piano module for the Computer.  
Full sample of 88 R.  
Steinway model D.  
Variations, reverb, effects & more!

### EMAGIC ES2

The software answer to subtractive synthesis.  
Full analogue tones, ports, warm pads, metallic leads.  
16 note poly, 3 oscillators per voice, FM, ring mod, parallel of series resonant filters with distortion.  
BPM syncable LFOs, 3 envelope generators.  
Vector modulation controls.

### EMAGIC EVOC20

The main recorder has 20 bands of filtering, with stereo pitch tracking.  
Another variant offers a polyphonic carrier and filter bank with stretch and shift controls.  
Accepts polyphonic MIDI input so it can be played.

### EMAGIC EVP88

Soft synth to emulate vintage electronic pianos.  
Fender Rhodes, Wurlitzer and Hohner Electric.  
88 note polyphony.  
Effects, EQ, tuning, drive.

### EMAGIC SOUND DIVER

Literally an 8th editor.  
Most modern and classic synths included.  
Easy interfaces, can work within Logic or stand alone.  
Mac or PC.

### NATIVE INSTRUMENTS TRAKTOR

Virtual DJ production.  
Plays CD or MP3 format DJ master, beat matching.  
Digital scratcher, cues.  
Filters with visual knobs.  
Waveform display.

### PG MUSIC BAND-IN-A-BOX

World touring intelligent arrangement software.  
Full backing band from entering chord letters.  
Full GSX compatibility.  
Can export MIDI files.

### PROSONIQ TIME FACTORY

Premium quality time stretching and pitch shifting plug-in available for Mac, Windows, 24 bit 96kHz file support and processing.  
Formant manipulation.  
Time, BPM or % units.

### SONIC FOUNDRY SOUND FORGE 5.0

Stems audio file editing up to 32 bit, stereo, 7.1 & video.  
Now Version 5 has plug-ins including Acoustic Mixer.

### SYNTRILUM COOL EDIT PRO

84 audio tracks of total sample accurate editing.  
Countless built in effects and DSP tools superior to most specialist plug-ins.  
Up to 32 bit 192 kHz.  
Fingerpick denoising, convolution, FIR EQ etc.







# EUROPE'S LOWEST

**SPIRIT**  
BY SOUND CRAFT

## GET IN THE MIX!

### FOLIO NOTEPAD 10 INPUT UTILITY MIXER

For quality mixing on a budget, this has to be the nearest 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  
**£POA**  
SCRA-FOLNOTE

### M SERIES MIXERS

Moving from grey to black, Spirit's next generation of mixers to enhance the Folio range is the M Series, currently available in 4, 8 or 12 channel versions indicating the number of main mono mic inputs with 3 band sweep mid EQ. They have 4 stereo line inputs, 4 dedicated effects returns, 4 auxes, direct outs, signal / peak LEDs on each channel, 100mm faders, rack ears and even built in A/D converter and S/PDIF out for the main stereo bus. All this, with Spirit's renowned value for money!



RRP £399  
**£POA**  
SCRA-M4

### FOLIO F1 14 & 16 INPUT STEREO MIXERS

Spirit's affordable F1 is available in two frame sizes offering a 14 or 16 inputs, with 6 or 8 main mono channels having mic preamps, inserts, and 3 band EQ with sweep mids. The stereo line channel pairs have 2 band EQ. F1 has 3 aux sends, long throw 100mm faders, built in carrying handle and optional rack ears.

RRP £379  
**£225\***  
SCRA-FOLF1/14,16

### 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  
**£329\***  
SCRA-FOLSX

### SPIRIT FOLIO FX-8/FX-16 16 CHANNEL 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.

RRP £339  
**£POA**  
SCRA-FOLFX8

### DM24 DIGITAL MIXER

Tascam's new professional digital mixer offers 24 channel 8 bus mixing at 32 bit floating point supporting 24 bit 96kHz signal throughput on both its analogue converters, digital I/O and all onboard DSP. This mixer is the long awaited answer to affordable 96kHz digital mixing and an ideal partner for Tascam's DM2424 HDR. It has 16 mic inputs, modernized 100mm faders, 4 band fully parametric EQ, compressor / expander / gate and delay on each channel, full automation, transport control, 2 effects busses inc. Antares and TC Waves licensed effects, and includes 24 ch. TDI, dual AES/EBU and twin S/PDIF plus two 8ch aux slots.

RRP £2999  
**£2499\***  
TASC-DM24

### O1V DIGITAL MIXER

Yamaha's fabulous new O1V replaces the ground breaking ProMix 01 and is basically a slightly cut down O3D for a less busy day! As well as its long new silver paint job, the O1V also features 16 analogue input plus 8 digital ins and outs via optional cards in either ADAT, TDI 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 £1599  
**£POA**  
YAMAHA-O1V

### DPS16 STUDIO DIGITAL PERSONAL STUDIO

Aerchord's exclusive Turnkey offer features 10 gig hard disk recorder and mixer with a 16 channel mixer, which records 16 tracks of uncompressed audio up to 24 bit 96kHz. There are 250 virtual tracks available to keep all your outtakes and 100 locate points per song. The 16:2 digital mixer section has 3 band sweepable EQ with parametric mid and snaphot memories for the whole setup. The built in optional EBM FX board provides 44 effect types onboard from the 4 auxes. Don't miss out on this incredible one off deal - this price is a STEAL!

RRP £1099  
**£829\***  
AKAI-DPS16

### BR532 DIGITAL FOUR TRACK

A compact portable 4 track digital portastudio, built in stereo drum machine and multi-effects section, designed by Boss and ideal for guitarists with a COSM amp simulator, distortion etc, as well as rhythm, theme and many filter effects. The 532 records four audio tracks onto SmartMedia cards up to 128MB, and includes a 32MB card. Data compression gives you plenty of recording time and the built in mixer and S/PDIF digital output allow you to master your work to external CD. Onboard non-destructive editing, XLR mic inputs and can even run on batteries for ultimate portability.

RRP £350  
**£269\***  
BOSS-BR532

### D8 DIGITAL WORKSTATION

For the last few years, Korg's high end SoundLab hard disk recording system has enjoyed considerable success in post production houses around the world. Now they've used all that expertise to bring you the amazing D8 - a complete digital recording studio in the size of a shoe 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 on Turnkey - call now for further details.

RRP £1499  
**£499\***  
KORG-D8

### D8B DIGITAL 8 BUS CONSOLE

Mackie's highly sought Digital 8 Bus console is now available. A 24 bit A/D/D/A console with 56 inputs, 72 channels and full dynamic automation plus a host of unique features, inc. Agipex LP22 encoding as standard. The FX section includes compressor, gate, reverb, delay and chorus with open architecture allowing for 3 additional plug-in boards. The desk has an integrated meterbridge and supports an SVGA graphic monitor for fader edits, FX, S/L or 7.1 surround sound and file management. Software upgrades can be downloaded with its built in modem link.

RRP £1005  
**£795\***  
MACKIE-D8B

**EXTRA 10% OFF**  
Available on fully guaranteed  
'B'-Stock versions of many products

### CDR830 REWITABLE CD RECORDER

Scrambled version of HHB's stylish purple 2U rack CD recorder with an eight channel analogue phono and S/PDIF optical and coaxial digital I/O. It uses both CDR or rewritable CDRW discs, and being a professional machine, is free from SCMS coding. Features built in sample rate converter for digital sources from 32kHz to 48kHz, and uses 24 bit converters for its analogue A/D and D/A stages. Includes infrared remote control, headphones socket and features the CD-TEXT data read / write. Extra facilities include double speed finalizing, and a digital input gain and balance.

RRP £295  
**£295\***  
HHB-CDR830

### DA302 DOUBLE DAT

The DAT dual of the decade! The DA302's two professional transports have a single stereo input and separate stereo outputs allowing them to record two DATs simultaneously from the same source, record while playing back, or even continually record seamlessly from one deck to another, for as long a recording time as required. In addition, a high speed dubbing mode make digital clones in double time (timecode and 24 bit DATs can also be copied) and multiple machines can be stacked for large scale duplication or long recordings without tape changing. Each deck has its own set of transport controls and a professional hard wired remote is also included. The DA302 comes in a sturdy 3U metal chassis, offers professional AES/EBU and S/PDIF digital interfacing, is immune to SCMS copyright restrictions and an optional balancing kit can be bought for only £39.99 which gives two XLR ins and four XLR outs. This incredible end of the clearance deal means it's the only sensible DAT choice on the market - buy now while stocks last.

RRP £1495  
**£499\***  
TASC-DA302

### MACKIE 16:8 BUS

- 8 bus professional mixing console with external PSU
- Optional meterbridge
- 6 aux sends, 4 band semi-parametric EQ
- Tabback mic, direct outs on all main channels plus high quality mic preamps
- Also available in 32 or 24 channel frame sizes

### MACKIE 24/8

- 8 bus professional mixing console with external PSU
- Optional meterbridge
- 6 aux sends, 4 band semi-parametric EQ
- Tabback mic, direct outs on all main channels plus high quality mic preamps
- Available in 16, 24 or 32 channel frame sizes

### MACKIE 32/8/2

- 16 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

### 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 750Hz LPF
- 16 mic inputs with inserts

### 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 750Hz LPF
- 16 mic inputs with inserts

### 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 750Hz LPF
- 16 mic inputs with inserts

### MACKIE 1202VLZ PRO

- 12 inputs with 3 band EQ, HPF, 2 auxes, mute, PFL
- The highest quality small format mixers today
- New XDR extended dynamic range preamps with ultra low 0.0007% THD figure

### 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 1:0 appendage suite racks

### MACKIE 1642VLZ PRO

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

### SOUND CRAFT 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 MMC hence is much less expensive!

### SOUND CRAFT 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 muting and MMC hence is much less expensive!

### YAMAHA O2R

- Fully automated 8 bus digital mixer with effects
- 4 band parametric EQ and dynamics on each channel
- 40 inputs, 16 mic inputs

### YAMAHA O3D

- Fully automated digital mixer with integrated faders
- 36 ins, 4 ins, 4 auxes
- 2 built in stereo effects processors with 32 bit filter
- 4 band fully parametric EQ & dynamics on each ch
- 5.1 surround panning

### BOSS BR8

- Portable 8 track recorder
- Built in 250 MB Zip drive
- Up to 64 virtual tracks
- Non-destructive editing
- Effects including COSM amp modelling & sampler

### FOSTEX VF-16

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

### KORG D12

- Unlimited filter and 6GB hard disk recorder
- Linear compressor
- 24bit 5 tracks (4 record)
- 16bit 12 track (4 record)
- 3 band EQ and 192 effects

### KORG D1600

- Hard disk recorder with 20GB drive
- 16 tracks 16 bit 44.1kHz
- 8 tracks 16 bit 48.1kHz
- 24 bit digital mixer with 3 band sweep mid EQ
- 98 effects with 1600
- 16 bit sample and hold
- 16 bit digital filter
- CD backup & recording
- TouchView Interface

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# PRICES GUARANTEE

## TASCAM

## DIGITAL RECORDING

### CD-RW700 COMPACT DISC RECORDER

The newest CD recorder in town at the moment is Tascam's CDRW700 - a bargain priced professional machine with a 2U rack case design, jog wheel, separate record level knobs, Digital Direct button to bypass sample rate converter 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  
**£289**  
TASC-CDRW700

### MD350 MINIDISC RECORDER

Tascam's professional 2U rack machine offers balanced XLRs and phono connectors, with optical S/PDIF digital I/O, front panel headphone socket, infrared remote control and instant editing and track shuffling / renaming tools, data wheel, fluorescent level meters, recording level knob, pitch control, auto cue and auto record ready. The MD350 uses the latest ATRAC version 3 encoding for the MiniDisc format is an ideal workhorse for radio broadcast / TV audio where channel idents or jingles need fast access, and speedy editing and track recording. Popular with DJs who backup their sets to MD, or those with MD walkmans who need the format in the studio.



RRP  
**£349**  
TASC-MD350

### 788 HD PORTASTUDIO

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 788's control and the mixer includes S/PDIF master stereo I/O.



RRP £799  
**£549**  
TASC-788

### MX-2424 24 TRACK 24 BIT RECORDER

The world's foremost 24 track 24 bit 96kHz hard disk recorder has recently been upgraded. Version 3 MXView software gives waveform display and editing from Mac or PC via ethernet link, and internal RAM is doubled to 256MB. Tascam have also released a new extra low noise fan for the MX2424, available as an upgrade. The MX2424 has a special new mastering / mixdown mode which can play all 24 tracks yet recording 2 more as virtual tracks. The number keys now have letters silkscreened on the front panel for track naming and the machine offers full 24 track rec / edit with more features than we can describe here! (Our picture shows optional DVD-ROM drive in front panel.)



RRP £3440  
**£2699**  
TASC-MX2424

### VS1824 HARD DISK RECORDER

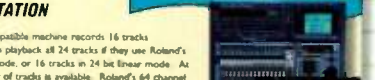
18 tracks of 24 bit hard disk recording onto the built-in 10GB drive, and an integrated 28 channel digital mixer with 8 mic inputs and 3 band EQ. The huge blue LCD screen guides you through the many menu pages for mixer setup and non-destructive editing. Built in VSEF effects board includes COSY mic modelling, reverb and loads of multieffects. The VS1824 will handle CDR burning / ripping on its S/PDIF digital I/O for two tracks. It can retain 16 virtual tracks per track giving you 384 tracks to play with. The integrated design makes operation very straightforward and efficient.



RRP £1500  
**£POA**  
ROLA-VS1824C

### VS2480 HDR WORKSTATION

The 24 bit 96kHz compatible machine records 16 tracks simultaneously, and can playback all 24 tracks if they use Roland's RDAC compression mode, or 16 tracks in 24 bit linear mode. At 96kHz half the number of tracks is available. Roland's 64 channel digital mixer with 34 mic buses offers 16 mono/stereo channel faders and 8 XLR mic inputs, and 4 band EQ, dynamics, 8 FX sends and full automation. The VS2480 provides a 24 note poly phrase sampler and detailed editing via the LCD or a connected VGA monitor.



RRP £2599  
**£POA**  
ROLA-VS2480P

### 202MKIII TAPE DECK

The 202 MKIII is a double deck, which records on 180cm tapes. Makes two duplicate copies simultaneously, or records from two separate audio sources. Also performs high speed copies.



BUY WITH 20 x 90 MIN TAPES - ONLY £29.99 EXTRA  
RRP £312  
**£265**  
TASC-202MK3

### DA20MKII DAT MACHINE

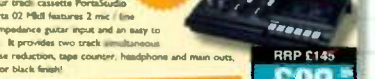
The new MK II version of the DA20 builds on what is already a quality machine - reliable tray-loading mechanism, switchable SCMS, analog and digital recording at all 3 sample rates and coax S/PDIF I/O. New features include error counting & adjustable ID encoding.



BUY WITH 10 x QUANTIZED 90 MIN DATS - ONLY £99.99 EXTRA  
RRP £575  
**£POA**  
TASC-DA20WQ

### PORTA 02 MKII MULTI-TRACKER

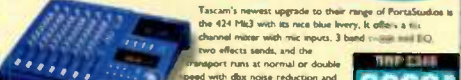
Incredibly affordable four track cassette Portastudio from Tascam! The Porta 02 MKII features 2 mic / line input channels, a high impedance guitar input and an easy to use four channel mixer. It provides two track simultaneous recording with dB noise reduction, tape counter, headphones and main outs,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



BUY WITH 10 x QUANTIZED 90 MIN DATS - ONLY £29.99 EXTRA  
RRP £145  
**£99**  
TASC-PORTA02

### 424 MKIII MULTITRACK RECORDER

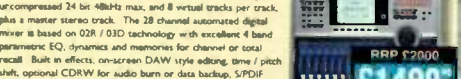
Tascam's newest upgrade to their range of Portastudios is the 424 MKIII with its nice blue livery. It offers a 16 channel mixer with mic inputs, 3 band EQ and 2 effects sends, and the transport runs at normal or double speed with dB noise reduction and can record 4 tracks simultaneously.



RRP £340  
**£269**  
TASC-424

### AW2816 HARD DISK 16 TRACK

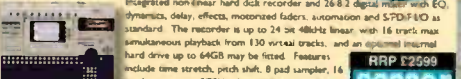
The AW2816's baby brother brings you 16 track recording at uncompressed 24 bit 44kHz max, and 8 virtual tracks per track, plus a master stereo track. The 28 channel automated digital mixer is based on 02R / 03D technology with excellent 4 band parametric EQ, dynamics and memories for channel or total recall. Built in effects, on-screen DAW style editing, time / pitch shift, optional CDRW for audio burn or data backup, S/PDIF coaxial, SCSI, 2 XLR mic inputs, 8 buses, 8 aux sends and more!



RRP £2000  
**£1499**  
YAMA-AW2816

### AW4416 HARD DISC RECORDER

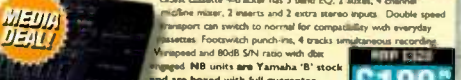
Integrated non-linear hard disk recorder and 26-63 digital mixer with EQ, dynamics, delay, effects, track-based faders, automation and S/PDIF I/O standard. The recorder is up to 24 bit 44kHz linear, with 16 track max simultaneous playback from 130 virtual tracks, and an optional internal hard drive up to 4GB may be fitted. Features include time stretch, pitch shift, 8 pad sampler, 16 track sequencer, SCSI backup, serial mouse input and optional onboard CDRW.



RRP £2599  
**£2299**  
YAMA-AW4416

### MT400 CASSETTE 4-TRACKER

Latest cassette 4-tracker has 3 band EQ, 2 axes, 4 channel midline mixer, 2 inserts and 2 extra stereo inputs. Double speed transport can switch to normal for compatibility with everyday cassettes. Footswitch punch-ins, 4 tracks simultaneous recording. Wirewound and 80dB S/N ratio with dB noise reduction. 8 line input channels. 8 line input channels. 3 band EQ, 2 aux sends and 37 minutes of 4 track.



RRP £120  
**£199**  
YAMA-MT400

"How good you guys are, fine service, damn fine prices"  
T.G. (London)

### HNB CDR 850

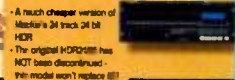
Use regular or rewritable discs (pro or consumer)  
Balanced analog I/O  
AES/EBU digital input  
Get 100% CDR14 for only £69.99 extra!



RRP £899  
**£535**

### MACKIE MDR24A

A much cheaper version of Mackie's 24 track 24 bit HDR  
The original MDR24 has NOT been discontinued - the model won't replace it!  
Lenses the built in editing via keyboard - mouse - mouse  
Controls either 24 channel Digital or analogue I/O



RRP £2200  
**£1999**  
MACK-MDR24A

### MARANTZ CD4000P

2U rack pro CD player  
Plays CDRW discs  
S/PDIF coaxial out  
Analog phono outputs  
Peak search  
Digital volume control  
Programmable tracks



RRP £250  
**£149**

### MARANTZ CDR500

Professional hi-fi tray CD player and CDRW recorder  
S/PDIF and AES/EBU inputs  
Supports CD-TEXT, SCMS control and Disc At-Once mastering mode



RRP £700  
**£525**  
MARA-CDR500

### MARANTZ CDR 770

Stand alone 2U rack pro CD recorder  
Sample Rate Converter  
CD Text compatibility  
SCMS file recording  
Coaxial S/PDIF input also reads AES/EBU  
APC error correction  
Infrared remote control



RRP £250  
**£249**

### MARANTZ SD4050P

2U rackmounted double cassette deck  
Dolby B and C noise reduction with XE-Pro  
Auto reverse on both decks  
Two head transport mechanism  
Varyspeed pitch control



RRP £270  
**£199**  
MARA-SD4050P

### ROLAND VS840GX

8 track non-linear HD recorder, 84 Virtual tracks  
Internal 250MB 720 drive  
8 channel digital mixer  
S/PDIF digital I/O  
Effects bus with 28 types  
CDR burning software  
Optional SCSI interface



RRP £999  
**£549**

### ROLAND CDX1

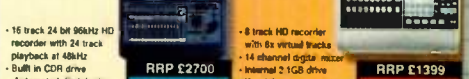
Complete CD production in a single box  
16 track hard disk recorder  
512 sample phase sampler  
Massive range of quality effects  
Built in CD burner



RRP £1200  
**£999**  
ROLA-CDX1

### ROLAND VS2480

16 track 24 bit 96kHz HD recorder with 24 track playback at 44kHz  
Built in CDR drive  
Automated digital mixer  
Onboard editing & effects  
8 XLR mic inputs  
Vocal phrase sampler



RRP £2700  
**£2665**  
ROLA-VS2480

### ROLAND VS880EX

8 track HD recorder with 8x virtual tracks  
14 channel digital mixer  
Internal 2.1GB drive  
New V2 software adds FX, mic simulation, mix data rec, and CDR burning



RRP £1399  
**£POA**  
ROLA-VS880EX

### SONY MZR-700

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 £199  
**£199**  
SONY-MZR700

### SONY MZR-900

MiniDisc rec walkman  
New blue colour and LCD screen controller  
S/PDIF digital input  
Sample rate converter  
40 second anti-shock



RRP £299  
**£249**  
SONY-MZR900

### TASCAM DAP1

2 head 2 motor portable DAT with XLR mic inputs  
20dB pad, limiter, +48V  
Professional SCMS free  
S/PDIF, 32, 44.1, 48kHz  
Buy and get 10x 90 min DAT tapes for £49.99



RRP £1100  
**£POA**  
TASC-DAP1

### TASCAM DA40

16 bit DAT  
Analog 16 bit 48kHz  
S/PDIF coaxial & AES/EBU  
Pre-mixable - no SCMS!



RRP £800  
**£POA**  
TASC-DA40

### TASCAM DA45HR

The world's first 24 bit DAT recorder, running the tape at double speed  
Operates at standard 16 bit resolution too  
Professional features and interfaces, 32, 44.1, 48kHz



RRP £1200  
**£1089**  
TASC-DA45HR

### TASCAM 414 MKII

4 track Tape Portastudio  
2 band EQ & effects send  
Noise reduction by dB  
Double speed for digital audio bandwidth  
4 trk simultaneous record



RRP £2  
**£POA**  
TASC-414MK2

### TASCAM MD301MK2

2U rack MiniDisc recorder  
S/PDIF coaxial digital I/O  
Built in sample rate converter for 32 to 48kHz  
Infrared remote control  
Analogue phono I/O  
Front panel phono jack



RRP £340  
**£POA**  
TASC-MD301

### YAMAHA MD4S

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 £629  
**£439**  
YAMA-MD4S

### YAMAHA MD8S

8 track MiniDisc recorder + analog mixer  
2 XLR mic line - inputs  
8 line input channels  
3 band EQ, 2 aux sends  
Jog shuttle wheel



RRP £1100  
**£749**  
YAMA-MD8S

### ZOOM MRS1044

10 track audio hard disk recorder with sequenced synth bass and stereo drum tracks (13 tracks)  
15GB drive a 44 hours!  
Built in drum machine beats with 400 patterns  
Zoom multi effects, for 8 inserts simultaneously  
2 map inputs, S/PDIF, MIDI and optional SCSI / USB



RRP £700  
**£549**  
ZOOM-MRS1044







# PRICES GUARANTEE\*



## BRING THE HOUSE DOWN!

With everyday studio dynamics processors, the pressure is on among manufacturers to come up with more features at a lower price without sacrificing quality and ease of use. The newest models to cause a big splash in the outboard market are the S-Series, which impressive in themselves, are also much lower priced than you might expect!

### S-COM



Dual channel VCA compressor with built in expander / gate, and HF enhancer useful for brightening treble if it becomes too dull after heavy compression. The compressor features switchable mid band boost, auto mode and smart knee settings for easy use.

RRP £119  
**£95.99**  
SAMS-COM

### S-COM 4



The S-Com 4 packs four channels of VCA dynamics into a 1U rack without sacrificing controls or features. Includes compressor with smart knee detector and expander / gates. Channels are stereo linkable in pairs. Balanced XLR and TRS jacks and LED meters.

RRP £159  
**£139.99**  
SAMS-SCOM4

### S-COM PLUS



Has everything featured in the S-Com, plus an additional de-esser section for each channel and an external sidechain input. The controls for the gate / expander are more extensive. Uses balanced XLR and TRS I/O.

RRP £149  
**£139.99**  
SAMS-SCOMPLUS

### QUAD GATE



With its 24 densely packed control knobs this four channel expander / gate ensures you have full manual control of all relevant parameters and includes built in HPF and LPF filters, stereo linking and sidechain inputs for ducking or frequency conscious gating.

RRP  
**£180.99**  
SAMS-SGATE4

### PENTA COMPRESSOR/PREAMP

2U stereo compressor with presets optimised for kick, snare, ambient, loop, bass guitar, synth bass, perc, acoustic guitar, strummed, elec guitar, piano, keyboards, vocals, crunch, mix pump & limit. Also offers full manual controls for makeup gain, ratio, attack & release. Front panel XLR mic input, HPF, O, 48V and high Z line input. "Tube Tran" valve warmth simulator effect plus output stereo width enhancer and optional A/D.

RRP £295  
**£295**

### MIXMASTER 3 BAND COMPRESSOR

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 mid-range, and there are balance, stereo width (M+5 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 £880  
**£749.99**

### TRAKMASTER CHANNEL STRIP

The latest channel strip on the Platinum series in the Trak Master which distils the best ingredients into a sleek design with LED meters, front panel XLR mic input and guitar jack as well as rear sockets. There is a discrete mic preamp front end with HPF and 48V power, smooth optical compressor with a "Lens / More" compression knob that even drummers could understand! The EQ is 3 band with sweepable mid. A tube sound feature adds benign distortion and the compressor may be switched pre or post EQ. Very good value for money, and ideal for project studios.



RRP £229  
**£229**

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

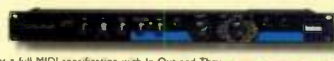
### M2000/24 DIGITAL MULTIEFFECTS UNIT

M2000 runs 2 simultaneous true stereo MIDI controllable effects, covering reverb, delay, pitch shift, chorus, phase, compression, gating, expansion, limiting, EQ, and ambience / stereo width enhancers. It has 500 patches, AES/EBU and coaxial I/O, 24 bit converters, and a dither function. Also features full automation, Wizard auto setup, "Preset Guide" and "Dynamic Morphing". Strictly limited stocks only.

45% OFF!  
RRP £1099  
**£599.99**  
TG M2000/24

### MPX 100 DIGITAL REVERB / MULTI FX

The MPX100 also features a full MIDI specification with In Out and Thru, and even the ability to sync delay times to an incoming clock signal. The S/PDIF 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 £230  
**£175.99**

### MPX200 EFFECTS + COMPRESSOR

Hey, it's new! The MPX200 may look strangely familiar with its black and blue front panel, but it boasts a brand new stereo digital compressor section which runs simultaneously before the effects stage. There are 4 compressor presets to join the 140 famous reverb and multi-effects presets. Like the MPX100 you get coaxial S/PDIF, complete MIDI parameter control and 24 bit converters. And now you can pick one up for under £200 at Turnkey!!



OVER 40% OFF!  
RRP £350  
**£199.99**  
LEX MPX200

### MPX500 MULTI EFFECTS PROCESSOR

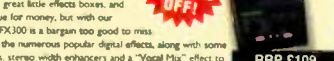
Hiem, what have we here...? It looks like a high quality effects unit - it has balanced XLR & jacks ins and outs, plus S/PDIF coaxial digital I/O as standard, so it just might be a high quality effects unit. It has 240 presets, 30 user patches, 4 edit knobs, MIDI and a big LCD, and oh yes, it says LEXICON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



RRP £369  
**£369**

### RFX-300 DESKTOP MULTI-EFFECTS UNIT

Zoom are synonymous with great little effects boxes, and have always been terrific value for money, but with our massive 30% discount, the RFX300 is a bargain too good to miss. It provides 22 presets cover the numerous popular digital effects, along with some interesting cabinet simulator, stereo width enhancers and a "Vocal Mix" effect to actually lift the vocals perceived volume from within a composite stereo mix. Similarly, the "Mix Simulator" is designed to impart the presence and detail of an expensive studio condenser to any dynamic mic input you feed in, through the built in mic preamp. This is a limited offer so get your order in quick!!!!



55% OFF!  
RRP £109  
**£49**  
ZOOM RFX300

### RFX-2000 MULTIEFFECTS

The RFX-2000 is the top of the range in Zoom's new multi-effects lineup, with S/PDIF digital output as standard. Eight variations each of six different effects groups covering reverb, delay, pitch-based effects like flange and chorus, plus associated special processes like a Vocoder (with mic input), Ring Modulator, Time Trip, Dimension, Isolator, Comb, Step Cry, Resonance and many others. There are parameter control knobs and the unit is MIDI addressable. The RFX2000 includes patch editing software on CD-ROM for PC and Mac, which also includes an effects effects bank.

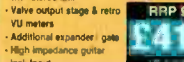
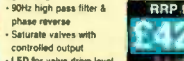
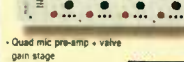
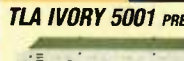
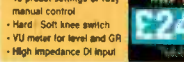
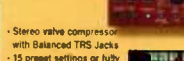
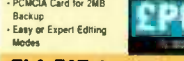
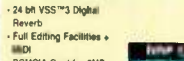
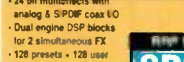
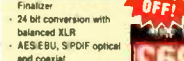
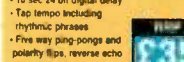
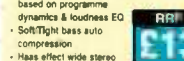
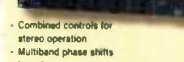
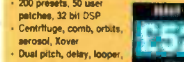
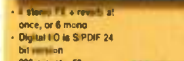


ALMOST 35% OFF!  
RRP £229  
**£149.99**  
ZOOM RFX2000

### FOCUSRITE RED 1



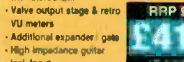
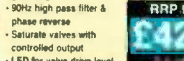
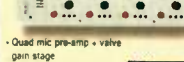
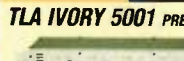
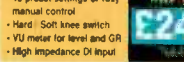
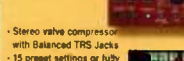
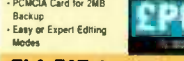
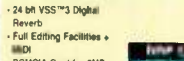
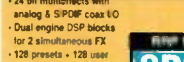
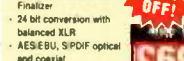
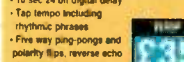
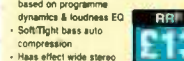
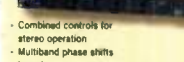
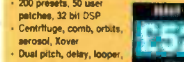
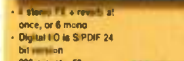
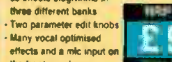
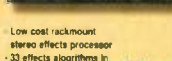
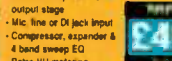
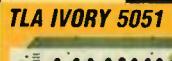
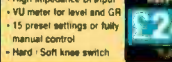
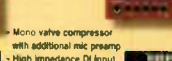
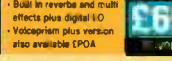
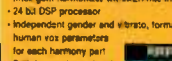
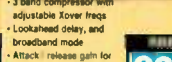
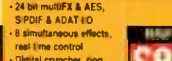
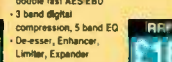
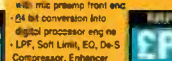
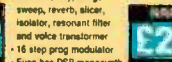
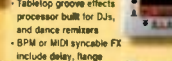
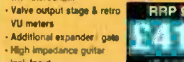
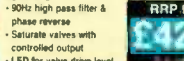
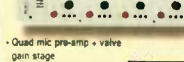
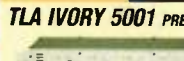
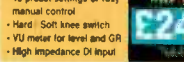
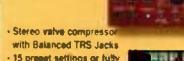
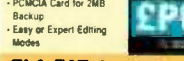
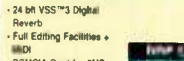
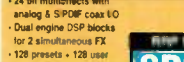
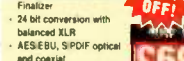
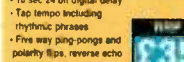
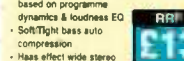
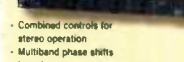
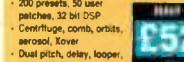
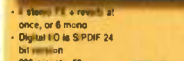
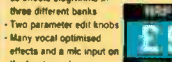
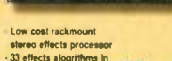
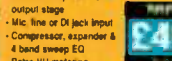
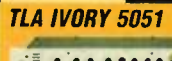
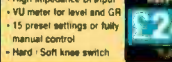
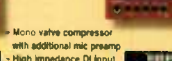
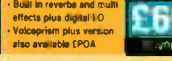
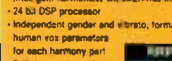
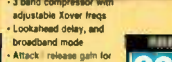
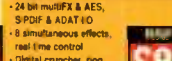
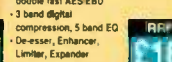
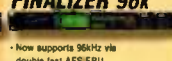
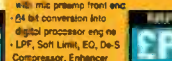
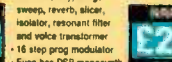
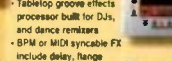
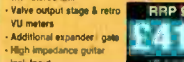
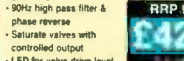
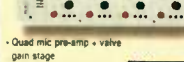
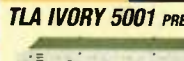
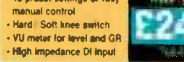
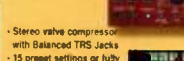
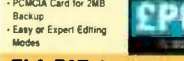
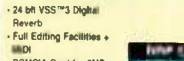
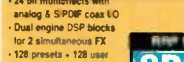
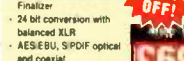
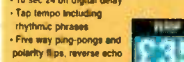
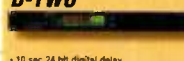
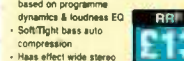
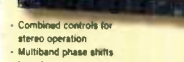
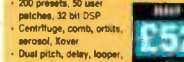
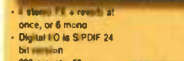
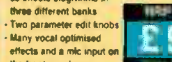
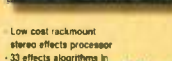
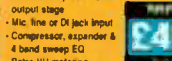
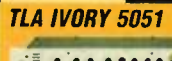
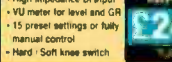
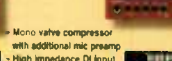
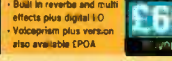
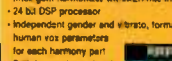
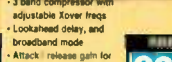
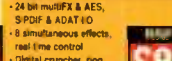
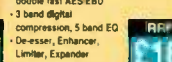
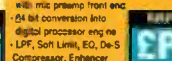
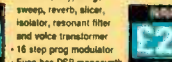
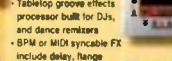
Four channel professional microphone preamplifier  
Transformer balanced I/O for reliable interfacing  
Massive peak headroom  
48V phantom power, gain, polarity and VU meters



### JOE MEEK VC3Q



Low cost channel strip for mic or line signals  
Fully balanced in & out  
Mic preamp with 48V phantom powering  
Dolby compressor  
Three band equaliser





# EUROPE'S LOWEST



## FACE THE TRUTH!

Referencing to close field monitors has become such a standard working practice in professional studios, it's a shame that truly accurate active nearfields cost upwards of £3000 a pair! Where does that leave quality conscious home and project studios on a tighter budget?! Well, thanks to Mackie there is an affordable alternative for accurate reproduction.


Getting low bass out of a small speaker cabinet is another huge challenge for any speaker designer. Small domestic music systems often have distortion or compression deliberately introduced to boost the perception of what little bass there is through the puny 6 inch woofer. Even larger 15 inch woofers don't help if they are built into cramped cabinets like the average disco PA speaker, with responses quoted to 60Hz or so. (That means -10dB at 60Hz, by the way! unless stated otherwise) Proper bass extension in a loudspeaker should create the shuddering feeling of infrasonic sound power, like a nearby helicopter or a Harley engine at low revs. Serious full range studio monitors and high end audiophile speakers can do this, but has anyone ever heard real bass from a pair of low cost nearfields.??!

Mackie have utilised a passive radiator method, at the rear of the cabinet with a 12 inch x 6 inch elliptical honeycomb membrane, whilst the main woofer is an 8.5 inch cone driven by a 150 watt amp using negative feedback to greatly 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 separate 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  $\pm 1.5$  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 surprise considering Mackie used FFT analysis from Ometron laser vibrometry measurements to fine tune the design. A realistic pair of nearfields at a realistic price.

- 2 Way Biamped Nearfields of Outstanding Value
- Possibly The Next Industry Standard Low Cost Nearfield..?!

### RA150/300 POWER AMPLIFIERS

Alesis have introduced some new models into their RA power amp range, including the RA150 which offers 45 watts per channel into 8 $\Omega$  or 75W into 4 $\Omega$ , and is bridgible (150W into mono 8 $\Omega$ , hence the name) The RA300 amp is higher powered, but in the same 2U rack size with the addition of an LED volume bargraph. It offers 90 watts per channel into 8 $\Omega$  or 150W into 4 $\Omega$  (bridgible as 300W into 8 $\Omega$ ). Both amps feature balanced TRS inputs, and damping factors of 200, with a high 60V $\mu$ s slew rate and 20k $\Omega$  input impedance.




FROM **£199**

AL-RA150

### BM6P PASSIVE NEARFIELDS

There is a quality of sound to Dynaudio drive units that few people outside of the iconic hi-fi market may be familiar with. When it comes to reference nearfield monitoring you can trust what you hear from these compact 10.5 litre rear ported two way nearfields. The 17W/75 woofers sports a 3 inch voice coil for its 6.5 inch frame giving excellent mechanical drive and exemplary control and transient response. The 1 inch silk dome Esocac tweeter is phase aligned and the system delivers 43Hz - 20kHz  $\pm 3$ dB with 86dB SPL per watt sensitivity and 150W handling at 4 $\Omega$ . Make sure you audition these neat ones you get the chance!



RRP **£669**

DAUD-BM6P

### 1029A BI-AMPLIFIED MONITORS

BUY WITH SUB WOOFER FOR ONLY £749.99

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




RRP **£749**

GENE-1029A

### 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 100. Power ratings are: 55 watts per channel into 8 $\Omega$ , 85 watts per channel into 4 $\Omega$  or 170 watts into a single 8 $\Omega$  load when both channels are bridged together.



RRP **£289**

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. The 260 weighs just 6.5 kg, yet offers 85 watts per channel into 8 $\Omega$ , 130 watts per channel into 4 $\Omega$  or up to 260 watts into a single 8 $\Omega$  load with both channels bridged (hence the name.)



RRP **£329**

SAMS-SERVO260

### 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 8 $\Omega$ , 275W per channel into 4 $\Omega$  or 550W bridged into 8 $\Omega$ .



RRP **£399**

SAMS-SERVO550

### CONTROL 1 COMPACT MONITORS

These compact speakers have a protective front metal grille, and house a 5.8 inch woofer which is driven up to 6 kHz, where it's crossed over to the tweeter. The 4 $\Omega$  nominal dual handles 75W at 90dB SPL per watt, and bass extension is -3dB at 120Hz.



RRP **£189**

JBL-CONT1

### 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 90dB SPL/W sensitivity gives them ample headroom for peaks at typical close field monitoring levels. The distinctive blue coned 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 8 $\Omega$  and the enclosures have a slightly contoured front baffle and are very solidly built.



RRP **£269**

SCRA-AB2

### REVEAL PASSIVE NEARFIELDS

A meticulously selected two way nearfield monitor with a concurred front baffle. The 6.5 inch woofer is re-ported in a 12 litre cabinet and achieves a -3dB point around 80Hz. The port is tuned to approx 40Hz. The design uses a x/c'd dome tweeter and offers 50-watts power handling at a sensitivity nominally 87dB SPL/W with passband ripple around  $\pm 3$ dB above 80Hz. The drivers are crossed over at 3kHz with good timing coherence.



RRP **£249**

TANN-REVEAL

### LSR25P ACTIVE NEARFIELDS

JBL are one of the few companies to make significant advances in loudspeaker cabinet technology, pioneering the use of certain new composite materials and notably their aluminium baffles coupled to the woofer baskets to aid heat dissipation. The entry level LSR25 benefits from some of these innovations with its rigid aluminium enclosure and integral tweeter waveguide, providing a smooth seamless finish and an inert structure. This front ported 2 way nearfield monitor is bi-amped active with a 5 inch woofer and corresponding 100 watt amp, plus a 1 inch titanium tweeter and 40 watt amp. It has a volume trim and switchable 80Hz HPF - should you ever need it! (Perhaps not ironically but as added protection if you are soldering a kick drum at high levels to listen for a squealing pedal etc.) Output response -3dB points are: 65Hz - 20kHz. The name: LSR stands for Linear Scaled Reference and implies JBL's philosophy of maintaining similar dispersion characteristics between the woofer and tweeter to avoid inconsistent colouration in the off-axis sound. This is an exclusive chance to own these speakers at a price that defies belief!



RRP **£799**

JBL-LSR25P

### BEYER BLUEPRINT

• 1U rack dual channel high quality power amp  
• XLR input, Speaker out  
• 100 watts per ch into 8 $\Omega$   
• 150 watts per ch into 4 $\Omega$   
• LF Damping factor > 350  
• VCA control link option



RRP **£410**

BEYE-B150

### DYNAUDIO BM5

• Two way front ported nearfields  
• 6.5 inch woofer  
• 3 inch voice coil  
• 28mm Tweeter  
• Lightweight Al coils  
• 150Wp, 86dB SPL per Watt  
• Nominal 4 $\Omega$ , 50-20k Hz  $\pm 3$ dB



RRP **£408**

DUAD-BM5

### HNB CIRCLE 5

• Popular low cost nearfields. Pink cone  
• 8 inch woofer, silk dome tweeter  
• Front ported, 8 $\Omega$  nominal load  
• 60 Watts RMS, 87dB SPL per Watt  
• Active versions also available only £599.99



RRP **£319**

HNB-CIRCLE5P

### QUESTED VS2108

• Self powered bi-amped nearfield monitors  
• Two way front ported design with 8 inch woofer powered by 110W amp  
• Soft dome ferrofluid cooled tweeter driven by 100W amp  
• 60Hz - 19kHz  $\pm 2$ dB  
• Volume 5 H, Lo EQ trim  
• Cabinet 15x13x13 inches



FACTORY DIRECT **£2256**

QUES-VS2108

### SPIRIT ABSOLUTE 4P

• Two way rear ported active nearfields  
• 6.5" woofer with 1" voice coil + soft dome tweeter  
• Built in 100W amp + approx 112dB SPL max  
• Fourth order crossover



RRP **£769**


SCRA-84P

### “Keep up the good value deals”

L.B. (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 MFC, which helps to damp any nasty cabinet resonances. Amp noise is 100dB below clip with 0.03% THD (-70.5dB). System response offers high / low EQ tweaks, and the "flat" setting is -3dB at 60Hz.



FACTORY DIRECT **£1149**

QUES-F11

### VS2205 ACTIVE MONITOR

One of the most popular models in the Quested range, the VS2205 is designed as a highly accurate reference monitor, and its low profile and shielding make it ideal for a wide variety of uses. The built in amplifiers separately drive two 130mm bass units and a 28mm ferrofluid damped soft dome tweeter. Switches are provided for input sensitivity and HF and LF equalisation, to compensate for room conditions and position ng.

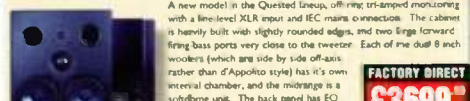


FACTORY DIRECT **£1739**

QUES-VS2205

### VS3208 ACTIVE MONITORS

A new model in the Quested lineup, offering tri-amped monitoring with a line-level XLR input and IEC mains connection. The cabinet is heavily built with slightly rounded 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'Arsonville style) has it's own internal chamber, and the midrange is a softdome unit. The back panel has EQ trim switches for each driver if you prefer flat-on-flat voicings, along with gain trim.



FACTORY DIRECT **£3699**

QUES-VS3208

### MSP5 ACTIVE SPEAKERS

Yamaha's mini active bi-amped speakers, with a front ported 4 inch woofer powered by a 40W amp, and a metal dome tweeter powered by its own 27W amp. Both drivers are magnetically shielded to suit desktop music applications / multimedia. Maximum long term output is around 95dB SPL broadband, and the -3dB point is quoted as 60Hz which gives them a similar voicing to Yamaha's ever popular NS10 nearfields.



RRP **£449**

YAMA-MSP5



# PRICES GUARANTEE\*



## HAVE YOU GOT THE DT's?

## 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 constraints. 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

### DT100 EAR PADS



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

RRP £15  
**£15**  
BEYE-DT100/4

### 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**  
BEYE-IC10007

## SM58 INDUSTRY STANDARD DYNAMIC MIC

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 yardstick by which all other mics are judged, now at an unrepeatable price. Cardioid pattern, moving coil dynamic design.

40% OFF!



RRP £125  
**£75**  
SHUR-SM58/CE

## C1000S CONDENSER MIC

A back electret condenser mic with battery or phantom power operation. The pre-amp is built into the mic capsule, so the mic can be used with a standard 1/4 inch stereo jack plug. There is a steep bass roll-off below 100Hz, tailored for vocal use. The mic gives 6mV/Pa output sensitivity at 300Hz impedance. AKG's updated silver version also fits a premium boom stand for a studio peak around £70. Unprecedented value price.



OVER 40% OFF!

RRP £199  
**£115.99**  
AKG-C1000S

## C3000/B LARGE DIAPHRAGM MIC

Pressure pumped large diaphragm back electret condenser mic, with an unusual design, comprising one single 1 inch water diaphragm with a small internal diaphragm behind it which compensates for its response to achieve either a cardioid or a hypercardioid polar pattern. Switchable grille grille high pass filter and 10dB pad. The frequency response spans around 50Hz to 20kHz, and a slow bass roll-off below 100Hz, 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 £185  
**£185**  
AKG-C3000/B

## C414B CONDENSER MIC

For a long time this microphone, through various revisions, has been an essential part of the studio and live soundC equipment where its sheer completeness and multi-functionality was its easy friend. A phantom powered multi-pattern large diaphragm condenser microphone with a switchable grille grille high pass filter and 10dB pad. The frequency response spans around 50Hz to 20kHz, and a slow bass roll-off below 100Hz, 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 £800  
**£449**  
AKG-C414B/US

## D112 BASS DRUM MICROPHONE

The successor to the legendary D12 bass drum mic, AKG have updated the specs and performance to continue its heritage. It is a cardioid dynamic, moving coil design with bright presence lift to enhance bass drum's low end and a frequency response of 50Hz to 20kHz. Includes a standard 1/4 inch stereo jack plug and a carrying pouch.



RRP £229  
**£134**  
AKG-D112

## SOLIDTUBE HYBRID VALVE MIC

The SolidTube gives a cardioid response, ideal for studio recording of vocals and many instruments. The PSU unit has switches for -20dB pad and a high pass filter. The Solidtube comes as standard with the full range of accessories including the HT power supply unit, a bright yellow pop shield, silver, chrome shockmount, 5 pin XLR to mic cable, XLR to PSU cable, PSU main cable and a thoroughly constructed aluminium flightcase.



RRP £700  
**£400**  
SOLIDTUBE

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:

### DT75



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

RRP £29  
**£29**  
BEYE-DT75

### DT231



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

RRP £39  
**£39**  
BEYE-DT231

### DT250



• Closed back circumaural design  
• 80Ω nominal, 100mW max, 95dB SPL/mW  
• Response -10dB, 10-30,000 Hz  
• 250Ω version available

RRP £109  
**£85**  
BEYE-DT250

### DT770 Pro



• Closed back circumaural design, 16dB isolation  
• 600Ω nominal, 160dB SPL/mW  
• Response -10dB, 5-35,000 Hz  
• Single-sided cable

RRP £119  
**£119**  
BEYE-DT770/PRO

### DT150



• Closed back circumaural design  
• 250Ω nominal, 95dB SPL/mW  
• Response -10dB, 5-30,000 Hz  
• Extended bass response

RRP £119  
**£119**  
BEYE-DT150

### DT990 Pro



• Open back circumaural design  
• 600Ω nominal, 95dB SPL/mW  
• Response -10dB, 5-35,000 Hz  
• Single-sided cable

RRP £139  
**£139**  
BEYE-DT990/PRO

## SM57 DYNAMIC MIC

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 pickup to 40kHz and is supplied with a stand clip and case.



ALMOST 35% OFF!

RRP £113  
**£75**  
SHUR-SM57/LC

## NT1 LARGE DIAPHRAGM MIC

For the warmth and presence of a large diaphragm condenser mic on a budget, the Rode NT1 is a popular choice and performs well. The gold sputtered capsule is based on the successful NT2, with a 154Hz boost that enhances most vocals giving extra presence and intelligibility. Balanced transformerless FET output. Requires standard 48V phantom power and has a cardioid polar pattern. Includes carry case - all full shock mount.



RRP £329  
**£200**  
RODE-NT1

## NT2 LARGE DIAPHRAGM MIC

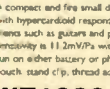
Rode's hugely successful NT2 offers cardioid and hypercardioid patterns, and a 10dB pad. The package includes nice aluminium flight case, windshield and shockmount. This is a wannabe expensive pro studio mic in look and feel at a bargain home studio price!



RRP £499  
**£265**  
RODE-NT2

## NT3 CONDENSER

A compact and fine small diaphragm condenser microphone with hypercardioid response and ideal for making up instruments such as guitars and percussion, as well as vocals. Sensitivity is 11.2mV/Pa with 16dB SPL self noise and it will run on either battery or phantom power. Includes carrying pouch, stand clip, thread adapter and foam windshield.



RRP £199  
**£115**  
RODE-NT3

## NT1000 CONDENSER

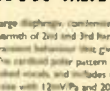
Large diaphragm condenser studio mic with excellent polar pattern and an exceptionally low self noise figure of 10dB A weighted at 16mV/Pa sensitivity. It handles from levels up to 140dB SPL, peak emitting comfortable use as drum overheads, or on overalls and, and has 100Ω impedance. The mic includes a stand clip and a built in pop filter.



RRP £235  
**£235**  
RODE-NT1000

## NTK VALVE CONDENSER

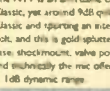
Large diaphragm condenser with class A valve preamp offering the famous warmth of 2nd and 3rd harmonic distortions and other non-linearities in the transient behaviour, this give valve mics their particular sheen over the sound. The cardioid polar pattern and large diaphragm are especially suited to close miked vocals, and includes the valve PSU and all cables. Has 120dB A self noise with 12mV/Pa and 200Ω output impedance.



RRP £449  
**£385**  
NTK-VALVE

## NT-V LARGE DIAPHRAGM MIC

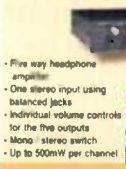
The NT-V is an affordable cardioid entry version of the Valve Classic, yet around 800Hz it's actual operation, like the Classic, and sporting an interesting edge connected diaphragm with no central bolt, and this is gold-sputtered mylar only a micron thick. The aluminium flight case, shockmount, valve power supply unit, cable and main lead are included, and this is the mic offers 15mV/Pa sensitivity and a 200Ω source, and a 1.6dB dynamic range.



RRP £499  
**£425**  
NTK-NT-V

## SAMSON Q5

• Five way headphone amplifier  
• One stereo input using balanced jacks  
• Individual volume controls for the two outputs  
• Mono - stereo switch  
• Up to 500mW per channel



RRP £119  
**£119**  
SAMSON-Q5

## AKG K55

• Low cost dynamic headphones  
• Closed back, circumaural design  
• 20Ω nominal impedance  
• 16mV/Pa sensitivity



50% OFF!  
RRP £19  
**£19**  
AKG-K55

## AKG K240DF

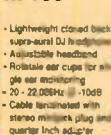
• Semi-open back padded circumaural dynamics  
• 200mV at 16dB SPL/mW  
• Professional 100Ω load  
• Response -10dB, 15Hz - 20,000 Hz



50% OFF!  
RRP £99  
**£49**  
AKG-K240DF

## NUMARK HF150

• Lightweight closed back supra-aural DJ headphones  
• Adjustable headband  
• Rotatable ear cups for single ear monitoring  
• 20 - 22,000Hz (10-10dB)  
• Cable terminated with stereo minijack plug and quarter inch adapter



RRP £19  
**£19**  
NUMARK-HF150

## SENNHEISER HD25

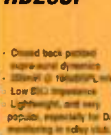
• Closed back dynamic headphones  
• Padded double headband  
• 70Ω nominal impedance  
• Response -10dB, 16-22,000 Hz



RRP £129  
**£129**  
SENN-HD25

## SENNHEISER HD25SP

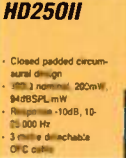
• Closed back padded supra-aural dynamics  
• 200mV at 16dB SPL/mW  
• Low 100Ω impedance  
• Lightweight, and very popular, especially for DJ monitoring in club settings



RRP £89  
**£79**  
SENN-HD25SP

## SENNHEISER HD250II

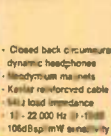
• Closed padded circumaural design  
• 100Ω nominal, 200mW, 95dB SPL/mW  
• Response -10dB, 10-20,000 Hz  
• 3 metre detachable OFC cable



RRP £149  
**£149**  
SENN-HD250II

## SENNHEISER EH2200

• Closed back circumaural dynamic headphones  
• Neodymium magnets  
• Kanlar reinforced cable  
• 100Ω load impedance  
• 10 - 22,000 Hz (10-10dB)  
• 100dB SPL/mW sensitivity



RRP £49  
**£49**  
SENN-EH2200

## SONY MDR-V500DJ

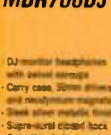
• Supra-aural dynamic headphones  
• Designed for DJs with swivelling earpieces  
• Closed back design



RRP £59  
**£59**  
SONY-MDRV500DJ

## SONY MDR700DJ

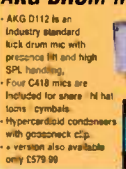
• DJ monitor headphones with swivel ear cups  
• Carry case, 20mm drivers and neodymium magnets  
• Silver metal finish  
• Supra-aural closed back. Gold plated plug adapter



RRP £139  
**£139**  
SONY-MDR700DJ

## AKG DRUM MIC SET

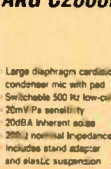
• AKG D112 is an industry standard kick drum mic with presence lift and high SPL handling  
• Four C414 mics are included for snare, hi-hat, toms, cymbals  
• Hypercardioid condensers with 20dB pad  
• Includes stand, shockmount and elastic suspension



RRP £375  
**£375**  
AKG-DRUM-MIC-SET

## AKG C2000B

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



RRP £239  
**£139**  
AKG-C2000B

## AKG WMS40HT

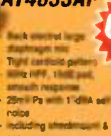
• Handheld transmitter radio mic with receiver  
• Dynamic cardioid capsule  
• Single antenna receiver with 1/4 inch jack output  
• Compander circuitry reduces system noise



RRP £149  
**£149**  
AKG-WMS40HT

## AUDIO-TECHNICA AT4033AP

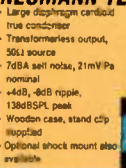
• Back control large diaphragm mic  
• Tilt cardioid pattern, 100mV/Pa, 200Ω output  
• 20mV/Pa with 1/4 inch jack output  
• Includes shockmount and accessories



RRP £239  
**£199**  
AUDIO-TECHNICA-AT4033AP

## NEUMANN TLM 103

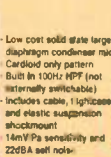
• Large diaphragm cardioid mic condenser  
• Transformerless output, 50Ω load  
• 70dB self noise, 21mV/Pa nominal  
• 440, -8dB ripple, 136dB SPL peak  
• Wooden case, stand clip included  
• Optional shock mount also available



RRP £699  
**£485**  
NEUM-TLM103

## PURE 1 MIC

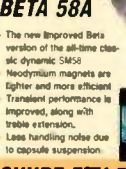
• Low cost solid state large diaphragm condenser mic  
• Cardioid only pattern  
• Built in 100Hz HPF (not internally switchable)  
• Includes cable, flightcase and elastic suspension  
• 10mV/Pa sensitivity and 220Ω self noise



RRP £129  
**£129**  
PURE1

## SHURE BETA 58A

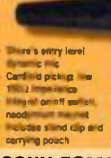
• The new Improved Beta version of the all-time classic dynamic S45  
• Neodymium magnets are lighter and more efficient  
• Transient performance is improved, along with treble extension  
• Less handling noise due to capsule suspension



RRP £195  
**£129**  
SHURE-BETA58A

## SHURE BG1.1

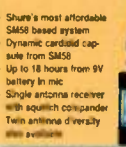
• Shure's entry level dynamic mic  
• Cardioid pickup, low 100Ω impedance  
• 10mV/Pa sensitivity  
• Includes stand clip and carrying pouch



RRP £49  
**£49**  
SHURE-BG1.1

## SHURE ETV 58S

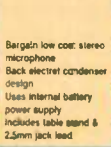
• Shure's most affordable S45 based system  
• Dynamic cardioid capsule from S458  
• Up to 18 hours from 9V battery in use  
• Single antenna receiver with squelch compander  
• Twin antenna diversity also available



RRP £299  
**£279**  
SHURE-ETV58S

## SONY ECM907

• Bargain low cost stereo microphone  
• Back electret condenser  
• Uses internal battery power supply  
• Includes table stand & 2.5mm jack lead



RRP £95  
**£95**  
SONY-ECM907



## THE FUTURE OF MUSIC TECHNOLOGY

**Tiny portable hardware sequencers have been available for several years, but the clever Crusoe chip is now making possible incredibly portable software studios, running on pocket-sized PCs.**

*Dave Shapton*

I'm writing this on a computer that's running a word processor (obviously) and a music application. While I'm typing, I've got software emulations of the following devices hammering away at the processor: a digital mixer with fader automation, four samplers with 16-note polyphony, two polyphonic 'analogue' synths, three sample-loop players, a drum machine, a digital patchbay, a compressor, two delay lines, a phaser, an envelope-controlled filter, and a reverb unit. Not to mention a MIDI sequencer. The software is, of course, Propellerhead's *Reason*.

What I forgot to tell you is that the computer in question fits in my pocket, despite having a 15Gb hard disk and 128Mb memory. It may surprise you even more to hear that it doesn't have an Intel chip. Nor does it have a Power PC one. And just in case you were wondering, it's not based around an AMD device either.

You might be forgiven for thinking that this computer is not a PC or a Mac. But it is indeed a PC, and, with no apparent effort, it's running Windows 2000 Professional. The processor is one I mentioned over a year ago in *Cutting Edge*, when it was first announced — a Transmeta Crusoe. When I first came across descriptions of the Crusoe, it caught my attention because if it was ever built it would represent an important development in processor design, that could have significant implications for the

way studios could work in the future. Here's why.

### Processor In Disguise

As we've already established, the Transmeta device is not a device from the Intel family of chips that has powered PCs since IBM (unintentionally) established the PC standard a couple of decades ago. It's not an Intel clone, either. It has an architecture that is completely novel and unlike anything that's ever been soldered to a PC motherboard before. It might as well have come from Mars. So how is it, then, that it can quite happily run a Microsoft operating system?

Well, the remarkable fact is that you could probably run any operating system that works with Intel chips on the Crusoe. Linux, for example. I suspect you could even have a go at running BeOS (sadly ironic in the light of the company's recent history). That's because Transmeta have written a special 'hardware translation' layer of software that runs on their chip. It sits between the chip and the operating system and makes the Crusoe look like a conventional Intel device. So Windows 2000 doesn't know it's not running on a Pentium. Indeed, the Windows 2000 system information tool reports the presence of an x86 processor (which is the general shorthand for an Intel). I've never had it confirmed, but it probably follows from this that Transmeta could write alternative hardware translation software to make the Crusoe look like a G4. It would be pretty cool, wouldn't it, to have a

computer that you could dual-boot as a Mac or a PC? But I won't go there, because this is speculation based on supposition.

To sum up, then: this device sports a processor that uses a software emulation layer to appear to be a different kind of processor than it actually is. It quite happily runs a software package that can itself behave, in real time, as if it is a complete recording studio. (I should point out that, as far as I can tell, the Transmeta chip runs software more slowly than the Pentium device it is emulating. There were a few glitches in the more complex *Reason* projects.)

This 'software emulation of hardware' technique is significant because it's the first time I can recall ever seeing studio-quality audio processes running on hardware

that the software writers may have had no conception of. It means that in the future you could create, let's say, a reverb setting and run it on anything that can support the application, and it will, without qualification, sound exactly the same.

The computer concerned is a Sony Vaio PCG-C1VFK, and it's by

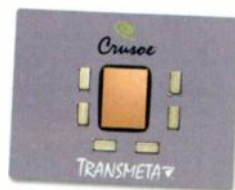
far the nicest gadget I've ever seen!

### Digital Radio Developments

Digital Radio Mondiale is an exciting idea that is the first suggestion I've come across for rejuvenating the part of the radio spectrum that we call the AM bands: Long Wave, Medium Wave and Short Wave. These were the frequencies on which we used to listen to radio, before, over the last 20 years or so, FM became our default waveband. I love radio and think it's still the best way to maximise the amount of music in our busy lives.

At the risk of sounding ever so slightly nerdish, I need to introduce some explanations at this point.

AM stands for Amplitude Modulation, a simple way of getting around the fact that radio waves at audio frequencies do not travel very far. It's a good job that they don't, because if they did, every amplifier and loudspeaker voice-coil would be broadcasting to the world, which would make reception a nightmare. Radio waves only travel any distance at frequencies well above the ones we can hear (although you don't have to go too much above the audio spectrum before they can travel



A tiny Sony Vaio PC, with the Transmeta Crusoe chip at its heart, running the self-contained *Reason* software studio.



# MOTIF<sup>ation</sup>

Every so often, a keyboard synth  
changes the way music is made.  
Motif is the keyboard.  
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Motif 7

Motif 6

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MUSIC PRODUCTION SYNTHESIZER

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[www.yamaha-music.co.uk](http://www.yamaha-music.co.uk)



► truly huge distances: Radio 4 goes out at a frequency that is only 10 times that of the highest sound we can hear, and only twice the frequency of the standard for DVD Audio sample rates).

So, faced with contradictory requirements (having to send an audio signal on a radio wave that has to be at much higher frequencies than we can possibly hear), we have to find a way to superimpose the audio signal on the radio wave that carries it. The radio signal is, unsurprisingly, called the carrier wave, and the process of superimposing the audio on it is called modulation. And, yes, there are several types of modulation, of which AM and FM are only two.

FM sounds pretty good. To most people it sounds nearly as good as a CD, but in fact its frequency response is limited to 15kHz and it is prone to hiss (especially in stereo) when there is less-than-ideal reception. But the biggest problem with FM is that it doesn't go very far. In fact, reception is almost limited to 'line-of-sight'. It's only by putting the transmitters on top of very tall masts, and having pretty powerful transmitters, that any sort of useful range is achievable. Absolutely the worst possible circumstances for FM reception is when the receiver is moving — and guess what? Most of us listen to FM when we are in our cars. Brilliant.

There is an answer, of sorts, to this: Digital Audio Broadcasting, or DAB. Designed to take over from FM for high-quality audio broadcasting, it's available now. But I think it's safe to say that I'm as likely to win the lottery as I am to meet a reader of this column who has a DAB receiver. Which is ironic, because the only way to afford one is to win the lottery.

Suffice to say that DAB hasn't reached critical mass yet, which is a pity, in some ways, because DAB certainly addresses the biggest problem of mobile reception: multi-path interference. When you listen to an FM station in your car, you are likely to drive through the

'standing wave' patterns created as multiple reflections of the original signal add and subtract. Neither the transmitters nor the buildings reflecting their signal move, but if *you* do, you will hear regular swooshing noises as you pass through the peaks and troughs. Not ideal as you listen to the Adagietto from Mahler's Fifth Symphony.

DAB reduces the fragility of the information in the radio signal by using multiple carrier waves (up to an incredible 1536 of them), at 1kHz intervals. Spreading the information across all these carriers makes it much easier to reconstruct the original signal. In fact, it has even been claimed that multi-path reflection actually reinforces the signal — like reflected light in a room. The BBC's snappy title for this technique is Coded Orthogonal Frequency Division Multiplexing, or COFDM, to make it only slightly shorter.

## World Waves

For general radio reception, DAB sounds like a good bet. (I do have reservations about quality, which I will talk about in more detail in a future article.) Still, for all its cleverness, DAB is anything but a worldwide standard. A bit like NICAM, the technique we use for stereo television, it only works in the UK and a few other places — and definitely not in America.

Digital Radio Mondiale, on the other hand, is designed from the outset to work anywhere on the planet. The original document setting up the technical specification for DRM states that "a DRM digital receiver, operating below 30MHz [*that encompasses the long, medium and short wavebands*], bought anywhere in the world, should operate anywhere (where the frequency bands are available)."

I was at one of the first ever public presentations of DRM, at the International Broadcasting Convention in Amsterdam. The technology is at the stage where you need a wardrobe full of electronics to make up a working radio, but don't worry about this. All consumer technologies go through this stage and rapidly

## Bluetooth: Will It Happen After All?

The little Sony PC discussed earlier in this column has one more trick up its sleeve: Bluetooth.

We've been talking about Bluetooth for so long now that "it will never happen" seems almost to be part of its definition. This wireless 'cable replacement' protocol is so cheap and so economical with power that it's set to become a standard feature of computers, hand-held organisers, mobile phones, and anything else that needs to move data between devices. I'm rather hoping that we'll see it on some electronic music and studio devices before long, as it easily outpaces MIDI for capacity and would work nicely to connect remote controllers to rackmount units. But it's here and now in the Sony PCG-C1VFK.

Bluetooth is supposed to be completely self-configuring. Devices in a Bluetooth transaction would ideally discuss with each other what kind of facilities they offer and devise a way to collaborate. You can imagine the conversation. Say I'm a mobile phone and I want to print out a text message. Hearing this, an inkjet printer would say to the phone, "I can print your

message. Just send me the text and I'll do it right away." Or, alternatively, another mobile phone might say, "Sorry, I'm the wrong kind of device and I can't help you, so don't waste time talking to me."

It would be very nice if it worked like that, but because it doesn't — yet — Sony have included an application called *Bluespace* that lets you intervene in the Bluetooth discovery dialogue and tell the computer what kind of devices are out there searching for partners.

I managed to borrow an Ericsson phone with Bluetooth and had no trouble getting each of the two devices to acknowledge that the other was there. I never did manage to exchange any information, but it might have worked if I had had manuals for either device and more than 10 minutes to mess around with them.

You can normally tell when a device has Bluetooth. Look for a bright-blue LED that probably consumes more power than Bluetooth itself. (By the way, you can see why Bluetooth was named after the viking of that name and not after his son, who was called Forkbeard.)



become smaller in size and cost.

DRM uses some incredibly clever and complex compression techniques — including one where the highest frequencies are not fully encoded but are 'hinted' at, and are regenerated synthetically at the receiving end. This won't please audio purists, but don't forget that the whole idea is to make AM reception sound better than before.

In practice, the results are pretty good. The system allows the broadcaster to choose between audio quality and the robustness of the transmission (its ability to withstand interference and adverse signal conditions). I don't know where the sample I listened to was on

this scale. It sounded to me rather like a commercial FM chart-hits station, with masses of (dynamic range) compression, and with the kind of unmusical grittiness you expect from MP3 files at too low a bit rate. And it was in mono, although the system does allow for stereo transmission where appropriate.

Not perfect, then, but a huge improvement on anything I've ever heard on the AM bands — and especially impressive when you consider that the system can use existing transmitters and aerials. I look forward to listening to Radio Moscow in stereo on my hi-fi. The DRM roadmap tells me that this may be possible by 2003. **SOS**



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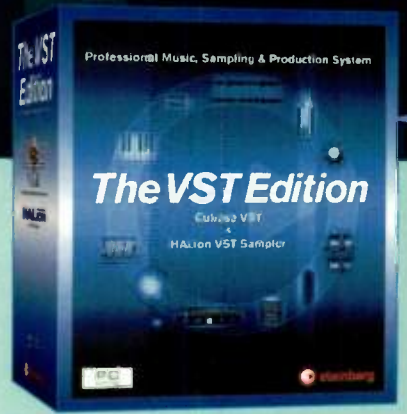
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# Q&A

Your technical questions  
and queries answered

## Q What causes soft-synth latency?

I'm interested in buying a built-for-audio PC, so I tried out a Carillon, specifically to find out how soft synths would sound. I have not used soft synths before, but I didn't expect so much latency. The advisor in the shop told me it was to do with the soundcard, but I would have thought it would have more to do with the processor. Can you give me an idea of the main factors affecting soft synths in terms of latency and sound quality?

Andrew Sharpe

### PC Specialist Martin Walker replies:

Latency is, indeed, a result of the soundcard, although the speed of your processor is also involved, as well as the design of the soft synth in question. To ensure the smooth flow of audio from any audio application, whether it's a sequencer such as Cubase VST, Logic Audio or Sonar, or one of the many software synthesizers that can run either inside these applications or in stand-alone mode, the soundcard drivers employ a small number of RAM buffers.

These are regularly filled up by the soft synth with audio data, which can then be clocked out smoothly by a small low-level routine that has a high enough priority to ensure that, whatever other PC activities need to be carried out, the audio still has enough time to emerge without interruption.

Meanwhile, assuming

your PC processor is powerful enough, the soft synth will also get plenty of time to periodically perform the calculations that determine what waveform data goes into the buffers.

The time between pressing a key and hearing the sound from the software synth (the latency) is determined by the size of the soundcard buffers and the sample rate, so that (for instance) with a 512-byte buffer and the most common 44.1kHz sample rate, it would take the synth sounds 512/44100 seconds, or 11.6 milliseconds, to emerge. This time delay is virtually unnoticeable by most musicians, who won't normally find soft-synth latency annoying until it exceeds about 20 milliseconds.

Soundcard buffer size can nearly always be altered, and the lowest practical value (and therefore shortest latency) is determined by how well the drivers have been written, how fast your PC processor is, and how well Windows has been set up to suit the special requirements of audio recording and playback. The smaller the buffer size, the shorter the interruption that it can cope with before you get a glitch in audio playback.

Given that even the cheapest Carillon PC contains a powerful 866MHz Pentium III processor, and has been expertly set up for use by musicians, any noticeable soft-synth latency must be due to a conservative soundcard buffer size. I've reviewed the majority of the soundcards used by Carillon in their systems, and there's no reason that their latency should need to be any more than 11.6ms to avoid glitching, which makes it virtually unnoticeable. Therefore I can only

think that the particular model you tried hadn't been set up properly, or that someone had mistakenly altered some settings. Many musicians are finding that they can use even smaller buffers, and regularly achieve soft-synth latencies of 6ms or even lower!

As for sound quality, although this is ultimately determined by the D-A converters and output circuitry of the soundcard, it's far



Latency can be an issue when it comes to soft synths: a modern soundcard design and fast computer processor are key requirements for avoiding problems.

more dependent on the soft-synth algorithms. These determine such factors as basic waveform purity, filter characteristics, smoothness of envelopes, and so on. Some may also provide internal options to improve sound quality at the expense of higher processor overhead, so you should always judge soft-synth performance on a combination of sound quality and how much CPU power is used.

## Q Can I ensure that my CDs will play on all hi-fi systems?

I have a couple of completely unrelated queries for you. First, I am aware that certain CDRs will not play on certain hi-fi systems. Obviously, commercially released CDs don't suffer from the same problem. Is this because the burning process for commercial

### quick fixes

**Q** I'm planning to start offering location recording for local bands and orchestras, using two Yamaha D24 8-track magneto-optical disk recorders. When I'm recording in my static studio, it's easy to overdub and drop in. How is this done on location — if I'm recording (for example) a perfect take of a town band, but the clarinet section needs overdubbing? If I took just one of the D24s out (giving eight tracks) would it still be possible to use 10 mics going through a mixer to the D24's eight tracks? If so, are there any issues that I should be aware of? **Paul Lee**

**A** Eight tracks should be enough for live recording if you use a mixer and record the performance as logical groups of instruments. Overdubbing is another matter, because to overdub a section comprising multiple musicians you'll ideally need to provide them all with headphones, so they can hear what you've already recorded as they play along. Another possibility is allowing them to monitor via small loudspeakers; one trick is to provide a mono monitor mix to a pair of speakers, one of which is wired out of phase (swap the red and black speaker terminals on one speaker). If you place

the mic exactly between the speakers, most of the sound will cancel out, so it won't ruin your overdub, but it will allow the musicians to hear what's going on. **Paul White**

**Q** Could you tell me the best place to purchase drum-loop CDs for use in digital recording? **Mike Reeves**

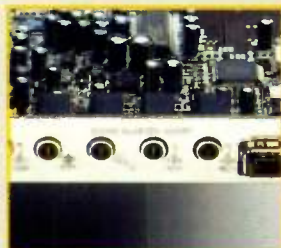
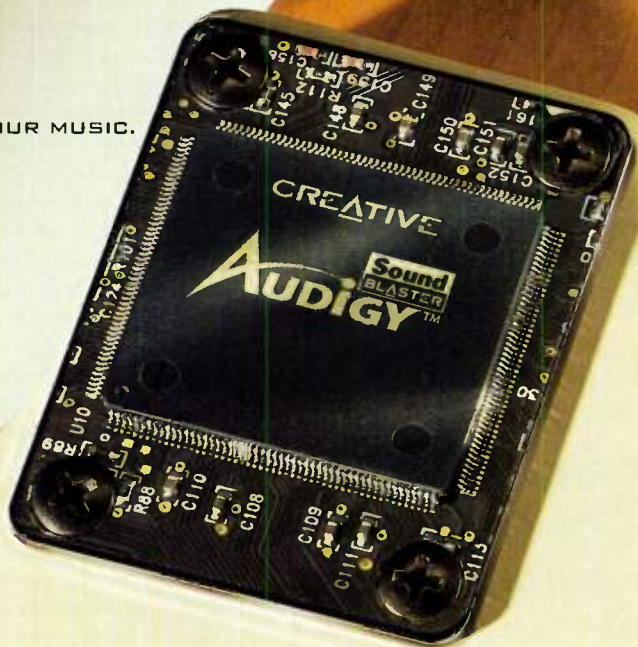
**A** There are a few main sources of sample CDs in the UK. You're sure to be able to find something to your taste from either Time & Space (+44 (0)1837 55200, [www.timespace.com](http://www.timespace.com)). AMG (+44 (0)1252 717333.

[www.amguk.co.uk](http://www.amguk.co.uk)), or Turnkey's Loop Station (+44 (0)20 7419 9999, [www.turnkey.uk.com](http://www.turnkey.uk.com)). Selections of demo sounds can often be auditioned on line or downloaded. SOS reviews sample CDs every month, and many of our reviews are available on our web site, [www.sound-on-sound.com](http://www.sound-on-sound.com). We also give them star ratings, from five to one, and we include contact details, so you should be able to pursue CDs you like the sound of from smaller, independent producers, as well as from the companies listed above. **Debbie Poyser**





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# Q&A

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► releases is different, or because the discs themselves are different? If I send a master to a duplicator (such as the ones who advertise in your magazine), how can I be sure that the resulting CDs will play on any hi-fi? Or is it possible to overcome the problem with my own duplication?

Second, I'm interested in getting into guitar synthesis, but it seems limited to dedicated units such as the Roland GR33. What I really want to be able to do is control any synth module or keyboard with my guitar. Can you suggest any devices that would help me do this? (By the way, I want to do it live, so software wouldn't be suitable.)

**Jonathan Boyle**

**Assistant Editor Sam Inglis replies:** For a full explanation of why CDRs won't always play on hi-fi systems, and of the manufacturing differences between CDRs and commercially released CDs, see Q&A November 2000 (page 256 of that issue), or visit [www.sospubs.co.uk/sos/nov00/articles/questions.htm](http://www.sospubs.co.uk/sos/nov00/articles/questions.htm). Different brands of CDR, burned at different speeds, may make a difference, but the underlying reason is that pressed CDs are more reflective than CD-Rs, and some player mechanisms are insufficiently sensitive to read them. Duplicators should be able to advise you on the best choice of CD-R media, but if you want to guarantee that your CDs will work in all players, having them glass-mastered and pressed is the only sure solution. If you want to get 500 or 1000 copies pressed, this is often the most cost-effective way of doing it in any case.

To control MIDI syths with your guitar, you'll need to add a MIDI

## quick fixes

**Q** I've just bought an Akai DPS16i and need a microphone. I'm a male pop singer with a voice along the lines of Lionel Ritchie. I can spend up to £250 and have been told to look at the Rode NT2. Can you advise me?  
**Paul Stone**

**A** Unfortunately, there's no way to know which mic will suit your voice. Each mic has its own character, determined by its diaphragm, casing, components and build. It's possible that a cheap mic might suit you in just the right way. However, you'll probably get the best results from a

large-diaphragm condenser. Your DPS16 has switchable phantom power, so you'll be able to plug directly into one of the XLR inputs. Currently, good mics are very competitively priced, and there's lots of choice. Try to find a shop where you can test some or, better still, another musician who has a decent mic you could try. The Rode NT2 is definitely worth considering, as are the AKG C3000/B, Audio Technica AT3525 or AT4033, MXL2001, CAD M177 or M179, or one of the Superlux mics (see January's SOS). Some mics offer low-cut filters to reduce rumble, 10dB pads to reduce mic sensitivity,

for recording loud instruments, and even switchable polar patterns, which may come in handy. Think about whether you need these features. Finally, try to make sure the price includes a suspension shockmount.  
**Tom Flint**

**Q** Is there any convenient way to transfer all my old Akai S2000 programs into EXS24 format? The Akai programs are on a Zip connected via the SCSI to the S2000, but I currently have no SCSI facility on the computer, though buying one is not a problem if needed. **Chris McCormack**

**A** I've tried this with my Mac G4, which doesn't have SCSI, but does have a Zip drive. Provided that you load EXS24 and then select 'Import Akai' from the Edit page before inserting the Akai-format Zip disk, it reads fine, if slowly. Once the Zip disk appears in the Editor window, convert the samples in the usual way. If you don't have an internal Zip drive, there are inexpensive USB-to-SCSI adaptors available for both Mac and PC machines that should enable you to do the same thing using your existing SCSI Zip drive, provided that you first install the Zip drivers that came with it. **Paul White**



pickup and an interface. These convert your playing into MIDI note data, which can then be sent to the synth or sampler of your choice (provided it's MIDI-compatible, obviously).

Although Roland's GR33 has a built-in synth, it does in fact give very good results with external units via MIDI. Other MIDI pickups to look out for are Yamaha's G1D/G50 system (reviewed SOS December 1996) and Blue Chip's Axiom AX100 (reviewed May 1998).

## Q What's the best thing to do when my old gear begins to wear out?

I have a Boss DR660, which I have had for about four years, on which the velocity pads appear to be wearing out. They have become so sensitive that anything above the most feather-light tickle produces a MIDI velocity of 127. I also have a Roland PC180 which, on certain keys, is exhibiting the same behaviour. What exactly happens when these things wear out, and is the same fate waiting for my Nord Lead? Is this an expensive repair job?

**Owen Turley**

**Assistant Editor Tom Flint replies:** Everything will wear out eventually, and I'm sure the Nord Lead is no exception. Pressure pads and mechanical moving parts like keys are prime candidates for going wrong, and you may also find that buttons which are

used a lot will give out eventually too.

If you decide to get the keyboard and drum machine repaired professionally, it's either a case of sending them back to Roland for their service department to fix, or finding a specialist repair centre (there are a number of good ones listed in SOS's classified ads). If you take them to a Roland dealer or shop they will probably just send your gear back to Roland or to a specialist repair centre anyway, and will charge you accordingly. Bear in mind that any company repairing your synth will charge for parts, labour and VAT, which could add up to the second-hand value of your equipment. Boss DR660s can now be bought for about £120 (see the SOS online ads at [www.sound-on-sound.com/adverts](http://www.sound-on-sound.com/adverts)). I'm sure you can get a second-hand PC180 very cheaply too, but Edirol currently sell a PC180A MIDI Keyboard Controller for around £89 including VAT, and that is bundled with a copy of Steinberg's Cubasis AV MIDI + Audio sequencer ([www.edirol.co.uk](http://www.edirol.co.uk)). At that price it might just be worth buying one new; buying second-hand gear can take a lot of time and effort and there is always the chance that the item you buy is wearing out too.



Drum machines: take a lot of beating.

If it turns out that the repairs on your gear will be more expensive than buying second-hand (or new) replacements, you might want to try fixing the equipment





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# Q&A

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Korg's Electribe ES1 loop sampler.

► yourself. I'm sure your old gear won't have a warranty to invalidate, so it's certainly worth opening it up and taking a look inside. One possibility is that dust and general grime could be gumming up your keys and pads — something as simple as that could affect MIDI triggering. It's also possible that some moving parts are out of alignment or that a wire or two has worked loose and your problems may be fixable by pushing something back into its correct position. While you have your gear open, check the keys and pads to make sure they are not wearing underneath in any way. It is likely that you will be able to replace parts like these yourself, and a call to Roland (Roland Spares +44 (0)1792 515020) will soon enable you to find out if the bit you want is available. Roland UK's service department stocks a wide range of spare parts. If the keys and pads show no obvious signs of wear, the trouble might be wearing circuit contacts which the pads and keys press on.

Finally, under no circumstances allow your keyboard or drum machine to be powered up, or even just plugged in to the mains while you are poking about inside it — even if you are sufficiently careful not to electrocute yourself, it is surprisingly easy to damage microprocessor-based circuitry simply by shorting out of a couple of contacts.

## Q What extra gear should I buy to make dance music?

I am a frustrated musician in dire need of information. I want to write dance/trance music and don't really know how to go about it. I have a Korg X3 workstation (which I am still exploring), and a PC with Cubase VST. I'm planning to also get Reason. It has been suggested that I buy a Korg Electribe. Is this the right way to go? When I buy extra gear, how do I connect it all — ie. how do I use MIDI thru? And do I need to get a mixer when it comes to recording?

I also have found that I can only have two effects over the whole sequencer in my X3. Is there some way I can apply effects to separate channels?

**Michael Grant**

### Assistant Editor Sam Inglis replies:

There are several Electribes, in fact — a drum machine, a synth, a sampler, and a fourth one which combines bits of the others.

For most types of dance music, these will all add a lot to the range of sounds you get in the X3. Probably the most important thing for dance music is a good source of drum and percussion sounds: you could try the drum machine, but I recommend you consider getting a sampler. The Electribe is a good choice, but you could also check out Yamaha's SU200 and the Boss SP202, or more sophisticated instruments like Akai's MPC2000XL. A sampler is the most flexible instrument for drum programming, and you can use it for other instrumental sounds too.

Regarding how to connect everything up via MIDI, it's best to have a separate MIDI port for each instrument, especially if you'll be using more than one instrument to generate MIDI signals as well as to play them back. In other words, if you're happy to play all your sounds from the X3 and use whatever other instrument you get simply as a sound source, you could just connect the MIDI Thru on the X3 to the MIDI In on that instrument (you'll need to set up the X3 and the other instrument to respond on different MIDI channels, though — remember that each MIDI port carries 16 MIDI channels). If, however, your other instrument is a drum machine (for example) and you want to play drum parts on the pads and have your computer sequencer record them, you'll need to be able to connect a MIDI Out from the drum machine to a MIDI In on your computer. (I'm assuming you're using Cubase to do the MIDI sequencing, rather than the sequencer built into the X3.) You could buy a MIDI merge box to merge the MIDI Outs from the X3 and drum machine, but it would be a lot better to get a MIDI interface for the PC that has more than one input and output.

As for whether you need a mixer, it's up to you. If you have lots of hardware instruments and you want to hear their outputs all at the same time, you need one. If you have only one or two, you could just get a multi-input soundcard and mix and monitor via the PC.

The X3 has only two effects generators, so you will only be able to use two effects programs at a time. You should, however, be able to apply different amounts of each of these to the different parts in your tracks.

Finally, if you plan to buy Reason (which is a self-contained music-making system, including sounds and samples), it might be

just as well to wait until you have checked out the sounds it generates. If you're happy with them, you might find you don't need to buy extra hardware instruments at all.

## Q How can I stop my music annoying my neighbour?

I've converted my loft so that I can practice my sax. Walls, floor and ceiling are padded with rockwool, and the floor has thick underlay, plus carpet. The doors are solid fire doors, but still the sound is travelling through the house (a three-bedroom semi). The walls and ceiling are plasterboard, skimmed and painted. Is there anything else I can do to prevent annoying my very unhelpful neighbour?

**Mick Cape**

**Editor Paul White replies:** Putting Rockwool on the walls may improve the acoustics but does little to help with soundproofing. The fact that you have plasterboard walls and ceilings is probably the biggest problem, but the only way to improve these is to add mass. If the structure is strong enough, I suggest adding a layer of lightweight fibreboard and then the thickest plasterboard you can buy, on top of that. You'd need to get the whole thing reskimmed, but it should cut down significantly on sound leakage through the walls. You might even want to add an extra layer of plasterboard to the wall facing the neighbour.

If you're getting too much transmission through the floor, consider making a simple floating floor by putting chipboard flooring on top of a layer of rockwool. Use two layers of chipboard screwed together, to get enough strength and rigidity. Be aware that your fire doors may still leak sound around the edges, so check that the seal touches the door all the way along all four sides when the door is closed. These measures will undoubtedly improve the situation, but sound travels through houses in mysterious ways, so the practical results aren't always quite as calculated! **SOS**



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Not only is this new cardioid condenser microphone extremely striking to look at, but it also boasts performance which is well out of the ordinary.

*Hugh Robjohns*

**B**altic Latvian Universal Electronics (BLUE) are specialist microphone manufacturers with an office in California and a factory in Riga, Latvia. The company produces only half a dozen different models of hand-built capacitor microphones — and those only in relatively small numbers — but each is a stunning blend of form and function, where innovative and highly individual styling is combined with real craftsmanship. The various models employ either solid-state (FET) or valve circuitry, but always with the best discrete components and Class-A topologies.

### It's Got The Look

The Dragonfly is an eye-catching fixed-cardioid transformerless capacitor microphone, with a styling which easily justifies its unusual name. It has a large spherical grille head and long thin trailing body, the whole assembly suspended at a thirty-degree angle from the integral elasticated shock mount. This is the lowest-cost model in BLUE's range, although it is certainly not a low-cost microphone!

However, its UK price does reflect its technical performance, which puts many revered high-end classic mics to shame. For example, the self-noise figure is claimed to be a very low 7dBA, where most capacitor mics offer ratings in the low 20s. The output sensitivity is 21mV/Pa — a healthy enough level, although fractionally lower than many comparable mics — and the output impedance is a very low 50Ω thanks to the transformerless design, which means that it's very tolerant of long or high-capacitance (eg. Star Quad) cables. As an externally

polarised capacitor microphone, employing a solid-state, discrete FET-based Class-A head amplifier, the Dragonfly requires a 48V phantom power supply, but draws a modest current of 3mA. Maximum SPL capability is a very respectable 132dB for 0.5 percent THD.

The hand-built and hand-tuned BLUE capsule employs a conventional brass back-plate construction with a single one-inch-diameter, six-micron-thick mylar diaphragm. This is sputtered with 'a unique mixture of pure 24 carat gold and aluminium', which is claimed to bestow the mic with an excellent transient response whilst retaining good LF characteristics.

The capsule is supported internally on an injection-moulded rubber mount to provide a high degree of isolation from mechanical vibration, but must be protected during transport and storage by means of two removable set screws. These are threaded into the circumference ring of the capsule grille and are easily removed and replaced by hand, although the act is somewhat

tedious and I would imagine the two screws will be lost quickly. If their securing role is really that vital, perhaps BLUE should consider fitting a small threaded bracket to the shockmount into which these screws could be 'parked' when the mic is in use.

To complete the list of microphone specifications, the whole assembly weighs 640g and has an overall length of 165mm. The bulbous rotating head measures 60mm across, and the main body consists of a 20mm square tube containing the electronics. The spherical capsule is supported from a C-shaped bracket at one end of the body, while an integral XLR socket occupies the opposite end. Running between the capsule pivot points and a collar fixed part way down the mic body are two elasticated cords (attached permanently) suspending the microphone further isolation from vibration. This stand adaptor is tapped for the American standard 5/8-inch thread — a European 3/8-inch



# BLUE Dragonfly

## Cardioid Capacitor Microphone



adaptor was not supplied with the review model.

The capsule assembly is able to rotate almost 180 degrees in either direction — a small knurled stud provides a finger hold and also stops the capsule being rotated all the way around by colliding with the bracket. The front of the capsule is denoted by a shiny, chromed grille surface, while the back has a duller matt finish. Being able to rotate the capsule, even when the mic stand is firmly locked in place, is surprisingly useful for fine-tuning the tonal balance of virtually any source, especially when close-miking. A 10 or 15 degree rotation can make all the difference in the sound quality and is far more effective than messing about with the EQ on the desk.

The dragonfly is supplied in an almost old-fashioned linen-covered cardboard box with resilient foam padding. Apparently, precision-matched stereo pairs of the Dragonfly can also be supplied to order, with a very distinctive green lacquer finish instead of the standard black, and stored in handmade cherry-wood boxes.

### Listening Tests

The first thing I noticed was how low the output level of the mic is with the transit screws left in place! Fortunately there is a red tag on one of these screws to remind the user to remove them, and just as well — I wonder how many Dragonflies have been returned to the dealer as defective because of this very unusual arrangement? With the screws removed and the mic functioning properly, I then became aware of just how effective the integral shockmount and internal capsule suspension are. Mechanical vibrations through the mic stand are isolated extremely well from the microphone — made all the more obvious by its very low noise floor, which allows the gain to be cranked up more than normal.

The Dragonfly is not equipped with pad or bass roll-off switches, so a little care has to be exercised with particularly loud instruments and with the pronounced proximity effect when close miking. The bass tip-up on this mic is very noticeable even when working at distances of over a foot and, when working closer, changes in distance of a few centimetres altered the response significantly. However, this effect can be used to creative advantage in many situations, and can certainly add a considerable degree of 'body' and

## SOUND ON SOUND

### BLUE Dragonfly £846

#### pros

- Exceptionally low self-noise.
- Highly effective integral shockmount.
- Distinctive styling.
- Almost valve-like sound character
- Unique rotating capsule.

#### cons

- Uneven frequency response.
- Unpredictable interaction with instruments.
- No low-cut filter.
- Expensive.

#### summary

A uniquely styled microphone with a slightly quirky character, both visually and sonically. Superbly quiet, with an excellent integral shockmount, but the uneven frequency response will not suit all tastes or applications.



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## BLUE DRAGONFLY

## BLUE Restoration Services

Besides the design and manufacture of their own unique range of microphones, BLUE also offer a restoration service for classic Telefunken and Neumann M49, U48 and U47 mics — bringing tired and battered relics back to 'Concourse Condition' in both looks and sound.

Strictly speaking, the treatment provided by BLUE is a refurbishment rather than a restoration, in that the end product incorporates new components to improve and update performance beyond the capabilities of the original design. However, BLUE are careful to retain the original sound qualities of the mic whilst incorporating a more stable and significantly quieter amplifier.

Any refurbishment job starts with complete

disassembly followed by acid stripping of the metal body parts and renewed nickel plating. The grille screens are also repaired and the inevitable dents removed before replating. The microphone is then meticulously reassembled, with new Teflon-insulated silver-plated copper wiring, and high-quality capacitors and resistors replacing the original tired and often noisy components. New valves are installed too — an NOS (AC701K) valve in the case of the Neumann M49 and an EF86 for the U47/U48, for example.

The output transformers are either rewired or replaced as necessary, and the capsule is replaced with BLUE's single-backplate kk47 or kk49 capsule. The microphone cable is also 'rebuilt' with

BLUE's own 'Champagne Tube mic cable' and the connectors are either refinished or replaced. The original power supply is replaced with the BLUE 9610 and the rebuilt mic is packaged in a handmade cherry-wood box with an original-style shockmount. The whole thing is then protected with sturdy flightcase and comes complete with a one-year warranty and a bag full of the discarded original components! The whole process takes a couple of months from start to finish.

Although some would undoubtedly describe this kind of rebuilding as sacrilegious, it has the advantage of rejuvenating classic mics with a more modern technical performance, while retaining their principal original sonic characteristics.

► warmth to a voice.

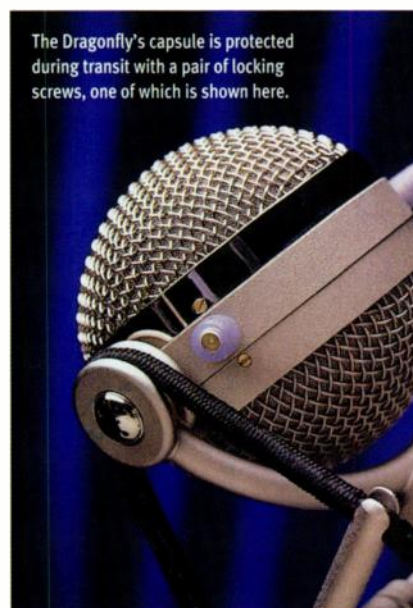
BLUE don't provide a polar response for the mic, but do publish a frequency response. This can hardly be described as flat, although, to be fair, the plot is contained within a  $\pm 3\text{dB}$  window. However, mics in this price bracket (and most of those far less expensive) are, in general, rather more uniform. This odd response seems to be a design feature of the Dragonfly, though, as all the other mics in the BLUE range have very much more uniform published frequency responses. Strange then that the handbook refers to the sonic character of BLUE mics being developed through 'the consensus of expert engineers and discriminating musicians on the type of sound that is needed in the recording process today'.

The main response peaks are centred around 100Hz, 2kHz and 12kHz, with the valleys around 5 or 6dB lower at 800Hz and 6kHz. This mountainous response manages to convey a simultaneous sense of extended top end, detailed midrange and warm LF region — a character not dissimilar to some valve mics, in fact. However, these peaks and troughs don't always coincide with the characteristics of every instrument or voice, and so the results can be somewhat unpredictable. This is certainly not a technically precise, clinical kind of mic, but one which oozes character and demands to be used creatively.

The polar pattern seems to be a fairly tight cardioid which narrows further at high frequencies — as most large-diaphragm mics do. In fact, in the upper frequency range it behaves almost as a hypercardioid, with a noticeable rear lobe and side nulls around the 135-degree mark. At lower frequencies its response is much broader, again much as expected with this type of capsule, tending towards a figure-of-eight response with obvious sensitivity dips to the sides.

BLUE recommend the Dragonfly for a

wide range of instruments including voice, acoustic guitar, wind instruments and percussion — the latter taking advantage of its transient capabilities. Its ability to accommodate high SPLs also makes it suitable for use in front of electric guitar and bass cabinets. Although I would not



The Dragonfly's capsule is protected during transit with a pair of locking screws, one of which is shown here.

disagree with these recommendations — and I found it was exceptional with a wide range of hand percussion and drums — the mic has a recognisable sonic signature which means that it can be a little erratic. For example, it's stunning with some guitars, and only average with others.

Whereas a more technically accurate mic tends to produce reliable, uniform results almost regardless of the nature of the source, I found that the Dragonfly could be extremely complimentary and flattering with some instruments, yet almost strident with others — and sometimes its character seemed to change if an instrument was played in a different way. This matching issue was also readily apparent with

singing voices and seemed to depend on the quality and character of each voice, the nature of the resonances and harmonics. It really worked well with two voices, but prompted a mic-swapping session with another. In other words, this mic can sound hugely expensive and impressive in some instances, but rather unbalanced and almost 'budget' on others.

When the combination of mic and source worked it certainly produced superbly detailed, intimate and full-bodied results, and this was, to be fair, the case most of the time. But when the combination of mic and source didn't work, no amount of repositioning seemed to help and I could only acquire rather lacklustre performances — and this in comparison to my similarly priced favourite Sennheiser MKH40 and considerably cheaper Neumann KM184 mics, both of which provided exactly what I was expecting, and with far greater consistency.

### Flight Of The Dragonfly

While the Dragonfly isn't a must-have, it would be a very useful and creative addition to any microphone cupboard already well stocked with more versatile devices. This is a highly desirable mic, from both the aesthetic and sonic points of view, but one which is very much a luxury creative tool for bringing out the best from specific sources in specific circumstances. It's a definite case of try before you buy — it won't suit everyone — but it is certainly worthy of personal investigation, because you may just fall in love with it! **EOS**

### Information

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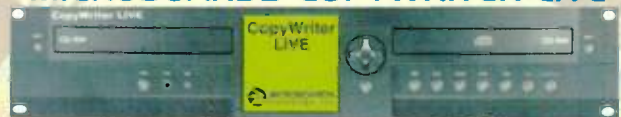
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# Ableton Live

## Performance Loop Sequencing Software For Mac & PC

Ableton's *Live* allows the user to create and record musical performances by combining sampled loops in real time, with high-quality pitch-shifting, time-stretching and audio effects.

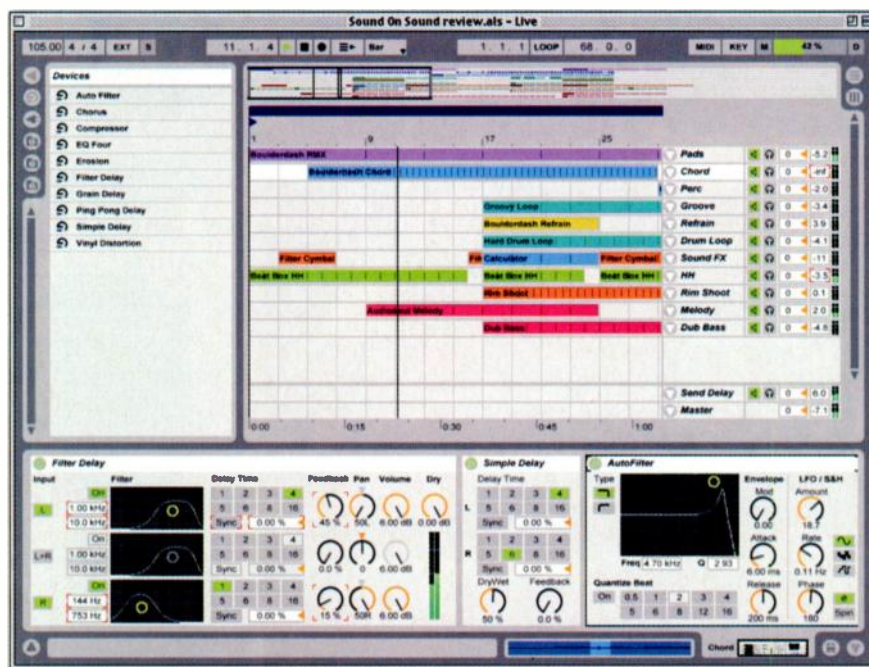
Paul Sellars

Ableton *Live* is described by the manufacturers as a 'sequencing instrument' and is, according to the manual, "the result of musicians wanting a better way to perform live, improvisational music using a computer." In essence it's a software sequencer, designed to play back audio 'clips' — which may be short 'soundbites', whole mixed and mastered recordings, or anything in between — via an intuitive graphical front end allowing for a fair amount of improvised rearrangement. For musicians whose music is wholly electronic in nature, *Live* potentially offers a happy medium between, at one extreme, taking an entire studio's worth of MIDI gear out on the road and, at the other, standing motionless on stage with one finger poised meaningfully over the Pause button on a DAT recorder.

### Coming Alive

*Live* comes in a garish bright green box containing a cross-platform installation CD, a fairly hefty paper manual, and a selection of Ableton stickers to plaster your flightcases with. Copy-protection is of the challenge and response variety, so mercifully there's no dongle to contend with.

The Mac version of *Live* supports Sound Manager and Apple's built-in audio hardware, and any third-party card compliant with the ubiquitous ASIO standard. The PC version supports any soundcard with an MME, DirectX or ASIO driver, so if you already have your computer set up to handle digital audio, no additional hardware or drastic system reconfiguration should be necessary to use *Live*. Minimum system requirements are fairly modest: the Mac version needs a G3 with at least 64Mb of RAM, and OS 8.6 or later. The PC version should run on a 300MHz Pentium with 64Mb of RAM, and Windows 95 or later. However, as with any audio software, the more computing power you can give *Live*, the better its performance will be. Apart from a couple of folders of demos from Big Fish and E-Lab, no bundled samples are supplied, but



*Live* is designed to connect with the Sonomic on-line sample download service.

Installation is painless, and authorisation only slightly painful. When first run, *Live* presents a dialogue box including a unique challenge code, which identifies the particular machine on which the software is installed. Point your browser at the Ableton web site ([www.ableton.com](http://www.ableton.com)) and enter this code, along with your serial number, into a form on the 'unlock' page: when the page refreshes, you'll be given the response code you need to authorise your installation. An unauthorised copy of *Live* will run fully functionally for several days, in case you have any difficulty obtaining your response code after installation. Be sure to make a note of your code, since it may be required again if your authorisation becomes damaged as a result of a hard disk crash.

After installation, the next task is to configure *Live* to make use of any audio and MIDI peripherals you may have. The Mac version defaults to the built-in audio hardware, while the PC version offers a generic

**SOUND ON SOUND**

**Ableton Live £219**

#### pros

- Clear, well-designed front end.
- Makes working with sampled loops easy and enjoyable.
- High-quality effects, with support for VST plug-ins.

#### cons

- No MIDI sequencing.
- No destructive audio editing.
- Switching to Hi-Q mode causes crashes on my Mac.

#### summary

Ableton *Live* makes improvised arrangements of loop-based music easy. It won't replace your usual MIDI + Audio sequencer, but it might be the ideal tool for taking your studio-bound creations out to a larger, sweatier audience. While no combination of computer and software can be guaranteed to work 100 percent reliably under the conditions encountered in gig venues, Ableton *Live* seems relatively stable and should work well.



MME/DirectX driver. If you have an audio card with a specific DirectX or ASIO driver, this can easily be selected from the drop-down menu in the Audio Preferences dialogue. MIDI interfaces and controllers can be selected in the MIDI / Sync dialogue (OMS 2.3.8 is needed for the Mac version). *Live* offers no MIDI sequencing functions, but MIDI controller messages can be mapped to almost any of the program's parameters, so you need not be tied to your mouse and QWERTY keyboard on stage. *Live* can also be sync'd to MIDI Clock or MIDI Time Code.

### Going Live

The first thing you notice about *Live* is its striking appearance. The program benefits from a pleasingly minimalist design allowing numerous parameters to be displayed at once, without overwhelming the eye. Some familiar transport controls, knobs and faders are in evidence, but all are displayed 'in outline' rather than as 'realistic' 3D representations, resulting in a clear, high-contrast display that can easily be read at a distance even in poor lighting conditions. A variety of 'skins' is included to allow some scope for changing the program's appearance, but sensibly, these only allow you to choose from a few different colour schemes, without compromising the basic functionality of the original design.

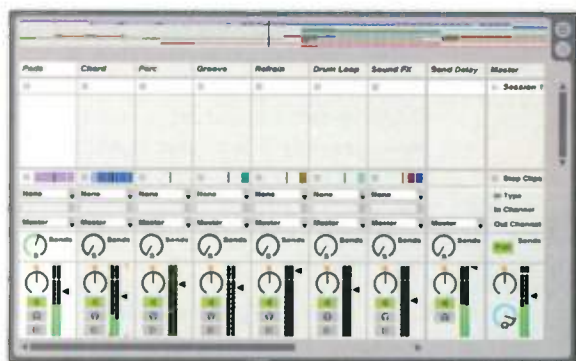
The main *Live* window is divided into three panes. The top left-hand pane acts as a 'browser' for locating files, choosing effects plug-ins and so on, the larger top right-hand pane can be switched between the Session View and Arranger View, and the bottom Track View pane displays detailed information and editing parameters for whatever is currently selected in either of the other panes, whether it's an effects plug-in, an audio Clip, or whatever.

Basic arranging and mixing tasks are performed by switching between the Session and Arranger Views in the top right-hand pane as necessary. When the Session view is active each track is displayed as a vertical column, with slots at the top for holding the various Clips to be played, and basic mixer controls at the bottom. An unlimited number of Tracks can be created for a *Live* song or 'Set', but in reality the total number of tracks that can be played simultaneously will be limited by the speed of your computer.

When the Arranger view is active the tracks are displayed horizontally, with coloured rectangles representing different instances of different Clips as they occur on the time-line, just as in any conventional sequencer.

### In Use

Like Sonic Foundry's *Acid* (see John Walden's review of *Acid Pro* v3 in last month's *SOS*), *Live* is very much geared up for the loop-based approach to music beloved of many dance



The Session View provides a simplified on-screen mixer, with faders for each track.

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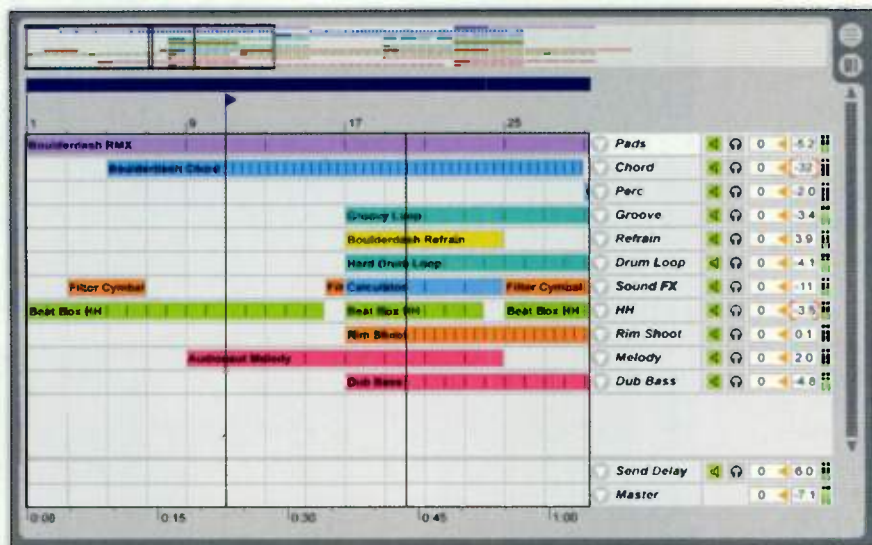


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## ABLETON LIVE



The Arrange View is not unlike that of any other sequencer, and shows the usual linear progression through a Set from left to right.

► producers. In this spirit, I began by searching through my samples folder using *Live*'s built-in file browser, and dug up one two-bar-long drum loop at 121bpm, one one-bar-long drum loop at 108bpm and one half-bar-long shaker loop at 151bpm. I dragged each of these in turn to its own track in the Session View, and set *Live*'s tempo to 115bpm. I clicked the Play button beside the Clip on track one, and the first loop duly began looping at 115bpm, with barely a trace of audible time-stretching.

Next, I clicked on the Play button for the Clip on track two, and waited to see what would happen. *Live* bided its time for a couple of beats, then cleanly dropped the new loop on the 'one' of the next bar. So far so good. Looking around, I found the Quantize control, changed its setting from 'Bar' to '1/4', then clicked on the play button beside the Clip on track three. *Live* triggered the shaker loop on the next available quarter note, then left all three Clips happily chugging away together. Too easy.

Without stopping playback, I then changed the Quantize setting back to 'Bar', cleared the tempo field, and entered 75bpm as the new tempo. At the start of the next bar, without missing a beat, *Live* reduced the tempo as requested, instantly creating a convincing Fatboy Slim-esque slow-down effect. Impressive.

*Live* seems to handle tempo changes by sensing the peaks in a Clip and using these to divide it into segments, like *Recycle*, then applying a time-stretch algorithm to each segment individually. However, this process is entirely automatic, and is carried out non-destructively in real time. From the point of view of the end user, it really is as simple as loading a few Clips and setting the desired tempo.

Extreme reductions in tempo necessitate more time-stretching, which inevitably begins to introduce some noticeable artefacts into the sound. However, it is possible to slow down many loops by as much as 20bpm without the sound becoming too unnatural, and some nice special effects can be produced by pushing it even further. Playing a loop faster than its original tempo involves no time-stretching, as *Live* simply has to gate the various Clip segments to prevent them from overlapping. It does this cleanly and without clicks, and increases of as much as 50bpm are well within the realms of possibility.

### Pitch Perfect

*Live* allows the pitch of each Clip to be controlled independently of its tempo, and over a very wide range. You can tune a loop up or down from its original pitch by no less than 32 semitones, although shifts of more than about two or three semitones quickly begin to sound unnatural. The more extreme pitch-shifts available in *Live* can be used to create some intriguing effects: tuning a drum loop up by 32 semitones while simultaneously reducing its tempo, for example, can produce a weird, digital, 'sample & hold synth' phrase. Vocals can be tuned up to become manic, buzzing insect noises, while hi-hat loops can be pitched down to create waves of thunderous industrial noise. Lots of fun.

### Test Spec

- Ableton Live 1.03.
- Blue and white 400MHz Apple Mac G3 with 192Mb RAM, running Mac OS 9.1.
- Emagic Audiowerk II soundcard.
- An old K-Tel LP entitled *Music Of The Greek Islands*, for sampling loops from.

A 'Hi-Q' option is also available for each Clip, and supposedly activates a high-quality playback mode, intended to produce more natural-sounding pitch- and time-shifting effects at the expense of a slightly increased CPU load. However, this appears to make only a very subtle difference to the sound and, irritatingly enough, experimentally switching Hi-Q on and off a few times seemed to be enough to crash *Live* and freeze my computer completely, necessitating a forced restart. Not good.

Each track in the Session View functions as basic mixer channel strip, including a volume fader and pan knob and two Send knobs for directing output to either or both of the Send Tracks, which are equivalent to group busses in a conventional mixer. You can also select 'insert' effects for a track, by simply clicking on it, locating a built-in *Live* effect or a VST plug-in in the browser, and dragging and dropping it to the Track View pane below. Multiple effects can be added, allowing for the creation of complex multi-effects chains if your CPU permits.

Drop-down menus are used to select inputs and outputs for each track. 'Master' is the default output, but if your audio card offers multiple outputs, these can be selected individually. Each track input is by default set to None, the other options being Master Out, ReWire and Live In. Master Out enables you to record *Live*'s main output onto a new track, in order to capture a mixdown of one or more tracks complete with effects. ReWire enables you to route the output of any ReWire-savvy application, such as *Rebirth* or *Reason*, into the *Live* mixer, and process it with any effects you may be using.

Live In enables you to record a new Clip onto a track, direct from your soundcard's input. Recording in *Live* is very straightforward: you simply select Live In as the input for a track, click the Monitor/Arm Recording button to monitor your source, then click the red button that appears next to an empty Clip slot to begin recording. Click again when you've finished, and there you have it: a new Clip, ready to be included in your Set. Selecting the Clip allows you to set start, end and loop points for its playback, but unfortunately *Live* has no proper built-in destructive audio editor, and clicking on a Clip's Edit button only offers you the option to choose an external audio editor application. This is a more or less workable compromise, but it seems a shame that basic functions for trimming and normalising Clips couldn't have been included.

### Creating A Sequence

Recording a *Live* song or Set is simplicity itself: load up the Clips you want to use in the Session view, click the Record button in the



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## ABLETON LIVE

- ▶ main transport controls and, when you're ready, trigger your first Clip, either by clicking with your mouse or sending a pre-assigned MIDI controller. You can add more elements to the mix by triggering, muting and unmuting other Clips on other tracks as you see fit, and most parameter tweaks you make during recording will be stored and automated on playback.

When you've had enough, switch to the Arranger View, and you'll see the Set you just played laid out horizontally, with different-coloured blocks representing the different clips as they occur on the time-line, just like in a conventional sequencer. Clips in the Arranger View can be edited, trimmed, moved around, copied and pasted in all the usual ways, and arranging a Set is easy and intuitive. All edits can be made without pausing playback.

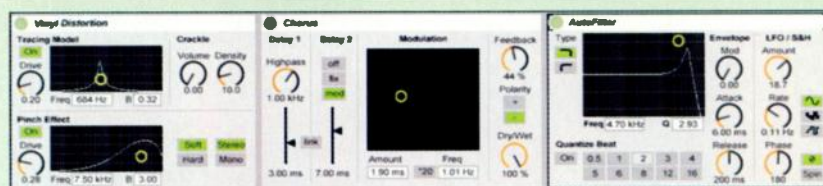
*Live* saves Sets in its own proprietary file format, and these files in turn point to the location(s) on your hard drive where the audio files used are actually stored. This might potentially cause problems if audio files happen to get moved or deleted after a Set has been saved, so *Live* sensibly includes a Save As Self Contained option, which saves the Set files and copies of all necessary audio files in a new, separate folder.

Disappointingly, there's apparently no simple way to export a *Live* Set as a stereo WAV or AIFF file, but you can work around this by creating a new track named (for example) 'Mixdown' and using the Live Input option to record the whole Set as one long stereo Clip. The Set can then be saved As Self Contained, whereupon the Mixdown Clip can be located in the Set's folder, in standard WAV (in the PC version) or AIFF (in the Mac version) format.

## Final Thoughts

Ableton *Live* is easy to use, enjoyable and at times an inspiring creative tool. Whilst using a computer to play live gigs will always be fraught with potential difficulties, from dodgy power supplies to interference from lighting rigs, *Live* seems fairly stable (I experienced only two unexplained crashes in several days' intensive testing) and should not introduce too many extra problems into the equation. Provided they are willing to spend a little time creating loop-able excerpts from their original tracks, imaginative electronic or dance artists will find that *Live* provides them with the means to spontaneously remix themselves on stage, without the need for racks and racks of hardware. Technologically literate DJs might use *Live* to build whole seamless, beat-matched sets, to be altered and rearranged at will, in keeping with the changing mood of the crowd, while *Live*'s recording capabilities offer the bravest

## Live Effects



*Live*'s built-in effects sound good and provide a reasonably wide range of treatments.

*Live* comes with a good selection of proprietary-format real-time effects for processing your Clips. *Erosion* produces 'downsampled' digital distortion which may or may not be to your taste, *Four EQ* provides a useful parametric EQ, and *Auto Filter* offers a choice of four different resonant filter types, all of which can be modulated by a sync'able LFO. *Vinyl Distortion* produces a fairly convincing simulation of what its name suggests, *Chorus* provides subtle but pleasant chorusing, while *Grain Delay* and *Filter Delay* are capable of producing anything from standard tempo-sync'd echoes to outlandish warped effects bearing almost no resemblance to their input source. On the whole, the quality of the effects is good, although they do seem to be fairly CPU-intensive as a consequence, and older computers may struggle if several are used at once.

In addition to the built-in effects, *Live* supports most standard VST effects plug-ins, so you won't

have to do without your favourite compressor, reverb or whatever in your *Live* Sets. VST plug-ins are automatically wrapped in skins that mimic the appearance of the built-in effects, although the original VST editor windows can still be accessed if required. The *Live* effects interface allows you to assign two effects parameters to an X-Y controller, which can be dragged around using the mouse for real-time adjustments.

VST Instruments are not supported (without MIDI tracks to feed them, they wouldn't be any use anyway) and their presence in the VstPlugins folder can actually cause problems. The manual addendum also reports that Prosoniq's *Orange Vocoder* plug-in doesn't work, and TC's *Native Bundle* will not work properly in the Mac version if a low-level debugger (a tool used by software developers) is running on the same machine, although that's a problem that will affect almost nobody.



VST plug-in effects can be used within *Live*, and by default they are displayed in 'skins' that mimic the built-in effects, allowing the use of the mouse as an X-Y controller.

experimenters the option of capturing audio from turntables or the PA desk and reworking it back into the mix 'on the fly', although some practice will be required in order to really get the hang of this.

The absence of any MIDI sequencing capabilities or proper destructive audio editing means that *Live* is never going to serve as a replacement for *Pro Tools*, *Logic* or *Cubase* in the studio. Nevertheless, if you're stuck on a track or remix, and you need a change of direction, firing up *Live* could be a great way to get the ideas flowing again. Drag and drop a few existing takes onto tracks in the Session View, add a couple of loops from randomly chosen sample CDs, and see just what happens. There can be few quicker or easier ways to get apparently incompatible chunks of audio playing in tune and in time together, and in a few minutes *Live* can quite often turn the most unlikely loops and samples into something that might at least serve as the basis of a new track. Your

creation can be exported as a standard WAV or AIFF file, and imported into your usual sequencer to be developed further.

*Live* won't appeal to everybody, but it may be the answer to some people's prayers. If, after reading this review, you think it sounds like what you've been waiting for, download the demo and give it a try. You'll soon get a feel for whether or not it suits the way you work. If you're comfortable with the way *Live* handles audio, and if you're looking for a way to take your studio-based project on the road, you might find it an ideal solution. **SOS**

## Information

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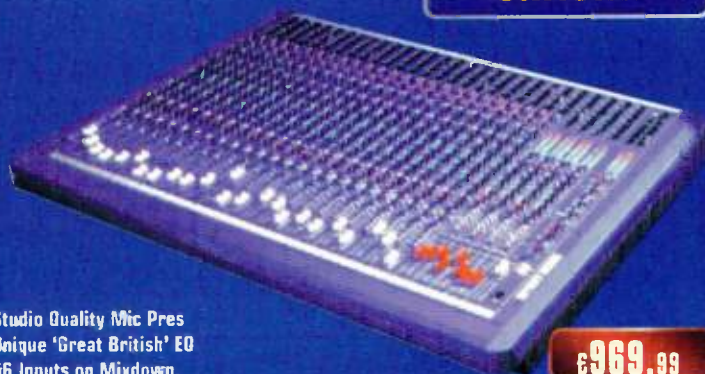
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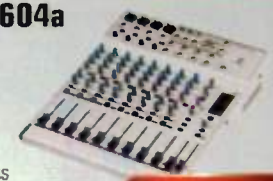
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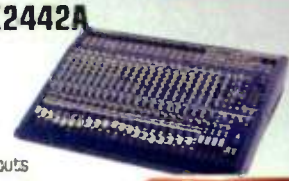
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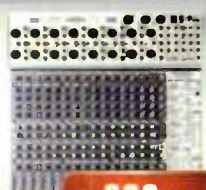
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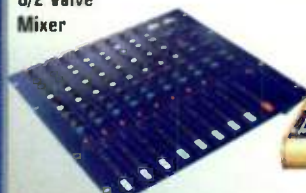
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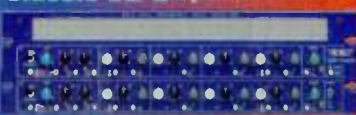
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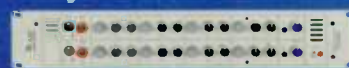
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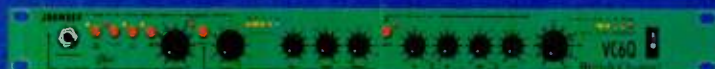


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5



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<b>DV ProTools 5.1 Studio</b>	Digidesign Mx001, ProTools 5.2 - 1 X ADAT i/o, 8 X Balanced analogue i/o, 2 x Mic Pre, 1 X Midi i/o and ProTools 5.2.	<b>£1449.99</b>	<b>£1549.99</b>
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<b>DV HALion / VST Delta Studio</b>	Steinberg HALion, VST v5, Delta 1010 LT - Balanced I/O, 8 I/O, SPDIF, 2 MIDI I/O, 24-bit 96K resolution. Plus HALion & VST.	<b>£1499.99</b>	<b>£1599.99</b>
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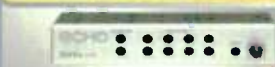
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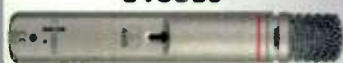


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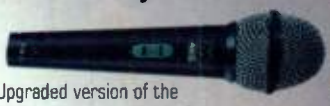
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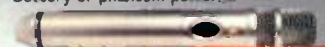
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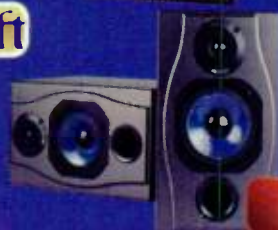
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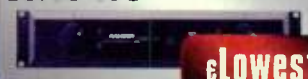
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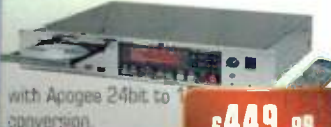


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# M Audio Studiophile SP5B

## Nearfield Monitors



Photo: Tom Hart

Hugh Robjohns

**T**he SP5B is an active nearfield monitor, measuring 350 x 166 x 200mm (hwd) and weighing 5kg. The front panel of the vinyl-covered MDF cabinet carries a 5.25-inch polypropylene bass/mid-range driver, and a one-inch silk-dome tweeter. Both drivers are magnetically shielded.

The tweeter's mounting stands proud of the baffle such that the axis of the voice coil is some 30mm in front of that of the woofer. This also makes it very vulnerable to damage as the silk dome rises slightly proud. There is an unusual wave guide which can be angled to alter dispersion and directivity as required.

The metal rear panel supports the internal electronics and is fitted with an IEC mains inlet, complete with integral fuse holder and a rocker switch. Both XLR and TRS quarter-inch jack sockets provide balanced line-level audio input, and the two inputs are mixed internally with a single level control.

A large 1.5-inch flared port is positioned at the top of the rear panel and extends about

**M Audio's first foray into active nearfield monitors is certainly extremely affordable, but could it be a false economy for the home recordist?**

four inches into the cabinet. Data provided with each loudspeaker showed a fairly flat frequency response, although closer inspection of the graph axes revealed that the plot only covered the range from 200Hz to 20kHz, and a dynamic range from 20 to 120dB SPL. In fact, the speaker's on-axis response fills a  $\pm 5$ dB window between 220Hz and 20kHz, with broad dips centred around 4kHz and 12kHz. The response peaked at 1kHz and seemed to tail off gently from there down, falling 8dB by 200Hz and looking like the trend would continue.

### Listening Test

The SP5B sounded pretty much as you'd expect, given its frequency response. In a free-field situation the initial impression was of a small boxy-sounding speaker with a very forward mid-range and a generally weak bass response — the handbook insanely suggests a frequency range of 33Hz to 22kHz, but doesn't specify the measurement limits! You get more bottom end if you place the speakers close to rear or side walls, although not too close, as most of the LF comes from the rear port, which needs room to breathe.

The treble is clean and well extended, and the stereo imaging is precise and stable — an advantage of the small cabinet size. The speaker also sounds very fast, but is quite two-dimensional — there is no real depth and it fails to convey any impression of room size.

The amplifiers generate more than enough output level for nearfield use. An input of 200mV ( $-12$ dBu) is enough to produce full output with the gain controls fully up — a normal  $+4$ dBu monitor signal required the

speaker's gain controls to be turned over half way down, which made balancing the stereo image a fiddly procedure.

Like many companies before them, M Audio claim that 'after long research and development' the SP5B changes 'the concept of nearfield reference monitoring', and is 'designed to overcome all the limitations of conventional nearfield reference monitors'. I think not! With the lack of any real bass energy, the SP5B does create an impression of 'transparency', but I really don't think it justifies the 'reference monitor' tag. I found mixes performed on this speaker didn't travel very well to other systems, and it was poor at revealing the details in complex mixes. Even choosing reverbs was difficult, as the speaker didn't seem to reveal any differences between my Lexicon's programs!

The SP5B has no real UK competition at the price. Most two-way active systems cost at least a hundred pounds more — the Genelec 1029, Yamaha MSP5, Tannoy Reveal Active, or HHB Circle 3A, for example. But a comparison with any of these would quickly reveal the weaknesses of the SP5B. I find it hard to recommend the SP5B, and would suggest you saved up a few hundred pounds more to buy a more dependable monitoring system. **SOS**

### Information

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**SOUND ON SOUND**

**M Audio SP5B £329**

**pros**

- Compact.
- Self-powered.
- Loud.

**cons**

- Poor bass response.
- Two-dimensional sound stage.
- Boxy sound quality.

**summary**

A two-way active loudspeaker which sounds rather small and boxy.



Until now, removable hard drives have been an expensive luxury, but RATOOC's Firedock brings them within the reach of almost any musician.

Roger Jackson

**M**any digital studios have been using removable hard drive racks for some time, so that all the data for each session can be stored on its own drive, just as people would buy reels of two-inch tape for their analogue recordings. The advantages are obvious: you can swap between projects without even rebooting the



Photo: Roger Jackson

# RATOC Firedock

## Removable Firewire/IDE Hard Drive Mounting System

computer, move your projects to other studios with a minimum of fuss, and back them up quickly without filling your box cupboard with endless CD-Rs. Until now, however, removable drives have always been exclusively SCSI devices, since this format was necessary to achieve the access speeds demanded by video and audio applications, and these carry a much higher price tag than the ATA/IDE drives produced in higher volume for the PC market — a 60Gb IDE drive now costs well under £200.

Now RATOOC Systems, known for their networking cards as well as Firewire and SCSI interfaces, have produced a removable hard drive system which uses the cheaper ATA drives and connects to your computer via the Firewire buss. It doesn't use the Oxford W911 chipset as recommended by Digidesign for Pro Tools, but does support 100MHz buss speed and 7200rpm drives. It is compatible with PCs which have a Firewire port, and with Apple computers that have Firewire as standard; you need

Windows 98 or higher or Mac OS 9.0.4 or higher, the only exception being that you can't use this unit on a blue and white G3 running OS X. My comments here are based on using a 400MHz Mac G4 with OS 9.0.4.

Firewire is Apple's proprietary name for the data-transfer protocol also known by the frankly less inspiring name of IEEE1394, and caused great excitement with its inclusion as standard on Macs, as its fast transfer speed (up to 400Mbps) enables direct transfer of digital video into the computer without the need for digitising hardware on PCI cards. We have already seen other peripherals migrating to the Firewire buss, including audio interfaces and stand-alone hard drives, and the Firedock is the logical next step. In the UK it is available in two formats, single- and double-bay external, while a single-bay internal model is also available in some territories. For this review I used the FRDK2 double-bay external drive.

The rack is housed in a traditional grey/beige case, 180x165x340mm in size

(about as big as three slim hard drives on top of each other) with two lockable drawers at one end for housing drives. On the back panel are two Firewire ports, one to connect to the computer and one to chain other devices, and single IEC power inlet and outlet. Also supplied are screws to hold your drive in the caddy, keys to lock the caddies

**SOUND ON SOUND**

**RATOC FR DK2 Firedock £382**

### pros

- Easy and fast to back up or copy whole audio projects.
- Fast enough for multitrack audio recording.
- Huge amounts of backup or sample data on-line.
- Cheaper than SCSI alternatives.
- Less configuration problems than SCSI.

### cons

- Still more expensive than CD backup.
- Not yet recommended by Digidesign for Pro Tools.

### summary

The RATOOC Firedock provides a very cost-effective way of adding effectively unlimited drive capacity to Firewire-equipped computers, whether it's for multitrack audio, sample data or fast, convenient backup.



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World Radio History



## RATOC FIREDOCK

► in place when you're using them, and a hybrid software CD containing Mac and Windows formatting and mounting software. A neat 20-page A5 manual, a quality braided Firewire lead and an IEC power lead complete the package. Drives are not supplied.

## Installation

Each hard drive you use with the Firedock needs to be fitted into a caddy, and if you want to hot-swap between drives quickly, you'll want to buy a caddy for each drive (they cost £35.25 each) rather than replacing the drives in a single caddy.

The caddies are moulded in quite chunky grey plastic, and look sturdy enough. When you lift the handle on one of the drawers at the front of the unit, it starts to lever out the caddy inside, and you can then pull it right out. A sprung door closes to keep out dust when the caddy is removed. There is just one PCB-mounted connector on the back of the caddy, while the top slides comfortably back like an old-fashioned pencil case, leaving an 80-way ATA100 ribbon connector and a power cable ready to attach to the drive. A strip of sticky-back polystyrene protects the PCB. I feel this could easily peel off, leaving the solder points prone to shorting by any metal parts touching, or to

having one drive be a slave, as you would if both were being installed on the same IDE buss. Once the cables are plugged in, the drive fits very snugly into the caddy, hardly needing screwing in at all.

After inserting the caddy into the rack, you turn the lock switch with the key to activate the drive. The lock ensures that the caddy is fully pushed in and well connected to the bay, as well as making the power connection to the drive. It also prevents idle fingers removing a drive when in use, as long as you keep the keys out of the way! The fan is described as low-noise, but is by no means silent, and produced about about the same amount of noise as my G4 itself.

My OS 9.0.4 reported an unformatted drive and offered to format it, which worked fine. If you want to partition it, you will need to use the bundled mouter software, which as later tests showed, gave slightly better performance too. The manual helpfully tells you step-by-step how to access the Apple web site to download the latest Firewire driver, although you should already have one as part of the normal system. If you are running Mac OS X, you won't need the supplied software. Once the software is installed, you simply connect the unit and reboot.

## Drive Time

Once formatted, my drive appeared on the desktop and I copied some files across. Under each key socket are two LEDs, a green one to show that the drive is activated and a red one which flashes to indicate data transfer. This flashed away reassuringly as a large chunk of backup data was successfully copied over. As with all removables, you should take care to unmount a drive and let it spin down before removing and replacing it, otherwise the CPU can get confused about which drive it actually has connected at any time. Unlike *SCSI Probe* and similar utilities, you can't force the mounting software to scan the Firewire buss for new drives — it either recognises that you've attached a new drive, or it doesn't! The ability to swap drives without having to reboot your computer is, however, a great time-saver.

In performance terms, running an *FWB Hard Disk Tools* bench test returned a very creditable average access time of 8.4mS, with a sustained read rate of 28217Kb/sec and sustained write rate of 21629Kb/sec, figures that compared well with a similar IBM drive on the internal IDE buss. As well



Once an IDE hard drive is mounted within a caddy, it can be inserted and removed from the Firedock in a matter of seconds, allowing true hot-swapping of hard drives.

as using the Firedock for backup, many users will want to record multitrack audio direct to drives mounted in it, so I set out to see how many *Logic* audio tracks I could play back before it fell over. Using a MOTU 2408 with the buffer size set to its smallest value of 64 samples, it played 64 mono tracks without difficulty, so I did an edit across all 64 tracks to force the head to jump to a new location for each track. With the edit in place, the drive managed only 51 tracks compared to 63 when the same drive was mounted in the internal IDE buss, but increasing the buffer size to 128 samples gave back the full complement.

## Final Thoughts

In conclusion, the RATOC Firedock is a brilliantly easy way to store your backups on a medium you can search with your computer's standard 'find' utility, and is fast enough to run multitrack audio directly. It appears to do the same as SCSI systems costing twice as much, and the drives are also much cheaper, making long-term storage more cost-effective too. As a backup format, it does work out a bit more expensive than CDs — about 60p per Gigabyte more, at average media prices — and quite a lot more than tape backup. However, it offers considerable speed and convenience advantages over both these formats. **5/5**



The external Firedock models provide two Firewire ports, allowing you to chain devices on a single Firewire buss.

static from your fingers, although admittedly this is not a big risk in practice, and a piece of Sellotape could hold it more firmly if you are nervous.

Resisting the urge to eat the enclosed silica gel (why do they put that on there?), I inserted a 60Gb IBM Deskstar, one of the recommended drives. A number of the most popular drives from Maxtor, Seagate, IBM and Quantum are listed as guaranteed to work with the Firedock. All drives should have their jumpers set to 'master': this is probably the default setting as your disk is delivered, and you don't have to worry about

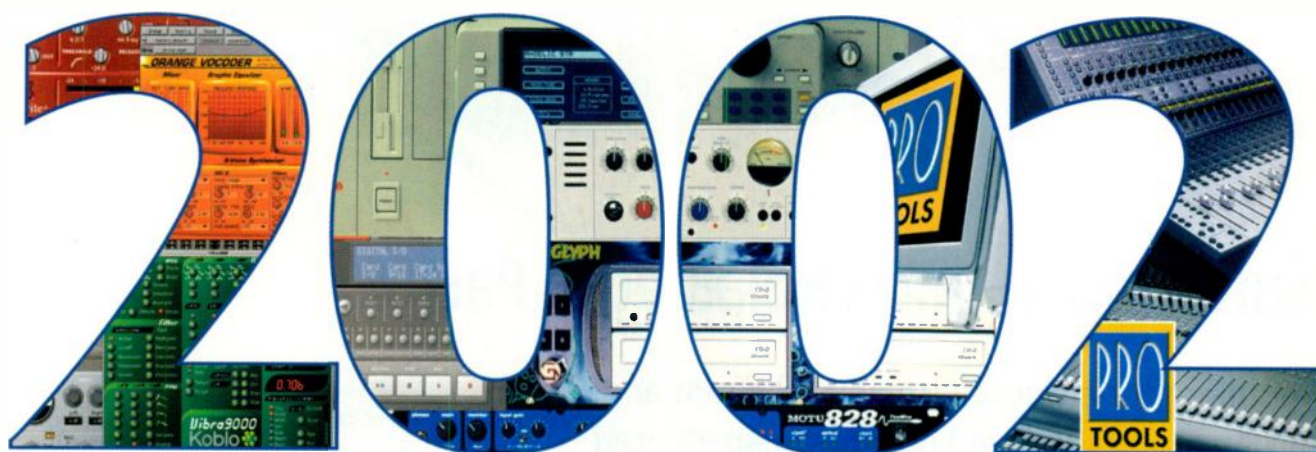
## Information

**E** FR DK1 (one-bay external) £240.92; FR DK2 (two-bay external, as reviewed) £381.88; FR MR1 hard drive caddies £35.25 each. Prices include VAT.  
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# You Are Surrounded

## Surround Sound Explained • Part 7

This month, we consider some of the pros and cons of mixing in surround, and hear how experienced surround producers take advantage of the format, and tackle the problems.

*Paul White, Hugh Robjohns, Matt Bell*

In last month's instalment of this series, we looked at some of the difficulties that need to be overcome when you try to set up a surround-capable studio using project studio equipment. We also spoke to two surround recording engineers with very different setups to see how they were addressing these problems, both of whom we'll hear from again this month: Rik Ede, a Dolby employee who runs his own business from his project studio composing 5.1 surround soundtracks for computer games, and Peter Cobbin, Senior Recording Engineer at Abbey Road studios.

This month, we're going to move on from putting together your system, and look at how you can make use of surround when you have a suitable system up and running. Obviously, mixing for surround is a more complex process than for stereo, with a much greater range of options for the spatial

placement of instruments in a mix, and of course there's the '0.1' channel — the subwoofer — to consider as well.

One of the constant refrains from the professionals working in surround who we've spoken to so far is that they have a feeling of greater freedom when mixing in the format, which they attribute to the current lack of clearly defined guidelines or accepted conventions for surround mixing. However, one effect of this is that engineers differ over what's acceptable in surround production and what isn't (even more than in stereo production!), and this is clearly evident in the interviews with Rik and Peter this month, where they frequently contradict one another. Of course, neither of them is correct or incorrect; they just have different approaches.

### Points To Consider

So how *should* we approach surround production? My own feeling on this is that the answer should be 'cautiously'. We've all seen

badly set-up consumer hi-fi systems, so consider the implications of a badly adjusted surround playback system, where the scope for incorrect placement or misuse of the speakers is so much greater, because there are so many more of them. Most people buy surround systems for home cinema use, and all such systems have a built-in facility to help the user match the levels of the speakers, usually by routing bursts of noise to each speaker in succession. Nevertheless, it's my guess that even where the user has bothered to do this, there are still likely to be discrepancies of several dBs between the Centre and front Left/front Right speakers, and between the front three and the Surround speakers. And that's without considering the sub-bass speaker, which is probably running 10dB too hot just to make the earthquakes and space battles on video DVDs sound impressive (or is that just my system?). Imagine what damage that could do to a carefully crafted music mix!

Now, it's probably fair to say that as more surround music becomes available, people will cotton on to the fact that they have to set up their systems properly. But until that happens, should we construct our surround mixes so that they take account of potential problems with the playback system (and if so, what do we assume people will have done



wrong)? Or should we just assume that everyone is playing back 5.1 on perfectly calibrated systems and leave it up to end users to sort things out?

Another factor some people like to take into account when they mix is the DVD player being used to listen to finished 5.1 epics. Some DVD players have only stereo speakers attached, and when they are given a 5.1 surround mix to play back, they 'collapse' the 5.1 mix into a stereo-compatible affair that will play back without losing channels or musical information. The technical term in use to describe this process is 'fold-down' or 'downmixing', as explained in Part 5 of this series (see *SOS* December 2001 or [www.sound-on-sound.com/sos/Dec01/articles/surround5.asp](http://www.sound-on-sound.com/sos/Dec01/articles/surround5.asp)), and many engineers like to create cautious 5.1 mixes that produce reasonable-sounding stereo when downmixed.

There's also the question of whether you should consider not only the playback system, but also the storage medium containing your 5.1 mix. If your surround mix is destined to end up on a DVD-Video disc with video material of some sort, it will have to be data-compressed in order that it can fit on the disc along with the video data, as even DVDs only have so much space and playback bandwidth, and video is very data intensive (see the 'Balancing The Bit Budget' box later in this article). As explained in part four of this series (see *SOS* November 2000 or [www.sound-on-sound.com/sos/Nov01/articles/surround4.asp](http://www.sound-on-sound.com/sos/Nov01/articles/surround4.asp)), the most widely used data-compression formats for DVD-Video are DTS and AC3 (Dolby Digital), and these can also affect your audio. Should attempts be made to minimise the effects of these compression algorithms during mixing, as in the days of mixing for Dolby's Pro Logic format (see part two of this series)?

## Use Of The Centre Channel

Opinions vary tremendously on all these topics. Some contend that the only completely safe way to do a surround mix is to use just the front Left and Right speakers to produce a conventional stereo mix, and ignore the Centre and Sub speakers, because some people don't have them connected or are driving them at the wrong level. This is the same school of thought that advocates conservative use of both Surround channels, so that a stereo downmix still comes out sounding listenable.

However, many people feel that this careful approach rather wastes surround's potential, and that it's much more interesting to place important sounds in the dedicated Centre channel, so that they cut through a mix that bit more effectively, rather than relying on the 'phantom image' generated by a conventional left/right stereo speaker



Rik Ede with his two cascaded 02R mixers in his surround-capable Gamesound studio.

system (for more on the difference between the 'phantom' and 'real' centre in a 5.1 mix, see part five of this series). Technically, this latter view is perfectly valid, but I would nevertheless urge caution, as it's also true that the most important musical components tend to be in the centre of the mix, specifically vocals and solo instruments. Think back to your last mix, and remember how hard you tried to get the perfect vocal balance by making adjustments of less than half a dB. Now imagine the same mix played back on a surround system with all the vocals mixed to the Centre channel. If the Centre speaker hasn't been set up properly by the end user, the vocals will sound noticeably too loud or too quiet. My feeling on how to deal with this problem is that it would be prudent to hedge one's bets, and combine vocals routed to the Centre channel with a phantom-centre image generated in the front Left and Right speakers, which will be unaffected by an incorrectly configured Centre speaker. Incidentally, this was also the approach to use of the Centre channel taken during the preparation of the 5.1 mix of the Super Furry Animals' album *Rings Around The World* (see last month's *SOS* or [www.sound-on-sound.com/sos/jan01/articles/superfurry.asp](http://www.sound-on-sound.com/sos/jan01/articles/superfurry.asp)).

Rik Ede is a firm believer in unashamed use of the Centre channel; "I very rarely have things in the Centre and front Left/Right speakers at the same time, and I like to keep things like the snare drum, lead guitar and vocals pinned to the Centre speaker." However, Rik also pays careful attention to how his mixes sound when played back on a variety of systems, from surround-compatible Soundblaster and small multimedia speaker-based PC systems, right up to full-range surround monitoring setups.

At Abbey Road, Peter Cobbin has yet another approach. He's a definite fan of the Centre channel, but doesn't use it for everything he wants to be located centrally. "There's a lot of discussion about whether we need the Centre speaker. My experience is that classical music often works well without it, but I couldn't do pop music without it — it really nails the centre solidly. However, phantom and real centres sound very different, and both work for some things but not for others, so I find it important to try both as I'm building a mix. We've had a modification done to the SSL J-series desk here at Abbey Road to allow me to do that quickly. Originally, the desk could be switched globally to operate with either a Left-Centre-Right panning mode, with a dedicated Centre channel, or a straight stereo Left-Right mode, with a phantom centre. The individual Pan knobs on each channel have all now been fitted with a switch element, so that if you pull the knob it pops up, like some of the other rotary controls on the desk, and that allows individual channels to be switched between Left-Centre-Right and Left-Right panning."

## Sub Culture

If there's much debate about the role of the Centre channel, the situation is even worse when you come to consider the subwoofer, originally designed to handle low-frequency effects for cinema. Should you leave its upper roll-off set at the Dolby standard of 120Hz, or should you reduce this frequency so that anything added to the subwoofer channel sits beneath the normal range of full-range speakers? For example, setting the LFE frequency at 80Hz, as THX recommend, would minimise the overlap between the full-range surround speakers and the sub.



## DVD Mastering At Abbey Road

We looked at Abbey Road's facilities for 5.1 Surround mixing last month — this month it's the turn of the mastering department. The studios have an in-house DVD-authoring department (Abbey Road Interactive), who put finished AC3 or DTS audio files together with edited video and create the graphic front-end needed for finished DVD-Video releases, but before this stage can happen, the surround mixes need to be properly mastered and converted to AC3 or DTS format in the first place. This task falls to the engineers in Abbey Road's Audio Restoration suite, who are also responsible for creating high-resolution MLP-format audio from the surround masters for use with DVD-Audio discs (for more on MLP — Meridian Lossless Packing — see part four of this series). As their title suggests, the Audio Restoration engineers also clean up old mono and stereo audio

recordings, and are responsible when required for upmixing this restored audio to create 5.1-compatible mixes.

Completed six-channel surround mixes are sent from Studio 3 on eight-channel Tascam DA98HR tapes, or placed as six-channel digital files on Abbey Road's central computer server, where the Audio Restoration engineers can access them. The six-channel mixes are then loaded into the studio's mastering systems. At the time of our visit, both SonicStudio HD and SADiE digital audio workstations were in use for mastering, but the Audio Restoration suite had moved over to SADiE. Mastered files are passed through Dolby AC3 or DTS encoders, and metadata (see part five of this series) is also set up for the files at this point via the workstation being used. The encoded audio files are then passed on to the Interactive department for DVD authoring.



The 5.1-capable SADiE mastering setup in the Audio Restoration suite at Abbey Road.

- Even then, can you afford to put more than just a hint of energy into the Sub channel, in case the end user has it set too loud?

Again, people have differing beliefs on this subject, as we'll hear in a moment, but for me, pragmatism wins the day; I think it's wise to avoid feeding anything into the 0.1 channel that you can't afford to lose. In other words, make sure the mix sounds OK without it, then use it to add that bottom octave to deep bass, kick drums or sound effects. It's important not to feel pressured into using the sub for the sake of it, or because you think that omitting it will make your mix sound thin on one of those compact domestic surround systems that uses tiny satellite speakers in conjunction with a subwoofer. These usually have their own bass management systems that feed low frequencies from the main channels into the sub so as to produce a nominal full-range response, and this happens whether you make use of the 0.1 channel or not.

This time both Rik Ede and Peter Cobbin are in agreement on basic use of the Sub channel, although they still use it in different ways. Rik: "If you don't have a subwoofer connected to your playback system, then depending on how your system is set up, information destined for the Sub channel may be redistributed to the rest of the speakers, but not necessarily equally. For that reason, it's important not to feed any essential information to the sub, because it may not get reproduced on some domestic systems. To check everything is OK, I always run through finished tracks with my sub switched off and check that they still sound OK."

Another concern of Rik's is the upper roll-off frequency for the sub. "If you go back to when Dolby Digital was invented in 1991, the sub roll-off was set at 120Hz, and that was fine for film use, but they didn't envisage dance music producers coming along and wanting to use it. Around four years ago,

Dolby themselves were recommending that those mixing music should steer clear of the sub altogether, but once you start creating music for 5.1, as opposed to just mixing existing music in surround, the sub's extra low-frequency control is useful. I roll mine off at 66Hz so that what is coming through the sub is really only the very low-frequency, gut-moving stuff, and it falls below the range of a typical full-range system. Pianos will cross over that 66Hz point at the low end, but I don't mix any of that into the sub because it can tend to make everything a bit 'washy'. With bass guitars, I might send a little to the sub,

but not much. Percussive bass synths can sound good with some low end fed to the sub, though. It's a personal thing, but I like using it just to reinforce, say, the bottom end of kick drums and things like that, so that they really hit you in the chest.

"My 02R mixers don't handle the filtering for the sub, so I produce my Sub channel at full bandwidth, then apply low-pass filtering at 66Hz to the material that feeds it, via a plug-in with a fairly steep rolloff — 18dB per octave usually does it."

At Abbey Road, Peter Cobbin has a full-range five-way B&W 801N monitoring system, and doesn't bother altering the roll-off of the sub, leaving it at the suggested Dolby standard of 120Hz. However, he is just as cautious as Rik Ede when it comes to using the 0.1 channel. "The end user may not be using the Sub channel, so I tend to spread bass over the front three speakers, and only use the sub to create extra depth for special effects. Sometimes I'll run a little of the low end of the drum kit to the sub, but always after I have made sure the basic five-channel mix works by itself, without the sub switched on at all. This is really why I like to mix on a full-range system, not one with satellite speakers and a bass-management facility."

## Artistically Speaking

As well as the Centre and Sub channels, there's the thorny subject of how to use the rear (Surround) channels in an artistically meaningful way. Some of the full-on surround enthusiasts we've spoken to relish the thought of having backing vocals and guitar solos coming from all corners of the room, but in my view, it depends on the type of



Peter Cobbin at the modified SSL J-series in Studio 3 at Abbey Road.





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► music you're creating. If you're trying to produce the illusion of a band playing on stage, then it may be enough to use surround's capabilities to widen the stereo mix and to place some room ambience in the rear speakers. Certainly this 'safe' approach provides the maximum insurance against your mix being ruined by a badly set-up playback system, but is it placing too many restrictions on what is really a very open-ended format? For example, I can certainly see the artistic attraction in using surround more overtly for ambient or dance music, and the traditionally experimental bands such as Pink Floyd (who originally did a quadraphonic mix of *Dark Side of the Moon*) could have a field day with their creative links. I can also envisage having a lot

of fun with surround delay effects that move around the speakers.

Rik Ede is quite unequivocal about using the Surround format to the full extent of its potential, and is not so interested in producing mixes that retain stereo compatibility. "There are some really poor 5.1 music mixes where the mix doesn't take advantage of the format. I've heard live concert DVDs where only the crowd and the ambience are in the Surround channels and the band sound is just a stereo mix spread across the front Left and Right speakers. To me, that seems to be missing the point. There are plenty of 5.1 studio mixes, too, which are more or less just a traditional stereo mix with a bit of reverb going to the rear speakers. I think that's such a waste!

We've yet to see much 5.1 music that's been created for the format and exploits the 5.1 palette. I look forward to the time when major artists like Madonna produce music conceived for 5.1 from the ground up. Properly used, surround can really enhance all sorts of music, including ambient material and even classical music. I did a 5.1 mix of Vivaldi's *Four Seasons* and the conductor said that was the first time he'd listened to a recording that sounded the way he heard it while conducting."

Unsurprisingly, Rik is fairly experimental when mixing his own material in surround, making no attempt, as some engineers do, to recreate the sound and realistic placements of a notional 'live band' around the listener. So what mix advice can he pass on? "There are

## Balancing The Bit Budget: Data Compression & Fold-downs

As Peter Cobbin explains elsewhere in this article, producing a suitable surround mix isn't just a question of creating listenable six-channel audio — there are often various commercial pressures that need to be considered. Sometimes, he is asked to provide a new stereo mix of an existing track as well as a surround mix, so that both can be included on a DVD, and end users can determine whether they listen in surround or stereo. Sometimes, however, the record company choose not to fund a stereo mix, or it is decided that there simply isn't room on the disc for both, and Peter then needs to make sure that the Surround mix he makes will fold down reasonably well into stereo if downmixed by the DVD player.

Abbey Road Interactive, who are responsible for DVD authoring, are the department who have to decide what rate of data compression should be applied to the various video and audio streams (for more on the various compression formats, refer back to part four of this series), and how much space in total should be devoted to the audio, video and multimedia content in any given DVD project. This is what Rob Pinniger, Technical Manager of Abbey Road Interactive, jokingly refers to as "the bit budget". "There often isn't enough space for everything, or indeed bandwidth. The maximum data transfer rate from a DVD is 10.08 Megabits per second, and we never go above 9.5Mbits per second, because experience tells us some DVD players cannot play back the full bandwidth... Then you have to subtract the data rate of every soundtrack as well, even though only one will be used at a time. A DTS surround track is something like 1.5Mbits per second — although there is a half bit-rate version of that.

AC3 Dolby Digital would be 448 kilobits per second, and the stereo Dolby track is 192 or 224kbits per second... That leaves a maximum video data rate of maybe 7Mbits per second, which is very poor — we would want that rate as an average. The problem is worse if the video is of poor quality as well, because the worse the video, the higher the bit rate needed to encode it accurately and avoid blocks appearing in the image. So when people come along from the audio side and say 'We want DTS and Dolby Digital, and a stereo track...', if the video master is not brilliant, we have to make decisions about cutting programme length or dropping the stereo track just to make it all fit.

"Having said that, we always try to provide a separate stereo mix for DVD-V, because we haven't been that impressed with the automatic surround-stereo folddown. Even if the stereo mix is data-compressed Dolby Digital, at least it is always mixed specifically to sound good in stereo. We try to encode it in uncompressed PCM if we can, although again, space on the disc does not always permit that. Because most of our DVD-V work is with music material, pop concerts and the like, we feel a good-quality stereo track is important.

"With DVD-Audio discs, this is less of a problem, as there is no video taking up all the room. Nevertheless, we still try to fit on a surround version and a stereo version, both in MLP format. A knock-on effect of using MLP is that we can provide some downmix coefficients in the metadata which give much more control on the fold-down than is possible with Dolby Digital or DTS on DVD-V. So we may not need to continue providing the separate stereo mix on DVD-A in the future."

Unsurprisingly for an audio engineer, Peter Cobbin prefers to have a separate stereo mix for his projects to ensure the best possible reproduction irrespective of the playback system used, but this doesn't mean he neglects to check how his surround mixes will fold down to stereo. "I do push for a separate budget to do a stereo mix where I can. In my experience fold-downs work well for classical orchestral music and film scores, but I really believe in maximising both formats for pop music. However, regardless of whether I have the luxury of doing separate stereo and surround mixes or not, I always have the monitoring set up so I can check the stereo fold-down. Some players will inevitably fold down from the 5.1 tracks anyway, even if there is a separate stereo mix on the disc, so it is always worth checking to make sure the folddown sounds decent. To do this, I use a little Mackie mixer to manually create a fold-down mix from the 5.1 surround output of the main desk. I route the 5.1 Centre channel to the Left and Right outputs at -3dB, with the rear Surrounds going to the Left and Right at -6dB, and the Sub at -10dB. I run the stereo output to an external monitor input on the SSL desk, and then I can easily check the fold-down and compensate for anything that isn't working as well as I want.

"When I'm building up a surround mix and sending signals from the front to the Surround channels for ambient effects, I get better results by delaying the signal to the rear rather than using the direct signal, and I might also have the delay feeding a separate reverb. Depending on how long or short that delay is, sometimes when you fold the rears back into a stereo fold-down it sounds great, although sometimes it sounds like



Rob Pinniger, Technical Manager, Abbey Road Interactive.

I've applied a comb filter! In those situations, I tweak the delays to make the fold-down work as well as possible without compromising the surround mix too much."

Peter views the various data-compression methods used on DVDs with equanimity. On the one hand, data compression affects the sound of his lovingly crafted mixes — but without it, there wouldn't be much hope of fitting video and audio of any great length onto DVD at all. "Needless to say, I think that the uncompressed masters sound better, but I still think AC3 and DTS are great formats. When I did my first mixes for DVD, I got AC3 and DTS encoders in so I could hear what they were doing as I mixed through them. I think it's fair to say most engineers prefer the sound of DTS. However, AC3 is in the spec of DVD as a mandatory format, and I've learned to live with it. These days, I don't unnecessarily modify my mixes for the sake of the compression format, which may change in the future anyway. Instead, I concentrate on producing the best 24-bit, 5.1 surround tracks I can, which may then be used for DVD-V, DVD-A or whatever format is deemed appropriate."



no established rules in surround yet, so I'll tend to do things like keeping the snare drum in the Centre channel and the reverb from it in the Surround channels. It isn't right or wrong, but when I paint my surround picture, it seems to work for me. It's definitely not just a wall of sound at the front with reverb and delay in the rears, though.

"For a typical pop mix, I pretty much always put vocals and lead guitar in the front Centre channel. I tend to spread drums around the soundfield, too, so although I nearly always have the snare drum in the Centre channel, I'll put the hi-hat sounds in the front Left and Right channels and the bass drum about two-thirds towards the front of the mix, so a little of it is coming out of the rear Surrounds as well — I tend not to feed kick drum to the Centre speaker because it seems to sit better in the mix without it. I pan toms all around the speakers and use two sets of drum overheads, so that I can route one to the front and one to the back. Other percussion might go into the rears as well as delays from other percussion where the dry sound is mixed to the front. I know this is subjective, but being able to place things around the room can really enhance the

material. Putting a small delay between the front and back speakers on a pad sound can make a real difference, and backing vocals sound great in the rears.

"It works a treat on acoustic and electric guitars, too. It's common to double-track guitars, but I've been quad-tracking them and placing them around the speakers, and it really adds to the whole experience."

Rik even likes to introduce surround effects to enhance the arrangement of a song. "On some of the surround projects I've done, I've tried to create contrast by having the soundstage quite narrow when the song starts, then introducing harmony vocal parts coming out of all the speakers when you hit the chorus."

So is there anything Rik does shy away from trying in his surround mixes? "There is the danger that some people will think it's early Beatles time again and put each instrument on a different speaker, but the novelty of that wears off pretty quickly. It's the same with extreme panning effects — moving things around the surround field can actually make you feel disorientated. A bit of subtle movement is fine, but a spinning lead guitar is overkill."

## 5.1 Remixes

Of course, Rik has the advantage of working on self-composed original material most of the time, which means he can give his imagination full rein when he wants to experiment. For engineers like Peter Cobbin at Abbey Road and the well-known American producer Elliot Scheiner, who are currently remixing record company back-catalogue material into 5.1 for release on DVD (Scheiner has worked on 5.1 mixes of The Eagles' *Hotel California* and is preparing a mix of Queen's 'Bohemian Rhapsody' as this is being written), there are additional complications. For a start, if you're working on a soundtrack which is destined to accompany a video on DVD, as Peter Cobbin often is, you may feel restricted in what you can do to the audio because you have to reflect what's happening on screen. Sometimes, multitrack tapes of the original recordings may no longer be available — or the record company may not be prepared to make them available for budgetary reasons! In such cases, you may have to work from a stereo mixdown, rather than the original multitrack master. The surround remix process is then known as an 'upmix' (for more on how

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## Practical Upmixing: Converting Stereo to 5.1

Andrew Walter is one of Abbey Road's 5.1 Audio Restoration engineers. Despite his title, he is not only responsible for the restoration of damaged or noisy recordings, but also mastering, AC3 and DTS encoding of surround material, and upmixing — the production of 5.1-compatible mixes from stereo (or even mono) sources. At the time of *SOS*'s visit, Andrew was creating upmixes from a bizarre range of source material, including a pile of shellac 78rpm records, some mono piano concertos recorded when magnetic tape was a recent invention, and, bizarrely, a new Emma Bunton single. Upmixes of the first two of these were understandable, as there never was a multitrack version of the material available, but we were puzzled as to why the Emma Bunton material was coming to Andrew in stereo instead of going to Peter Cobbin in Studio 3 on multitrack for a 'proper' surround remix. It turns out that the reason is purely economic.

Upmixing, as explained in part five of this series, is a relatively simple process, and can be done using a finished, paid-for stereo mix as a starting point. Put bluntly, it takes the likes of Peter Cobbin a lot longer to produce a true, discrete-channel 5.1 surround mix (and therefore costs the record company a lot more) than it does to pay Andrew Walter to create an upmix from the stereo version in a few hours. But as he explains, it's not quite as crude as that...

"It's not *always* best to go back to a multitrack source for surround mixes. Very few multitracks were recorded with any kind of surround sound in mind — most were intended for stereo at best. So even when you have the multitrack, there's always

an element of fudging things to create surround ambience because it wasn't recorded with that in mind. You don't find many tapes with ambience tracks ready-recorded for the Surround channels, believe me. So even engineers like Peter have to make that up during the remix. Of course, what they can do better from the multitrack is produce a decent spread of individual sounds across the front three speakers, send things deliberately to the sub, and pan solo instruments — but the ambience sound will still have to be faked!

"It also depends what you're mixing. I'm upmixing a live Deep Purple concert for DVD at the moment, and when you watch the video, your perspective is that you're in the audience listening, so you don't really want to have separate instruments out of the mix and flying around the soundstage — it wouldn't be realistic.

"We've tried various test recordings for EMI Classics in here, and some of those were originally recorded to multiple channels with quad sound in mind. Those we did remaster in four-channel surround sound, and it worked very well. Most of the classical recordings, though, were stereo, and we could have remixed those to surround in a variety of different ways. At the time, we chose not to use technology, but achieved the surround ambience by playing the stereo tracks out into Studio 1 and miking it up. That's the room where the recordings were originally made, so it was very effective. However, now we have got to grips with our new TC System 6000 surround processor, I'm not sure we'd do it like that again. If

you know what you want to create and you're careful, you can do that with good digital reverb and delays. We have the TC set up so that one DSP engine provides 5.1 panning capabilities, and then we feed that into a second Engine to introduce multiple delays and some sort of reverb effect.

"The System 6000 now offers an 'Unwrap' algorithm, which is supposed to automatically convert stereo to 5.1, but I haven't been that impressed with it so far. I'm sure it has its uses if you need to put something into 5.1 really quickly, but you can't really control anything sufficiently for our purposes."

So how do Andrew and his colleagues perform an upmix? "We take the left-right stereo mix and always keep that exactly the same in the Left and Right channels of the surround mix. Then we add to it a Centre, Surround and Sub channels as necessary, so we are not damaging or destroying the original sound, we are just adding to it to enhance it for surround.

"To take a specific recent example, we took the original stereo, put delays on it and sent it to the surrounds with an effect and a stereo-width enhancer on it to widen it. The problem is always how to fill in the sides, and how to create the Centre channel — what can you really do other than put a mono sum at a lesser level in the centre? On some things I send some of the information going to the sub directly into both Surround speakers, so that it helps focus the bass on a line running from front to back. I also often shelve off the high end going to the Surrounds.

"In a nutshell, what I like to hear from an upmix

► upmixing is done, see the box above. The technical side of the process was described in part five of this series). Finally, there are what you might call ethical considerations — when remixing for surround, the music you're working with is often well known in an existing stereo mix. How closely should you follow this version, and to what extent should you use surround effects? There may even be a brief from the record company or artist which restricts what you can do.

As Senior Recording Engineer at Abbey Road Studios, Peter Cobbin is familiar with taking points like this into consideration before he even starts work on a given project. Over time, he has become accustomed to getting a wide variety of guidance from record companies, ranging from nothing at all to an exacting list of what he can and can't do. "I have been briefed to 'make it sound exactly like the stereo', but of course that's impossible, as they actually want it in 5.1! I usually take that to mean that they want the same effects, delays, EQs, and so on to evoke the same sort of feeling that you remember from the stereo, but for it to have the experience of 5.1. Sometimes, people are less guarded and say 'just do whatever you need to do'.

"There aren't any rules on where to begin with a surround mix. Sometimes, if I've been asked to do a new stereo mix for the DVD as well as the surround, I'll do the stereo mix

first, as that helps me get to know the track, and work out which things need particular attention. Then I go on and build the surround version afterwards. But I'm not always given the budget to do a separate stereo mix."

When mixing surround soundtracks for DVDs with video content, Peter pays careful attention to the positions of sound sources, and does his best to ensure that there are no discrepancies between what you hear on the soundtrack and what you see on the screen. "I tend to keep sounds more towards the front when working with pictures than on a pure music track, particularly if the music involves a singer. I think it can be very distracting if you can see the singer in the middle of the screen, but the voice is coming out all over the place!"

Sometimes, though, certain aspects are completely beyond Peter's control. When taken on to remix the soundtrack for a DVD of Freddie Mercury singing his 1988 hit 'Barcelona' live in concert with Montserrat Caballé, he was given not the multitracks of the version recorded on the night of the concert, but the multitracks of the *studio* version of the song, and told to use those! "I was told to make the soundtrack feel like

the video looks — that is, a live concert on a big open-air stage. But then I was sent these four 24-track analogue multitrack tapes recorded in the studio. They were very dead-sounding, and very unlike what we were seeing in the pictures, which showed fireworks going off and the audience applauding at the climax of the song, for example. None of that was on the studio tapes, of course!

"That wasn't the end of it, either. I don't know the full story, but apparently at the concert there was a Nagra tape machine playing the backing track of the song, with live vocals from Freddie, Montserrat, and backing singers. The thing was, for some reason the Nagra played back a bit slowly on the night. Freddie, being the consummate pro, held the performance together, but this meant that I then had to sync the studio version over a slow performance! The record company didn't want to have the film recut, so I just had to do the best I could. The lip sync is not particularly wonderful as a result, but I couldn't do much about it!

"I had to create all the live ambience, which I did by playing the studio track out through speakers into Studio 1 and miking them up with a surround mic array tie-lined back to the desk. I used foley samples for the





— a classical one, anyway — is really just an enhanced stereo where you hear a few more reflections from behind in the Surround channels. Ideally, you have hardly anything coming out, and we do tend to err on the side of putting very little there. We did some tests where we played material to the other engineers in the building and many of them questioned whether the Surround speakers were on at all, but after they had listened to it for a while we switched to stereo, and then they realised just how important the surrounds had been in creating the illusion of space and ambience. I think it's nice to use it very subtly like that.

"On the other hand, with pop music, there is more freedom to use everything less subtly. With the Emma Bunton single I've just done, the Sub comes in and out at different places, and the Surrounds are not used so much during the verses, but then come in heavily on the choruses for emphasis.

"Obviously, as an engineer, the more options you have, the better, so if you have multitrack tapes recorded with surround in mind in the first place, that is probably the ideal material to start from. With something like the Eurythmics' *Peacetour* concert Peter Cobbin worked on, where they had the luxury of being able to spend the thousands of pounds needed to go back and remix it in full surround, that was fantastic. But whether the market will ever allow that to happen on a broader scale is another question. We know people in America who are setting up purely to provide upmixes from stereo material for surround release. I think if DVD-A takes



off and people want surround, there's a good chance that most of the 5.1 mixes will be produced by upmixing.

"The bottom line is that if you don't like what we have added in the upmix, you can always get back to the original stereo. We have found, though, that in most cases people don't realise how it has been done, whether it has been upmixed or rebuilt from original multitracks."

5.1 Audio Restoration and Mastering engineer Andrew Walter in the Audio Restoration suite at Abbey Road. Andrew was upmixing a stereo live Deep Purple soundtrack to 5.1 for DVD release when *SOS* visited — the video can be seen in progress on the screen behind him. You can also see the suite's hardware Dolby encoder units to the left of the SADiE workstation.

fireworks and audience applause at the end. I layered various different audience samples around the surround soundstage, and applied lots of different reverbs to help build up the signal in the Surround channels.

"This is one of the things that I have learned about working in surround; often the surround mixing is just one component. I may end up mixing a whole concert, adding sound effects, laying it all back to picture, taking care of the fold-down stereo and even the mastering — all under the banner of 'remixing for surround'."

Much less difficult were the production of DVD soundtracks for a live Eurythmics concert and a 5.1-compatible version of John Lennon's 'Imagine' to accompany *Gimme Some Truth*, a DVD about the making of the original album. In both cases, Peter was given complete artistic control. Nor was the raw material problematic as with the Freddie Mercury DVD. The Eurythmics concert had been conceived as a 5.1 DVD-V from the beginning, and had therefore been carefully miked and recorded to multitracks on the night. In the case of 'Imagine', Yoko Ono, impressed by Peter's work on the surround soundtrack for The Beatles' film cartoon *Yellow Submarine*, sent him a copy of the original eight-track multitrack master! Peter approached both



projects differently. For the Eurythmics concert, he once again used the facilities at Abbey Road to recreate the feel of the concert. "These concerts involve a lot of close-miking and DI'd instruments, so you don't get any sense of ambience from those. There were special audience mics set out, but even when I put those in, I felt it was missing something. I've found this even with stereo: sometimes to create a live-audience effect it has to be *larger* than life, so again, when I mixed this I had a lot of things pumping out into the studio and being re-recorded. I had a signal going out through a guitar amp, there was a Leslie speaker going at the back of the studio, and the main speakers were carrying something else again — you could walk around in the studio and it was almost like you were at the concert!

"Now you can really hear the interaction with the audience, which is nice, and I tried to create a sense of the depth and the size of auditorium in the surround soundstage, too, which the original multitracks didn't have. Now, when Dave Stewart plays a guitar chord, it seems to bounce off the back wall — all that kind of thing I had to create with processing and re-recording."

Peter took a more conservative approach with the mix for Lennon's 'Imagine', although it's still impressive when you hear it over a surround system. The main 'rock' instruments — bass, piano, and vocal — are spread predominantly across the front three speakers, and the strings, which enter at the start of the second verse, are mainly routed to the rear Surround channels, enabling you to hear the string arrangement with a clarity impossible in the stereo version.



## Next Month

As this piece has shown, there are plenty of questions about surround production at present, but no hard-and-fast rights and wrongs, so the only useful way to find out more about creating surround sound is to talk to people working with it! With this in mind, next month, we'll get the low-down on how two more producers are coping with working in 5.1 — Gavin Sutherland, a folk musician who has set up Scotland's first surround-capable project studio, and the aforementioned Elliot Scheiner, who should have wrapped up work on his 5.1 mix of 'Bohemian Rhapsody' by then... **SOS**



# RME DIGI 96/8 PAD

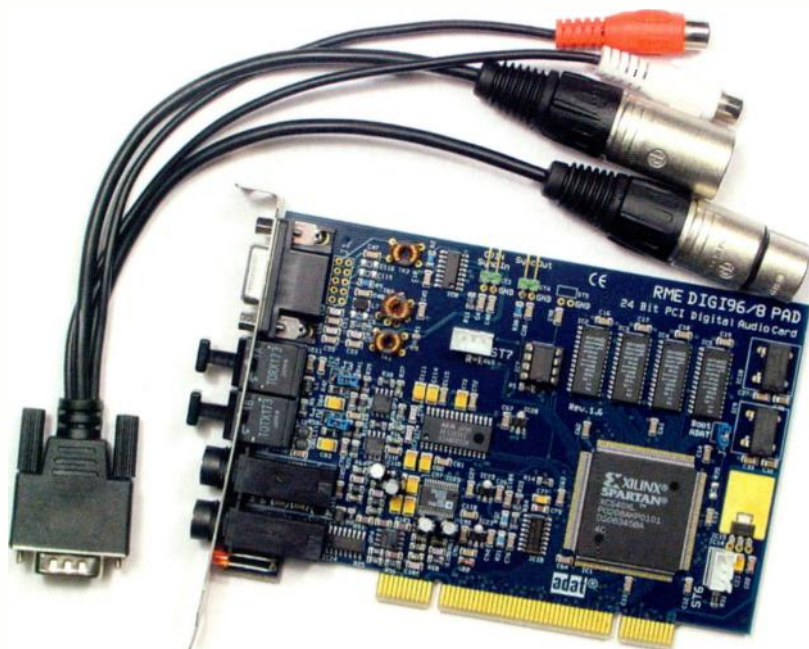
RME's DIGI range of soundcards offers comprehensive cross-platform support, high audio quality and lots of extras, such as digital format conversion.

*Martin Walker*

**F**ounded in 1996, Germany-based RME Audio have gained an enviable reputation over the last few years, largely for their excellent Hammerfall range of soundcards (reviewed in *SOS* September 1999), which provide rock-solid performance with low latency settings. This is possibly because they develop all their hardware in-house, including lower-level components such as the PCI and ADAT interfaces, giving them full control over every aspect of the design. Their products have also appeared in disguised form from other manufacturers such as SEKID (as the PRODIG range) and Steinberg, who currently market both a rebadged Hammerfall and DIGI 96/8 PST model.

The subject of this review is another member of the DIGI 96 range, which currently consists of five models. The basic

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model is the DIGI 96, featuring a single S/PDIF optical in and out; the 96/8's optical I/O is switchable between S/PDIF and eight-channel ADAT formats, and the 96/8 PRO adds an XLR connector for AES-EBU compatibility and a stereo analogue output. The 96/8 PST foregoes the XLR connector in favour of a stereo analogue input, while the DIGI 96/8 PAD is the model under review here. As the flagship of the range it incorporates every feature of the others in one card, giving it an S/PDIF co-axial in and out, an optical in and out switchable between S/PDIF and eight-channel ADAT formats, AES-EBU in and out on XLRs, and 24-bit/96kHz stereo analogue I/O.

### Overview

The DIGI 96/8 PAD is a compact 5.5-inch PCI card, featuring a pair of stereo quarter-inch jacks for the analogue I/O — users will need some sort of splitter lead to separate the left and right channels for connection to other gear. Completing the backplate socket quotient are two Toslink sockets for optical duties, and a nine-way D-type connector for attaching the supplied adaptor lead. This is about nine inches long and carries an in-line XLR plug and socket for AES-EBU connection,

plus a pair of in-line phono sockets for co-axial digital I/O. Also on the backplate is a useful red error LED that remains lit until a valid signal is detected at any one of the digital inputs.

On the card itself are various additional connectors and jumpers. There's a digital input suitable for connection to a CD-ROM's digital output, or to synchronise another DIGI card, and a Sync output for which a suitable short cable is also supplied. A pair of jumpers lets you switch analogue input sensitivity between -10dBV and +4dBu: it's a shame that this can't be done by software switching, but this preset approach does tend to make for a cleaner signal path. The default 'jumper in place' settings are for the more sensitive -10dBV, but if your gear will provide the required +19dBu for 0dBFS, you'll get slightly lower noise levels removing them. Finally, two three-pin connectors are also provided to connect the optional WCM (Word Clock Module).

### Drivers & Software Options

I'm pleased to report that the DIGI 96 series not only has drivers for Windows 95/98 and NT 4.0, but also for Windows 2000, Mac OS, and even Linux, Unix, and Solaris. There

SOUND ON SOUND

RME DIGI 96/8 PAD £365

**pros**

- Excellent analogue sound quality.
- Can be used for real-time digital format conversion.
- Cleverly designed automatic sync option.
- Versatile and reliable drivers.
- Supports CD-ROM digital connection.

**cons**

- No built-in DSP monitor mixer.
- Doesn't support 22kHz or 8-bit formats.

**summary**

RME's DIGI 96/8 PAD is a very well-thought-out design featuring high audio quality and a surprising number of extra options for those whose gear has ADAT and S/PDIF I/O.



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## RME DIGI 96/8 PAD

► have been dozens of releases for all the various platforms, each either curing bugs, improving performance, or adding new features. I downloaded the latest version 4.96 drivers for my PC running under Windows 98SE. These support any combination of DIGI 96-series cards, as long as they are sync'd together, either by using a common clock signal at their inputs, or by using the optional word clock module mentioned previously.



The Setting utility provides a range of options that makes it a real pleasure to use the DIGI 96 series with a wide variety of other gear.

The DIGI was correctly detected without a hitch, and I was up and running within a couple of minutes, with a new shortcut and Taskbar icon, both of which launch the comprehensive Settings utility.

The Windows 95/98 drivers support MME, DirectSound, ASIO 2.0, and GSIF, as well as full multi-client operation as long as all applications use the same audio format. You can even set up different sample rates at input and output if desired. Windows normally sees the ADAT input and output as four stereo pairs, although an eight-channel single device is also supported. The ADAT mode is fairly transparent to use: once your software accesses more than two tracks, it switches into this automatically.

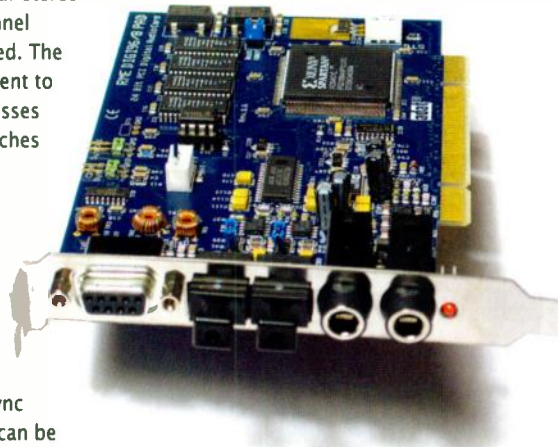
The digital I/O is very versatile, with a Mixed mode allowing you to select ADAT in and S/PDIF out or vice versa, while SyncAlign ensures that whatever you choose, all the channels remain in sample-accurate sync with each other. Input clock can be set to Optical, Co-axial, Internal, XLR, or Analog, or you can use the AutoSelect option to search among the digital inputs for a valid clock signal to lock onto. An Input Status window

displays the current settings. Along with the error LED on the card's backplate, this makes tracking down digital problems comparatively easy, especially with helpful error messages such as 'No Lock', 'Out Of Range', 'Stereo', or 'ADAT'. I was also impressed by the attention to detail with options such as Check Input, which prevents recording if (for instance) you've selected a 44.1kHz sample rate in your software, but the detected input clock is at 48kHz.

There are three options for general monitoring: Automatic patches the input signal to the output when it's activated for recording, while Play Only prevents this causing digital howlround when patched to a digital mixing desk, and Input patches real-time signals through to the output whenever playback isn't active. Zero-latency monitoring is available both as Punch I/O mode when using *Samplitude*, and when using the ASIO 2.0 drivers in any suitable host application.

### Output & Clock Options

When in ADAT mode you can select which pair of channels to monitor through the D-A converters and analogue output, while in S/PDIF mode, the analogue output defaults to channels 1 and 2. Various options such as Consumer/Professional format and Emphasis can be altered to taste on all digital outputs, and the card creates a completely new header for widest compatibility with other digital devices. The analogue output has four-way switched attenuation, along with variable faders, so that you can adjust output level over a 72dB range. This makes it compatible with virtually all external



The DIGI 98/8 PAD is compatible with every major form of digital I/O: the optical ports are switchable between ADAT and S/PDIF, while co-axial S/PDIF and AES-EBU are also supported, the latter via a flying lead.



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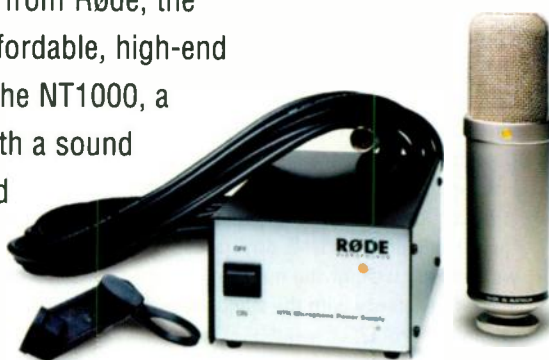
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## RME DIGI 96/8 PAD

► gear, as well as handy for headphone monitoring.

Force ADAT mode lets you record or play back stereo files, but transfer them to an ADAT device. You just select which of its four pairs to use inside your software application. In conjunction with the Input monitoring mode, you can use this for real-time S/PDIF to ADAT conversion, and the stereo input signal is then copied to all four stereo pairs at the output (sadly, this function isn't currently available in the NT or 2000 drivers). Conversely, selecting A/S Conv converts an ADAT input to S/PDIF output: you can choose which one of the ADAT stereo pairs is routed to the S/PDIF output using the Track buttons.

It can get confusing dealing with digital clocks manually, but unless you do it correctly you'll end up with skips and jumps in your audio. To make things easier, RME provide an intelligent AutoSync mode that



sticks with the low-jitter internal clock unless a valid clock is detected at the active input, when it switches over automatically. This should be a great help during 'on the fly' recordings, since you don't have to rely on the external clock being present before you start, and it also enables multiple DIGI cards to be synchronised from one input signal. However, there are some situations in which this mode can cause digital feedback, when you should switch the card to Master clock mode. A third Word Clock option is available if you've fitted the optional WCM module.

### Performance

Unusually, while the A-D converters are from AKM, and employ the AK5383 chip also found in M Audio's flagship Delta 1010

### Test Spec

- 1GHz Pentium III Coppermine PC with 256Mb PC133 RAM, running Windows 98SE.
- Motherboard: Asus TUSL2C with Intel 815EP chipset.
- Graphics Card: ATI Rage 128.
- Installed soundcards: Echo Mia, Yamaha SW1000XG.
- Tested with: Cubase 5.0 r6, Wavelab 3.0, Sonar 1.02.

### RME DIGI 96/8 PAD Brief Specifications

- Analogue connectors: unbalanced quarter-inch stereo jacks.
- Analogue inputs: two, unbalanced, nominal level +4dBu/-10dBV (selectable using jumpers).
- Analogue outputs: two, unbalanced, nominal level +10/+4/-2/-8dBu (software switched).
- A-D converters: AKM AK5383, 24-bit, dual-bit delta-sigma.
- D-A converters: Analog Devices AD1852, 24-bit.
- Dynamic range: Input 109dB, output 112dB.
- Total harmonic distortion + noise: <0.001%.
- Frequency response: 5Hz to 44.8kHz,  $\pm 0.5$ dB, at 96kHz sample rate.
- Channel separation: >110dB.
- Digital connectors: Toslink optical, in-line phono co-axial, XLR AES-EBU.
- S/PDIF jitter: <1nS in PLL mode (44.1kHz, optical in).
- ADAT jitter: <2nS in PLL mode (44.1kHz, optical in).
- Supported bit depths: 16, 20, and 24.
- Supported sample rates: 32, 44.1, 48, 64, 88.2, 96kHz, and variable (word clock).

model, the D-A converters are from a completely different company: the Analog Devices AD1852 chip. Listening tests against my new benchmark Echo Mia proved that these D-A converters were well up to scratch. There were subtle differences between the two, with the Analog Devices AD1852 of the RME card having a marginally sweeter, more natural, and open sound than the AK4528 of the Mia, as well as slightly better stereo imaging. However, on some material I preferred my Mia, so it was a close-run race.

The A-D converters also performed well, and I measured the RMS background noise at -109dB in 24-bit/44.1kHz mode — an excellent figure, and identical to that of M Audio's flagship Delta 1010, which uses the same converters. Doubling the bandwidth to 24-bit/96kHz reduced this to -101dB, again in line with the Delta 1010, placing these two cards joint best in my table of noise results.

Four ASIO buffer sizes are available, and I managed to run *Cubase VST* at the lowest 256-byte setting, giving me a very good 6mS latency with a 44.1kHz sample rate. The GSIF drivers also worked flawlessly in *GigaStudio*, and after a few tweaks I did get both applications running simultaneously, although RME don't recommend this. Both the DirectSound and MME drivers also worked very well, giving me 15mS glitch-free latency with the stand-alone version of *Pro 52*.

### Final Thoughts

When I first received this soundcard for review, I expected it to be a good all-rounder for those who need to record, playback, and interface with a wide variety of digital and analogue gear. I was surprised at the number of unexpected features such as S/PDIF to ADAT conversion, intelligent AutoSync and the various ways to support multiple cards, and beyond all I was impressed by the attention to detail. No



stone has been left unturned in the design and execution of this RME soundcard, and I repeatedly found myself wishing that my own had features such as the informative Input and Output Status displays, and the Check Input safe mode.

I haven't come across any other soundcard quite like the DIGI 96/8 PAD for comparison, but it does seem good value at £365 considering everything on offer, and would be an ideal choice for any musician with an ADAT or DAT recorder who wants to move into computer editing. There's no built-in DSP monitor mixer for the inputs and playback channels as on some cards, but then these other cards don't provide the versatile ADAT and S/PDIF conversion options.

For those who don't need all its facilities, the other four members of the DIGI 96 series provide different feature sets at lower prices, while those needing more analogue I/O could add external ADAT-compatible converters. The DIGI 96 series may have been around for several years, but it's a sign that RME got it right first time that they are still selling so well. As long as they carry on making and supporting them there's no reason why this shouldn't continue. **SOS**

### information

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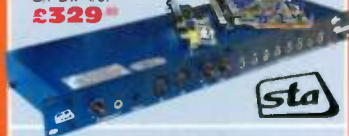
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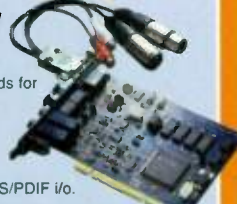
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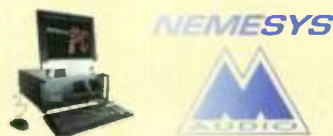


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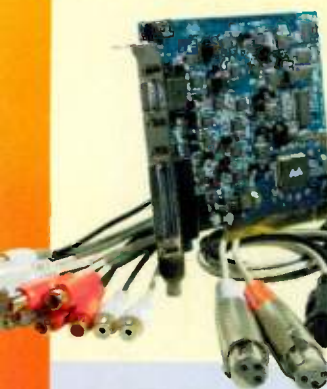


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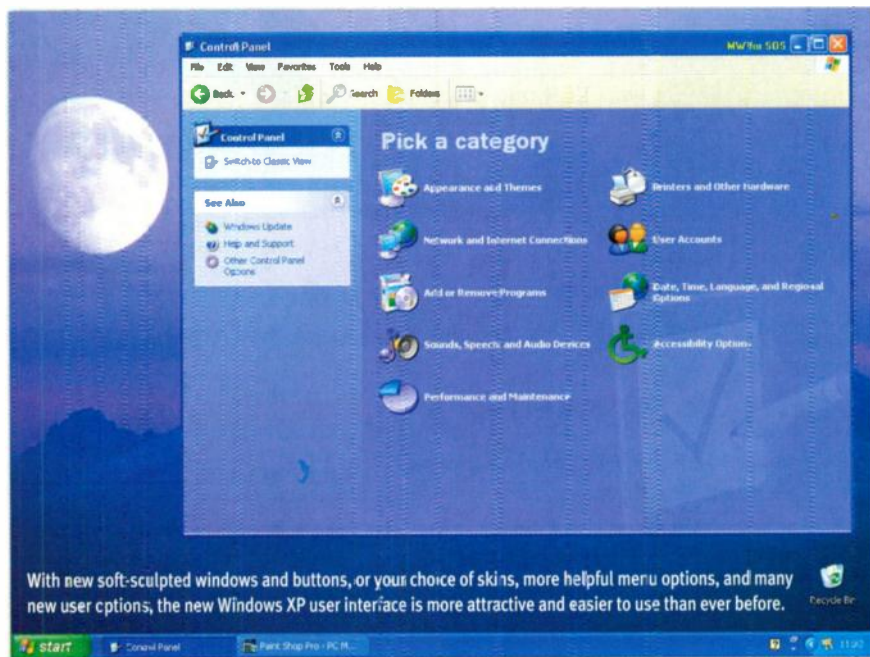
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Windows XP is probably the most important PC operating system upgrade since Windows 95, but as always, its new features come at a cost. Should you upgrade your computer? Here's the definitive guide...

Martin Walker

As promised in last month's PC Notes column, I'm going to devote this PC Musician to Microsoft's new operating system, Windows XP. As always, the requirements of real-time music applications are dramatically different from those used by your average punter, and so what may be considered invaluable by Microsoft might be one of the first things we musicians disable. So, I'm going to concentrate on the factors that really determine whether or not it's a



# Windows XP

## Is It Suitable For Music?

### Microsoft Windows XP

#### pros

- Probably the most stable, reliable, and robust Microsoft OS to date.
- Includes compatibility mode for troublesome Windows 95, 98, NT4 and 2000 applications.
- More hardware and software support than any other Microsoft OS.
- Easier to use interface with support for skins.
- Highly configurable multi-user accounts.
- Integrated CD writing at operating-system level.
- Applications launch much faster than with Windows 98/ME.
- No 10-device MIDI limit with WDM drivers as with Windows 2000.

#### cons

- Product Activation Code.
- Not all software and hardware is supported, and older items may never be.
- Multiple-processor support only available with XP Professional Edition.
- Applications perform no faster than with Windows 2000, although boot-up time is significantly faster.
- No software DVD or RealAudio decoders included.

#### summary

Apart from the various issues raised by Activation, Windows XP provides an overwhelmingly positive experience for the musician, as long as suitable hardware drivers are available.

wise move to rip out the most fundamental piece of software on your computer — the operating system — and replace it with another completely different engine.

Most musicians will be tempted by Windows XP's promise of greater robustness and stability, which it shares with Windows 2000. This is due to its 32-bit architecture and fully protected memory model, so that even if a badly behaved application crashes, your PC will carry on running happily. However, compared to Windows 2000 Professional, Windows XP offers significantly faster startup times, has much greater software and hardware compatibility, simplified security features for easier setup and use, a simplified log-on procedure, faster user-switching so that you can move more quickly from your music to general-purpose accounts, a new user interface featuring context-sensitive, task-oriented views, and enhanced support for digital media files such as video, pictures, and streamed music.

### Compatibility

If you intend to create a fresh partition to try out Windows XP, then by all means go ahead, but *don't* assume that your existing hardware and software applications will

automatically run on it. Remember, it's a completely different platform to Windows 98/SE/ME, more akin to Windows 2000 (see last month's PC Notes). Although some musicians may have heard that Windows XP combines the stability of Windows 2000 with the hardware support of Windows 98, this doesn't mean that you can necessarily use the same drivers and software versions.

Despite such warnings, some people still seem determined to upgrade before they check whether or not their existing hardware has suitable drivers, and whether or not their applications will run on it. I've spotted queries on user forums from musicians whose Windows XP PCs give an error when attempting to install one of their favourite applications, asking what to do next. Well, there's a compatibility mode in XP that 'changes the operating environment' to emulate Windows 95, Windows 98/ME, NT 4.0 (Service Pack 5), or Windows 2000. You can select this individually for each application, and this should let you install and run some applications that are otherwise cranky, such as Steinberg's *Setup MME* utility, which needs to be run in Windows 98/ME mode until the next update.

However, any applications that access the operating system or hardware at a lower



level, such as defragmentation utilities, personal firewalls, multi-boot launchers, virus checkers and utility suites are still unlikely to run, and in these cases there's not a lot you can do except wait until the developers release a Windows XP-compatible version. This may in some cases mean waiting weeks or even months, or buying a major new version incorporating support and other new features, while sadly, some older applications may never be updated.

## Soundcard Drivers

Before you even think of installing Windows XP, you should download all the necessary drivers and available updates from the appropriate manufacturers' web sites. You'll need one for your graphics card, and although in many cases a suitable one will already be on

the Windows XP CD-ROM, for optimum performance it's best to find the most recent release from the manufacturer's web site. You'll also need drivers for your soundcard and other audio and MIDI hardware devices. If there isn't a specific mention of Windows XP compatibility, in most cases a WDM driver written for Windows 2000 will work, and occasionally one written for Windows NT 4.0. If none of these exist then you should hold off buying Windows XP until they do, or replace the offending item with one that has XP support.

Installing new soundcard drivers once inside Windows XP will probably generate a 'not passed Windows Logo Testing' error message. Few soundcard manufacturers are

likely to pay the sums necessary to obtain a digital signature and the 'Designed For Windows XP Logo', and so as with Windows 2000, in most cases you can ignore the warnings and press on. There's little point in me attempting to compile a list of soundcards that have XP-compatible drivers, since the situation is changing rapidly and would be long out of date by the time you read this.

## Installation

When you run Setup from the Windows XP CD-ROM, you can choose its Upgrade Advisor utility option to test your installed hardware and software for compatibility. The same utility is also available free from

## System Requirements

As always, the recommended hardware requirements of a Pentium 300MHz processor or equivalent, along with 128Mb of RAM and 1.5Gb of hard disk space should be taken with a pinch of salt. You will certainly need at least 1.5Gb of hard disk space, and probably 2Gb or more once you start installing applications, but most authorities seem to agree that a more realistic target is a Pentium 400MHz or equivalent with 256Mb RAM, while if you have a somewhat more powerful processor such as a Pentium II 500MHz you can get away with 128Mb RAM. However, any musician will benefit from having at least 256Mb, and at current prices 512Mb isn't overkill, especially if you intend to use a software sampler. I've recently given in and installed a further 256Mb in my main PC for the princely sum of £25 including VAT and shipping!

### Users of Windows 98

Original or Second Edition, or Windows Millennium Edition, can upgrade to either XP Home or Professional Editions for less than the cost of a full version, while Windows NT 4.0, Windows 2000 Professional, and XP Home Edition users can upgrade to Windows XP Professional only, also at a reduced price. Windows 3.1, 95, NT 3.51, and Server users don't qualify for either upgrade and will have to buy the full version.

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## WINDOWS XP FOR MUSIC

- Microsoft's web site, although it's a hefty 50Mb download.

If you're migrating from Windows 2000 then updating is probably the easiest option, but if your current OS is Windows 98 or ME, I would recommend creating a new installation, either in a new folder in the existing partition, or preferably from scratch in a new partition. The latter option lets you run a dual-boot system, so that if you get any problems your previous setup will be totally intact.

If you intend to update any existing installation, you should take a few precautions. Low-level utilities might cause serious problems on a newer and therefore (to the software) unknown platform. If XP-compatible updates or upgrades have been released, you should install these before XP; otherwise, you should uninstall them altogether.

This is also an ideal opportunity to uninstall any older applications that you haven't used for ages, and with any computer more than a couple of years old, it's worth seeing if a BIOS update is available for your motherboard. Some music



Before you install Windows XP, running its 'Check System Compatibility' option should inform you of any hardware and software that may subsequently cause problems.

applications are also better uninstalled before you upgrade to XP. One example is *Cubase VST 5*, to make sure its older 16-bit DLL files don't remain in the system folder: you can safely reinstall it afterwards, since as in Windows ME, applications can save and access their own preferred versions of system files.

Remember that although some applications work across the entire set of Windows platforms, they may require different versions to be installed to run on Windows 2000/XP. One example is *Wavelab 3.0*, which you should uninstall before upgrading from Windows 98/ME, before reinstalling the NT version after upgrading (remember that a different serial number is required). However, judging by my enquiries, sometimes only minor updates are required for full XP compatibility — a

## Home Or Professional?

As far as Microsoft are concerned, the fundamental difference is that Windows XP Professional Edition is intended for a managed environment with higher security, while Windows XP Home Edition is intended for a single user or small network, with all users having the same status. The Home Edition is a strict subset of Professional, so it's far easier to point out its extra features — other than these the two are identical.

Both versions support Remote Assistance, a technology that works rather like Carillon's Remote Fix, allowing your PC to be interrogated remotely to determine the cause of any problems. However, only Pro supports Remote Desktop, which lets your PC act as the server to interrogate another PC.

Other Pro-only features are probably of less interest, such as Microsoft Fax (although you can install this manually from the Home CD-ROM), some network protocols and services, and some of the high-end power features of the NTFS file system, such as file encryption and file-level access control. You may be more interested in these if your PC is going to be on-line, to provide even more security against hackers, but for a music-only machine these features are all unnecessary.

The most important difference between Home and Pro is that only the latter supports multiple processors, so if you want to take advantage of the dual-processing optimisations of both *Cubase VST* and *Logic Audio*, Pro is the one for you.

new dongle driver for NI's *Reaktor* for instance.

Since XP now includes CD-writing as standard (more on this later), you should also uninstall and reinstall any application that provides this facility, such as *Wavelab*, *Nero*, and *Easy CD Creator*. All three of these do apparently run fine on XP, but it's safer to give them a clean install once XP is running correctly.

Finally, just like Windows 2000, those opting for a clean install also get the choice to format the partition into which they're about to install Windows XP in either NTFS (NT File System) or FAT32 format, or leave it as it is. FAT32 is the best for an audio partition, as it probably is for a Windows XP Home install and any single-computer installation, unless you want create a partition of over 32Gb in size. However, if your PC is going to access the Internet, be part of a network, or you're using Windows XP Professional, choosing NTFS for your OS and application partitions will let you restrict file access, for more security. For a single PC devoted to music, leave it as FAT32.

## The Upgrade Process

I decided to play safe and install Windows XP on my second PC, to let me try it out without disturbing any of the three Windows 98SE partitions on my main machine. If you intend to upgrade an existing installation, you can run the setup file directly from within your current version of Windows, which makes it very easy. Most recent PCs will also let you boot directly from the Windows XP CD in your CD-ROM drive if you want to perform a clean install — again, an easy option. Unfortunately, I'd chosen the most challenging route, since my three-year-old PC has a SCSI CDR/W drive. This makes things somewhat more complicated, since a driver is needed before it's recognised. Unlike Windows 98,

Windows XP isn't shipped with a floppy boot disk, and even if you have one you can't use it, since like Windows ME, Windows XP abandons all links with DOS.

Thankfully, I soon tracked down the required boot disk utility in Microsoft's download area ([www.microsoft.com/downloads](http://www.microsoft.com/downloads)), transferred its contents to the six floppy disks required, and then used them to start the boot process. My first installation attempt failed mysteriously after complaining of a vital but missing *hall.dll* file. Judging by Internet forums, a lot of people seem to have had this problem, but as I later discovered, it's easy to correct once you know how, and is normally caused by XP's built-in multi-boot loader program looking in the wrong partition if you already have another OS installed elsewhere.

Going through the process for a second time gave no such problem, and I finally emerged onto my new desktop some two and a half hours later. If I can get Windows XP running successfully on a three-year-old PC with SCSI hard drive and CDR/W drive it ought to be a doddle on most modern PCs, and all the industry professionals I spoke to agreed that this is the case.

## Product Activation

Next we come to one of the most hotly debated aspects of Windows XP, the Product Activation Code. In an effort to combat piracy, Microsoft have decided to make us authorise each copy with a challenge and response system. Once you first launch your new installation, you have 30 days in which to contact Microsoft, either over the Internet or by Freephone (local numbers appear for each country in the drop-down list on the Activation page). Thereafter, your copy of Windows XP will cease to run until you receive your confirmation ID. The Installation ID is a 50-digit code unique for each PC, and derived from both the 25-digit Product Key supplied with the product, and ►



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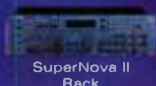
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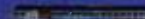
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## WINDOWS XP FOR MUSIC

- a further 25-digit 'hardware hash' code derived from almost a dozen aspects of your hardware, including processor type, amount of RAM, and the Plug and Play codes of your graphics card, hard drive, and CD-ROM.

Of course the whole point is to stop you buying one copy of XP and installing it on several different machines, but there is a lot of misinformation about the Product Activation Code. You don't for instance have to supply any personal details at all to get it: activation is completely anonymous, and Microsoft claim that the ID cannot be reverse-engineered, so they won't know anything about your hardware either. If you wish to register Windows XP for technical support, this is a completely different process.

Once you have your confirmation ID, you can reinstall Windows XP as many times as you like, as long as you don't reformat your hard drive, which erases the activation status. Most people's biggest worry is that they won't be able to upgrade any of their hardware and carry on using XP without getting Microsoft's permission. In fact, there is quite a bit of latitude when changing hardware, with a different weighting being applied to the various items. For instance, you can change your soundcard or video card quite a few times before requiring reactivation, but a major change like a new motherboard is far more likely to tip the balance.

Microsoft are understandably cagey about releasing too many details, but upgrading the way most people do, adding one new item at a time over a period of several months, may never require reactivation, while suddenly changing lots of hardware may be seen as more 'suspicious'.

The most important issue for many musicians will be whether or not you can install a multi-boot Windows XP system onto the same hardware, so that, as before, we can run a stripped-down version for music, and a no-holds-barred blowout version for everything else. My helpful contact within Microsoft UK told me this shouldn't be a problem, since an almost identical hardware configuration is being used in each case. Judging by my experiments, a completely different Installation ID is generated on each occasion, but apparently, although Microsoft cannot tell what your hardware configuration is from the number, they will know that it's exactly the same copy of XP running on almost identical hardware, and will be happy to supply another confirmation ID.

If you upgrade to a new computer, you will require a new activation code, although Microsoft claim that in the vast majority of cases they will still be happy to supply you with a reactivation code: I was told that no

European users at least have yet been refused a reactivation. After all, they're trying to stop people installing a single copy of XP on loads of different PCs, not prevent the average user upgrading.

Many PCs with the OEM version of XP installed will already be activated before delivery. This is one less thing for you to do, but a possible problem area if you intend to immediately install various items of new hardware such as a more advanced soundcard and extra RAM, as well as moving across an existing hard drive. In this case you would be well advised to request a non-activated product, or carry out the changes over a few weeks. Incidentally, businesses that acquire a software licence after purchasing five or more copies are not required to activate at all.

By far the best approach is to wait until the majority of your 30 days are up before activating. This will allow you enough time to track down suitable drivers, change any rogue hardware that refuses to run, and install more RAM if you feel you need it. Then, once you have a stable set of hardware, get your Product Activation Code, and it should last you for a year or more before you need to contact Microsoft again for a new code.

### New Features

The first and most obvious new feature in Windows XP is its new-look graphics, with soft-sculpted windows and buttons, rounded corners, and drop-shadows under menus, mouse pointers, and even desktop icon



The redesigned Start Menu includes many more icons that previously appeared on the desktop, which reduces clutter, although you can revert to the classic design if you prefer. A new version of TweakUI is available to further customise your settings.

labels. This default look showcases the new built-in 'skinning' capability that lets you customise the look of your software with new buttons, borders, and so on. Only one default new skin is included, and no editor, but others are already popping up as free downloads on the Internet. Those with more conservative leanings can revert to the 'classic' look of the Windows 98 family, and thankfully skins don't seem to impose any significant CPU overhead, as long as you disable the graphic fades and scrolls to make operations feel more immediate.

There's a completely redesigned Start Menu, which now includes options to launch My Computer, My Documents, My Pictures, ►

### Pricing Issues

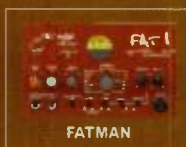
With two editions of Windows XP available in both full, upgrade, and full OEM (Original Equipment Manufacturer) versions, it's worth finding out which one is the best for you, as they aren't cheap. Inclusive of VAT, the Home Edition upgrade has a street price of around £80 and the full version £160, while the Professional upgrade is £160 and the full Professional version £235. The upgrade versions of Windows XP are significantly cheaper, as long as you have one of the qualifying operating systems already installed, but there also seems to be another much cheaper route.

Strictly speaking, OEM versions of any product used to be available only when bought with a complete PC system, although that didn't stop some unscrupulous retailers breaking their contracts and selling cheaper OEM versions

direct to the public. However, it's now much easier to do this, as the rules have been relaxed. In many cases a small hardware purchase such as a modem or even a £5 mains cable will now entitle you to purchase a full OEM Windows XP Home or Professional Edition package for about £80 or £125 respectively. You won't get telephone support from Microsoft, and only the clean install option is available (you can't update an existing installation), but it is a considerable saving.

Due to the new Product Activation (see main text), if you have multiple PCs, you will have to buy multiple copies of Windows XP. However, the requirements for a site licence have now also been relaxed, and home users can apparently now purchase a licence to get further copies at a small discount.





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## WINDOWS XP FOR MUSIC

► and My Music, as well as the Control Panel and any recently used applications. Clicking or hovering over the 'All Programs' arrow at the bottom launches the familiar cascading menus. There's plenty of customisation options too, including control over what icons appear, their size, and how many recently used programs are displayed, but the 'classic' design is still available for anyone who prefers it.

The Control Panel has also had a makeover, with its functions divided into various categories. Newcomers will probably find this easier to use, although once again you can switch to the 'classic' view if you prefer. The System Tray now hides icons if you don't use them very often, with a small horizontal arrow icon that lets you collapse or expand them (see main screenshot). Folders now have a new and more informative Tiles view, while the Details view can now display such options as Album Title and Artist when viewing MP3 files. Overall, the changes provide a more friendly and simplified interface.

### Multi-user Accounts

One feature that will certainly appeal to musicians is the multi-user accounts, designed so that several people can all use the same PC without interfering with each other's settings. Although you could set up accounts on previous versions of Windows, there wasn't enough customisation to make it worthwhile for most musicians. This time it's different. The first user is always the Administrator, with full rights to change anything on the PC, while further users can have their access restricted in various areas (useful for studio customers or children, for instance).

For the first time, Fast User Switching lets you switch between users while applications are still running. So, RAM permitting, you could have *Cubase* running on one account, switch over to another account to do some word processing, and then switch back to find *Cubase* as you left it. You can even leave it playing back if you like! I found I could not only set up and save a completely different graphic theme for my music account from my main one, without wallpaper, screensaver, or the various graphic frills that still eat processor cycles, plus my choice of default audio and MIDI devices, but also a completely different arrangement of shortcuts on the Start Menu. For instance, if you install loads of music software while in your music account, its

shortcuts don't appear in the Start Menu of other accounts, although all applications will always be accessible from Explorer.

System Restore first appeared in Windows 2000 and ME as a way to safeguard vital system files from being overwritten, and can now take snapshots of your complete system so that in the event of any problems after installing new drivers or applications, you can roll back to the previous snapshot. By default, it constantly

previous versions it's more stable and less resource-hungry. The only flies in the ointment are that you can't make MP3s, and that there's no support at all for RealAudio.

Since CD writing is now an integral part of Windows XP, you can save any files direct to a CDR/W drive without having to use a third-party CD-burning application, although most should still work and will probably provide more options. However, this support means that Media Player can directly rip CD

audio tracks onto your hard drive, and then use the Media Library feature to create playlists. You can also copy these files back onto a CD-R, or onto pocket or hand-held PCs and MP3 players. The video-editing features of Windows Movie Maker first appeared in Windows ME, but are more important now that even consumer soundcards like Creative Labs' Audigy provide Firewire ports for under £100 for those who don't already have them built in to their PC. Pictures from USB digital cameras are also easier to import than ever before.

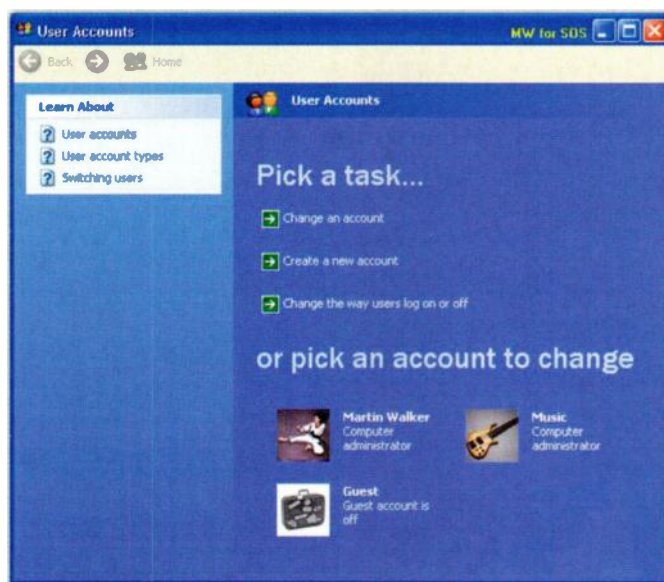
Windows XP also includes DirectX 8.1, which as well as offering updated graphics features for games supports the extra 3D Now! and SSE instruction sets of Athlon,

Pentium II, III, and 4 processors. However, Windows 98, 98SE, ME, and 2000 Professional and Server users needn't feel left out, as you can download DirectX 8.1 free from the Microsoft web site.

### Audio Performance

I've been having conversations with music developers as well as reading plenty of reports, anecdotal evidence, and downright lies about Windows XP before and after its release. However, judging by my own experience, and that of various experts whose opinions I trust, Windows XP must be Microsoft's most stable and reliable operating system to date. It's probably true to say that with its default settings, Windows XP won't provide audio performance on a par with a well-tweaked Windows 98SE, but once you've stripped out the unnecessary features, I suspect it will at least equal it, as well as being far more stable.

Many musicians have already reported much more reliable performance when running music software, especially when CPU usage is high and latency is low — the classic time for dropouts to occur under Windows 98 for instance. Stability also



Highly configurable user accounts let you adjust many more user-specific settings than ever before, although installing Windows XP into a second partition is probably still the best option for music.

monitors changes in the background, and reserves a sizeable proportion of each partition for a number of restore points, but it's best that musicians disable this while recording audio to avoid unexpected hard drive activity.

Other smaller but valuable new features include a Personal Firewall to keep the contents of your PC more secure from hacking while on-line, Internet Time Synchronising to keep your system clock automatically corrected while you're logged on to the Internet, and at long last, built-in support for ZIP files.

### Multimedia

Microsoft's new Windows Media Player for Windows XP has DVD playback support if you have a suitable DVD-ROM drive and a software or hardware decoder installed, and of course it also supports a huge range of video streaming formats including MPEG, AVI, and WMV, plus loads of audio formats, and CD audio tracks. Like previous versions, it also supports skins and visualisations, and if you're logged onto the Internet, you can also use its Radio Tuner to listen to streaming radio stations. Compared to





The latest version of Media Player incorporates CD ripping and burning, as well DVD playback if you have a suitable decoder, but does limit MP3 quality and has no RealAudio support.

seems to be better when resources are running low, which should mean less crashes when you launch a lot of plug-ins.

Most music applications I tried worked with only minor problems. *Wavelab* worked perfectly apart from a corrupted title-bar icon that conflicted with the new soft-sculpted buttons of the new Windows XP Theme. *Cubase VST 5.1*, *Sonar 1.3*, and *Reaktor 3* gave me no problems, and those developers who do need to release minor updates are doing so fairly quickly. Some musicians have had problems importing Akai-format CD-ROMs in *Halion 1.1*, but this should be fixed in the next update, and there is apparently a temporary workaround.

Where more work is needed, it seems to be well under way and in many cases approaching completion: for instance, *GigaStudio 2.5* has just been launched, and is compatible with both Windows 2000 and XP. Even the normally cautious Emagic have declared that their entire *Logic* series will run on XP from version 5 onwards, which should hit the streets by the time you read this.

In fact, all the developers I spoke to were unanimous in welcoming Windows XP, since it will eventually make their lives a lot easier. As with Windows 2000, development time will be shorter, since XP's robustness drastically reduces the number of reboots, even when testing early code versions: even if you have a crash your other PC applications should carry on regardless. With one common code base, new products can also be launched more quickly without having to solve the inevitable issues faced when trying to support upwards of half a dozen OS versions, and of course technical support issues will be far less complex.

One of the few remaining hurdles is the lack of suitable drivers for some soundcards.

Thankfully, after the painfully slow release of some WDM soundcard drivers for Windows 2000, XP is forcing manufacturers to pull their fingers out, since Windows 2000 and XP are eventually going to be the only PC platforms when Microsoft finally pull the plug and stop supporting the Windows 98 series.

### Final Thoughts

Installing a new operating system is never a task to be taken lightly, and I approached this review with caution. However, I was left with the feeling that Windows XP (along with its stablemate Windows 2000) is the platform that we may all end up using somewhere along the line, especially since most music developers seem to be welcoming it with open arms.

So, should you upgrade? Well, everyone will get the new easier-to-use and skinnable interface, the very customisable multi-user accounts, integral CD burning, and the latest versions of DirectX, Media Player, and so on. Windows NT and 2000 owners will in addition get faster system startup times, wider compatibility with both hardware and software, including various compatibility modes for running older applications, better support for multiple monitors, the removal of the 10-MIDI-device limit with WDM drivers, and may also manage lower latency values and smoother audio performance. Windows 98 and ME owners will get fewer new features, but the huge benefits of a new and far more stable engine, and faster application launch times. All new users will have the added complication of Activation to contend with, but this isn't as Draconian in practice as some have led us to believe.

By this point, most of you have probably made a decision one way or the other. Some may have soundcards that are no longer supported, and which therefore won't ever get XP drivers, or favourite software that isn't yet supported by XP and doesn't (for whatever reason) perform well under its compatibility mode. Others will be perfectly happy with the performance and stability of their current PC setup, whatever that is. The rest of us, however, should strongly consider Windows XP. I wasn't personally tempted by either ME or Windows 2000, but I've now installed Windows XP on my main PC and will continue to use it. I'll bring you a raft of new XP music-related tweaks shortly. **SOS**

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<b>Triton LE</b>	✓	1-insert, 2-master, and 1-final EQ	✓	optional	Dual Polyphonic	✓	✓	4	240 x 64 LCD	X	X	512 + 128GM	384	61-note Standard Quality	SmartMedia
<b>Triton Rack</b>	60 note polyphony	5-insert, 2-master, and 1-final EQ	X	✓	Dual Polyphonic	✓	✓	6	240 x 64 LCD	8	Moss, SCSI, DI & mLAN	1664 + 256GM2 + 128 for MOSS	1664	X	1.44MB FD drive
<b>Karma</b>	✓	5-insert, 2-master, and 1-final EQ	✓	X	KARMA Function	✓	✓	4	240 x 64 LCD	3	Moss	640 + 256GM2 + 128 for MOSS	768	61-note Standard Quality	1.44MB FD drive



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World Radio History



**Why use samples of analogue drum modules when you can have a proper drum synth in your sequencer, giving you complete control over your percussion sounds? Waldorf's *Attack* makes it all possible...**

**Paul White**

**A**nalogue drum machine sounds form the rhythmic mainstay of contemporary dance music, but as anyone who has ever tried to buy a real analogue drum machine will have discovered, they have drawbacks aplenty. They're expensive, many need modifying to work with MIDI, and they are far less flexible than modern instruments. Waldorf's *Attack* is a VST plug-in for Mac and PC systems that aims to recreate many of these classic analogue sounds, not by sampling, but by virtual analogue synthesis.

The biggest weakness of the true analogue drum machine was that each voice had to be based around a separate, dedicated sound-generating circuit. This meant the component cost was high and there was also a limit to the sonic variations that could be coaxed from each voice. Furthermore, each drum sound was strictly monophonic. Using software to emulate these analogue building blocks imposes no such limitations, and *Attack* is flexible enough to mimic machines as diverse as the Roland TR808 and TR909 and the Simmons SDS5, as well as being able to create new sounds not possible on any of the analogue machines. Furthermore, 12 of the *Attack*'s 24 voice elements can be played chromatically on separate MIDI channels (1 to 12) for use as bass or lead lines.

## Attack Formation

The drum sounds themselves cover the range C1 to B1 and the preset kits follow the GM drum-mapping protocol as far as possible, while the chromatic sounds can be played from C2 to G9. This means that all the drum sounds plus one chromatic patch are available on each of 12 MIDI channels. Controllers 12 to 59 are used to modify the drum sounds and Controllers 72 to 119 to modify the chromatic sounds. There are two built-in delay sections, and these accept MIDI only on channel 16 with Delay 1 using controllers 12 to 18 and

# Waldorf Attack



# VST Percussion Synthesis Plug-in For Mac & PC

Delay 2 using controllers 72 to 78.

I should point out that *Attack* is the software equivalent of a drum sound module, not a drum machine — it does not include any rhythm-generating capability, though the delays can be sync'd to song tempo. Mod/bend wheels may be used to control the chromatic sounds only and the software is set up so that this adjusts the filter cutoff frequency rather than vibrato depth. A mini keyboard and mod wheel are provided in the plug-in window for trying sounds and, as with other VST plug-ins, control changes can be automated. The polyphony of the plug-in can be set by the user up to a maximum of 64.

The 24 voices, their names and their MIDI channels are shown down the left-hand side of the plug-in window, and selecting any one of



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## WALDORF ATTACK

► them brings up the appropriate synth settings in the main window. When the sounds are played over MIDI, a virtual status LED attached to each voice lights up.

The synthesis engine is the same for all voices (see the block diagram, right) and starts off with two main oscillators that can generate all the classic analogue waveforms plus random sample-and-hold-style waves and noise. Additionally, samples of open and closed hi-hats and a crash cymbal are available. This makes creating cymbal sounds easier than by the traditional analogue method whereby a number of oscillators cross-modulate each other; in practice, *Attack* can generate both synthetic and natural-sounding cymbals. Oscillator 2 may be used to frequency-modulate Oscillator 1, and it's also possible to feed the two oscillators into a ring modulator. Using these facilities, a cymbal sample could, for example, be ring-modulated with an oscillator to produce a beatbox-type analogue cymbal sound.

A mixer combines the oscillator outputs with the ring modulator and the output from a specially designed 'Crack' generator (with speed and length parameters) is used to produce handclap-type effects. There are also controls to set the amount of influence the two ADSR envelope generators have on the level of Oscillator 2, based on key velocity. Envelope 2 is pre-routed to the main output amp (which operates like a VCA) while Envelope 1 can be used to influence different sound parameters, such as the filter cutoff and the Oscillator 2 level, and both Envelopes 1 and 2 can be used to modulate Oscillator 1.

The output from the mixer is fed via a resonant, switchable high-pass, low-pass, band-pass, or notch filter with adjustable overdrive, where the frequency can be modulated from the envelopes and also from an LFO. Next comes an amplifier envelope which feeds two modulated delays with stereo outputs as well as four straight mono outputs. This provides a total of eight outputs, the idea being that in systems that use multi-output soundcards, the various drum sounds can be routed to different destinations.

In order to produce natural-sounding hi-hats, the voices may be assigned to exclusive groups so that triggering a new sound, such as a closed hi-hat, will cut off a sounding open-hi hat assigned to the same group. As the block diagram shows, the synthesis engine is relatively straightforward, but it is still capable of generating a huge range of sounds. A section of the manual explains how the familiar TR808, TR909 and

SDS5 sounds were generated and examples of these sounds are provided within the preset drum kits. I used *Attack* under Emagic's *Logic Audio* and in order to gain access to the preset kits, I first had to copy them into *Logic's* Plug-in Settings folder.

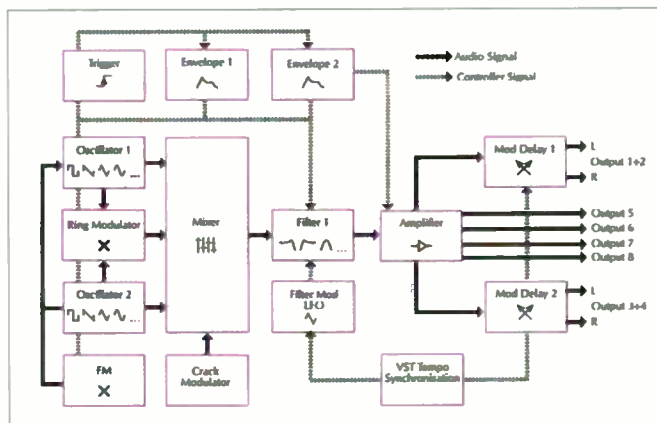
New sounds can be created from scratch either by modifying the presets or by starting from first principles, and sounds may be copied and pasted between kits. Modifications to a kit must be saved before you move to editing a new one or your changes will be lost, though you can move around within kits without losing your changes.

## Sound

All the classic analogue machines sound the way they do because of the way in which the analogue voice-generating elements are put together, and some are very distinctive. In many cases, the quality of the sound is due to the imperfect way in which analogue circuitry attempts to synthesise 'real' drum sounds and I was pleased to find that the TR808, TR909 and SDS5 presets were extremely true to the originals. What's more, it's very easy to customise the sounds to build up a library of individual voices or complete kits, and some of the presets provided show just how weird and industrial you can get when you try. You need to know the basics of analogue synthesis to get the best out of *Attack*, but even semi-informed experimentation can produce some very worthwhile variations, and there is a Random function that can be used to create new voices or even complete new kits. Oddly though, the randomisation also applies to the output assignment, so I had to keep switching back to Stereo 1 before I could hear anything! A 'vanilla' blip is also provided as a starting point for creating new sounds.

The envelope generators are fast and assertive, and the sounds consequently have plenty of punch. The more I played with *Attack*, the more I liked the way it sounded, and the ability to automate parameters is a techno composer's dream.

Further surprises were in store when I started to explore the lead/bass capabilities of the chromatic section. I'd expected this side of *Attack* to be a bit of a throwaway, but that turned out not to be the case at all. In fact *Attack* is enormously flexible as a musical synth and is great for producing fat bass



*Attack's* signal path in block-diagram form.

sounds, punchy TB303-style basses and even bass drones that are extremely reminiscent of Moog Taurus pedals. It's not too bad at leads either, and of course it is polyphonic, so you can get some nice pads out of it. The FM and ring modulation in the oscillator section coupled with the multi-mode filter provide more versatility than many of the simpler analogue synths, so it's possible to get glassy DX-like tones, silky Oberheim leads and even some fair Moog approximations. However, I found the lack of 'mod wheel to vibrato' routing a little limiting, and the pitch-bend seemed to be fixed at 12 semitones, which is far too coarse for normal use. This could be fixed in *Logic Audio* with a bit of trickery in the Environment page, but I felt it should have been adjustable from the *Attack* front panel.

## Summary

*Attack* is a powerful, great-sounding piece of kit. Its ability to do impressions of classic analogue drum machines is uncanny, its friendly user interface invites experimentation, and it turns in a better-than-average performance as a chromatic synth, even though some functions are missing in this department (specifically the fixed bend range and lack of mod-wheel vibrato). There's also no portamento control, but you can still coax some seriously good synth leads, pads and basses out of it. *Attack* is more than just a virtual drum module — it's a complete drum programmer's toolkit, and is flexible enough to be useful across a whole range of musical genres. Some software synths simply fail to excite, but this one is fun to play with and the results are more than worthwhile. **SOS**

## Test Spec

• *Attack* version reviewed: v1.01.

## information

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Software samplers are revolutionising studio recording, but can they replace their hardware counterparts in live performance? Jazz keyboardist Django Bates is in the process of finding out...

# Going Soft

## Django Bates' Human Chain: Soft Samplers For Live Music

Sam Inglis

**A**re hardware samplers dinosaurs, about to become extinct species at the hands of their software counterparts? Many studio-based musicians are turning to programs such as Emagic's *EXS24*, Bitheadz' *Unity DSI*, Nemesys' *Gigasampler* and Steinberg's *HALion*, and the benefits for music recording are obvious. Whether it's close integration with sequencers, full-screen graphic editing, effectively

unlimited sample memory, or the ability to load samples in seconds from the computer's hard drive, soft samplers apparently promise more of everything.

If there's one area in which you might expect hardware to remain pre-eminent, however, it's on stage. After all, it's a fact of life that computers crash every now and again. If this happens in a recording session, you might lose five minutes of studio time, but if your laptop goes down in the middle of a show, those lost

minutes could be very awkward indeed. Add to this the fragility of your average portable computer, potential issues with latency and the headaches involved in setting it up for live use, and you can understand why musicians might prefer to have a reassuring lump of rackmount hardware backing them up.

I was interested, therefore, to meet a top-flight musician who's in the final stages of moving to a soft-sampling setup for live use. Django Bates is one of Britain's foremost

jazz keyboardists and composers, and has brought a rare freshness and innovation to the genre, partly through his use of electronic instruments. For many years, his principal sound sources have been a battered Korg electronic piano and an Ensoniq ASR10 sampler, along with a Yamaha TX802 FM rack synth and Clavia Nord Lead keyboard, but in August 2001 he began the process of migrating to a system based around an Apple G4 Powerbook running Emagic's *Logic Audio* and *EXS24*, along with Bitheadz' *Unity DSI*. When I met him in late November, rehearsing with his band the Human Chain, he and his technical consultant Tim Adnitt were, they said, "Ninety percent of the way there..."

### Why Software?

Why leave behind a tried-and-tested setup for the uncharted territories of software sampling? According to Django and Tim, for the same reason why other people choose hardware samplers: reliability. The band tours extensively all over the world, and they have had innumerable problems transporting their rackmount gear. Django: "What started all this was, I suppose, jealousy of seeing a band that just had two laptops, and two people playing from them, although they were doing a very different thing to what I want to do. Jealousy, and also the cost of taking heavy equipment on

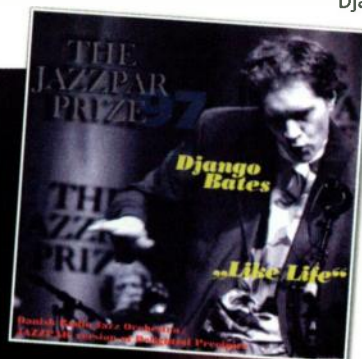


Photo: Richard Lickerson



Django Bates





Django Bates' existing keyboard setup is based around a Korg SG1D electronic piano and Clavia Nord Lead synth, along with his trusty Ensoniq ASR10 sampler and Yamaha TX802 sound module (in rack, left). The Kenton Control Freak on the chair will, if all goes according to plan, allow Django to create layered sounds in a similar way to the front-panel buttons on the ASR10.

planes. It's not only the cost, but they make it incredibly hard, by often breaking it on the way out and on the way back."

"There's also the problem that a lot of this equipment is getting old, and if it breaks, trying to get someone to supply the same piece of equipment is getting increasingly difficult," adds Tim.

Django offers an example: "I had two Syquest hard drives to store samples from

the Ensoniq. The first one died, so I started using the second, then that died, and I went back to see if the first one would work and it did — for a while. Then when that died, we tried loads of hire companies. They sent one that didn't work at all, and I just happened to stumble upon one that a friend, Ashley Slater of Freak Power, still had on a shelf somewhere. When that goes, we hope the new system is going to be ready!"

"It's good using a computer, because you can just burn an image of your OS and everything, set up and ready onto a CD," enthuses Tim. "I've never had any serious problems, but if you did, you could just reformat the disk, or hire a computer, and hopefully that will work. Although copy protection is a problem — *Unity* has to be manually installed because of the way their copy protection works."

## Django Bates: Keyboard Player

Since coming to prominence in the 1980s as keyboard player with big band Loose Tubes, Django Bates has forged a reputation as one of the most individual jazz musicians and composers in the country. As well as playing solo piano gigs, he leads several bands: Human Chain, which is comprised of Django plus long-term associates Iain Ballamy (sax), Martin France (percussion), and Michael Mondesir (bass), also form the core of his current big band *Delightful Precipice* and, with the addition of singer Josefina Cronholm, the vocal-led *Quiet Nights*. He's also in serious demand as a composer and a collaborator.

Human Chain's music is a refreshing antidote to the seriousness of much modern jazz. A bewildering blend of styles incorporating everything from free jazz and bebop to pop, classical and ethnic influences, it achieves the rare feat of being entertaining and

accessible, yet modern and experimental. Their up-to-date sound stems to an extent from Bates' choice of instrumentation: rather than use acoustic or electromechanical pianos, he leads the band from behind his Korg SG1D stage piano, which he uses both for its own sounds and to trigger layered samples (see main text). I asked him how he'd decided to take this path in a genre which is still predominantly the domain of more traditional instruments.

It seems that his first experiments with electronic keyboards came about largely for pragmatic reasons: "In England, you often find that pianos are really crap in the kind of venues you have to play in when you're starting out. In fact, the first proper jazz gig I got was at the Waterside Theatre in Rotherhithe, and there was no piano there at all, so I thought 'I've got to get something.' I tried all the obvious

things like Fender Rhodes and Wurliizers, and got pissed off with them all for the same old reasons that people always do — the Fender Rhodes is great for a certain thing, but it's the whole 'Can I play this for a whole evening?' problem.

"The point when it started to feel that I could really play music was when I found just a basic electronic piano that worked as a base, and a Prophet V which provided the excitement that could be thrown in with it. It was from getting the Prophet V that I started enjoying playing keyboards, and not just thinking 'Well, this is something I have to do because there isn't a piano.' I gradually built up an interest."

Nevertheless, he admits to being slow to see the potential of sampling technology when it became affordable in the late '80s: "When I was in Loose Tubes, there was a bit of a buzz about that band. I got a call

from Akai, and they said 'Come in, we just want to show you some keyboards.' I was really naive or thick, or both, and I went in there, and this guy showed me things that looked like that [*he points to his rackmounted ASR10*], and I was so untechnological that I could only relate to something that looked like a keyboard. They were trying to lend me or give me one of the first S900s, and I walked out going 'Yeah, I'm not really interested, it's not my kind of thing.' It was so stupid!

"A couple of months later I was in Rod Argent's shop, and a guy was playing a keyboard, and all these weird sounds were coming out of it, sounds that had nothing to do with music — farmyard sounds and stuff like that. I just thought 'God, there's so many possibilities.' And then it started to get really exciting. I thought 'That's great, that's what I want!' and I ended up getting an Ensoniq Mirage."



## SOFT SAMPLERS FOR LIVE USE

## ► The New Setup

The obvious basic requirement for the new computer-based system was that Django should be able to do everything that he'd been able to do with his decade-old ASR10. Despite the theoretically massive increase in power that modern software samplers offer, however, this has proved surprisingly difficult. The first stage was simply to transfer the raw sampled sounds from the ASR10 into the Mac.

"When we came to sample the sounds from it into the computer, we took a lead from the digital output at the back, thinking that this would be much better, and nothing happened at all," laughs Tim. "We spent about four hours thinking 'There must be some kind of method by which you activate the S/PDIF output.' Anyway, we opened it up, and we couldn't quite see what was going on, and during this time Jeremy [Farnell, *Django's manager*] was phoning all these people he vaguely knew who had contacts at Ensoniq, and I was looking on the Internet. And simultaneously, we discovered that the digital board was an option, but they'd put the connector on the back regardless of whether you had the board or not!"

"And then we rang Ensoniq and said 'Can we get the digital board?'" continues Django. "They said 'It was never built.'"

"So that was a dead end, but we found that doing it analogue didn't have any side-effects at all," says Tim.

At this point, though, they came up against a much more serious problem: even though their ASR10 belonged to a previous generation of instruments, none of the currently available software samplers could easily mimic its unique envelope shapes.

## Django Bates' Gear

## Keyboards

- Korg SG1D stage piano.
- Clavia Nord Lead synth.

## Old setup

- Ensoniq ASR10 sampler.
- Yamaha TX802 FM synth module.

## New setup

- Apple Mac G4 Powerbook.
- Bitheadz *Unity DS1*.
- Emagic *Logic Audio* and *EXS24*.
- MOTU 828 Firewire Interface and Micro Express USB MIDI interface.
- Kenton Control Freak MIDI controller.

## Live gear

- Shure SM58 microphones.
- Phonic MM122 mixer.

Django also uses *Sibelius* for composing.



Transfer the samples themselves was one thing, but getting them to respond to Django's playing in the way he was used to was quite another. "The samples are quite short, and we soon realised that many of the samples themselves were actually quite dull," explains Tim. "The real character of the sounds comes from the envelopes and all those kinds of aspects, which is why that's so important. I think that's something that could be improved in a lot of these software samplers, just to make the sounds more interesting. It's very easy to end up with something very lifeless and drab, and it's very easy to trigger a sound, but actually *playing* a sound seems to have fallen by the wayside. In some ways it's a compromise, because we just can't do what the Ensoniq can do in terms of envelopes."

## Just A Few Buttons

Perhaps the biggest stumbling block in the migration process was thrown up by another Ensoniq feature which Django had always employed, and which proved infuriatingly difficult to emulate on a computer setup. The ASR10 features a row of eight large buttons on the front panel, which the user can assign to call up eight of his or her favourite programs at one touch. Pressing any of these buttons once simply changes patch, but 'double-clicking' them effectively layers the new sound on top of whatever program(s) are already being used. In this way, it's possible to switch in and out up to eight individual programs on the same MIDI channel, at the touch of a button. Tim and Django decided

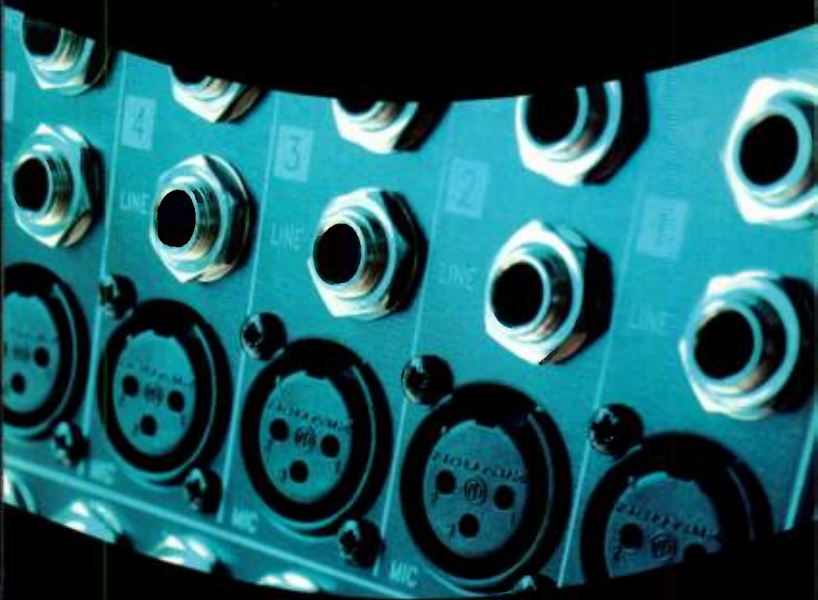
that the best way to reproduce this in a computer system would be to use a Kenton Control Freak hardware MIDI fader box to fade individual programs up or down.

Getting this system working properly, however, has been less than straightforward. Part of the problem is that most software samplers and sequencers are set up for studio situations where the different patches in a multitimbral performance are on different MIDI channels. "Initially what we'd been hoping to do is find some means of going directly into *Unity* by transmitting on more than one MIDI channel at once, but that didn't seem to be an option," explains Tim. "This was around the time when they released the update to *Logic* that allowed you to have multiple *EXS24s* triggered live, I think it was 4.71 or 4.73 or something, so I decided to look at that route as well, just as an option, and in many respects it's a lot tidier. *EXS24* is a lot easier to use: the envelopes are much more simple, but they do allow you quite a great degree of control, so they can actually do most of what we want to do. So at this point I looked at using the Environment and the *EXS24*. What I did initially was to create an Instrument Object of a master keyboard, which then goes into a MIDI Monitor Object, and then just goes to however many instances of *EXS24* we need.

"The other aspect of it is that Django needed to be able to control the sounds remotely and spontaneously, without messing around with the computer, so that's why we decided to use the Control Freak. ►



# Well connected.



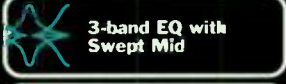
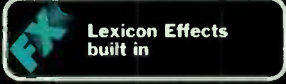
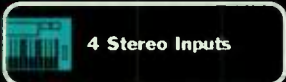
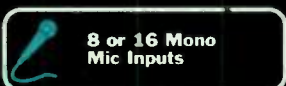
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## SOFT SAMPLERS FOR LIVE USE

► And to integrate that, all I had to do was put in a condition splitter transformer in the Environment — if it's controller data it sends it to the faders that control the levels of the EXS24s, otherwise it sends it to the EXS24s themselves. We also get the added bonus that you can change the volume of the sounds very easily. So I set all that up, and found that that was all working fine, and that the Control Freak does actually control *Logic's* faders very successfully on the audio Instruments, but the problem I had was with EXS24: if you go through anything at all in the Environment, it delays the sound massively. If you take out all of the Environment stuff for the Control Freak, and just route the MIDI input to a monitor and then to multiple instances of EXS24, the first instance of EXS24 on channel 1 is absolutely fine and very responsive, but any instances thereafter are also delayed by that amount. They're all together, but that far behind. So that more or less put us in a position where we knew we couldn't use EXS24 at this time, which is a shame.

"We can't use EXS24 because of those issues. I've also looked at *HALion* — the envelopes on that are great, I was very impressed by them, but there are other aspects of *HALion* that stop us from being

able to use it. It doesn't seem to give us enough means of using the Control Freak, because *Cubase* doesn't have an Environment. I even tried *HALion* in *Logic*, but it doesn't work, it just crashes *Logic*. I think it's something to do with the hard disk streaming. *HALion* and the Steinberg route I was slightly wary of, because I had some problems with MIDI and *Cubase* when I first moved from a PowerPC to a G4, whereas I've found *Logic's* MIDI really good. I've only been using *Logic* for about two years now, but I've found it a really fantastic program. The Environment is a whole new thing for me. It's got an aura of mystique about it and a lot of people find it scary, but actually it's not once you start to use it for something like this.

"This gave me the idea that I could use the Environment to control *Unity*. It's a very similar method, in that the keyboard goes through a condition splitter, and sends controller data to faders, which are then sent to the *Unity* channels [see the screen shots on the last page of this article], and that side of it works fine. On the other end of it, you've

just got it going to transformers that fix the channels at 1 to 8, so that we can transmit the same note information to more than one sound at once. What I was planning to do ultimately is put in a few routers so that we didn't necessarily transmit on all eight channels, because most of the tunes use three at most. Using it through a sequencer is actually quite a good thing, simply because we can do all this stuff with Environments and transforming signals and stuff which we couldn't necessarily do if we were using, say, *Unity* directly."

## Not Yet Perfect

It seems as though the current *Logic*-plus-*Unity* setup can do pretty much what is required, but it's less than ideal, and there are still teething troubles. *Unity's* arcane editor is making it hard to replicate the right envelopes and controller routings, as Tim explains: "The envelope aspect of *Unity* is very confusing, because you can make minute changes and end up with massive changes in the sound. If the envelopes were

## Martin France &amp; Electronic Percussion

Drummer Martin France, like Django Bates, is instrumental in contributing an electronic element to the Human Chain sound. As well as a traditional kit, he uses a Roland SPD11 Octapad sampler to trigger his sampler — also an Ensoniq ASR10 — and many Human Chain pieces see him continuously shifting between the two to impressive effect. I was interested to find out how he set about integrating electronics into a traditional kit performance.

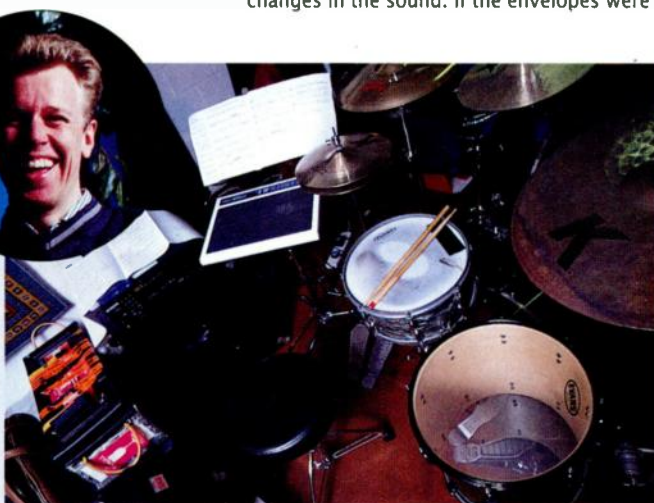
"I started off trying triggers on the drums. I used to use D-Drum drum triggers, and I found it so confusing organising the whole sound, I never knew whether I was playing the acoustic drum or the sound. Also, depending on how you played, if you were just playing tiny little things it wouldn't pick them up, so I found that quite hard. So after that I just decided to keep drums as drums, and keep the electronics separate. With outboard pads it's simple, you're either playing acoustic drums or electronic.

"What I like about the Ensoniq is the ability to effect sounds. In this kind of band I'm given quite a lot of space to create sounds, and even if you start off with just a basic drum sound, once you start effecting it you can basically do anything. I've also

Drummer Martin France uses both a traditional drum kit and another Ensoniq ASR10 sampler (in the rack at the left), triggered by the Roland SPD11 Octapad to the left of the kit.

got bass sounds and human sounds in there, I've got a load of wave drums which I'm really fond of, and I can trigger them all from the Roland. I can layer them from the Roland and Ensoniq, and mix the two live, so I can spin different sounds in and take them out. The other thing that I can do with the Ensoniq, and to an extent with the Roland, is bringing in effects by velocity, so you start off playing quietly, and you get sound A, and as you start getting louder the sound changes, A goes down and B comes up. Or you can have the sound there all the time, and another sound comes up with it, so at the end you're looking at A and B, or crossfades.

"Roland drum gear is very good, I think. This particular Octapad I've had for about eight years, and it's been all over the world. They're nice to play — I think now there's things with proper drum heads on that give you a proper response, but as a portable device that's a gateway to the world of MIDI it's very good. I use



the foot pedal to control effects, so that the more I put my pedal down, the more effect I put on it, or I can make it brighter, louder, pitch down or up. It's nice to have a route out of just playing ordinary drum kit sounds, you know, like drums and cymbals, and of course you can link it with computers, so you can write at home with the computer.

"In this band it's all single-shot samples, but at home I work with a lot of loops, and build things up. I'm working on tracks for an album at the moment, which is all loops, but then mixing the loops with acoustic drums as well. If you sit at home listening to loops all day it sounds very one-dimensional, but as soon as you put a real kit on it, it just brings it to life. Also, once you start playing with loops and sequencers, everyone has to play in strict tempo, and that's a problem for some situations.

I personally like it, because as a drummer you can imply time and make it feel by pushing the beat a little bit or sit back on it very subtly, but still hold to a constant tempo."

"It changes the flavour of the band massively, it just updates it I think, and changes what you play," says Bates. "You have to think very carefully about what you play, you can't be quite as impressionistic somehow — that's the way I see it, because you hit something, and something extraordinarily direct comes out straight away. But I do like it, and now, every piece that I write, somewhere written at the top of the drum part it'll eventually say 'Just use electric drums!'"

So will Martin be following Django in ditching his ASR10 and moving to soft samplers? "Not yet, anyway! I'll think about it when he's sorted out all the problems..."



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## SOFT SAMPLERS FOR LIVE USE



The new system: an Apple G4 Powerbook portable computer running *Logic Audio* and *Unity DS1*, communicating with the outside world via a MOTU 828 audio interface and Micro Express USB MIDI interface.



Although Django Bates' live rack is minimal by some standards, containing only an Ensoniq ASR10 sampler, Yamaha TX802 sound module and Alesis Microverb effects unit, transporting it has caused enough problems to provoke the move to *Unity*.

► graphic rather than numbers, it really would be so much simpler. You get this graph, but it's a very vague graph and it doesn't seem to do what you expect a lot of the time. It's a pity because it is very powerful, but with all these routings, you have to really think hard before you know where everything's going. I spent a lot of time drawing things on paper, just trying to work out where the routings were going. In that format it's very hard, because you can route modulators to other modulators.

"It leaves us in a position where we can hopefully use *Unity*, but we have this envelope problem. With this system, you should be able to use any mixture of *Unity* and *EXS24* and so on, just by routing the outputs to wherever we want it to go, and the advantage of that is that in *Unity*, for example, you can map an envelope to pitch, and there's one particular sound Django uses on the TX802 that's a guitar that bends down, essentially. Things like that you can do in *Unity* but you can't do in *EXS24*. So at

the moment we're just using *Logic* to control *Unity*, but ideally we would like to be able to use *Unity* for bits, like that bendy guitar sound, and then use *EXS24* for other things, because it integrates so much better and you're not running multiple applications. I think the OMS inter-application link is quite flaky, it seems to complain quite a lot. OMS has been highly problematic. FreeMIDI is great, but it won't work with *Logic*."

As is so often the way, moreover, the same system that Tim had carefully set up and tested at home promptly fell over when he brought the gear to a band rehearsal. "It was working with my keyboard, but strangely, with Django's keyboard, it doesn't seem to work, and I'm not sure why. I'm not quite sure what's happening, but that keyboard seems to be transmitting the same data twice, so you get two instances of every note, but that doesn't happen with my Yamaha synth, so we don't know why that is. Also, I wasn't using a USB hub. Today I did, and it completely messed it all up, you end up with so much latency that it's unusable. If you take the USB hub out of it, and just take the MIDI interface straight into the laptop and the dongle straight into the interface, it's really responsive. They're just teething problems — we'll probably work them out in time."

Django Bates and Tim Adnitt have learned an awful lot — perhaps more than

## Controllers & Sound Sources

Although Django Bates' profile is such that he could insist on having an acoustic piano, he's no *prima donna* when it comes to piano sounds, and seems perfectly content with his Korg SG1D: "We're so used to doing it the way we do it that using a real piano cuts off loads of sight lines, and then you've got drums going into your piano mics, and it's the old hell. I like the piano sound on this Korg, it's really useful, because it's not as glitzy and spiked-up as the ones you get that are billed as 'the ultimate piano sound', which all sound nothing like a piano! This is quite a flat sound in a way, and that makes it useful for playing the other sounds on top of it, and changing the character that way. After this they did the new SG1D, which was really crap. Everyone says they're crap. Right here where you do most of your 'singing out' playing [he indicates the couple of octaves above middle C], that's the quietest bit of the keyboard, it's really dead there. So we're stuck with this, falling apart at the edges."

The SG1D is used to trigger all of Django's samples, including the sound effects that are prominent in some Human Chain pieces. In this case, he sets the system up so that the notes at the very top and bottom of the keyboard trigger effects instead of the pitched sounds assigned to the bulk of the notes: "Our version of 'New York, New York' is probably the most down that route that we've ever gone. That happened because when we recorded it, I put some sound effects on afterwards, and then we wanted to do it live, and

there was just enough room to cram a few sounds on the notes at either end of the keyboard and still leave room to play the tune in the middle. It takes some organising, though. It's good, I think, to start off with an interesting keyboard layout and then write the piece around it. When the new system is up and running and I'm getting used to it, I think I'll do that a lot more. I'm always trying to keep the amount of keyboards down to a minimum, and it is nice to feel like you have one instrument that you feel like you're playing and stab away at something like the sampler or the Control Freak if you want to change what's going on."

Django's Ensoniq ASR10 sampler is his main sound source apart from the SG1D, but he also uses a Yamaha TX802 FM synth module and a Clavia Nord Lead. "I don't know why I ended up with the TX802, I think it's just because of this bendy guitar sound that I really like. Really I'm just carrying it around more or less for that one sound — it's a really quick way of adding a chorus to whatever you've got, it just gives a little curve to the sound. Also there's a couple of micro-tuning things I use in there. The Nord Lead has its special role. The first proper keyboard I got was a Prophet V, and I got used to the excitement factor that that provides when you whack it in there. It doesn't really matter which sound you go for — in fact I prefer to leaf through the programs until I find a sound that I don't know what it is, bung it in on the mixer, and see what surprises are in store. It takes the music in another direction."

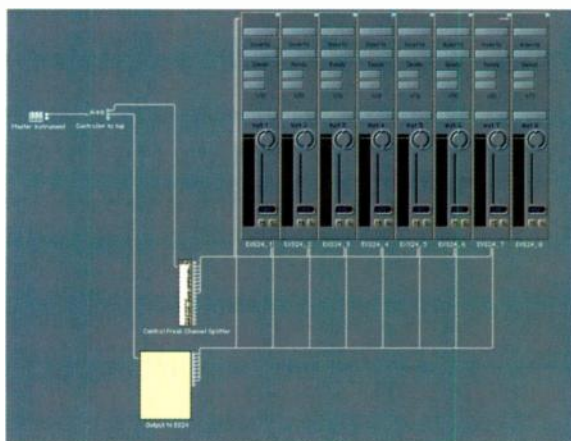


Technical Consultant Tim Adnitt.

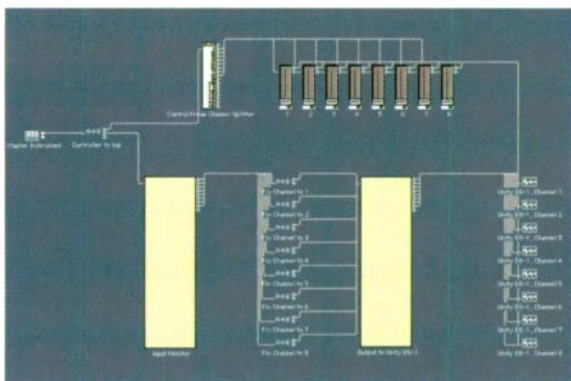


they would have liked to — over the four months they've spent trying to get an apparently straightforward system up and running. What lessons do they feel should be learned by companies making software samplers? "I think the way software samplers have been designed is largely with studio music in mind, rather than live music, and it seems a shame that it's moved away from that whole area, particularly now that computers are fast enough to do these things," says Tim. "Really what we're hoping is that there will come a time when the live aspect of this is thought about more."

"It's also incredibly hard to actually get the information you need about a piece of software. The reason why *Unity* was our first port of call was that it was the only one that had

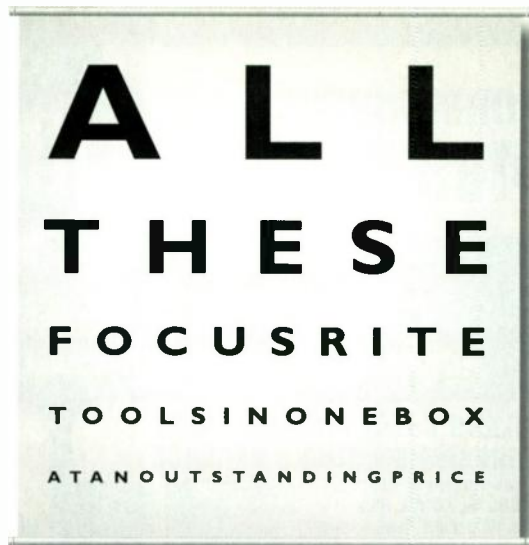


Two *Logic* Environments created by Tim Adnitt and designed to replicate the layering of sounds on a single MIDI channel that is possible with the Ensoniq ASR10. The first (above) routes incoming note data to eight instances of Emagic's EXS24 sampler, but latency problems make this setup unusable at present. The second (below) routes the note data to eight channels in Bitheadz' *Unity DS1*. In both cases, a condition splitter Object is used to detect incoming controller data from the Kenton Control Freak, which is then routed to a fader Object and thus used to control the levels of each layer of samples.



a demo. I can understand the risks of having a demo in terms of piracy and so forth, but Emagic didn't have a demo. You can read their web site, and it'll tell you all about the great features, but the bottom line is that it doesn't tell you whether it can do what you need it to do, and it's very difficult to find someone who can say 'Yes, it can do that.' And equally, *HALion*, there's no demo for that. You can travel to see these things demoed, but obviously you're outside your own setup, and often it takes a little time to find that it doesn't work."

Let's hope that Syquest drive doesn't die quite yet... **SOS**



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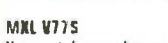
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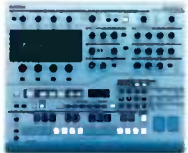


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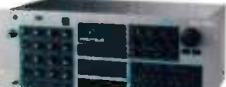
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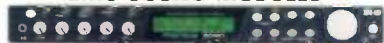
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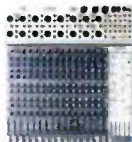
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# Line 6 Echo Pro



Line 6's acclaimed Delay Modeler pedal gets a rackmount makeover.

Paul White

In *SOS* March 2000, I reviewed the Line 6 Delay Modeler stomp box which uses physical modelling to very effectively recreate the sound of vintage tape, magnetic disk, analogue delay and digital delay boxes. The new Echo Pro rackmount model offers virtually all the features of the pedal version, but with a better user interface, 99 programs, stereo balanced ins and outs and MIDI, including MIDI control over the unit's loop record/playback functions. MIDI may also be used to change programs and parameters, as well as for controlling tempo. Echo Pro programs can be mapped to specific MIDI Program Change messages and virtually any Echo Pro parameter can be mapped to any available MIDI Continuous Controller. Tempo sync is achieved by setting a note value, after which the delay can be locked to MIDI Clock.

To create the Echo Pro, the designers analysed original hardware echo boxes, then attempted to recreate such factors as wow

## Modelling Effects Processor

and flutter, distortion and high-end loss to get their models to sound like the real thing, but without the hiss. In addition to the delay programs, there's a loop sampler capable of up to 60 seconds of loop time. Using the front-panel buttons or external MIDI controllers, a loop can be recorded, replayed, overdubbed, doubled or halved in speed, or even played in reverse. The loop can be started and stopped at any time and a separate echo/delay function can add delays of up to 800ms to the material being looped, with or without adjustable pitch modulation. On top of all that, the Reverse program lets you play genuine reversed guitar parts in (almost) real time. Actually, you have to play a bar ahead of the sound, but the effect is fantastic! The only downside of the rack format is that you can't control the looping from footswitches unless you have a suitable MIDI controller or a set of MIDI bass pedals.

The 1U package is mains powered, with the rear-panel stereo ins and outs on both balanced jacks and XLRs, though you can use the unit in mono if you prefer. There's also a jack input for an expression pedal, as well as MIDI In and Out/Thru sockets.

### The Back Panel

One look at the bright-green sculpted aluminium front panel reveals a rather more comprehensive user interface than on the pedal version, with proper input level metering, status LEDs around the model select knob, and further status LEDs next to the Tweak and Tweez knobs so that you are always aware of what parameters these are controlling. The main delay parameters — Delay Time, Repeats and Mix — have dedicated functions, while Tweak and Tweez vary their function depending on the model selected. A two-digit readout shows the current patch number as well as some cryptic two-character clues when in some of the setup modes. A further four-digit display

can be switched to read the delay time in seconds or bpm. The note values are shown beneath the digits in this display, and the buttons directly below the display double as time/note/tempo display selectors and as controllers for the loop sampler (Record/Overdub, Play/Stop and Play Once). A Global button allows the tempos or times stored along with a patch to be overridden by the currently set value, which can be set up using the Tap Tempo button or the Time knob. Other buttons allow for saving edited programs, bypassing the unit and getting into the MIDI setup mode.

Most of the models are based on specific commercial echo boxes, though the rhythmic delay of the stomp box version has



The Echo Pro models a variety of vintage analogue and digital delay processors, as well as offering a few original Line 6 treatments and a Loop Sampler.

been replaced by a 'platter'-type echo algorithm designed to sound like the old Binson echo units that used a rotating disc coated with magnetic oxide rather than a tape. Non-emulative effects include Sweep Echo, which combines delay with a swept wah-wah-like filter, and a marvellously effective low-resolution digital reverb, where the user can adjust just how much the decays deteriorate as they recirculate.

I won't go into each model in too much detail, but the main difference between these delays and regular digital delays is the way in which the tone or resolution of the recycled signal can be made to degenerate

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**Line 6 Echo Pro £459**

**pros**

- Excellent user interface.
- Convincing emulations of classic delay boxes.

**cons**

- No optional loop control footswitch other than a full MIDI controller.

**summary**

A more professional version of the Delay Modeler stomp box, with more loop memory and a better user interface, but at the expense of those useful loop footswitches.



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## LINE 6 ECHO PRO

► as it did on the original machines, creating a very musical effect as well as a sense of distance. Model types include Maestro's EP1 tube tape echo, the Roland RE101 Space Echo (with head switching for the four heads), the Boss DM2 and the Electro Harmonix Deluxe Memory Man analogue delay. There's also Auto Volume Echo, where a slow-attack envelope is combined with echo.

Programming the unit is very easy. For the echo models, you dial in a model type, then adjust the Delay Time, Repeats, Tweak and Tweez parameters, and set the wet/dry mix. Saving a patch can be done to the current location or to any other memory location, and the display will show FACT or USER to inform you what type of patch you are overwriting — factory patches can always be restored. Normally, when you

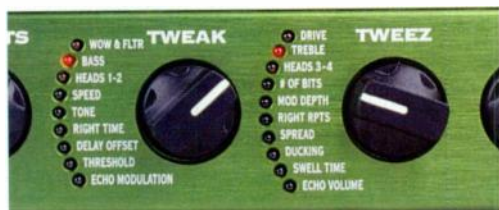
**"If delay is an important effect to you, then the Line 6 Echo Pro is one of the most advanced and flexible units of its kind that you can buy."**

the loop recorder functions. However, you do get stereo balanced ins and outs, much better metering and a clearer user interface than the pedal version, as well as the 99 user memories. Soundwise, there's little to choose between the pedal and the rack version — both are excellent and produce what must be the



call up a new model, it loads with a set of default settings, but you can replace these defaults with your own preferred settings if you wish.

An optional expression pedal can be used to move between two different front-panel control settings, provided that they are based on the same model. A simple procedure is used to memorise the two lots of settings, then this



The rows of LEDs beside the Tweak and Tweez controls show which parameters are assigned to them.

information is saved as part of the patch. A practical use of this facility would be to change delay time, feedback, modulation rate or modulation depth in real time, though you could arrange to change the Delay, Feedback, Tweak and Tweez values simultaneously if you needed to.

### Impressions

I'm already an owner and big fan of the pedal unit, and in some ways it seems perverse that you have to pay twice as much in the UK for the rack version. Although it has a much longer loop delay time than the 14 seconds of the pedal, it has no integral footswitches to control

best digital emulations of tape echo currently available. The wow and flutter that you can add to the models, along with the progressive breakup of the repeats comes very close to the sound of the real thing, but without the noise. I'm not sure that they've quite captured all the nuances of the old valve/tape-loop echo sound, but they've got pretty close. However, for Shadows purists, the ability to set up individual head timings is perhaps too limited.

If you're into looping, the loop function is great fun and quite easy to use, as is the reverse effect, which is simply the best thing of its kind I've come across. This kind of attention to detail shows up best on guitars, as those were the main instruments

which used these effects originally, but great results can also be achieved from vocals and electronic instruments. If delay is an important effect to you, then the Line 6 Echo Pro is one of the most advanced and flexible units of its kind that you can buy. **SOS**

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# Adding Feel To Your Rhythm Parts

Paul White

**N**ot a lot of people know this, but my first foray into pop music was at the age of 13, when I took up playing the drums as a form of rebellion against the classically-based school music lessons of the time. I must have played drums in bands for around ten years before I traded in my drum kit for a Gibson SG Junior.

During my time as a drummer, I learned something about rhythm and about how drum parts were constructed, but when it comes to creating sequenced drum parts on a keyboard, I'm probably as bad at it as anyone else. There are numerous reasons why programming drum parts is so difficult, not least being the way real drummers play all the hand and foot parts together in a very symbiotic way. Try to play one part without the others and the feel tends to evaporate.

It is always a temptation to input the individual drum or cymbal parts one track at a time and then to quantise them into submission. While this may work well enough for dance music (after all, the entire genre evolved from the quantise button), if you try to apply the same technique to anything that's supposed to sound in any way real, it invariably fails. The reason is plain — real drummers may seem to play to some mental quantise grid, but what actually happens is that they vary or offset the timing of certain beats to introduce feel.

You can experiment with this in a fairly superficial way by taking a quantised drum rhythm, then moving the snare drum part backwards or forwards in time by a few milliseconds to see how this affects the feel. Making the snare drum early will push the track, creating an energetic feel, whereas delaying the snare will give the same part a laid-back feel. This is just an approximation, however,

## Try these tips and techniques for creating more convincing programmed rhythm parts in a sequencer.

because a good drummer may make timing variations throughout the bar and, furthermore, there will probably be other subtle timing variations over the course of a verse or chorus.

One possible way forward is to use a set of MIDI drum pads or one of the all-in-one MIDI drum pad controllers to input parts in real time, ideally in conjunction with a MIDI bass drum pedal, but this only works if you're a reasonably good drummer in the first place. The whole point of this exercise is to capture the feel of the original performance, but if your timing is so sloppy that you need to quantise the end result, then you've thrown away the main advantage of inputting parts in real time. A practical compromise for some styles of music is to program the kick and snare parts

separately, as these tend to hang together (rhythmically speaking), then overdub the ride cymbals or hi-hats next time around, and finally put in your tom fills. However, if you're after an authentic sound, remember to delete any ride/hi-hat sounds that occur at the same time as any tom fills — a real drummer would be unable to play both at once.

There are however, other ways to create a sense of feel, one of which is to find a suitable drum rhythm on a commercial recording or sample CD and then play along to that, mimicking the timing as closely as possible (even though you may decide not to copy the rhythm exactly). Because you're playing along with an existing part, recording one or two drum parts at a time is less of a problem, and if you record several bars, you can pick the best example of each part and then combine them to produce the perfect groove. It doesn't matter about having exactly the right sounds at this point, as you can always change those for a different MIDI module or sampler sounds later on.

## If You Must Quantise...

Once you have your MIDI drum part, there are quantise options that you can try that won't rob your part of all its feel, one being percentage quantise. Most serious sequencers include this function and its purpose is to move your notes to a position between where you actually played them and the rigid quantising subdivisions. The amount by which your note is moved depends on the percentage you set, so if you were to choose 50 percent, your notes would be moved midway between their original position and the rigid quantised position.

Another useful avenue of exploration is the quantise 'swing' function, which in effect bunches up alternate pairs of beats to create a shuffle feel. This isn't always suitable, but a small amount of swing can sometimes



A set of drum trigger pads, such as this one from Yamaha, can be used to trigger artificial sampled sounds, while keeping something of a human feel in the rhythms.



add the required degree of life to an over-quantised drum part.

A third quantise option is to introduce random timing and/or velocity discrepancies into a part to simulate the natural variations that are part of a human drummer's performance. You may want to try treating the whole kit this way, or reserve randomisation for the hi-hat and ride cymbal parts. It can be quite effective providing you don't go too far and make your virtual drummer sound incompetent!

### Combine & Conquer

For me, it is often a combination of approaches that works best. For example, layering one or more elements of a sampled rhythm with MIDI parts played live, or with extra percussion and cymbal parts recorded over the top. The Spectrasonics Groove Control sample CD-ROMs work particularly well in this context, as the samples are arranged in a number of layers, allowing you to choose, say, just the kick and snare parts from some samples, or perhaps just the incidental percussion. Something that would really make life easier is a whole collection of practical hi-hat and ride parts sampled from

a real performance that could then be added over a programmed kick/snare beat, but very few sample collections seem to offer more than a token nod in this direction. If anyone came up with something like this, I think they'd be onto a winner.



The Spectrasonics Groove Control sample CD-ROMs not only let you manipulate the timing of the sampled loops, but also provide MIDI files which can be used to trigger your own sounds more naturally.

Another related trick I've found to work in some instances, especially in the context of ethnic percussion, is to find a sampled drum roll or flourish and then play just a short snatch of it (usually the first two or three beats) to create a flam-like embellishment. There are some nice examples of these

sounds in the Udu menu on the Roland World JV-series expansion cards. These little ornaments can be mixed with programmed single hits to produce a more organic-sounding drum part.

If the drums are sampled or played from a synth where the patches allow pitch-bend, a little pitch-bend can be used to produce a 'talking drums' effect. Note that this doesn't work with most drum machines, as pitch-bend (if available at all) tends to set the pitch at which the drum voice will play, rather than changing the pitch during the time the note plays back.

While on the subject of ethnic percussion, another useful device is to take a fairly atonal percussion sound (there are a lot of these metallic, nominally pitched sounds amongst African instruments) and drive these from a simple arpeggio based on the chords of the song. Layer them under your regular rhythm part and they make the whole thing sound more organic as well as adding some musical interest to the rhythm part.

### Steal That Feel

Something many people seem to overlook is that it's not only the drums that are played

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► with feel — any other rhythmic parts in the mix must also follow the drums to some extent, which is why it's important to have a guide rhythm part with the right feel. If you play along to a rigid metronome, then try to add a groove later on in the recording process, you will probably find that your track doesn't sit comfortably over the groove. If, however, you find yourself in just this situation (as you may do if you change your

every 16th-note division of the bar, otherwise your template will have a hole in it. If your drum part does have some holes in it, you can fill these manually, and a short, easy-to-hear sound such as a sidestick is a good option, because you'll be able to hear what effect it has on the feel. If you drop these 'filler' notes directly onto quantise positions, they'll probably sound wrong, but if you try moving them forwards or backwards slightly while listening to your pattern looping, you should be able to get them to sit in with the rest of the rhythm. Once you get to this point, you can go ahead and create your groove template, which may then be applied to other parts of the song, such as the bass line plus any other parts that feature fast-attack sounds. You don't usually need to worry about adding groove quantise to slow-attack sounds like string parts.

Some companies provide ready-made groove templates that you can impose on your own material, but you can also extract templates from other sources. For example, Groove Control sample CD-ROMs come with a set of MIDI note 'pulses' to control the sample playback, and, in many cases, these are unquantised so as to maintain the feel of the original performance. If you find a rhythm you like, it's a simple matter of selecting the MIDI control part and using this as the source for a new groove.

You can do a similar thing with the MIDI drum parts taken from libraries such as Keyfax's *Twiddly Bits*, but with the caveat that you may have to manually fill up any empty beat divisions so as to create a full bar for groove analysis. Of course you can also use *Twiddly Bits* MIDI drum parts just as they are, and the advantage of this, as opposed to using a sample loop, is that you can pick your own drum sounds, so you won't necessarily end up sounding the same as everyone else who's used the same rhythms.

Taking this concept one step further, you can use Groove Control samples in combination with conventional MIDI rhythm parts and drop beats from either to make the two parts slot together. I've also had some success in taking Groove Control parts and

## Pulling Magic Out Of The Hat

No matter how hard you try to program a drum part using MIDI module sounds, the hi-hat and cymbal parts tend to sound a little artificial — in real life, every hit sounds slightly different. You can make your programmed drum parts sound far more realistic by miking up a real hi-hat and cymbals (with the mic a couple of feet above the cymbals or around one foot above and a little to one side of the hi-hat), then recording these while playing along with the programmed parts. You still need to have a good sense of timing to do this effectively, but you certainly don't need to be a great drummer. The same is true if you choose the easy option and build your song around a ready-made groove sample — real cymbals (and any other live percussion you care to add) will add a new dimension of authenticity.

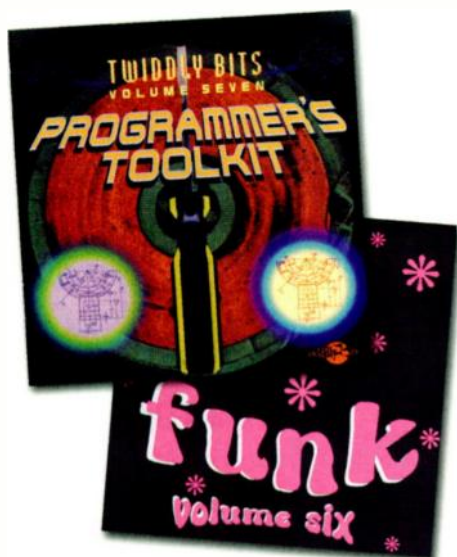


Overdubbing live hi-hats or cymbals can spice up your programmed drums, and you don't have to be a great drummer to do it.

then truncating them to change their time signature. Yet another ploy is to take a four/four part and use quantisation to force it into a different time signature. Sometimes these experiments end in disaster, but just occasionally a real gem emerges that forms the basis for a whole new song.

## Drum Major

As you can see, there are more choices than either programming your complete drum part or just working with samples. Often combinations of methods work best. If you can use somebody else's rhythm as a catalyst to get you up and running, that's no problem either (but remember not to use any 'borrowed' part in your final composition, otherwise you'll fall foul of copyright law!). Furthermore, it's often the case that if you can play some elements of the part live, the end result will sound far more convincing than if everything is synthetic. There are so many good rhythmic samples and drum MIDI files around that it would be a mistake not to explore them, but, at the same time, using everything exactly as it comes can also be a mistake too. Mixing, matching and adding 'real' percussive sounds can make all the difference to your tracks, so go ahead and experiment. SOS



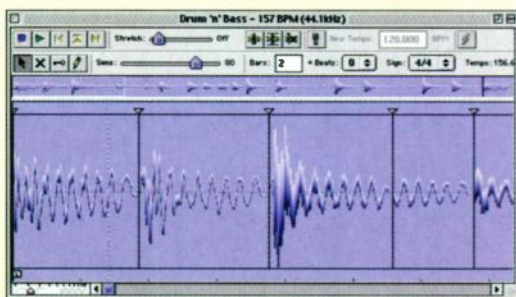
The Keyfax *Twiddly Bits* MIDI file collections can be used to get convincingly expressive performances even out of fairly budget sound modules.

mind about the groove half way through a project), you may be able to get the track to fit the new groove by first creating a groove template based on your unquantised drum part, something that all the main sequencers can do quite easily. Once created, this can be applied to some or all of the recorded sequencer MIDI tracks.

However, groove creation algorithms can only work properly when the MIDI performance they're based on has enough notes per bar to analyse. If you want to create a template for adding groove to parts with 16th notes in them, you need to make sure that you create the groove template from a drum part with MIDI notes on each and

## Generating Groove Templates Using Recycle

Another way of getting MIDI files upon which you can create groove templates is to use Propellerhead Software's *Recycle* sample editor. One of the things this can do is chop up a sampled drum loop into individual hits, subsequently generating a MIDI file with notes following the timing of the slices. If you import this MIDI file into your sequencer, you can use it to generate a groove template based on an audio loop.





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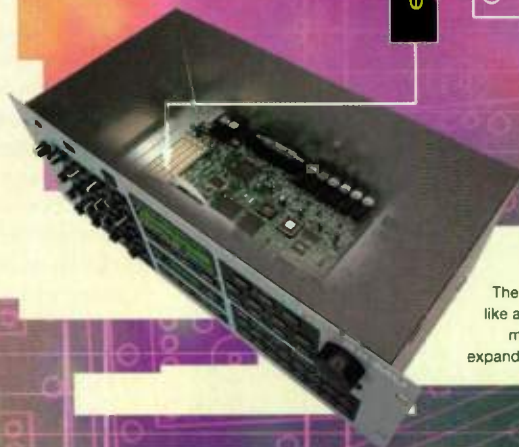
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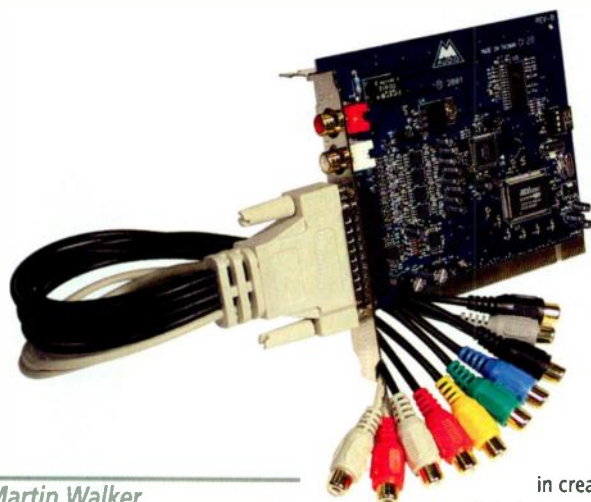
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World Radio History



# M Audio Delta 410



## Soundcard For PC & Mac

**Affordable, surround-capable equipment is at last starting to appear, and the latest addition to M Audio's Delta series of soundcards provides eight discrete analogue outputs for £249.**

Martin Walker

**T**he first soundcard that convinced me that you could record audio inside a PC without compromising on quality was the 20-bit Echo Gina, reviewed way back in SOS December 1997. With only two analogue inputs, it was designed primarily for stereo recording a track at a time, but offered eight separate outputs so that users could patch in various rackmount effects to individual tracks during mixdown. Four years later, computers now have so much processing power available that many musicians don't use outboard effects at all, relying instead on software plug-ins. However, multiple-output cards are once again becoming popular, this time because many musicians are interested

in creating surround sound mixes of their music, a process which normally requires at least six discrete output channels.

M Audio have, therefore spotted a gap in their Delta range for a new soundcard. The Delta 410 features two analogue inputs and eight analogue outputs, along with a co-axial S/PDIF digital in and out. To ensure a competitive price, the analogue I/O emerges on flying leads rather than from a breakout box, but still features 24-bit/96kHz converters, zero-latency monitoring, and digital mixing. At £249 it would seem to be a bargain, especially as it comes with the same comprehensive software bundle as its stablemates, which includes both the 24-bit-capable *Delta Logic* sequencer and Tascam/Nemesys' *Gigasampler LE*.

### Plugging In

Installation of the Delta 410 is simplicity itself. The 25-way D-type connector on its backplate connects to the supplied breakout lead, and while this is only one foot long, each of its 10 leads terminates in a gold-plated in-line phono socket so that you can connect any suitable length of standard phono lead to reach the rest of your gear. Thankfully, some attention has also been paid to making it easier to identify the various leads. The two inputs have grey cables, whereas the eight outputs are black, and each phono socket is a different colour as well as having a moulded channel number. The only other sockets on the backplate are the digital in and out, once again on gold-plated phono sockets, while on the circuit board itself the A-D and D-A converters are all contained in a single AK4529 chip from AKM.

Each new driver release from M Audio supports the entire Delta family, and support

is already available for Windows 95, 98, ME, NT, 2000 and XP, Linux, Mac OS 9 and even Mac OS X! The Mac OS X drivers apparently offer latency figures down to 1mS using a 40-sample buffer size, and are allegedly the first OS X soundcard drivers to be released by any manufacturer. I was particularly interested to try out the latest version 4.1.22.38 drivers for the Windows 98 series to test out their new features, as they now offer multi-client capability for ASIO, EASIO, GSIF, and MME, while DirectSound now supports multiple ports, and any Delta cards with MIDI support are now infinitely multi-client.

### Software Options

The M Audio Control Panel utility is common to all Delta soundcards, and provides a versatile Monitor Mixer with fader and pan controls which lets you create a mix of all available Wave Output channels, along with any signals present at the hardware inputs. So, in the case of the Delta 410 the Monitor Mixer inputs comprise WavOut 1/2 through to WavOut 7/8, WavOut S/PDIF, H/W In S/PDIF and H/W In 1/2. The Patchbay/Router then lets you route various signals to each hardware output. You can either play back the normal WAV channels, monitor the hardware input signals with zero latency, or listen to the entire Monitor Mixer output through H/W Out 1/2 and H/W Out S/PDIF, which is ideal for setting up headphone mixes for instance.

Each hardware output has its own software fader providing 18 levels in 0.5dB steps, varying from a nominal -4dBV to below -10dBV, and if you're working in surround you could use these to calibrate your speakers. By the way, a multi-output driver option is also apparently available to use with applications like *WinDVD* and *PowerDVD*. This makes

### SOUND ON SOUND

#### M Audio Delta 410 £249

##### pros

- Excellent value for the amount of I/O provided.
- Suitable for surround mixing.
- Drivers are fully multi-client capable.
- All data paths support 24-bit/96kHz audio format.

##### cons

- Slightly higher than average D-A background noise.
- You have to close down your audio application before changing latency.

##### summary

With two analogue inputs and eight outputs as well as S/PDIF I/O, all capable of multi-client 24-bit/96kHz operation, M Audio's Delta 410 is ideal for any musicians whose aspirations run higher than their budget!



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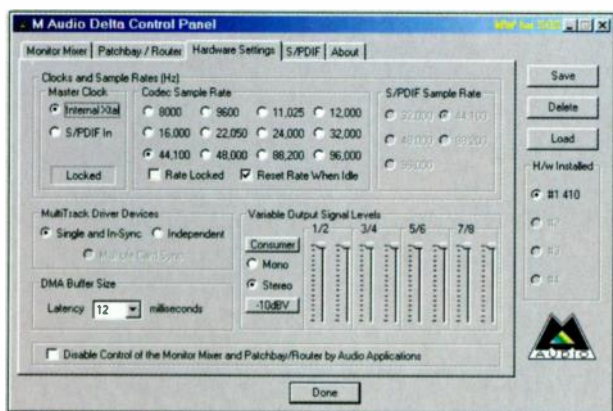
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## M AUDIO DELTA 410

► surround setup far easier, since it automatically routes the various signals to appropriate hardware outputs without the need to configure them separately.

The Control Panel supports up to four Delta cards, and can start their recordings and playback in perfect sync, but you would have to link their clocks using the S/PDIF connections to keep them permanently locked together. I've described the various other options of the Delta Control Panel in some detail in previous reviews (most recently in *SOS* April 2001), so won't go over old ground again. Just one new feature caught my eye: an option to 'Disable Control



The Delta Control Panel is common to all Delta soundcards, and provides comprehensive monitor mixing, patching of various signals to the hardware outputs, and numerous hardware settings as shown here.

of the Monitor Mixer and Patchbay/Router by Audio Applications', apparently introduced after *Cubase VST* mistakenly muted some audio channels.

## Performance

As always, I started with D-A converter listening tests, and found the Delta 410 to be quiet and clean, with fairly low background noise. I could just about hear a low-level background whine at loud listening levels, although this might possibly have been due to my earthing arrangements. In a direct comparison with my Echo Mia, the Delta 410 wasn't as smooth and transparent, having a slight top-end harshness, as well as less precise stereo imaging. Having said that, the Delta 410 features four times as many D-A converters for a similar price, so I expect

prospective purchasers will be more than happy with its sound quality.

On the A-D side, the RMS background noise of the A-D converters was commendably low when measured in *Wavelab*, as long as the inputs were suitably terminated. When they were left floating I heard some hum, but of course this isn't a problem in the real world where recordings are always made with something plugged in! The 16-bit/44.1kHz figure was -93.2dB, similar to most other cards, while this dropped to a good -99.0dB at 24-bit/44.1kHz, with a small increase to -97.6dB at 24-bit/96kHz, as expected given the doubled bandwidth. It's encouraging

whenever I find my measured figures roughly in line with the published ones. The S/PDIF I/O also provided bit-for-bit accurate digital copying, as claimed.

The ASIO drivers provide eight settings, giving latency values from 28mS down to 8mS, and I managed the lowest of these on my Pentium III 1GHz PC, as I did with the *Tassman* 2.1 soft synth when using either ASIO or EASI drivers. The GSIF drivers also worked perfectly alongside the ASIO ones

in multi-client mode, although I had to raise the ASIO latency to 12mS to run both *Cubase* 5.1 and *GigaStudio* 160 simultaneously. The MME and DirectSound drivers both managed 15mS with *Pro 52* — just 5mS above the minimum setting — and my only overall niggle with driver performance is that you have to exit an audio application before you can change latency. Thankfully the typical user won't have to do this very often.

## Final Thoughts

If you want plenty of analogue outputs for surround sound, running multiple soft synths, or adding analogue effects to multitrack recordings, the Delta 410 is excellent value for money at just £249. Its audio quality is roughly on a par with most entry-level soundcards designed for musicians, and easily exceeds that of any consumer soundcard. Moreover, all data paths support up to 24-bit/96kHz capability, which once again you won't find on any consumer model.

The obvious competition for any two-in/eight-out soundcard with digital I/O is Echo's Gina 24 (the cheaper Darla 24 was discontinued), but with its balanced ins and outs, ADAT and co-axial S/PDIF digital I/O,

## Brief Specifications

- Analogue and digital connectors: gold-plated phono sockets.
- Analogue inputs: two, unbalanced, peak input signal +2.1dBV.
- Analogue outputs: eight, unbalanced, nominal level -4dBu to -10dBV (software selected).
- A-D converters: part of AKM AK4529, 24-bit, 64x oversampling.
- D-A converters: part of AKM AK4529, 24-bit, 128x oversampling.
- Dynamic range: input 99.6dBA, output 101.5dBA.
- Total harmonic distortion + noise: <0.002%.
- Frequency response: 22Hz to 40kHz, +0.2/-0.7dB, at 96kHz sample rate.
- Digital connectors: phono co-axial.
- Supported bit depths: 16, 20, and 24.
- Supported sample rates: input 32kHz to 100kHz, output 8kHz to 100kHz.

headphone output, and a much better dynamic range of 112dBA, this is also much more expensive at around £370. If you're happy for the eight outputs to be mixed together internally for soft-synth work, Echo's Mia is £220, and also has noticeably better audio quality, but obviously this isn't suitable for surround applications or incorporating external hardware effects.

For those who need more inputs, Terratec's EWS88MT (reviewed in *SOS* October 1999) is an eight-in/eight-out card of similar audio quality, offering S/PDIF and a single MIDI port, and is now available at a street price of about £320. Another contender is M Audio's own forthcoming Delta 1010-LT. This has a very similar design approach to the Delta 410 using flying leads, and with an identical audio spec, but in an eight-in/eight-out-plus-digital format along with two balanced mic inputs, word clock and MIDI I/O, for a very reasonable £399. Most other cards with eight outputs, such as Echo's Layla 24, the EgoSys WaMi Rack 24, and M Audio's own Delta 1010 are significantly more expensive, largely because of their rackmount format and significantly better audio performance, although Hoontech's DSP24 and ADC/DAC2000 combination (reviewed in *SOS* July 2001) manages a £340 price point with reasonable audio quality.

Overall, for those who want plenty of analogue outputs but haven't got a lot of money to spend, M Audio's Delta 410 provides good audio quality at a bargain price. **SOS**

## Test Spec

- M Audio Delta 410 soundcard with version 4.1.22.38 drivers.
- Intel Pentium III Coppermine 1GHz PC, Asus TUSL2-C motherboard with Intel 815EP chipset, 512Mb PC133 RAM, running Windows 98SE.
- Other soundcards installed: Echo Mia, Yamaha SW1000XG.

## Information

- £ £249 including VAT.
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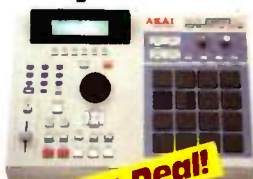
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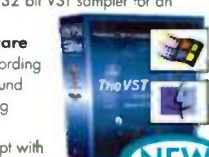


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# Alesis HD24

## Multitrack Recorder

The new tapeless ADAT provides 24 tracks of hard disk recording at less than the price of the original eight-track.

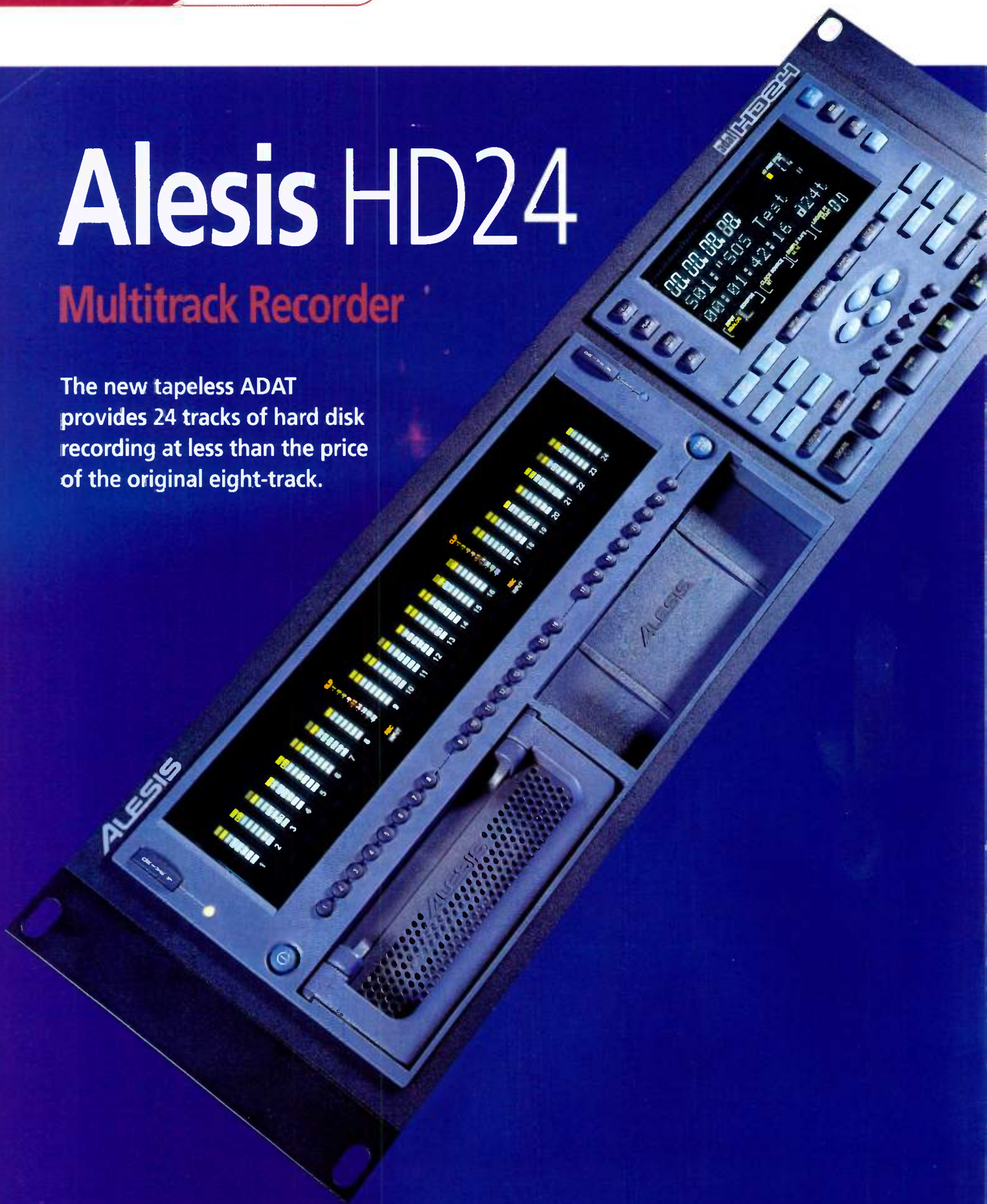


Photo: Mike Carrison



Many years ago, I tried to convince Alesis that it might be a popular move to build a tapeless ADAT, but at the time hard drives were still expensive, so all I was envisaging was a simple eight-track system. I argued that, by incorporating the nine-pin sync and optical connectors of the original tape machine, ADAT tape and ADAT hard drive could be mixed within the same system, enabling Songs to be archived to ADAT tape via the optical digital link when finished. At the time, Alesis chose not to go that route, but last year the company announced the HD24, which meets my wish list and more. Since that announcement, Alesis has been bought by DJ company Numark, but, happily, Numark saw fit to include the HD24 in their marketing strategy.

### First Impressions

In some ways the Alesis HD24 looks rather basic compared to some of today's hard disk recorders, but it offers up to 24 tracks of 24-bit recording at 44.1kHz or 48kHz (or 12 tracks at 88.2kHz or 96kHz with the addition of a forthcoming optional converter card). Unlike some systems, where I/O cards add to the basic cost, the machine comes with balanced jack analogue audio I/O for all 24 tracks, plus three pairs of ADAT-format optical I/O. The HD24 also features the nine-pin sync and remote control compatibility of its tape-based predecessor, which is extremely good news for existing ADAT owners, as it makes it very easy to transfer projects from tape to disk and vice versa, even though tape-based ADATs are limited to 16- or 20-bit recording depending on the model. Up to five HD24s can be sync'd to give 120-track capability with single-sample accuracy, and the machines may be controlled directly from their front panels, from the included LRC (Little Remote Control) or from a regular Alesis BRC (Big Remote Control). Basic transport operation is also available via MIDI Machine Control.

The unit ships with a somewhat modest 10Gb hard drive fitted in a removable caddy (around 45 minutes of recording over 24 tracks at 48kHz sample rate) and there's a second slot that will accept a second caddy-mounted drive of your choosing. Recording can be to either drive, but not to both at the same time, though you can back up from one drive to another, either on a per-Song basis or the whole drive.

The HD24 utilises a proprietary formatting system to optimise disk access speed from low-cost IDE drives, so a drive speed of 5400rpm is adequate — most

large-capacity hard drives are now faster than this. However, a downside of this is that track-minutes are wasted if tracks are not recorded on, just like tape. At one time this would have been a tragic waste of valuable storage space, but given that you can now buy IDE drives up to 100Gb in capacity for less than the VAT I paid on my original 600Mb drive, this isn't such a big deal. Based on track minutes, hard disk is now as cost-effective as ADAT tape. What's more, you can set the number of tracks on a per-Song basis to two, four, eight, 12, 16 or 24 to minimise wastage, so if you select 12-track mode and record 10 tracks, you only waste the disk space for two tracks, not for 14. This formatting system, known as FST, keeps the audio tracks from a Song in adjacent sectors, which provides a very fast seek time and allegedly reduces fragmentation quite significantly. Certainly I experienced no problems when performing multiple drop-ins across all 24 tracks, even when doing several in rapid succession.

Editing is limited to basic cut/copy/paste operations, across multiple tracks if

**“The strength of the HD24 is not its sophistication, but rather its transparency and smoothness of operation.”**

SOUND ON SOUND

Alesis HD24 £1999

pros

- Up to 24 tracks of simultaneous recording.
- 24 tracks of analogue and ADAT digital I/O provided.
- ADAT-compatible sync and remote control facilities.

cons

- Recording time not dynamically allocated.
- Small buttons.
- Limited editing functions.
- Unlike edit functions, recording actions cannot be undone.
- Audible fan.

summary

For less money in the UK than the original ADAT, you get 24-track recording capability, ADAT sync and optical I/O compatibility, and a very straightforward user interface. Will probably appeal most to existing ADAT users.



The drives of the HD24 can be easily removed and swapped for different projects, though you do need to carry out the simple dismount procedure first.

necessary, and, to facilitate this, 72 track minutes of drive space (calculated at 48kHz) are 'ring-fenced' for use in editing. Edits can be undone up to 99 steps, space permitting, but recording operations can't be undone, which could be a bit nerve-racking when you're doing tight punch-ins. On the other hand, it does mean you can do multiple drop-ins without stopping the transport, which I find essential for patching up vocal takes and so forth.

When the undo drive space is full, or if the number of edits exceeds 99, old operations are automatically discarded and replaced by the most recent. The capacity of the reserved drive space allows for one copy operation of up to 90 seconds long across all 24 tracks, though you can disable the paste undo facility to double this capacity when copying long sections of multitrack audio.

### Nuts & Bolts

Physically, the Alesis HD24 occupies the same rack space (3U) as the previous ADAT machines, and the front panel is set out in a similar way, making it very easy to operate. Above the two drive bays are 24 bar-graph meters with user-selectable peak hold options, and beneath each is a rather small track selection button. The drives must be unmounted using their respective Drive buttons before they can be removed from the machine, and an LED beneath the currently active drive flashes alternately red and green. Basic software drive repair tools are included within the system, so minor damage caused by unplugging a mounted drive can usually be fixed.

The right-hand side of the panel is given over to the plasma time display, the edit/locate controls, the transport keys and a number of other buttons dedicated to setting the metering and monitoring modes, the input source, clock source and so on. Though somewhat small, none of these buttons are multi-function, other than the cursor up and down buttons, which double



## ALESIS HD24

► It's also important to note that the BRC is designed to provide a 48kHz clock rate — it can just about manage 44.1kHz if you use the pitch control function, but it can't be used if you're working at the higher 88.2 or 96kHz sample rates.

While tape fast winds in a well-known and predictable way, hard drives can locate in an instant, so the transport controls function slightly differently to those of a tape recorder. Stop, Play and Record work normally, though it must be noted that you can only enter record by pressing Play and Record together, at which time any armed tracks will go into record mode. You can't work the other way around, by putting the machine into record first and then using the track arming buttons to punch in.

Rewind can be pressed momentarily to make the playback jump back by five seconds, or it can be held down to achieve an accelerating rewind in much the same way as tape. Forward wind works in the same way, though it's also possible to use both forward and rewind in conjunction with Stop to achieve low-speed audio scrubbing.

Monitoring works in the same way as on a tape ADAT, with dedicated buttons for All Input or Auto monitoring. Auto mode is generally used after the initial recording has been made, so that the monitoring automatically switches from the track to the input source when punching in.

To help with navigation, each Song can make use of up to 24 time locations (if you include the Edit Start/End and drop-in markers). Markers one and two are used by default when setting up a loop, which you may want to do when rehearsing a specific section of a Song. Locate points one to 20 are general purpose and may be stored on the fly or when the transport is stopped, just as with a tape ADAT. Locate times are referenced to the Song start time and move relative to it, so that they stay at the right location within the Song. If you've used a BRC before, you'll find the system very similar indeed, right down to the ability to directly edit locate times. The Locate button takes the transport to the currently selected locate time.

Various automatic functions can be achieved using the locators in conjunction

with the Auto Return, Auto Play and Auto Record buttons. When Auto Return is active, playback jumps to the loop start marker as soon as the loop end marker is reached, while in Auto Play playback begins from the locate position as soon as the Locate button is pressed. Auto Record handles automatic

**"You can treat the HD24 very much like a tape ADAT, but without having to suffer the indignities of endless lockup times or slow rewinding."**

drop-ins based on locate points 21 and 22 (with a rehearse option) while points 23 and 24 function as the Edit Start and End markers. It's also possible to combine automatic recording with looping if you need to keep going over a specific section, though my own preference is to punch in manually using the transport controls, or to use a footswitch if I'm playing guitar at the same time.

### Editing Facilities

With a tape machine, the only editing you can do without copying to a second machine is to punch in and out, something the HD24 does extremely smoothly using the same default 10mS crossfade as the original ADAT. However, we expect more from hard disk than mere tape emulation, and there are several buttons dedicated to editing, all of which revolve around the use of the Edit Start and Edit End locators. To set these times, it is necessary only to hold down the Locate button and then press the Edit Start and Edit End buttons at the appropriate times. These edit points may be adjusted in the same way as other markers by manually entering or changing time values.

By using the Track Edit button in conjunction with the track record enable buttons, it is possible to select one or more

tracks as editing sources or paste destinations. There's a useful audition mode that allows you to hear only the selected tracks playing back from the Edit Start point, though a more useful option would have been some means of auditioning how the paste transition would sound before actually doing it.

The basic edit moves comprise Cut, Copy and Paste (either within a Song or from one Song to another) where a paste operation will overwrite whatever audio data was previously in that location. Note that Paste Undo must be enabled in order to undo paste operations, even though cut and copy moves can always be undone. While these basic edit operations are adequate for many uses, and clearly are more flexible than working with tape, it would still have been useful to have an edit mode capable of removing a section of audio while joining up the two cut ends (for taking out excess bars for example) and for inserting sections.

### Usability

I've been using ADATs, often in multiples, since the format was invented, but I've never learned to live with the slow response of what is essentially a VHS video transport. Even one machine takes a few seconds to go into play mode from stop, and trying to lock up multiple machines is like waiting for the launderette spin cycle to finish. On top of



### Looking Through The Specs

Though figures don't tell you everything about how a piece of equipment sounds, the spec of the HD24 is impressive. Recording uncompressed PCM audio, the HD24 has a frequency response of 20Hz to 22kHz  $\pm 0.5$ dB with a signal-to-noise ratio better than 103dBA. Distortion is a minuscule 0.003 percent, while the dynamic range is claimed as being 144dB digital in to digital out, and better than 103dB via the analogue I/O. The A-D converters use 128x oversampling as standard, and if the 96kHz board is fitted (a dealer installation), it replaces the existing board. Like the ADAT tape machine, the analogue I/O is calibrated so that +4dBu is -15dBFS.

### Test Spec

• Alesis HD24 OS v1.00



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## ALESIS HD24

► that, the odd tape gets chewed after you've spent hours working on it, and usually minutes before you were planning to make a backup!

Coming from this background, the HD24 is an absolute joy to use because you can treat it very much like a tape ADAT, but without having to suffer the indignities of endless lockup times or slow rewinding. Moving through Songs is fast and easy, even without using the locators, and being able to start playback instantly or return to the start of a Song in an instant is extremely refreshing. Unfortunately, the fan noise is roughly equivalent to the whirring of a regular ADAT transport, but you can at least use the LRC or a footswitch to record sensitive parts from the other end of the room. It's sad that recordings can't be undone, which I guess is down to the limited size of the undo buffer, but again you're no worse off than you were with tape. If you fudge a punch in, you can always record the section again, just like in the old days — it's invariably faster than using technology to salvage something!

As I commented earlier, the edit functions are very basic, especially in the light of what you can do in a computer, but, being realistic, you're most likely to need the ability to copy good vocal choruses or bits of guitar solo, and this you can do (and undo) quite easily. However, if you decide to extend a Song by copying verses, you may find that you haven't left enough space at the end of the Song, and if you're using all 24 tracks, the longest section you can copy over to a new Song in one go is 3 minutes with the paste undo buffer switched off. There are also some edit moves that are noticeably absent, and I found some of the front-panel buttons, including those used for editing, to be rather small and quite difficult to read.

## Verdict

The strength of the HD24 is not its sophistication, but rather its transparency and smoothness of operation. It can function in an ADAT environment, it can



make use of your existing BRC, though a good external word clock is needed to tame the BRC's notorious jitter, and (not to be overlooked) it provides full balanced analogue plus ADAT digital I/O as standard. Though the editing facilities are limited, they're better than you get from tape, while having dual drive bays provides a practical and cost-effective means of backing up projects.

I feel the Ethernet solution to archiving is rather slow and cumbersome, but at least it's available. For existing ADAT owners, being able to move material between platforms is a real bonus. At least you can use your existing ADATs to archive HD24 recordings (albeit by compromising the bit depth) to single-sample accuracy, making it possible to back up all 24 tracks onto three ADAT tapes in three passes using just a single ADAT tape machine. During the course of this review I transferred an entire tape-based project to the HD24 for mixing, and, though my working method stayed essentially the same as with tape, I found it much faster and far less stressful — I wasn't always worrying that the tape might get chewed!

Sound quality is hard to define at this level, as modern converters tend to behave so well, but, subjectively, the HD24 is similar to the 20-bit ADAT XT, though those extra four bits give it additional low-level resolution, at least in theory. It also has a workable built-in backup strategy and it's easy to sync multiple machines if you really need more tracks. The high sample-rate options are available for anyone who feels they need them, but, for my money, I'd rather have the extra tracks! A high sample-rate board wasn't provided with the review model, but I'd have thought that any

sonic differences would be likely to be negligible when working in a project studio environment.

Naturally there are some things I don't like, other than the audible cooling fan and the small buttons, such as the machine's inability to play all the Songs on a drive automatically in sequence, which would have made unattended backup to ADAT tape possible. As it is, you have to recall and start playback afresh for every new Song. I also feel the edit features could have been made a little more flexible, perhaps to include insert and 'cut and join up' modes or, more importantly, a better way of auditioning paste edits before you commit to them, which is especially important if paste undo is disabled.

Ultimately, if you look upon the HD24 as a 24-track, tapeless ADAT with a few editing features thrown in for good measure, you won't be disappointed. It works smoothly, you can tackle the learning curve in slippers, not crampons, and it eliminates the worst frustrations of its tape-based predecessors, one of which ate a brand new tape during the course of this review! It may not have all the bells and whistles of the competition, but if you like everything about the tape environment other than the tape itself, the HD24 is a straightforward and affordable alternative. **SOS**

## HD24 MIDI Functionality

The HD24 responds to MIDI Machine Control messages and can also generate them. There's no SMPTE generation facility, but MIDI Time Code (MTC) is available, albeit at a fixed 30fps. The MTC start point is the same as the Song start point, so offsets can be introduced by changing the Song start time value. Additionally, the MIDI In port can be used to load in software updates, and all MIDI-related facilities are accessed via the MIDI button and the cursor keys.

## information

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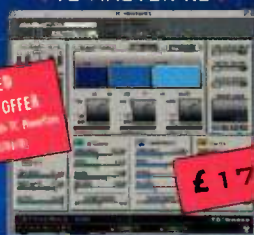
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# Aphex Model 204

Hugh Robjohns

## Aural Exciter

**Aphex update their famous Aural Exciter and Big Bottom processes for the 21st century.**

It seems hard to believe, but the Aphex Aural Exciter has been around for over a quarter of a century! First introduced in 1975, it has become a very common tool in the professional and home studio alike. The first generation Exciter could not be purchased, only hired, and it wasn't until the release of the Type 2 Exciter in 1981 that studios were able to purchase the system.

Two years later a simplified and cheaper version was developed — the Type B — to broaden the system's appeal to DJs, musicians and the smaller PA companies where budgets were too small to afford the Type 2. The Exciter circuitry has been continually developed and improved over the years with the low-cost Type C launched in 1985, the

professional Type 3 in 1989, and the Type C2 in 1992 — this last revision being quieter, more musical and easier to set up than previous low-cost versions. Of more interest in the context of this review, the C2 also included the Big Bottom circuit for the first time. The Big Bottom can be thought of as a low-frequency version of the Aural Exciter which is designed to enhance the bass frequencies in much the same way as the original Exciter enhanced the upper harmonics. (For more details on these processes, see the 'Aphex Technology' box.)

The latest in this surprisingly long list of products is the new dual-channel Model 204, which incorporates the most recent generation of Aural Exciter circuitry as well as a new version of the bass enhancer, the Optical Big Bottom.

### The Once Over

The Model 204 is an elegantly styled 1U rackmount box with integral power supply unit, and flexible I/O connections. It is a relatively shallow unit measuring only 180mm front to back, and it weighs about 2.75kg.

## The Aphex Technology

Although the circuitry has evolved considerably since its first release, the basic concepts behind the Aural Exciter have remained the same throughout the product's long life and various incarnations. The basic idea is to recreate or restore high-frequency harmonics in musical programme material — harmonics that are often lost as delicate signals pass through the various elements of the recording process. If these harmonics are lost or reduced in amplitude, the music will tend to sound dull and lifeless, lacking in clarity and detail. Unlike simple EQ, the Exciter doesn't change the balance of existing high-frequency components, but simply recreates and then reintroduces the missing harmonics at a level determined by the operator.

The Exciter was first developed to combat the inherent losses of analogue recording and replay (and the attendant noise-reduction

systems) which were the major source of signal degradation in the '70s and '80s. The widespread adoption of digital recording over the last fifteen decades has improved the preservation of high-frequency detail enormously, but the Aural Exciter remains a popular artistic tool, even if its corrective abilities are of less importance today. Having said that, one of the more common side effects of heavy data reduction is a loss of high-frequency detail, and the Aural Exciter can be used very effectively to restore some of the 'life' to material recorded on, or transmitted via, data-reduced systems.

The Aural Exciter uses various patented techniques to regenerate harmonics, at a level which is related to the level of the music. Along the way, the early designs have been refined significantly, and the current model uses a Transient Discriminate Harmonics Generator (TDHG) to create harmonics based on the spectral

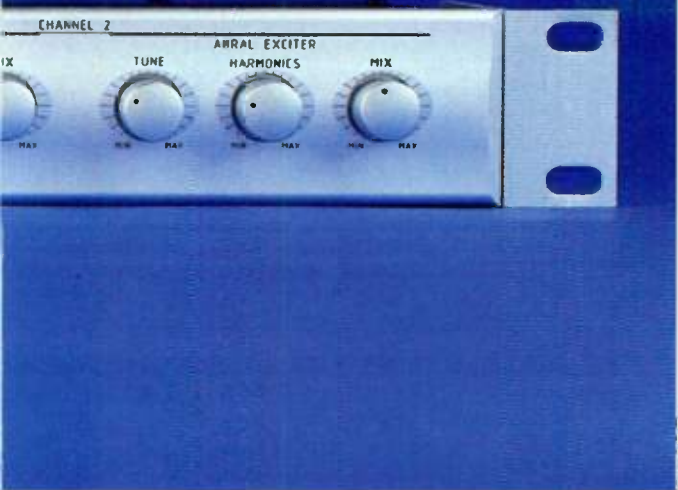
structure of signal transients, rather than any steady-state components. The result is a far more predictable and natural-sounding harmonic enhancement which is effective over a greater dynamic range than was achievable before.

The system works by splitting the input signal in two, one part being passed directly to the output while the other is processed in a side-chain. This side-chain comprises an adjustable high-pass filter (to determine the range of frequencies from which harmonics are generated), and the TDHG circuit. The added harmonic elements are at a relatively low amplitude compared to the overall level of the music, and so do not increase the peak level significantly when mixed back in to the original signal at the output of the unit. However, these harmonics are perceived to add dramatically to the mid-range and high-frequency energy, as well as increasing the

intelligibility and clarity of individual instruments and voices.

The Big Bottom system is superficially similar in approach, with a main signal path and a side-chain. The side-chain processing consists of an adjustable low-pass filter followed by a phase-shifting circuit and a dynamics processor. Essentially, the selected low-frequency region is compressed and added back to the original, extending the resonance and sustain. However, because this side-chain signal is phase-shifted relative to the original, the addition does not result in a significant increase in peak level, but does increase the perceived energy and make the spectral balance seem deeper and more substantial. The latest development to this circuit has been the inclusion of an opto-resistive device within the dynamics processor which has a temporal characteristic ideally suited to the compression of low frequencies.





The rear panel carries the ubiquitous IEC mains inlet with integral fuse holder and two sets of inputs and outputs for each channel. Electronically balanced XLRs and paralleled TRS quarter-inch sockets are provided, and a slide switch associated with each channel configures its operating level between -10dBV and +4dBu.

The silver front panel is clearly divided into two channels, each with two sets of three silver control knobs, plus illuminated Process In/Out buttons and a Power switch on the left-hand side. The Big Bottom section of each channel has controls for Tune, Drive (with adjacent LED) and Mix, while the Exciter section has controls labelled Tune, Harmonics and Mix.

### Does My Bottom Look Big In This?

Looking at the Big Bottom section in a little more detail, the Tune control is only marked Min and Max (like all of the controls), but actually adjusts the low-pass turnover between 50Hz and 190Hz, with 110Hz being at the 12 o'clock centre position. Adjusting this control allows the most appropriate range of frequencies to be enhanced by the processing. The Drive control sets the threshold for the dynamics processing and should be adjusted until the adjacent green LED flashes on bass peaks, indicating the onset of processing. Advancing the Drive control increases the amount of processing, and the LED reflects this quite well with its duration and brightness. The Mix control simply determines the amount of enhanced signal which is added back to the original, thereby determining the



#### Aphex Model 204 £348

##### pros

- Easy to use.
- Works well on individual tracks and complete mixes.
- The HF and LF processes complement each other well.
- Has both corrective and creative possibilities.
- Process In/Out switches allow instant reality check.

##### cons

- Can produce a lot of subsonic energy.
- Fatiguing if pushed too hard.

##### summary

The latest in a long line of Aural Exciters, the Model 204 benefits from all the incremental developments introduced by Aphex over the past 25 years. The inclusion of the Optical Big Bottom process extends the usefulness and creativity of the unit substantially.

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## APHEX MODEL 204



## ► strength of the effect.

The Aural Exciter controls are equally as simple to understand and operate. The Tune control adjusts a high-pass filter which controls the range over which enhancement will occur, and it spans 800Hz to 6kHz, with about 3kHz as the centre position. This determines the frequencies above which harmonics will be generated. The Harmonics control affects the quantity, number and nature of harmonics generated. The minimum position is generally considered to be ideal for subtle or complex sources — voices and complete mixes, for example — whereas, higher settings can be beneficial on individual instruments where a greater degree of edge and 'cut-through' is required. The final control is Mix, which determines the amount of harmonics introduced at the outputs.

The most important controls on the entire machine are the illuminated push buttons which switch the processing in and out of circuit. This is not a hard bypass function — the signal is still routed through the main signal path of the Model 204, only the processing side-chains are disabled. As with any form of signal processing, it is incredibly easy to fool the ear so that you end up adding more and more enhancement — brighter and louder is always perceived as better. By switching the side-chain in and out, it is easy to check whether the settings really do provide the required enhancement and extra loudness, or just add confusion and spectral clutter. Personally, I treat the Aural Exciter's enhancement in the same way as reverberation — add enough to be audible and then back it off a few decibels. Too much can be very fatiguing and artificial, with an easily recognisable sonic signature.

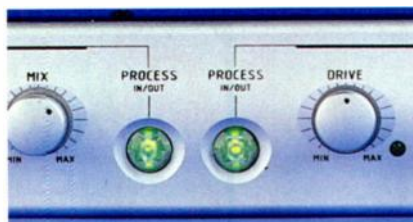
### Aural Thrill Seeking

The provision of both XLR and quarter-inch jack connectors makes interfacing the Model 204 very straightforward, as does the ability to switch between -10dBV and +4dBu operating levels. The unit accommodates balanced or unbalanced operation quite happily, although there is a special warning note about not shorting the XLR signal pins to ground — common practice is to tie pins one and three together. You are advised to leave the unused 'leg' floating instead. It makes more sense to use the quarter-inch connections for unbalanced operation anyway, so I'm sure this restriction will not

present many problems in practice.

The controls are very logical in function and use, and setting the unit up is simply a case of twiddling the controls until the desired sound is achieved. As I mentioned earlier, it is easy to get carried away and create the equivalent of the graphic EQ's 'smiley' curve, with lots of extra bass and sparkle, and this kind of thing becomes wearing extremely quickly. Fortunately, the Process In/Out buttons (sensibly placed to allow both channels to be dropped in and out together) make it easy to get a quick reality check.

Used on complete mixes, the Model 204 is a useful 'polisher'. It can restore life to flat, overprocessed or otherwise lacklustre balances with relative ease, as well as adding a pleasant warmth and fullness or weight to the bottom end when required. With all moderate settings the material can be made to sound substantially louder and fuller



The most important controls on the Model 204 are the two bypass buttons. Your ears quickly get used to enhancement processes, and the only way to tell if you're overdoing things is to switch the processing in and out frequently.

without any significant increase in the peak level. However, with extreme settings the level can rise quite dramatically, and all that extra LF energy might quickly cause a parting of the ways between cone and voice coil in less capable monitors!

The Exciter is much the same as the previous generations, albeit a tad quieter and smoother. Cranking the Harmonics control up too far produces a gritty, harsh sound — useful in some situations but certainly not all. During the review period I found the Harmonics control generally stayed below the halfway position, whether processing individual instruments or complete mixes. I also found the setting of the Tune control was critical in obtaining a natural and fatigue-free sound.

The Big Bottom facility also needs to be used with great care, as the higher Drive settings introduce a substantial amount of LF

compression, bringing subsonic rubbish into transparent audibility. If you are mixing on small monitors you have to be especially careful as, depending on the Tune setting, the lift may be confined to frequencies below the effective range of the speakers.

By far the most creative use of the Model 204 is on individual sources during mixing and, to a lesser extent, tracking. Although there is no substitute for careful microphone selection and placement, this Aphex unit can usefully repair the sound of badly miked instruments, and even enhance the sound of poor-quality instruments! It's not just for fixing problems though, it is also a creative tool in its own right.

I found it worked well on a very wide range of sources — wind and brass instruments could be given a degree of bite to help cut through the mix without increasing their levels, female backing voices could be given a breathy quality which often worked well, and male voices could be made to sound much richer and fuller. Drums and percussion could also be brought to life. However, where processing instruments while recording is necessary, caution should be exercised as the effect can't easily be undone.


A throw-away comment in the handbook made me try the Model 204 out on data reduced material and I found the unit extraordinarily effective in breathing fresh life into MP3 files and other heavily data-reduced recordings. More usefully though, processing tracks through the Model 204 prior to encoding seemed to help them survive data reduction rather better. By adding a modest amount of harmonic enhancement before encoding, the material seemed to replay with a greater sense of space, stereo imaging and detail, instead of the two-dimensional sound characteristic of the format. It doesn't restore uncompressed WAV quality, but it certainly improves matters.

All in all, this is an easy-to-use sonic tool which is extremely effective, restorative, and creative if used appropriately. **50%**

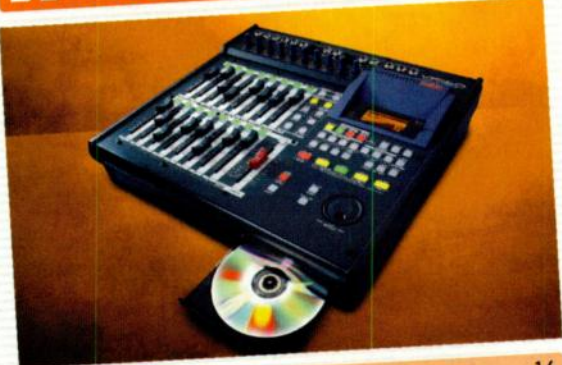
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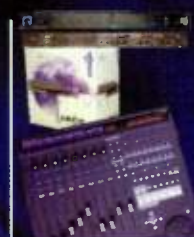
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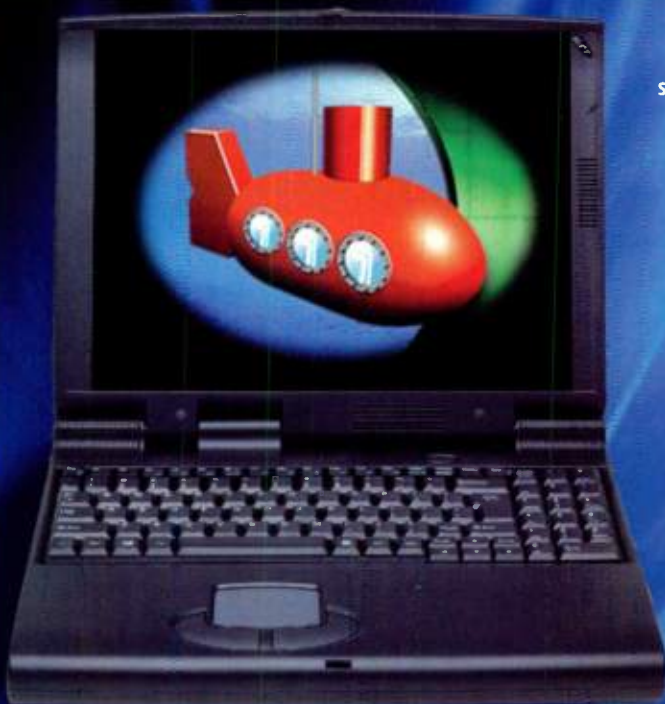
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# Recording On Location

## Cheshire Youth Orchestra



The chapel at the Conway Centre in Anglesey, where the Cheshire Youth Orchestra recorded *A Brief Encounter*.



PHOTOS: Mike Skeet

Recording a large orchestra can be fairly tricky, even in the most well-equipped of studios, but trying to get a great sound on location, using only the gear you can fit into your car, adds challenges all of its own.

*Mike Skeet*

A 420-mile round trip was required to get to Anglesey, North Wales, where I was to record the Cheshire Youth Orchestra. The 63-piece orchestra was to be in residence at the site for two days of rehearsals before I arrived late on the second day (Friday) with all the recording kit. Saturday and Sunday were to be the recording days, with two sessions per day from 10am to 1pm and from 2pm to 5pm, with a break in each — a very professional approach, which I thought augured well.

I had been advised by the orchestra's manager (and the producer at the sessions), Valerie Hayward, that we were to record in the chapel on the site. I had ascertained that the chapel was relatively long and that the

The main M&S stereo mic (Pearl DS60) is positioned above the conductor, with an M&S pair of Schoeps mics (CCM4 cardioid and CCM8 figure of eight) for the woodwind, and an M&S pair of Beyerdynamic ribbon mics (M160 hypercardioid and M130 figure of eight) for the percussion.

orchestra would fill nearly the whole length and certainly the whole width.

Orchestral layouts are very predictable, albeit subject to any restrictions imposed by the plan of a given venue. You have the strings close up to the conductor, with the first violins, second violins, violas and cellos spread out from left to right, and with double basses to the rear of the cellos on the far right. Behind the second violins and violas you usually have the woodwind — two each of flutes, clarinets, oboes and bassoons. Behind these, hopefully on risers, you find the brass section — trumpets, trombones, horns and possibly



a tuba. Behind these loud instruments, the equally loud percussion section is usually found. At this site, the four players involved had their kit filling the narrower sanctuary area distant from the conductor — including timpani, glockenspiel, xylophone, cymbals and a conventional drum kit.

Lone operators like myself usually work with a main stereo pair above and behind the conductor, covering the strings and the rest of the orchestra in general. However, I knew that this particular venue and resultant layout would not be well suited to only having a pair behind the conductor, even though this method can undoubtedly work when there's an effective tiered setup.

I figured it would probably be necessary to focus on the woodwind with another pair of some sort, and although I suspected that the sheer volume of the brass would mean they'd need no separate cover, I decided that I should prepare for the possibility that I might need to adjust the percussion balance against them. I packed a figure-of-eight and a hypercardioid for this purpose, as they could both be set up with their pickup nulls angled to reject the brass — cardioids are not the answer in such situations.

Knowing that there was to be a movement

from Rachmaninov's second piano concerto, and also an item with violin and harp soloists, I knew I would also need a moveable stereo pair available, placed in the space in front of the orchestra to help in balancing these soloists. I also included a couple of outrigger omnis in case I wanted to reinforce the left and right extremes of the soundstage.

All these mics, and a variety of cables, accompanied three tall stands with booms and one smaller set into a Cavalier saloon. Having enquired that a small separate room was available to monitor in, two stands for a pair of small BBC-designed Rogers LS35A loudspeakers accompanied the mic stands, along with a Quad 405 amplifier. I do not like loudspeakers on tables — I use them up in the air, clear of rear walls and room corners, and having stands on which to place them usually ensures these requirements can be met.

I used one of the mixers I designed and built myself; one with eight channels in a briefcase, including talkback, Frank Fox's The Box visual soundstage monitor and two Sharp Minidisc recorders. These act as backups to the separate Sony DAT and allow instant playback without disturbing the DAT. They also provide the producer with a take-home copy of the sessions for the edit planning.

## Setting Up On Location

The hour and a half up to midnight on the Friday when I arrived at the venue was spent carrying in all the kit, setting up and checking that everything was functioning. For the main microphone I used a unique Pearl DS60, made in Sweden, with its four rectangular capsules — I have a dedicated DIY desk which means I can use it as if it were an M&S pair (see the 'Middle & Side Mic Technique' box for details of M&S recording).

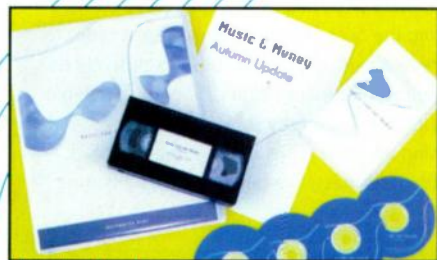
The woodwind had another M&S pair, comprising a Schoeps CCM4 cardioid and CCM8 figure of eight, held in place by a neat M&S mount. For balance reasons I favour a semicircular woodwind layout, when I can get away with it — I did so here by moving the music stands and seats around at 10 minutes to midnight, while no-one was looking!

The percussion area was covered by a couple of Beyerdynamic ribbon mics in another M&S rig — an M160 hypercardioid coupled with an M130 figure of eight. I like to use ribbon mics with percussion, and the low output levels associated with most ribbon mics don't tend to cause any problems with such loud instruments. I was able easily to set up the mic nulls to ignore the brass just

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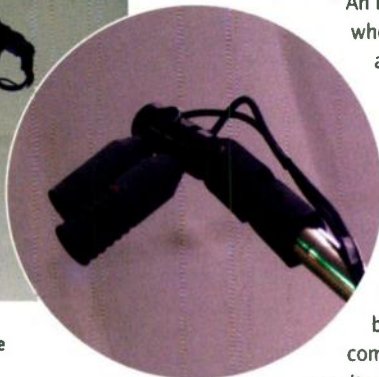
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The Schoeps and Beyerdynamic M&S microphone pairs used for the woodwind and percussion.



each pair is correctly connected each time. I had packed eight reels, making 200m in total.

An important regime to follow when running cables through an orchestra to your control room is to tape down the cables with white gaffer at sensible intervals. I also use the gaffer tape to protect the cables wherever they pass through doorways which need to be shut so as not to compromise the loudspeaker monitoring.

### Creating The Best Balance

The first thing I do, during the warm-up at

the start of the first session, is to set the gains and the faders for the main pair. For setting up the Middle channel, the conductor will always oblige by rehearsing a loud bit. I try to allow a cautionary headroom of about 6dB on the DAT, as the players' enthusiasm tends to rise as sessions proceed.

The stereo width then needs to be set by the amount of Sides mic in the mix. Apart from loudspeaker and Sennheiser HD600 headphone judgment, I also rely on The Box's display, which helps reassure me that things are not too wide or too narrow. You can see its diamond-shaped grid of LEDs at the top of my suitcase mixer in the picture, and a full diamond display is the aim.

With the main pair muted I then individually set the gains and the faders for each of the other pairs in the rig. Each also has its width provisionally set. Having got the

ball-park settings, the main pair is brought in again and the balance and perspective influence of the other pairs is judged, with levels and widths being trimmed. There is an argument for including time delays in the feeds of 'spot' mics, but this recordist remains to be convinced of this when relatively distant stereo spot pairs are used.

The dominant source of peak levels will generally remain the main pair and,

overall, the balance should give the impression of strings nearest, woodwind behind, brass and percussion behind them. It will be the main mic which will give the more ambient pick-up of the woodwind, brass and percussion — the spot pairs adding focus and

► behind the mic stand.

I usually make sure that I leave some spare mic cable under spot pairs, so that they can be easily moved to suit different works being recorded. In this case, I knew that there was to be a James Bond theme selection, and that I'd have to move the positioning to suit the drum kit for this.

The soloists, near the conductor, were covered with another M&S pair of Schoeps mics, this time with a soft cardioid CCM21 as the middle.

### Efficient Cabling

I had packed a 16-way 75m Klotz multicore, but with the short distances involved I preferred to use separate cables for each pair of mics — if I'd used the multicore, I'd probably have had to saw the centre corners from the doors to the playing area in order to prevent damage to the cable! I exclusively use dedicated four-core 25m cables, with five-pin XLRs, for each of my M&S rigs, each mic feed using opposite wires of the screened quad. The desks have five-pin XLR inputs ensuring



The two homemade mixers used for the recording sessions. The main mixer is on the left, with Frank Fox's The Box visual display above it, and the mixer on the right dealt with the feed from the Pearl DS60 microphone, allowing it to be used in place of an M&S stereo pair. Also in shot are the portable master DAT recorder, backup Minidisc recorders, and Sennheiser HD600 monitoring headphones.

## Homing-in On A Soloist

When it came to recording the piano concerto movement, we had to find the best way to balance the soloist, Fergal O'Mahony, with the orchestra. This involved getting the piano sensibly positioned and employing the soloist M&S pair. There were a number of factors to take into account here, not least that Tim Redmond had to be able to see Fergal's hands at some crucial moments. In the end they decided that the baby grand piano should be to the right of the conductor, in front of the cellos, which meant that Tim didn't need to turn too far to see Fergal's fingers.

The piano lid was fully raised and the spot pair was placed 2m from the

centre of the strings at about 2.5m above the ground. The level balance and perspective, along with the apparent width of the piano image, was quickly established as they played through the whole of the eleven minute movement. I favoured a 'slightly to the left' stereo position for the piano, with a width related to that of the orchestra. The spot pair was angled to get the slightly left-hand image, this having the advantage that spill from the cellos behind and to the right of the piano was captured to the right of centre, coinciding with the main pair's perception. Conflicting spill can create imaging problems, as well as balance difficulties.



An extra M&S pair of Schoeps microphones was used where appropriate to focus on solo instruments at the front of the orchestra.



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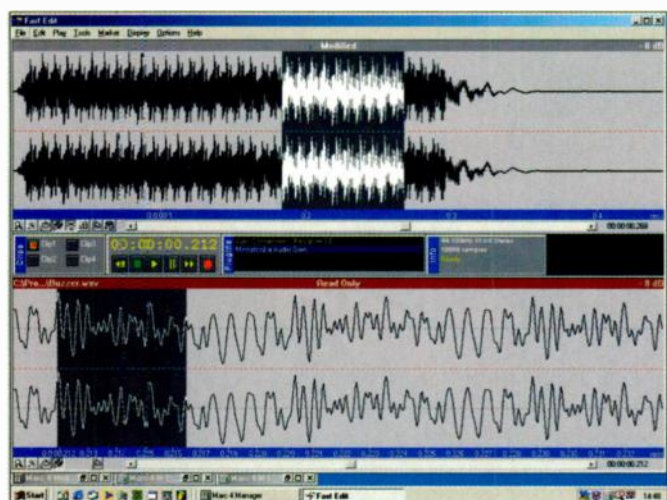
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Minnetonka Audio Software's *Fast EdDit*, which was used in compiling and editing the recorded takes into a final playlist.

DATs, with four Minidisc backups. The backups were given to the producer Valerie, who had to listen through in excess of four hours of music in order to plan the editing. She was assisted in

#### ► clarity in the mix.

The producer's ears also assisted here. Valerie had the scores of the works and advised me on the balance, as this particular engineer can't (and doesn't want to!) read musical scores — I take the view that an alternative judgement from a listener's perspective is a good thing. Finally, once we had a balance, the conductor, Tim Redmond, was invited in to hear a test take. We must have got the sound pretty good, as he felt he could make any further changes merely by working with the orchestra.

### Taking, Editing & Mastering

The four sessions went by without any technical problems. There was some subtle rebalancing and mic repositioning, especially for some of the film scores. By the end, we had a total of 124 takes recorded on three

this by Simon Roach, who has a degree in recording and who was then to come down to North Bucks with the scores in order to guide me in getting the edits right.

The editing program we used was Minnetonka Audio Software's *Fast EdDit*, which I find quick and tactile to use. The appropriate takes or parts of takes were loaded in as straight digital feeds via S/PDIF from a Tascam DAPI DAT. After some hours of copy-and-paste editing, involving over 50 edits within the music, the 16 works were assembled in a provisional final order.

It was not too difficult to come up with an opening number, the music from *Star Wars*, and the final track was to be Ron Goodwin's *633 Squadron*, with which the orchestra always ends their concerts. The piano concerto movement and the other piece with

soloists (John Williams' music from the film *Schindler's List*) were spaced apart in the middle, with the other works between. Each piece was trimmed to about two seconds at the start and about three seconds at the end.

Fade-ins and fade-outs were then made, and an appropriate number of seconds of digital silence placed in between — classical music needs around six to 10 seconds between works. Then we sorted out the track IDs, and these were placed at the start of the ambience fade-ins (rather than right up against the music) as is the norm for classical CDs.

The mastering technique we used was to output the entire playlist from the S/PDIF output of the editor to an Audio & Design DMM1 digital mastering desk. From there it went to two master DAT machines in parallel.

This setup allowed the levels of the quieter items to be raised manually, making them much more interesting to listen to. Increases of around 6dB were common, with one or two particularly low-level deliveries going up as much as 9dB. By watching the cursor move along the editor's waveform display we could gently get the level back to 0dB where necessary, thus preserving the impact of the orchestral dynamic range. This 'musical' approach is something which cannot be done with compressors or limiters!

I had noticed that we might need to add reverberation while on location, but I usually do this after the editing to leave my options open. In this case, I mixed in reverb from a TC Electronic M2000, though the send was first passed through a TC Electronic Finalizer in order to add some low-frequency lift and high-frequency cut as a means of warming up the sound. I also increased the stereo width of the reverb send in the Finalizer.

Finally, the tapes from the editing session were passed to fellow engineer and producer, Patrick Allen (of Opera Omnia Productions) who discussed it with the conductor, and put finishing touches to the track ordering, adding a touch more reverb using Patrick's TC Electronic M5000 system. **SOS**

## Middle & Sides (M&S) Mic Technique

M&S stands for Middle and Sides, which is a powerful stereo miking technique. Two mics are required. The Middle mic faces the centre of the soundstage, and can be an omni, cardioid, figure of eight, or any pattern in between. The Sides mic faces sideways to the soundstage, and must be a figure of eight. The mics should be as close together as physically possible and vertically coincident.

When the signals from these two mics reach your mixing desk, the Middle mic is fed at equal levels and in phase to the left and right of your master stereo buss — connecting it to one channel of a desk and panning it centrally takes care of this. The Sides mic is also fed to the left and right of the stereo buss at equal levels, but with the phase of the right channel inverted. This can be done by

splitting the mic feed to two channels of a desk, panning one full left and the other full right, and having a phase inversion in the right-hand feed. If the desk can't do the phase inversion, it can be incorporated in the splitter lead.

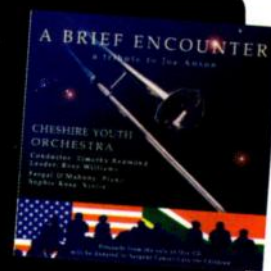
The level of the Middle mic is decided according to the headroom of your master recorder in the usual way, depending on what is being recorded. On the other hand, the level of the Sides mic determines the width of the stereo image — it shouldn't really exceed that of the Middle mic, and should usually be a maximum of around three decibels below, due to its out-of-phase nature.

I have been sold on the use of M&S microphone rigs for years. For a start, you get instant control of stereo width on your desk, as just mentioned. In

addition, the stereo image starts between the loudspeakers, as the centre of the soundstage is focused on axis by the Middle mic — compare that with any crossed or spaced pair — and the imaging is very clean, clear and coherent, with a depth of perspective. Mono compatibility is second to none, as the Sides mic contribution is simply cancelled when summing the stereo to mono, and if you have suspended a pair upside down on location, as is usually convenient, flipping the sides of the stereo is as simple as changing the phase-inversion settings on the desk. Another reason I like M&S is because I can use all sorts of combinations and makes of mic from my armoury — even the BBC-designed long-ribbon figure of eight microphone, the Coles STC4038.

The Cheshire Youth Orchestra's *A Brief Encounter* was recorded in aid of the Sargent Cancer Care for Children fund, following the recent early death of Joe Anson, who

had been a trombonist with the orchestra for five years. The CD is available for £10 (including UK p&p) direct from: Friends of CYO, The Croft, Chapel Lane, Lower Whittington, Macclesfield, SK11 9DE.







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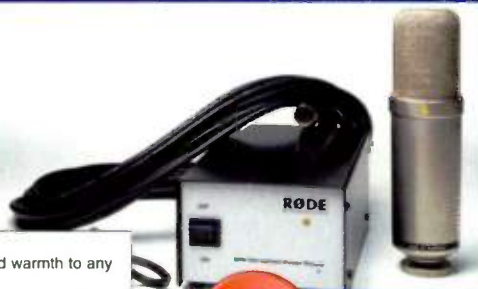
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## PRODUCT

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# Analogue Systems French Connection



## Analogue Keyboard Controller

Gordon Reid

**A**re you bored of the same old same old? I am. In fact, when it comes to synths and recording equipment, it now takes quite a lot to excite me. Show me the latest virtual analogue synth and it's likely that I will remain quite unmoved. Sure, I remember being very excited by the Clavia Nord Lead when it was released (see my review in SOS May 1995 or at [www.sound-on-sound.com/sos/1995\\_articles/may95/clavianordlead.html](http://www.sound-on-sound.com/sos/1995_articles/may95/clavianordlead.html)) but let's be honest — nothing much has changed since then. We now enjoy greater polyphony, and better effects sections, and instruments such as the Korg Z1 offer a wider range of physical models, but the philosophy and the way people use virtual analogue synths hasn't really changed in the intervening six years, whether we use them as hardware keyboards or (as has increasingly been the case over the last couple of years) in the form of virtual instruments. Likewise, my feelings towards today's breed of S+S workstations and synths. Many of these offer an astounding range of facilities, and processing power quite undreamed of just 10 or 15 years ago, but the *frisson* of

The Ondes Martenot was one of the earliest 20th-century electronic musical instruments, and found favour with composers of *avant-garde* orchestral works for many years. Now, thanks to Cornish company Analogue Systems, it's getting a new lease of life...

discovering something truly new is lacking. I suspect that the last time I felt an S+S tingle running up my spine was also in 1995, when Korg introduced the multitimbral effects in the Trinity.

Today, however, I'm playing something that's giving me quite a buzz. But far from being the newest, latest, whizz-bang digital marvel, and a million miles from the Pentium- and G4- powered software products that often fill these pages, it harks back to an earlier, golden age of musical experimentation. Developed in the 1920s, it's none other than the controller section of an Ondes Martenot. For more background on this fascinating instrument, see the box about its origins on the next page.

### French Lessons

Given that it was an early electronic instrument, the Ondes Martenot was

**SOUND ON SOUND**

**Analogue Systems  
French Connection £1050**

#### pros

- A uniquely expressive musical controller.
- A joy to play.
- Very well designed and built.

#### cons

- It's expensive.
- No MIDI (yet).

#### summary

The French Connection takes the control mechanisms of the Ondes Martenot and makes them available to players of modular analogue synths. It offers a degree and type of musical expression that is simply not possible using conventional keyboards and controllers. A unique and valuable product.



singularly playable, so it's not surprising that composers such as Barry Gray (see the box on the penultimate page of this article) continued to experiment with it throughout the '50s, '60s and '70s. Even today, its unique method of control and expression attracts musicians keen to develop new sounds and playing styles. So when Johnny Greenwood of Radiohead asked Analogue Systems to develop a Martenot-style controller for his modular analogue synthesizers, the company was keen to oblige.

Named the French Connection, Analogue Systems' design adopts the *control* mechanisms of the classic Martenot, but leaves the sound generation out, and packages everything in a neat unit designed to sit in front of any of the company's RS Integrator modular synths or, for that

matter, similar modulars produced by other manufacturers.

The keyboard itself is four octaves wide, and in front of this you'll find the wire controller with the small ring through which you insert your index finger. The wire (which is actually a fine nylon cord) is stretched above a fingerboard in which you'll find small circular depressions that represent the white notes on the keyboard; and protruding metal studs that mark the positions of the black notes.

To the left of the keyboard and the wire controller, there's a control panel reminiscent of those that you'll find on other Analogue Systems products. To the far left of this, there's a sprung X/Y joystick that returns to the central position when released. Above the joystick itself you'll find two knobs that determine the output range

for each axis, with a maximum maximum (if you see what I mean) of approximately 10V. There are four joystick outputs, two each for the 'X' axis and for the 'Y' axis. These, like all other Analogue Systems devices, use 3.5mm sockets.

To the right of the joystick you'll find the large, sprung wooden button that also harks back to the original Martenot. If left untouched, this sits in its uppermost position, and generates an output CV of 0V. As you depress it, the CV rises progressively to a maximum of approximately 10V. Again, a knob located above the button itself controls the actual range of operation.

There are just two further controls on the French Connection, and these are the switches located immediately to the left of the keyboard. The first of these determines whether the pitch CV is controlled by the

## The Origins Of The Ondes Martenot

Perhaps unsurprisingly, the Ondes Martenot was developed by a French chap named... Monsieur Martenot. Maurice Martenot (for it was he) was a French inventor born in 1898, who became a radio operator during the First World War. At this time, he noticed how the interaction of two pieces of similarly — but not identically — tuned electrical equipment could give rise to unwanted, but potentially musical, oscillations (a Russian gentleman named Leon Termin noticed the same thing, and used this technique to generate the audio signals in a subsequent invention of his, which he named the Theremin).

After the war, Martenot began his research into the musical applications of electricity and, in particular, the possibilities offered by allowing high-frequency oscillators to interfere with one another. However, much of his work over the ensuing nine years is clouded in mystery, because he did not unveil his eponymously named instrument until May 1928.

The first Ondes Martenot had a conventional, piano-style keyboard and a wire which stretched the length of the keyboard. The player moved this from side to side using a small ring which you were supposed to put on the index finger of your right hand. If you moved the ring to the right, the pitch of the sound produced by the instrument increased; if you moved the ring to the left, the pitch dropped.

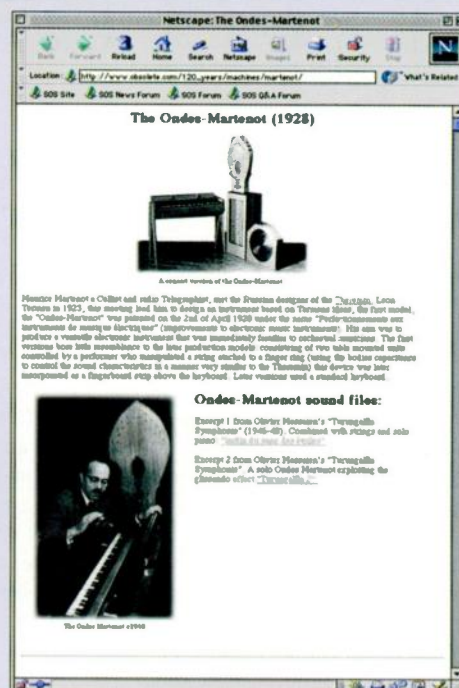
Had this been all the control offered by the Ondes Martenot, it would not have been a particularly musical instrument. However, there was a second control that allowed you to articulate notes using your left hand. The combination of the two made it possible to determine both the pitch and the amplitude of a note, and the result was not unlike a human voice, or an instrument such as the cello or violin (in fact, this similarity was not entirely coincidental; as well as being an inventor, Martenot was also a cellist).

If the Ondes Martenot's playing mechanism was novel, its playback system was amazing. There were three parts to this. The first was called the 'Principal', and was a straightforward — if rather primitive — loudspeaker. The second was the 'Resonance Diffuser', a flame-shaped device that

has since become the dominant image of the Ondes Martenot, one which makes it instantly recognisable to this day. Called the 'Palme', its resonant chamber and twelve tuned strings resonated in sympathy with the notes played by the performer, creating complex tones in the same way as some Eastern string instruments. The third part was a second diffuser called the 'Metallique'. This was, in essence, a traditional loudspeaker, but with the cone replaced by a metallic plate similar to a cymbal or gong. When driven, this added a distinctive metallic timbre to the sound.

It's hardly surprising that, in 1928, Martenot's instrument was considered a marvel, and it proved to be a huge success. Consequently, over the next few years, Martenot proceeded to design and build a number of variations. One of these allowed you to wiggle the keys themselves from side to side to create natural vibrato (still uncommon on synthesizers, this method was adopted in the mid-'70s by Yamaha for two of the three keyboards on their GX1). There was also a smaller version of the Ondes Martenot called the Ondioline. But whatever else changed, one thing remained constant... there was always a wire with a ring that controlled the pitch of the sound.

On a well-adjusted Ondes Martenot, the semitone positions of the ring — which were, of course, evenly spaced along the fingerboard — corresponded to the keys on the keyboard behind it. It should therefore be obvious that, compared with a Theremin (which produced a similar sound), the Martenot was much simpler to play. This fact was not lost on the serious composers of the day and, consequently, a number wrote music for it. Of these, the most famous were undoubtedly Ravel, Boulez, Messiaen, and (more recently) Maurice Jarre, but many others contributed to a repertoire of more than 1000 classical works that feature the instrument. Messiaen composed one piece, *Fête Des Belles Eaux*, which used no fewer than six Ondes Martenots!



Obsolete.com's Martenot history page. A complete Martenot system can be seen at the top of the page. The keyboard controller is on the left, the Palme resonance diffuser is to the right on top of the Principal loudspeaker, while the Metallique diffuser can be seen on the extreme right. The Palme is more in evidence in the lower picture on the site, where it can be seen behind the keyboard player.

There are many web sites on the net where you can read about the Ondes Martenot, and find out which works and recordings use it. As good a place to start as any is Obsolete.com's excellent site on the history of electronic musical instruments, [www.obsolete.com/120\\_years](http://www.obsolete.com/120_years) (shown above), which has a good section on the Ondes Martenot at [www.obsolete.com/120\\_years/machines/martenot](http://www.obsolete.com/120_years/machines/martenot)



ANALOGUE SYSTEMS  
FRENCH CONNECTION

The French Connection's control panel hosts a sprung joystick and the wooden expression button. These both output control voltages whose maximum ranges are governed by the knobs above the controllers themselves. The control voltages are accessed via the 3.5mm jacks on the panel for connection to appropriate modular synths. Finally, but most importantly, the two small switches at the bottom right of the panel determine which controllers (slider, button, or keyboard) will be active.

- ▶ keyboard or by the wire controller. The other determines whether the keyboard produces a conventional trigger and gate, or whether the button produces an amplitude CV. There are eight physical outputs for these — three pitch CV outputs, three button CV outputs, a trigger output, and a gate output.

And that's all there is to it. Add an IEC mains input and an illuminated on/off switch to the right-hand side of the unit, and mount everything in a gorgeous, polished wooden case, and you have a French Connection.

## In Use

The first time I had the opportunity to play a French Connection, I had no oscillators available to test it, but I was able to make do with an Analogue Systems RS8000 modular system, which contained RS100 filter and RS180 VCA modules. I raised the Resonance on the filter to maximum so that it went into self-oscillation and began to produce a sine wave at the cutoff frequency, and then patched the pitch CV output from the French Connection into the filter cutoff frequency input of the RS100. Finally, I patched the output from one of the French Connection's buttons to the RS180 VCA, and connected that to my monitors.

The results were magic. Not to the sound itself, you understand ... nobody could say that a self-oscillating filter passed through a VCA is anything to write home about. But controlling this sound using the French Connection proved to be completely

intuitive and incredibly musical. The depressions and studs on the fingerboard made it simple to locate conventional semitones, and the ring moved without any discontinuities or unevenness. I could articulate each note individually and smoothly using the amplitude button, or create slides and vibrato without difficulty.

Of course, I didn't confine myself to playing a simple sine wave in this fashion. Once I had the French Connection in my studio, I had access to numerous oscillators, filters, and other modules, and began to experiment with patches that used the French Connection's multiple pitch CVs and button outputs. Again, the results were superb, and I'm prepared to stick my neck out and say that I could not have created

precisely the same musical performances in any other way. Of particular note, synthesized violins and cellos have *never* sounded this good! Then there were the flutes, whistles, atmospheric voices and amazing effects...

Of course, I was not recreating the *sound* of a vintage Ondes Martenot because the French Connection offers only the *controllers* of the original, not the sound generator or (most importantly) the complex resonators that gave it its distinctive, ethereal tones. But that's not the point. The French Connection still offers all the expressive potential of the Ondes Martenot.

Next, I experimented with the four permutations afforded by the two switches on the French Connection's control panel. Everything I've described so far had them set to 'Button + Slider' mode, thus imitating the Ondes Martenot itself. Change them to 'Keyboard + Keyboard' mode, and the French Connection then acts as a conventional CV + Trigger + Gate monosynth keyboard. But what of the other combinations?

'Keyboard + Slider' mode allows you to control the pitch of the sound using the wire controller, but trigger envelopes using the keyboard. This is quite different from using the button to control modules such as VCFs and VCAs, and offers performance possibilities that are unavailable on either the Ondes Martenot or on a conventional monosynth. Then there's 'Button + Keyboard' mode, which allows you to play the pitch of the sound conventionally using the keyboard, articulating notes using the button. This is not a unique way of doing things... you could do the same thing using a keyboard and joystick, but the French Connection does it very elegantly.

If I have to find a criticism (and I always do) it's in the positioning of the left-hand pulley that guides the wire (see below). This protrudes from the case into the space



Using the sliding ring to determine the pitch CV output by the French Connection. On this model, the left-hand pulley supporting the wire fouls the bottom C key slightly, as you can see.



immediately in front of the bottom C key, thus fouling the ring and making it difficult to play this note accurately using the wire controller. Extending the case by a centimetre or thereabouts would cure this, so I hope that Analogue Systems will bear this in mind when planning the next production run.

There's only one other disappointment for me, but it's nothing to do with Analogue Systems. You can't use the French Connection with something as simple as a Roland SH101 or an ARP Axse, because neither of these offers an input that allows you to control the VCA Gain. Sure, you can use the wire controller to provide the pitch CVs and use the keyboard as a Trigger/Gate, but it's not the same. To appreciate the true value of the French Connection, you'll need an ARP 2600 or a true modular synth that allows you to patch and play it as it was intended.

## MIDI

The French Connection does not, unfortunately, have a MIDI output. This is not an oversight and, when you think about it, there are good technological reasons why this should be so.

## Barry Gray & The Ondes Martenot

You might think it unlikely that you've heard an Ondes Martenot unless you've studied obscure 20th-century classical music, but I'll lay odds that you have, even if you don't realise it. These instruments have cropped up in the most unlikely places... as the following story demonstrates.

If you were a child in the UK in the '50s or '60s, you may remember Gerry Anderson's early SuperMarionation (puppet) series; the ones that have, so far, escaped digital remastering and broadcasting on primetime TV. These were produced by AP Films — the company that later became 21st Century — whose musical director was none other than Barry Gray, the composer who was to produce the music for the majority of Gerry and Sylvia Anderson's TV series.

Gray had set up a small studio in London in 1950, and was much in demand throughout the decade, working with many of the top artists of the time. However, he had a passion for (what

was then) the new field of electronic music and effects, so, after discovering the Ondes Martenot, he bought an instrument, and later studied with Martenot himself in Paris.

As musical director of AP Films, Gray produced the scores for Gerry Anderson's earliest creations, *Twizzle* and *Torchy*, but it was Anderson's next production that brought both men to the attention of a wider public. This was *Supercar*, a futuristic series that proved to be the ideal vehicle for Gray's experimental sounds and music. The Ondes Martenot played a significant role in this, and it proved to be so successful that Gray went on to use it on many filmscores, including *Fahrenheit 451*, *Dr Who* and *The Daleks*, and *Journey to the Far Side of the Sun*.

Gray retired from film and TV composition in 1974. He remained musically active, and was contemplating a return to work with Gerry Anderson when he died in 1984.

Consider the MIDI protocol: the messages that play notes on MIDI synths contain at least two commands: a Note On for the appropriate note, and (later on) a Note Off for the same note. Other common commands include velocity, modulation

amount, pitch-bend, and MIDI volume.

Unfortunately, the French Connection doesn't fit this scheme, because there are no defined Notes On or Offs. You might think that this is no big deal... after all, you could use the keyboard to send a single Note On to



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ANALOGUE SYSTEMS  
FRENCH CONNECTION

## The Demon: Keyboard Controller

To complement the French Connection, Analogue Systems has also released the Demon, a four-octave keyboard/joystick controller designed for use with both MIDI devices and modular analogue synths.

The control panel on the Demon is, of course, quite different from that of the French Connection, comprising an AS RS220 joystick controller and an RS330 keyboard controller. And that's it... because it lacks the racking system of the larger modular Sorcerer keyboard (see Chris Carter's review in *SOS* October 2000, or head for: [www.sound-on-sound.com/sos/oct00/articles/analogue.htm](http://www.sound-on-sound.com/sos/oct00/articles/analogue.htm)), the Demon is unable to host any further modules itself, but is designed for use with modern modular synths such as Analogue Systems' own RS8000, RS8500, or any number of instruments from manufacturers such as

Doepfer or Analogue Solutions. It is also ideal for use with the Roland System 100M and the ARP 2600, both of which occasionally appear in shops and free ads without keyboards.

Round the back, the Demon — like its big brother the Sorcerer — offers MIDI In, Out and Thru ports connected to the RS330 keyboard controller, so you can combine MIDI input and output with the control possibilities provided by analogue CVs, triggers and gates. However, unlike the Sorcerer, which has a monophonic MIDI Out, the Demon is fully polyphonic over MIDI. This is an unexpected bonus, and very welcome.

The Demon uses the same non-velocity, non-pressure-sensitive keyboard as the French Connection, housed in a slightly smaller walnut case, and costs £550.



Below: Analogue Systems' Demon keyboard controller, and above: the Demon's MIDI interface, sadly lacking at present on the French Connection.



## Johnny &amp; The Martenots

The French Connection was not born out of nowhere... it was commissioned during 2000 by Johnny Greenwood of the band Radiohead. Greenwood already owned an Ondes Martenot (an instrument built in 1983 by the son of Maurice Martenot) complete with all three resonators, but was nervous about performing with it, fearing that it would be damaged on tour. So he approached Martenot to purchase a second device for live use. Unfortunately for him (but fortunately for the rest of us) his instrument was one of a production run of just 50, and these were long gone — 44 to a music school in Japan, and the remaining five to other musicians. So Greenwood approached Bob

Williams, owner of Analogue Systems, to ask whether he would be prepared to design and build a replica for use with Radiohead's existing RS Integrators.

Williams accepted the challenge, and in April 2001 demonstrated a prototype to Greenwood. Following a couple of minor modifications, production began, and the first two French Connections were delivered to Radiohead in May 2001.

The first public outing for the French Connection was on the BBC's *TOTP*, in May 2001, on which Radiohead performed 'Pyramid Song' from their album *Amnesiac*.

something new to my studio, something that it will take away when it leaves. Sure, I can go back to using the ribbon controller of my Yamaha KX5 (which I use with a footpedal to articulate notes) as I have done in the past. This has the huge benefit of outputting MIDI, but nevertheless, I'll never again be satisfied with its feel or responsiveness.

Finally, it's only right to note that the French Connection is not cheap. At just over a thousand pounds in the UK, it's only for the most committed composers and performers, plus that small handful of musicians with enough loose cash to be able to experiment as they wish. But for those who can justify the expense, it will provide a completely new opportunity for musical expression and creativity. I think that I can safely say that the French Connection is unique. *SOS*

► fire up an external MIDI device, switch to 'Slider + Button' mode, and then generate the articulation of subsequent pitches using Controller 7 (MIDI volume). With two seven-bit words to define the pitch (one for the note number and one for the detune when the pitch lies between semitones) you could then define any pitch, sliding smoothly up and down the full-frequency range.

While not impossible, this is far from trivial, because the Note Number is part of the Note On command, so it's likely that the external device will be retrigged every

time you cross from one semitone to another. Nevertheless, setting up a suitable MIDI synth as a single-trigger monosynth may provide a solution, and I understand that Analogue Systems are looking into the possibilities of this. I sincerely hope that the company succeeds... imagine being able to control MIDI synths using the French Connection. That's an exciting prospect.

## Conclusions

I don't want to give the French Connection back to Analogue Systems. It has added

## information

£ French Connection £1050; Demon £550.  
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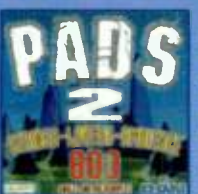
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## DOWNTOWN ORCHESTRA (POWERFX)

New in the 'Downtown' series, this collection features strings, brass, woodwinds and percussive loops and samples beautifully written, played and recorded specifically for contemporary production. You get entire orchestral parts and sections, plus a killer set of low string riffs. The highly inspirational phrases in this offering scream to be turned

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## DOWNTOWN BEATS (POWERFX)

Created as a compliment to 'Downtown Strings' and tempo matched to provide seamless interactivity or it also functions just as well as a stand-alone beat library. So if you need the latest beats or a perfect partner for Downtown Strings or Downtown Orchestra, then this is for you. "...the wide range of tempos could make this a valuable

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Sound on Sound  
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5 STAR Review  
Giga 10 CD-Rom Set - £379.00

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# Digidesign

## Software Sampler For Macintosh

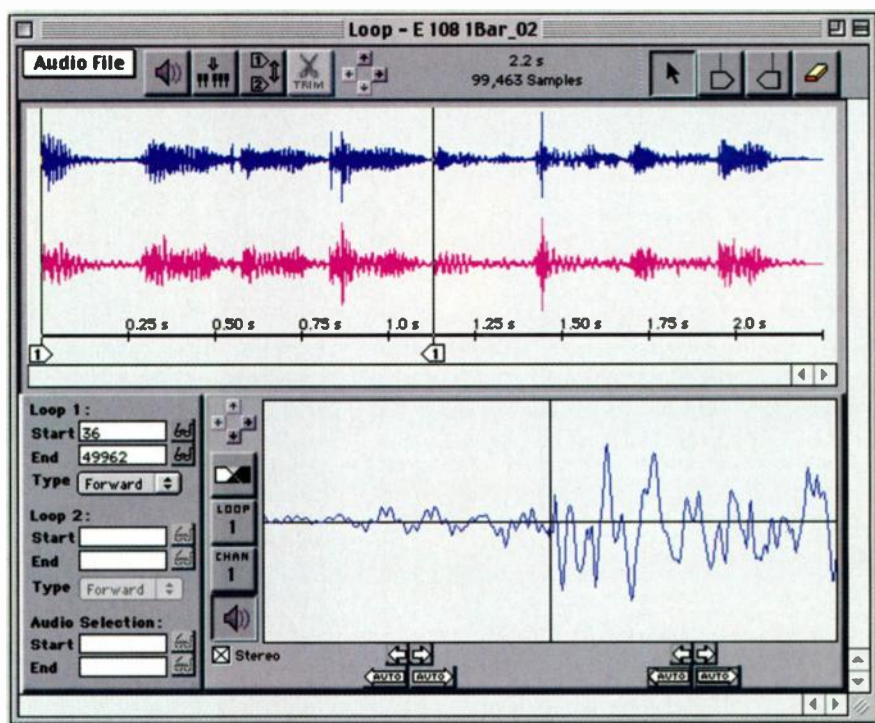
# Soft Sample Cell

Although the original hardware Sample Cell system has been around for years, there has until now been no software sampler that would integrate with Pro Tools systems.

Paul White

**D**igidesign's hardware Sample Cell system, now around a decade old, was one of the first serious attempts to integrate sampling into a computer environment. It featured eight audio outputs and up to 32Mb of onboard sample RAM, and could be used multitimbrally. Since then, native-powered soft samplers have taken up the baton, so it's no surprise that Digidesign have come up with a soft version of Sample Cell that relies on the host computer's processing power.

*Soft Sample Cell*, which runs on the Macintosh platform, is unique inasmuch as it is the only soft sampler I know of that will work within *Pro Tools* software and a TDM/DAE environment (although Emagic's *EXS24* can now be integrated into TDM systems using their System Bridge, it only runs within *Logic*). It has the advantage over the original hardware version that it can access the computer's own memory, thus overriding the 32Mb restriction of its predecessor. It is still multitimbral with multiple outputs (up to 32 using DirectConnect or 16 using Direct I/O) and though it can't record samples, you can



create Instruments using samples recorded in an audio program such as *Pro Tools*. File formats supported are *SDII*, *WAV* and *AIFF*.

The program receives MIDI via OMS (version 2.3.8 is included) and requires a minimum spec of system 9.04 running on a fast G3 or a G4 with more than 128Mb of RAM for any practical application. The documentation insists on a colour monitor, which is perverse when you consider that the program is entirely monochrome and preserves the retro black-and-white 'Doctor T synth editor' look of the original!

The audio output is compatible with Apple's Sound Manager, DirectConnect and Direct I/O and can handle both 16- and 24-bit playback with a polyphony of up to 16 voices at either 44.1 or 48kHz sample rates. Direct I/O or Apple Sound Manager is used when *Soft Sample Cell* is run as a stand-alone program, while DirectConnect enables it to be used from within an OMS-compatible audio sequencer that also supports DirectConnect. There's still no provision to support ASIO, and

Sample editing is limited to trimming start and end points, but *Soft Sample Cell* provides a well-specified loop editor.

**SOUND ON SOUND**

### Digidesign Soft Sample Cell

**£304**

#### pros

- Easy to use.
- The only soft sampler that works with *Pro Tools* and in a DAE environment.
- Flexible output routing capabilities.

#### cons

- Key floppy disk protection.
- Only supports Sample Cell sound libraries.
- Requires Digidesign hardware to work in a third-party sequencer.
- Graphically dull user interface.

#### summary

*Soft Sample Cell* is pretty much the only game in town if you need a soft sampler to run in a DAE system, but if your main environment is VST or MAS, then you'll need to look elsewhere.

### Test Spec

- *Soft Sample Cell* v3.0.
- Mac G4 450MHz, 256Mb RAM, running Mac OS 9.04.
- Digidesign 888I/O interface.
- Tested with: Emagic Logic Audio Platinum v4.81.



## Installing Soft Sample Cell

Installation of *Soft Sample Cell* is ostensibly simple, and OMS had no problem recognising my setup and installing *Soft Sample Cell* as an OMS node. Sadly, however, I couldn't get a MIDI response from *Soft Sample Cell* until I'd switched off my *Toast Firewire* driver, renamed the *Soft Sample Cell* extension to get it to load first and sacrificed a couple of goats! This kind of O-M-Mess is not the sort of grief we expect from a 'professional' product. And talking of which, it's way past time the obsolete key floppy disk install system was dropped, as Macs haven't had floppy drives for some generations now. Not only that, but although it installed perfectly well on my external Teac floppy (with suitable Pace extension), it simply refuses to uninstall: the uninstall program loads, the floppy whirrs for around 10 seconds, then it quits. Looks like I'm stuck with *Soft Sample Cell*...

there's no VST version of *Soft Sample Cell*, so you still need to be running Digidesign hardware (even if it's only a Digi 001) to use *Soft Sample Cell* with a third-party sequencer.

Though the software looks much like the original and is based around a handful of straightforward edit pages, there have been some improvements over the last 10 years or so, not least the upgrading of the resonant low-pass filters, which are now four-pole (24dB/octave). As the computer's own RAM is now used for sample memory, the upper limit has been expanded to a Gigabyte, and *Soft Sample Cell's* modulation capabilities more closely resemble those of a synth with 18 sources and 26 destinations (there's a maximum of 20 modulation routings per patch). There are three envelopes, one of which is pre-assigned to level, along with two LFOs and one filter per voice, but there's no way to sync controllers to tempo. The edit pages include a loop editor and a Tracking generator with 'user-bendable' curves based on nine breakpoints. Trackers can be used in the modulation matrix to vary the control law by which a source controls a destination.

Sampler Instruments may be either mono or stereo and can be based on a single sample or a set of multisamples with key zones and up to six velocity zones, velocity-switched or crossfaded. Keygroup boundaries may be adjusted by dragging. Each sample can have up to two loops, one of which plays for as long as the key is held down and the other during the release portion of the sound. A separate waveform window is available for loop editing and for creating crossfades to smooth the loop transitions. Here you can make fine adjustments to the loop markers as the sample plays, which makes it quite easy to find the best loop location: after this, a short crossfade may be applied if necessary. For some reason, *Soft Sample Cell* dictates the maximum and minimum number of samples that may be used for the crossfade, and often the available crossfade time is extremely short.

## In Use

Once it's installed and running (see box), *Soft Sample Cell* is actually pretty straightforward to use, even though the interface is visually unexciting and is arranged around a series of edit screens rather than a nice-looking main page with edit screens behind it. Sample loading is via conventional file menu browsers where sounds are arranged as Samples, Instruments and Banks, and you can organise your samples into library folders quite easily. The Instrument control panels look much like mixer channel strips and it is here that you can set the key range, level and panning of the part, choose the MIDI channel on which it operates and define the stereo audio output to which it will be sent. Tuning is on a per-Instrument basis, as is transposition.

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## DIGIDESIGN SOFT SAMPLE CELL

► A number of rather good samples, contributed by most of the main sample-library companies, are provided with the package. These are all in Sample Cell format, as the program is still unable to import library material from other sources — I feel that the lack of Akai support is a major drawback given the dominance of that format.

You can create your own Instruments in *Soft Sample Cell* by importing audio samples recorded in another application, after which all the usual keygrouping, velocity-switching and crossfade looping functions are available. However, audio editing within the program is limited to trimming the starts and ends of the samples and defining loop points. A number of semi-intelligent functions make setting out keygroups easier, with lots of drag-and-drop functionality to streamline the process. Once a set of keygroups has been created, you can then apply envelopes, filters and modulators to the sounds, though oddly there's no portamento function and no legato triggering option. A series of icon buttons gets you directly to any required edit page, and envelopes can be edited by dragging points on the graphical display.

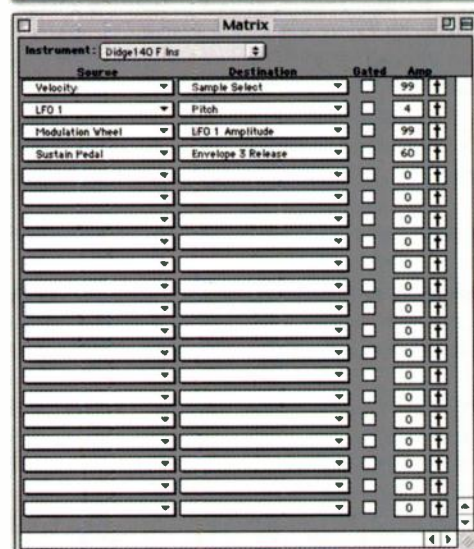
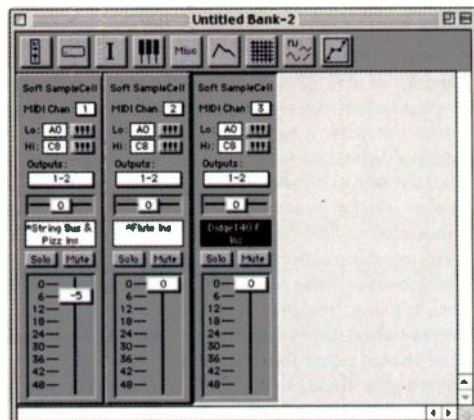
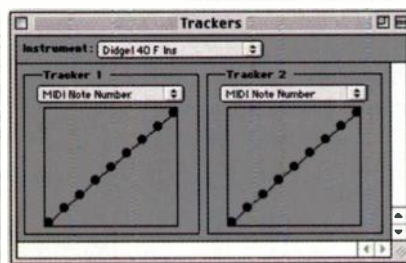
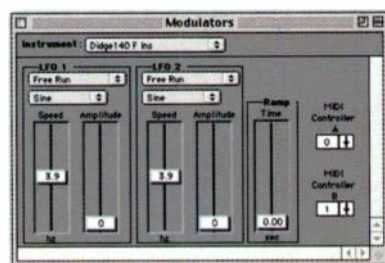
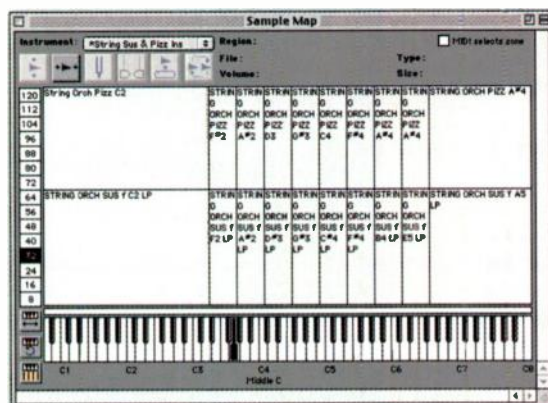
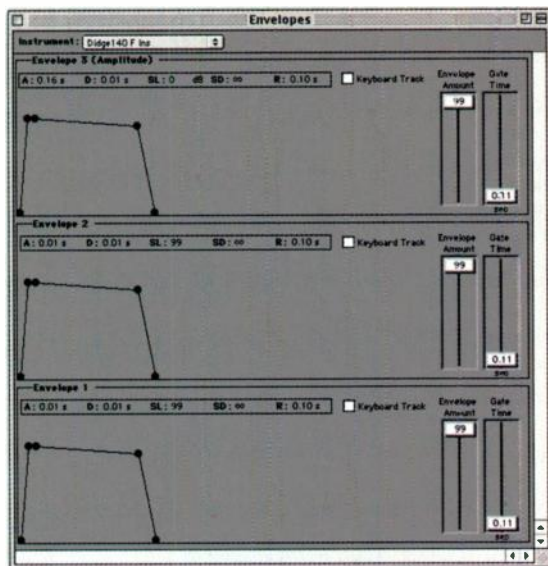
In stand-alone mode you can choose between two latency settings, Fast or Slow, and in Fast mode I'd say there was around 10ms of latency. Under DirectConnect, the user choice of latency setting is denied as the software manages this automatically. Calling up the CPU performance meter and then running my hand along the keyboard to play 15 or 16 notes showed about a 50 percent load on my 450MHz G4, which is rather heavier than from Emagic's *EXS24*.

As we're used to with VST Instrument plug-ins, *Sample Cell* Instruments are saved as part of a Pro Tools Session providing you save the sample bank first and then close it before closing the Pro Tools Session. To test the program from within a third-party sequencer, I used *Logic Audio* version 4.81. *Logic*'s built-in Sample Cell driver doesn't

recognise *Soft Sample Cell*, so you have to use OMS. Running *Logic Audio* under DAE, *Soft Sample Cell* appears as a MIDI Instrument, though its audio output has to be routed via a *Logic Aux* mixer channel. There's no direct access to the *Soft Sample Cell* editor from within *Logic* so this has to be opened separately, but I experienced no problems getting it to work. Other than the means of placing *Soft Sample Cell* into a track and routing its output, there's no real difference between using it inside a DAE application and as a stand-alone program.

## Conclusions

The fact that *Soft Sample Cell* can't be used in MIDI + Audio sequencers running audio hardware other than Digi's own is disappointing for those who use ASIO-compatible audio systems, but then



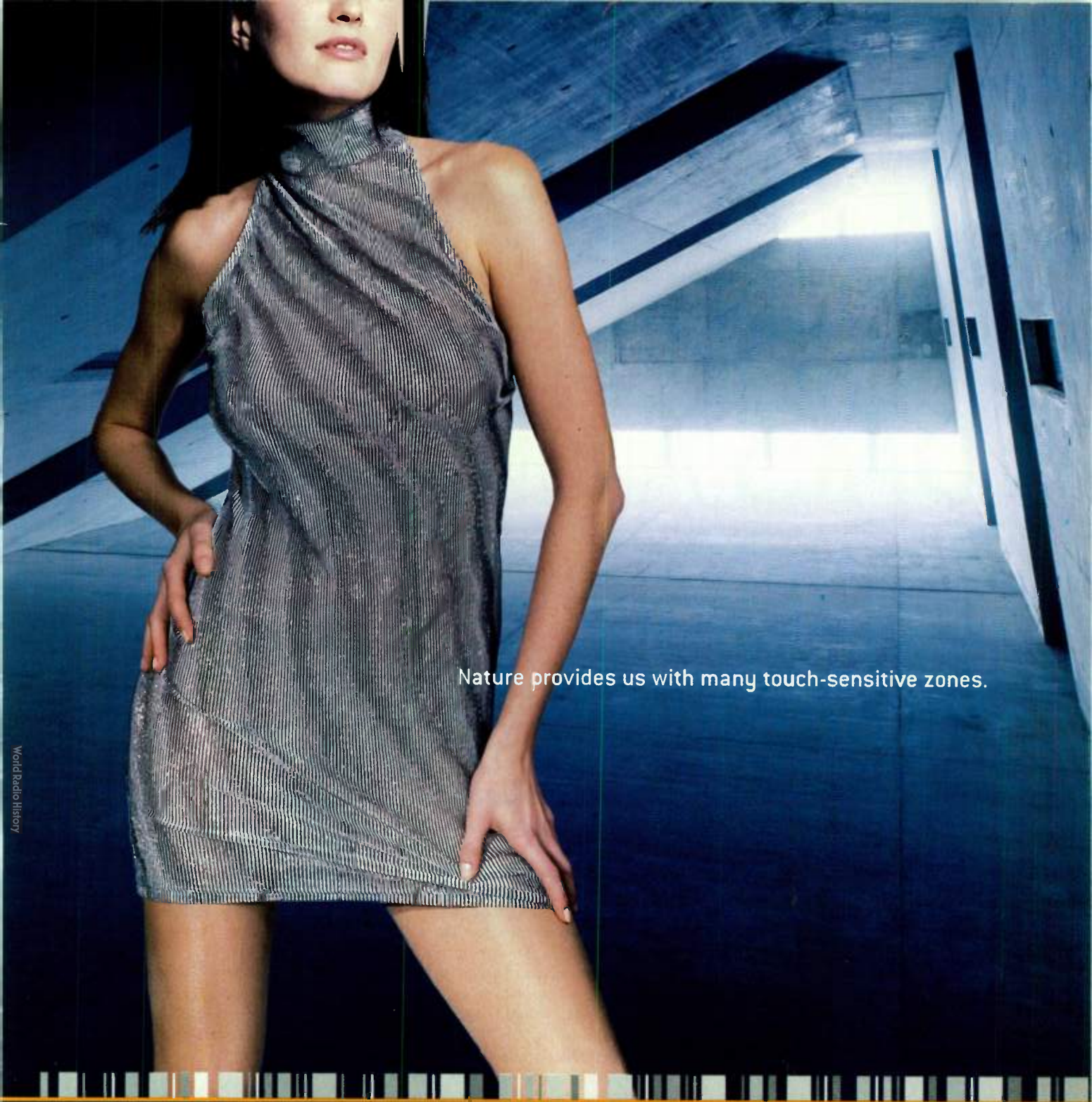
*Soft Sample Cell*'s interface presents various independent editing windows, without a unified main page: clockwise from top left are the envelope editor, Instrument control panels, modulation matrix, Tracking generator, modulation source editor and key assign screen.

it's probably fair to say that if you work in a MAS/VST environment, you'd be unlikely to choose *Soft Sample Cell* anyway as it is less flexible in terms of sample-import capability, and arguably more power-hungry, than the leaders in the VST sampler market. However, *Soft Sample Cell* does have the advantage that it can be used within a TDM/DAE program. It also has the benefit of being easy to use and it sounds good, which more than mitigates its rather dour interface. **SOS**

## Information

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# DACS Audio Freque II

## Ring Modulator & Frequency-shifter

Flying in the face of the 'digital all-in-one' trend, the Freque II unashamedly provides specialist analogue processing for the audiophile.

Paul Nagle

**W**hile awaiting delivery of the DACS Audio Freque II review model, I decided to do a bit of research in advance. A quick trawl of the Internet hinted at a gaudy, rather ugly-looking dual ring modulator and frequency shifter. The on-line images left me with the impression it was a budget unit — so I was quite surprised to learn it wouldn't spare much change from a thousand quid! Clearly, only first-hand experience was going to tell the full story.

In the event, when it arrived, it wasn't too ugly after all. True, the purple and red paint job did resemble the efforts of a manic simian artist, but in reality it could have been far worse. At least it wasn't bright yellow. At two rack units in height, this chunky module boasts no less than 17 knobs, and although of the basic black plastic variety, these are both smooth and responsive. Furthermore, seven small red buttons (with associated LEDs) and no less than 10 rear-panel sockets mean that there's no LCD or multi-functionality in sight.

This is a stereo unit, each channel featuring a separate ring modulator circuit,

two shelving filters, an internal oscillator, plus level-setting controls. Channel two features an additional routing switch, an FM Depth control and a Freque button (of which more later). In other respects each channel is the same. Curiously, channel two is positioned above channel one.

### Music Or Modulator?

Other ring modulators I've encountered offer little obvious distinction between their two signal inputs. However, the rear panel of the Freque II has input connections for each channel labelled Mus and Mod. There are two built-in sine-wave oscillators whose outputs are available at the rear panel, though they can be routed internally to each modulator input if required. Each oscillator's frequency can be controlled externally from dedicated external Hz/Volt CV inputs, making the Freque II an ideal partner for a modular synth, especially one from the Korg MS series. You can, of course, connect audio signals to both music and modulator inputs — indeed, some of the most sonically pleasing results are achieved when the modulation source is harmonically related to the musical input. The music inputs and each of the main audio outputs are balanced, although unbalanced operation is selected automatically if you insert a standard mono jack.

I was eager to get some sounds from this beast, so I started by connecting the stereo outputs of a drum machine to each channel's music input. I didn't connect anything to the modulator input, so I pushed each of the front-panel Osc buttons, enabling me to use the oscillators as modulation sources. Next, I adjusted the level of Music and Modulator for each

channel by means of the four small and rather closely packed knobs. LEDs on the left-hand side of the front panel provided adequate visual feedback of signal levels, although logic might have seen them positioned rather nearer to their associated controls than they are.

Only then, with audio pouring through the Freque II, did I start to appreciate the high quality of this processor. I have several other ring modulators, both within my modular synthesizer and stand-alone units, and none of them come close to the clarity and smoothness that DACS Audio have managed to achieve. The top end, in particular, sparkles — but not in the annoying way that typifies cheaper ring mods. Here, breakthrough of the original signal has been reduced to a minimum (by using phase cancellation) so that what you

### SOUND ON SOUND

#### DACS Freque II £998

##### pros

- Very high quality ring modulation.
- Built-in frequency-shifter function.
- Extensive patchability.

##### cons

- Expensive...
- ...but doesn't look it.
- No MIDI control.

##### summary

A superb, flexible processor, the Freque II generates a broader spectrum of sounds than other ring modulators I've heard. The frequency-shifting function is a welcome plus, the shelving filters and the frequency modulation add extra mileage, but all at a price which is not to be taken lightly.





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## DACS AUDIO FREQUE II

- hear is the ring modulated output with very few unwanted artefacts.

The onboard sine-wave oscillators provide convenient modulation sources, their range selectable from 0.1Hz-10Hz, 0.3Hz-30Hz, 1Hz-2kHz or 1kHz-16kHz. Within each range, Fine and Coarse tuning knobs allow very precise setting of frequency, although some form of display readout would have been the icing on the cake. An Osc 2 To RM1 button is available should you wish to use the same modulator for both channels, and this is handy if controlling a stereo source. However, it's also fun for processing totally different signals, perhaps a bass and rhythm guitar, through each channel at the same time. The FM On switch routes oscillator one internally to the CV input of oscillator two, and the Depth knob controls the amount of the resulting modulation. Naturally, you can connect other modulation sources via the rear panel jacks to vary the frequency of

the upward-shifted signal, whilst channel two produces the downward-shifted one, 180 degrees out of phase. Using the Output Mix knobs, you can determine how much of the original is blended with the shifted output.

Although this is pretty straightforward to explain, the effects it produces range from drastic sound-warping to quite subtle thickening. External control of oscillator two's frequency becomes even more funky with this function. I experimented using an analogue sequencer's CV output to produce precise frequency shifts in sync with the musical input for some fascinating, quirky transformations — instant Björk! I was a little disappointed that there was no MIDI control of oscillator frequency, nor indeed any onboard MIDI at all. Perhaps MIDI simply doesn't have a high enough controller resolution to do justice to the Freque II? If necessary, a MIDI-to-CV convertor could be employed, perhaps translating MIDI notes



either oscillator, or both come to that. Each channel has an output balance that controls the ratio of the original music signal and the processed signal.

Both channels feature two shelving filters to process the incoming music signals; you can activate each of them with another of those cute red buttons. The filters are labelled Weight and Edge, just to add a little mystery, though the labels Bass and Treble might have been more familiar. Each offers  $\pm 12\text{dB}$  of boost; the centre position leaving the signal unchanged.

### What The Freque?

The unobtrusive Freque button at the right-hand side of the panel activates the Freque II's frequency shift mode, and with it a whole new slant on pitch-shifting. The amount of shift applied is set by the frequency of oscillator two (oscillator one's switch is deactivated when the Freque button is engaged). Effectively, this process combines the two music inputs, and creates two shifted versions of them, one shifted upwards and the other shifted downwards by the same amount. Once Freque is activated, channel one's output produces

into voltages to drive those onboard oscillators.

DACS Audio offer some practical applications for the Freque II in a supplementary guide that is supplied along with the spartan eight-page manual, and this guide is also provided on their web site. One trick I discovered was to route an entire stereo mix through the music inputs and then to pick just a single instrument from it (a bass or arpeggio part) as modulation source. As the song played, I found that adding a small amount of the Freque's output produced an effect rather similar to an exciter, but with far more harmonic wildness. Used in dance tracks, the Freque can add a hard, raw distortion, although if overdone it could easily become jarring.

The metallic fizz achieved when running the onboard oscillators at high frequencies was surprisingly clear and worked well with drum samples as music input. I'd also recommend using the sounds generated by other synthesizers as modulation sources, as these can be more extensively manipulated during playback. Similarly, I got some vocoder-like results using a slowly sweeping string pad as a Modulation source, again

## Hear The Freque II On The SOS Web Site

Even if you've heard a ring modulator before, you should still check out the sound of the Freque II — you can get sounds out of this box which nothing else I've heard can match. Obviously, not everyone will be able to get their hands on this beast for themselves, so I've created a few MP3s to demonstrate what it can do — you can download these from [www.sound-on-sound.com/soundbank.asp](http://www.sound-on-sound.com/soundbank.asp). Bear in mind, though that MP3s can't really do justice to the smoothness of the sound quality here — if you want higher-resolution audio demos, contact DACS Audio and they can send you their own demonstration CD.

with a drum loop as the music input. With my existing ring modulators, such experiments sounded altogether harsher and crunchier, but the Freque II makes it easier to find 'sweet spots' even within fairly complex material. Using the frequency-shifting function and then activating FM allows you to produce gated-style effects by setting the FM control oscillator (oscillator one) to a low frequency. At times, you might connect the Freque II like a conventional effects box (to your mixer's effects sends and returns), or alternatively you could place it directly between sound source and mixer. Both methods spawned their own new ideas.

### Conclusion

I've used numerous ring modulators over the years, but none have felt either as musical or as natural to use as this one. Depending on the source material and your choice of modulation input, it is possible to obtain results that aren't instantly identifiable as 'classic' ring modulation. Whether it's producing distortion effects, high-pitched sizzles, circuit-bending rumbles or supersonic screams, the Freque II has a surprisingly wide range of applications. DACS Audio have added a few useful extras in the form of tonal control, FM, frequency-shifting and extensive connectivity, but, ultimately, the question will be whether anyone is going to be prepared to pay for such high quality in a stand-alone ring modulator. Though my own initial scepticism was eroded the longer I used the Freque II, I fear the UK price will deter many. Make your own Frequin mind up... **SOS**

### Information

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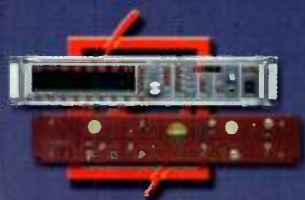
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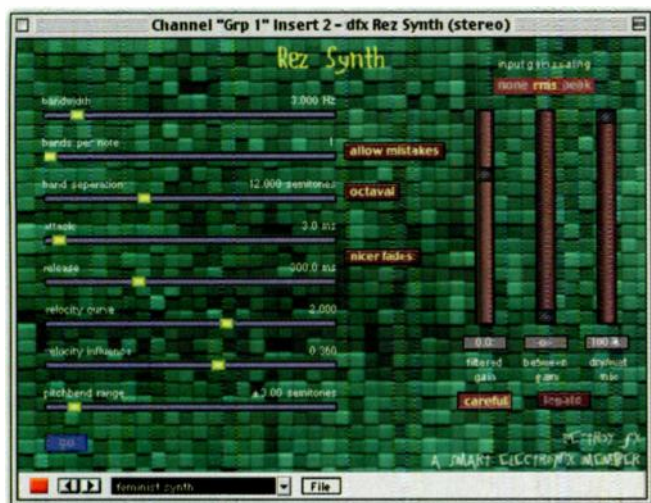
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## DFX Super DestroyFX

**Formats:** Mac and PC VST, Mac OS X

The gloriously named 'Super DestroyFX bipolar VST plug-in pack' is a collection of four highly unusual freeware VST effects plug-ins, created by a couple of inspired programmers known only as 'Marc' and 'Tom 7'. While some plug-in developers go to great lengths to recreate the familiar sounds of vintage analogue hardware, the DFX team have deliberately and enthusiastically turned their back on the past, instead opting to bring us a selection of new, high-quality and unashamedly 'digital' effects, aimed squarely at the most broad-minded and experimental producers.

*DFX Transverb* is a 'delay with a difference', which allows the contents of its delay buffers to be played back independently, and at different speeds. You can think of it as being like an old-fashioned tape loop delay, but with two automated, mobile playback heads. It's difficult to describe what this sounds like in practice, except to say that *Transverb* is capable of creating a wide variety of outlandish effects, many of which will be quite unlike anything you've heard before.

I'll have to come clean and admit that I don't really understand what *DFX Buffer Override* does. The DFX web site tells us that "Buffer Override can

overcome your VST host's audio processing buffer size and then (unsuccessfully) override that new buffer size to be a smaller buffer size." Which is probably true. All I would add is that if you're looking to make some truly scary stuttering, pseudo-vocoder sounds (and some other noises which frankly defy description), *DFX Buffer Override* is in a class of its own.

*DFX RezSynth* (see screen shot, above) is a fascinating halfway house between an effect and a virtual instrument. It processes your sound via a bank of resonant band-pass filters, which can in turn be controlled by input from your MIDI keyboard. If you're working in *Cubase*, for instance, you select *RezSynth* as an Insert effect, create a new MIDI Track and, in the Inspector, set *RezSynth* as its output. You can then 'play' the filters in real time as they process your audio, allowing for the creation of some unique, pitched synth-like effects.

Finally, *DFX Skidder*, as its documentation explains, "turns your sound on and off". Which might not sound very exciting. However, it is capable of doing this in literally dozens of different ways, and can create all kinds of interesting, rhythmic gating effects. These can be tempo-sync'd or randomised, and fine-tuned via parameters including 'pulse width', 'slope', 'floor' and 'rupture'. The results are frequently surprising, and lots of fun.

All the DFX plug-ins are

## Plug-in Tips

If you have *Wavelab 3.0*, you can chain together up to six plug-ins in its Master Section, then save your choices and their settings, using the 'Master Section presets' function in the Options menu. This is ideal for any complex setups that you tend to need again and again, such as for mastering, where a suitable chain might be EQ, enhancement, compression/limiting, and dithering.

When you add a global auxiliary plug-in such as a reverb to the elements of a mix, it's very easy to be misled into thinking that it's making your mix sound better by the fact that it will make it louder. It's a good idea to keep a close eye on the master output levels in your sequencer, and use

the master fader to make sure you're A/B-ing the dry and reverbed mixes at the same average level.

**Sam Inglis**

*Wavelab* saves its settings in the *Wavelab/System/Plugins* folder, where a SET file is created for each plug-in as soon as you create your first preset. It's well worth periodically copying the entire contents of this folder to another partition, drive, or even onto a CD-R. Then, if you ever have to reinstall *Wavelab* after a nasty crash, or onto a new hard drive after you've upgraded your PC, you can drag the SET files back into your new Plugins folder, and all your carefully created presets will be immediately ready for use once more.

**Martin Walker**

available in three versions: Windows, 'normal' Mac OS and Mac OS X (great news for any *Spark ME* users). Curious programmers are also free to download the source code to found out how they work.

**Paul Sellers**

**W** [www.smartelectronix.com/~destroyfx/](http://www.smartelectronix.com/~destroyfx/)

## Silverspike Reverb.it

**Formats:** Mac and PC VST

It used to be difficult to get hold of decent VST reverb plug-ins even if you were prepared to spend hundreds of pounds on big-name products. These days, however, shareware companies are beginning to produce reverbs that rival the most expensive native offerings, and the best I've yet encountered is *Silverspike's Reverb.it* (which has already been mentioned by Robin Bigwood in

December's *Performer Notes*). Originally PC-only, this has recently been ported to the Mac platform, and its impressive spec is matched by a smooth, controllable sound.

*Reverb.it's* creator Hans Stadtherr has put a lot of thought into writing a native plug-in that is capable of generating high-quality reverb without crippling your CPU. For instance, you can adjust the amount of 'repeats' in the reverb tail to conserve CPU power at the expense of decay quality when mixing, then switch to a higher value for the best quality when you write your mix off-line to disk. Similarly, you can use *Reverb.it* as a standard 'one-band' reverb, but it also offers a true three-band mode where each frequency band's decay characteristics can be controlled independently: again, you can use the former while setting up a mix and the latter when bouncing it to







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▶ disk. Support for 96kHz/32-bit audio and full automation capability are the icing on the cake.

The quality achieved by *ReverbIt* matches that of many more expensive plug-ins, and at a mere \$39 it should be considered a bargain. You can buy it or download a demo version from the web site; alternatively, US and European customers can order it by 'phone on the Share It! order line. Quote product number 145095 for the Windows version, or 149079 for the Mac version.

Sam Inglis

£ \$39.

Share It! +1 800 903 4152 (USA only).

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www.allverspike.com

## Steinberg TL Audio EQ1

Formats: Mac and PC VST

Way back in 1993, TL Audio introduced their valve EQ1, which went on to sell in thousands and become a classic. For those who can't quite afford its hefty price tag, this VST plug-in version mimics the simple design that made the hardware version so easy to use: four bands of EQ, each with a choice of four carefully chosen switched frequencies, but all with gentle slopes and broad curves to provide a warm, musical sound.

The four bands can be switched in and out separately: each has a gain control and a four-way frequency selector. The turnover frequencies are identical to the hardware version, as follows: low shelving at 60, 120, 250, and 500 Hz, high shelving at 2.2, 5, 8, or 12 kHz — both with a

swing of  $\pm 20$ dB — low-mid at 250Hz, 500Hz, 1 and 2.2 kHz, and high-mid at 1.5, 2.2, 3.6 and 5 kHz, both with gain swing of  $\pm 12$ dB. The graphic interface is

attractively retro, but the *faux* 'valve' window can be replaced by a rather more useful graphic display of frequency response. There's also a Channel Selector switch to modify left, right, or both channels.

Those used to the flexibility of fully parametric EQ designs may be underwhelmed, but the sound is the most important thing, and this doesn't disappoint. I've used this on various occasions in preference to any other EQ at my disposal: I love its transparent and musical results, and the way even a 0.5dB gain change has an audible effect. In keeping with its heritage, input and output gain controls also let you drive the 'output stage' harder to add subtle but warming 'valve distortion': I measured several percent of second- and third-harmonic distortion when fully driven. While not suitable for surgical EQ, *EQ1* is perfect for mastering, sweetening, and working on critical sounds like vocals, solo instruments and drums.

Martin Walker

£ £149.99 including VAT.

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## Wave Arts MasterVerb DX

Formats: PC DirectX.

Wave Arts is a new name to me, but their *MasterVerb DX* plug-in is apparently the result of three years' development. It's a true stereo-in/stereo-out reverb, supports audio files of up to 32-bit/96kHz, and like many modern plug-ins has 32-bit internal processing.

The Reverb Control window lets you adjust both Decay Time and Room Size simultaneously by dragging the mouse, and displays helpful green and red areas to indicate sensible combinations. It's a great shame that you can't easily automate DX plug-ins, as moving this in real-time generates some very interesting effects! A little pre-delay before the reverb tail is useful to maintain clarity, but you can extend this for special effects.

Early Damping restricts the bandwidth of the entire reverb path from bright to dull, while Late Damping simulates the effect of reflective surfaces ranging from tiles to carpets. Low Frequency



Scaling lets you adjust the low-end decay time relative to the mid-range, which is useful to avoid rumble or add bottom-end clout. Selecting suitable settings for all these parameters is made easier by a 3D plot, which shows how the frequency response varies during the decay period.

I found the *MasterVerb DX* reverb tails fairly smooth, and

although they can occasionally exhibit slightly metallic tendencies on longer settings, they still eclipse the reverbs bundled with *Cubase*. Like all reverb plug-ins, *MasterVerb DX* has its own sound, and the closest comparison I could find was TC's *Native Reverb*.

Wave Arts have paid special attention to CPU overhead, and their claim that *MasterVerb DX* is at least twice as efficient as most competing plug-ins, without compromising on sound, seems to be borne out by my measurements — it only took 2.3 percent of my Pentium III 1GHz processor for a stereo 44.1kHz track, compared with 3.2 percent for the TC *Native Reverb*, 5 percent for Cakewalk's *FX3*, 6 percent for Waves' *TrueVerb*, and 11.3 percent for Waves' *Reverb*, which makes it a prime candidate for anyone with a slower processor or who wants to run lots of different reverbs.

You can download a demo version to hear it in action, and it only took me a few hours to create a further bank of 16 patches that stretched it in many other directions: I'll post this on the *SOS* web site so that you can try them out for yourself. Overall, while it's not as smooth as Waves' reverbs, I found *MasterVerb DX* a versatile performer with a good sound, and a very low CPU overhead.

Martin Walker

£ \$149.

info@wavearts.com

www.wavearts.com

## Plug-in News

Obsidian Software made a name for themselves as plug-in developers for Creamware DSP platforms such as the Pulsar. They're now known as Blackstone Software, and have entered into the VST plug-in fray with a port of their *AnaFX* series to PC.

*AnaFX* is an emulation of an analogue delay line, offering real-time pitch warping in the same way a real delay will bend the pitch of the signal when you move the delay length knob. The package includes four plug-ins: the basic delay plus three others which use the same principles to generate chorus, flanging and phasing. *AnaFX* promises plenty of

control over your sound and some interesting modern twists on the vintage effects that inspired it.

£ \$75.

www.blackstonesoftware.com

TC Works have followed the first Mac OS X audio application, *Spark ME*, with one of the first plug-ins for the format. *Native PerformanceVerb* is available by download only, and although it lacks the control available in TC's more sophisticated reverbs, it also lacks the substantial price tag.

£ \$14.95

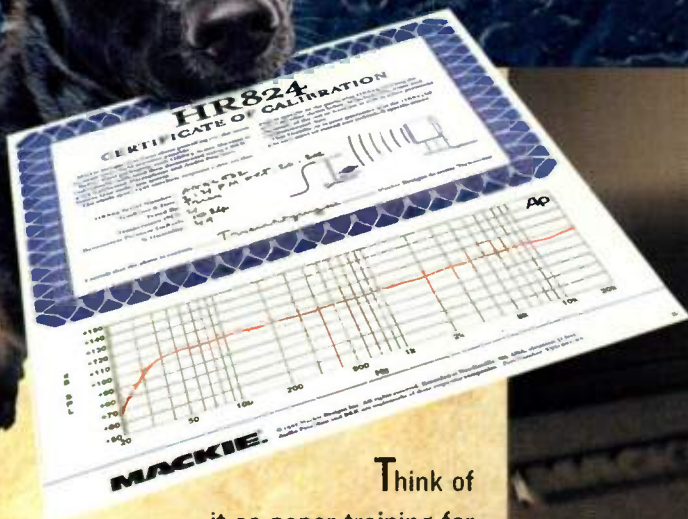
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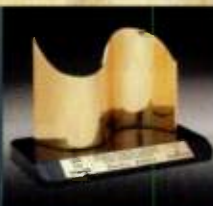
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One of the original pioneers of electronic music in Britain, David Vorhaus has remained at the cutting edge of the genre for over 30 years.

Paul White

There is a big difference between musicians who happen to use synthesizers and musicians who make electronic music. Although David Vorhaus started out as a classical bass player working with symphony orchestras, a chance encounter plus his background as a physics graduate and electronic engineer steered him inexorably in the direction of electronic music. "I guess it started around 30 years ago when I met Brian Hodgson and Delia Derbyshire, who were then in a band called Unit Delta Plus," he recalls. "I was on my way to an orchestral gig when the conductor told me that there was a lecture next door on the subject of electronic music. The lecture was fantastic and we got on like a house on fire,

# David Vorhaus

starting the Kaleidophon studio about a week later!"

Brian and Delia worked with David on his early recordings at the same time as they were working at the BBC's Radiophonic Workshop. David's introduction to commercial recording came about because Island Records' Chris Blackwell was so enthused by their approach to electronic music that he offered them an album deal with what was then a significant advance. In 1969, David released *White Noise: An Electric Storm*. This was followed by *White Noise 2* in 1975 and *White Noise 3* in 1980, and David has just released *White Noise 5: Sound Mind*. As well as being available in record shops, a library version is also available through Music House under the name *Science Friction*. Between albums, David has written a lot of music for TV and film: his music features on a number of high-profile TV commercials as well as on TV themes. David also plays live under the White Noise mantle.



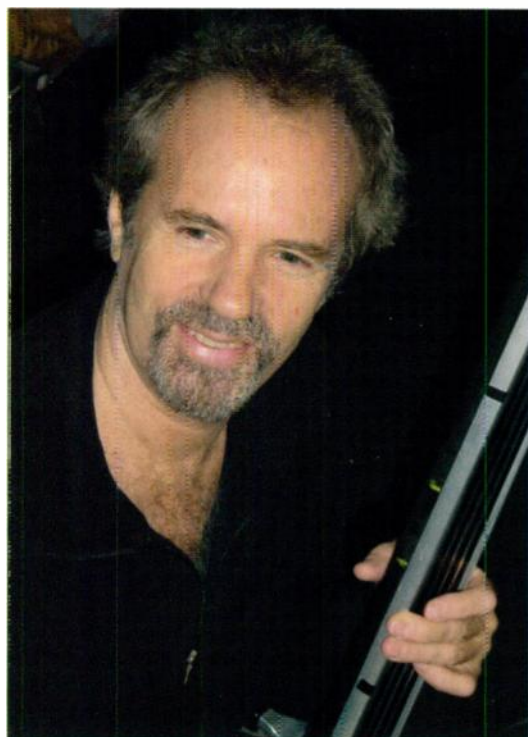
## Building Blocks

David always designed and built a lot of his own equipment, which was quite an achievement, especially in the early days, as there was very little published information on electronic musical instruments. I remember scouring the pages of *Practical Electronics* at around the same time, trying to find out how synthesizers and effects worked.



David Vorhaus demonstrates his bass technique on the Kaleidophon. In the foreground is his Zyklus sequencer.





avalanche, it would make the most hysterical-sounding chattering noises. I've used that in tracks and that's really the way I make music — I find little quirks and then find ways of incorporating them.

"One of the first things I built was an analogue sequencer called the Maniac that plays as fast as you like, has variable step lengths and can be configured to do things other sequencers of the time couldn't do. If you used it linearly it worked as a 64-step, duophonic sequencer, but I also built in the ability to split it into several smaller groups, which gave it the potential for cybernetic serendipity. For example, I might set one group to run around a sequence of seven steps and another eight steps, then add and subtract the control voltage outputs. That's the great thing about voltage control, you can just add and subtract, so I might have one sequence running

"That kind of information didn't really exist then," says David. "Behind you is the very first synthesizer built in Europe, the Serial Number 001 VCS3 with Veroboard inside. I've got a few others, but that was the very first one. It was possible to come up with some very original sounds back then through experimentation with electronics, very often by accident. I remember one instance where I had built a circuit that was just slightly overloading and was on the verge of blowing a field-effect transistor, and if you set it on the edge of runaway where it was just starting to

octaves and fifths with the other running passing notes. That means it would run for seven times eight, or 56 steps before repeating. I could chromatically correct the output if I wanted to. Incidentally, the name is an acronym for Multiphasic ANalog Inter-Active Cromataphonic (sequencer).

"Bob Moog had already built a 16-step sequencer with all the steps the same, but it cost a fortune back then which kind of forced you to be creative when it came to building your own gear. CMOS chips were just coming out back then and they made this kind of

project possible. I built it with the help of a friend, Johnny Sherrieff, and it could play faster and more accurately than I could. We called it the Maniac and I still use it today, but recently I've built a more sophisticated Maniac entirely in software using Native Instruments' *Reaktor*."

## New Strings

Although David had extensive classical training, his main instrument was the double bass, not renowned as a control source for synthesizers. "I never really liked keyboard playing," he explains. "I had this fascist South African piano teacher as a kid and he put me right off. So, I sat down and came to the conclusion that I'd either have to learn the keyboard or invent some other instrument that would let me utilise some of my existing playing skills. You never succeed entirely in creating something that will let you sound exactly like a great keyboard player, but I knew that I could come up with something a little bit original and different. You can't believe how bad I still am on the keyboard. I use it as an input device — an 88-note calculator! It's good for working out big chords in step time."

In order to exploit some of his bass-playing skills in an electronic music environment, David invented the Kaleidophon, a kind of double-bass-like instrument using four home-made ribbon controllers instead of strings. The instrument is played entirely using the left hand, leaving the right hand free to manipulate the sound via a number of controllers and a joystick. David describes the thought processes that went into its design: "Being a bass player and not liking keyboards much, I wanted it to have a string-type action, and that suited early synthesizers which were voltage-controlled and monophonic. It seems to me so obvious that the keyboard is a glaring mistake in the direction electronic music has taken. No monophonic keyboard instrument has survived the test of history, yet all orchestral instruments are essentially monophonic, which enables them to be very expressive. When you try to add expression to an electronic keyboard sound, it just sounds like sine waves being pushed in via a control wheel and I think that's why in the early days electronic music got a reputation for being very sterile. I believe that the range of available electronic sounds is potentially as expressive as anything achievable from a traditional instrument, but what's missing is the means to control it effectively.

"I made the ribbons for the Kaleidophon using thermal paper which has a carbon underlay with a wax coating. I got hold of some of the material before they put the wax on and, amazingly, its resistance was quite linear. Obviously paper wasn't robust enough so I got them to put it on plastic. Eventually



Classic synths from the '80s: the Oberheim Xpander and PPG Wave, the latter now apparently serving as a cassette rack...

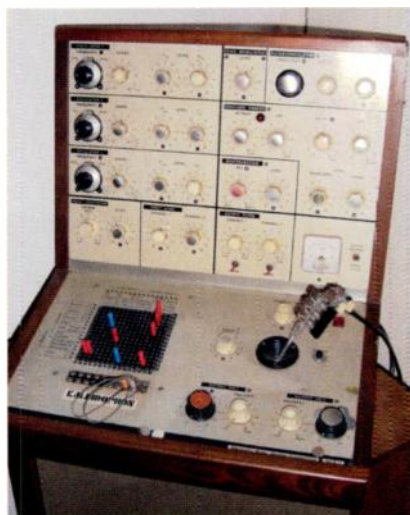


► these were made for me by the French Space Agency because the person who worked for Ozalid in the UK, who made the original strings for me, died and took the manufacturing secret with him.

"The triggering is activated by pressing on the strings and the fingerboard is velocity-sensitive so you can hit it harder to get a louder note or a different effect. There are controllers at the bottom for the right hand and other devices such as chromatic switches to make it behave like a fretted instrument. It can also be semi-fretted, which corrects you if you're close to the right note but still lets you do slides.

"The instrument itself generates voltage control, but I can feed it into my CV-to-MIDI converter and use it to control just about anything. At the moment, the MIDI is being fed in to a Zyklus performance sequencer which can do all kinds of tricks. It came out at around the same time as the Atari, which people bought because they wanted a more straightforward sequencer while the Zyklus was rather quirky and weird. It didn't sell well because it was quite expensive, around 2,000 quid at the time, but it's a great tool as it allows you to modulate what you're doing in real time."

David breaks off to demonstrate some Korg Wavestation sounds controlled by the Kaleidophon and the Zyklus, which were then passed through Oberheim analogue filters. "I'd really like to build something like the Zyklus in software that would allow me to combine my real-time playing and performance control with simple sequences that are modulated by what I'm doing.



In the early years of electronic music, there was only one compact, commercially available synthesizer: the EMS VCS3. David Vorhaus has several, including this, the first one ever built.

"I have thought about trying to make the Kaleidophon commercially available and this one got very close to production. One option is to get a big company to take it on while the other is to get a group of friends to build it. However, it's hard to get the big companies interested because they would rather make products based on something that already exists, so that they know they'll have a market. On the other hand, the group of friends approach means you have to stay closely involved all the time and it would be a full-time commitment. I had to decide whether to be a full-time musician or a full-time manufacturer, and clearly music is what's important to me."

## Plug-in Weirdness

Unlike some pioneers of electronic music, David Vorhaus has embraced the idea of recording and processing sound using a computer, and is enthusiastic about the possibilities that are opened up by plug-in effects. "GRM Tools is a favourite because you can get effects that aren't achievable any other way, even though the core effects are based on established principles. I also have *Spektral Delay*, but I haven't got much out of it yet — I'll go on experimenting until I find the magic. It's the same with some of the effects you can connect in *Reaktor* — often you end up with results you never conceived of. I think that part of getting new gear is to force yourself to work in a different way, otherwise you tend to make tracks too much like the last ones. You don't see too much new hardware here as, in a sense, very little is actually new other than different internal sounds or different knobs, but there's some very exciting stuff happening in software. I was reading about *Absynth* in the latest issue of *SOS* and look forward to trying it. In fact one of my favourite hardware instruments is still the Korg Wavestation, and for me, everything that Korg has come out with since is a bit of a

disappointment. The Wavestation concept could be taken so much further with today's technology, and if you combined it with the interactive sequencer of the Zyklus, you'd really have something.

"I've just constructed a VST version of my Soft Maniac in *Reaktor* so now I can put it directly into a *Cubase* track, whereas before I've often had to record sequences as separate elements and then place them into a song. I had to resize all the knobs to make it fit into the VST window. I haven't used it in a composition yet but I have started to experiment with it.

"Other than *Reaktor*, there are few soft synths that impress me. It's great that you can get a PPG in software, but it offers nothing new other than convenience, and it's much the same with samplers. That's fine, but I'd also like to see something new, like scanning around within a sampled waveform. You could do this in the old EPS which came out 10 years ago, so I don't know why modern instruments don't offer the same kind of flexibility. Everything seems to be going for convenience, whereas what I'd like to see is just a bit more weirdness."

The instrument was a joint winner of an International Electronic Music Instrument Competition in Austria: David shared the prize with the Fairlight CMI, and he soon became close friends with Fairlight designer Peter Vogel, who went on to help David with some of his designs. "Up to then I'd spent half of my life building gadgets to help me make music, but Peter was head and shoulders above me in designing stuff, which meant I could spend six months of the year using it to make music and then spend the other six months of the year in Australia, which is what I tend to do."

David still builds equipment if the device he needs is not commercially available, and his DIY approach has even extended to sophisticated recording hardware: "I still make all sorts of things, though probably not on the same scale as I used to. In the early days I built my own one inch, 16-track recorder using electronics and Meccano! I even got a 24-track together using redundant stock from Levers Rich.

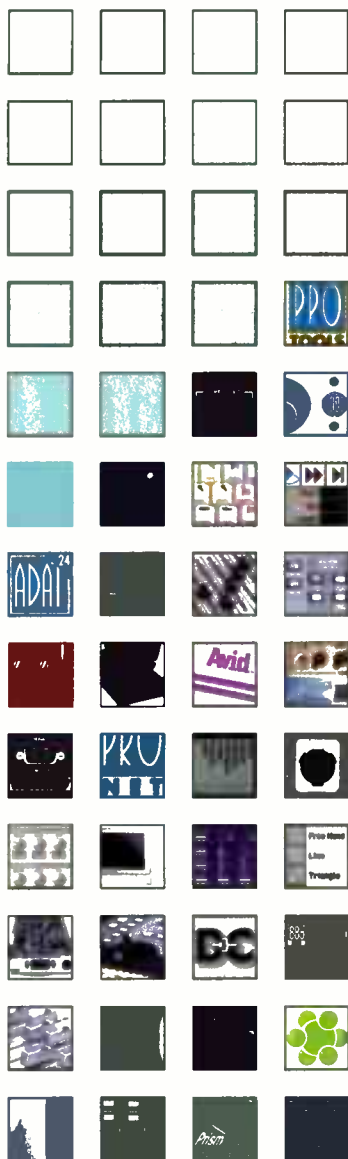
"I still have a 24-track Soundcraft two-inch recorder but I probably won't be using it for future projects, even though I don't have the heart to sell it. Now I do everything in *Cubase* running on a PC. When I first got it, I played around with it to find out how it worked, did a few overdubs, messed around a bit and thought I'd send this piece of junk to the record company along with the 'proper' stuff I'd been working on. I didn't even give it a name but that bit of junk ended up being 'Ulster Weather', and was earning me 20 grand a year. PCs change so fast and what is fast one year is obsolete the next, but stuff is so cheap now that you can afford to keep upgrading. It's a complete reversal of how things used to be when a Fairlight was £20,000."

## Computer Intervention

David's system continues to evolve, and now combines equipment that goes back to the dawn of electronic music with modern instruments from the likes of Novation, and also virtual instruments. "I used things like the Supernova a lot on my last album and I like the way you can control everything in an analogue-like way but be able to record it via MIDI. Also, now that computers are so inexpensive and so powerful, I'm convinced that software instruments is the way it's going to go. The discovery of *Reaktor* was almost a dream come true for me, because it allows me to build the kind of synths in software that would have a taken a lot of time and expense to build using hardware. It's like going back to my early build-it-yourself days but without the need for a soldering iron or Meccano, and of course no component costs. It's fantasy — not like hardware where everything takes months and you spend ages debugging. You just connect



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► everything up and it works, straight away."

David demonstrates the latest device he's built in *Reaktor*, which seems very typical of the way he makes music in that sequencers, sound generators and human inputs interact, sometimes in not entirely predictable ways. For example, one of the sequencers is linked to a probability generator which determines whether certain notes are or are not played.

"It's all about finding the interesting bits of things that are not predictable," explains David. "You can bias the notes so that the volumes are controlled by probabilities or, in the case of a module that I called the Transmutron, you can take bits of information from one source and then take semi-random elements of other lines of music to influence the outcome. Of course when you get so many virtual knobs, it's hopelessly clunky trying to control it all with a mouse, so I've hooked up one of the little Fostex MIDI mixer control units to access the main parameters in real time. It's so small and light it looks as though it came in a packet of cornflakes, but all it needs is a MIDI In and Out, and it works. Having physical controls allows you to bring one thing down while turning another up — something you can't do with a mouse. Also, *Reaktor* can learn control assignments fairly quickly.

"I guess the idea was to complement the Kaleidophon, which is a great lead-line instrument but at the same time it needs an accompaniment, otherwise it sounds very naked out there. This is really an electronic orchestra that does anything except the lead line, and it started from the idea of the



David Vorhaus' Soft Maniac, a *Reaktor* patch recreating his original hardware step sequencer.

hardware Maniac I made all those years ago to do the same kind of job by driving half a dozen VCS3s. The soft version generates its own sounds and my approach is to experiment to find things I really like and which are musically appropriate, such as some of the rhythm loop things. Some elements are based on samples, but the rhythm loop length can be changed in real time to emulate the variations a real drummer might introduce during performance. However, it gets to the stage where there are so many things to control that you don't have enough hands to manage it all, which is why I've created it so that some of the controllers are automatic, enabling the thing to control itself. That way I can combine the automatic controllers with real-time input. There's also a sample playback section that can scan and loop around short sections within a sample, which completely changes the sound. It's a very creative way of using vocal samples."

The main rack in David's studio includes, from top, Sony DAT recorder, Yamaha stereo compressor, Alesis Microverb effects, Digitech TSR12 multi-effects, Ensoniq EPS16R sound module, Yamaha reverb, MIDI router, Sequential Prophet 2002 rack synth, Roland D110 sound module, Yamaha SPX90 multi-effects and TX81Z sound module.



## GM-Free Zone

You don't have to hear much of David Vorhaus' music to realise that he's not very impressed by the General MIDI sound set or even emulative synthesis of any kind. Most of his sounds are defiantly abstract, and anything that was once real (such as guitar phrases or voices) is usually twisted beyond recognition before it's allowed out!

"I feel synths have been so misused from the word go, by which I mean the way in which they have been used to attempt to emulate real instruments. It is such a shame because we shouldn't be aiming to put musicians out of work but instead to discover new things. We've been limited to a dozen or so musical instruments since the invention of the orchestra and now we have an infinite range of sounds at our disposal. What a terrible shame not to use them!"

At the same time, David's music is as much about controlling the sounds as the sounds themselves, and nothing is allowed to stand still either spatially or timbrally: "I think you have to do this with electronic sounds, more so than with conventional instruments, because something like a sustained piano note has a constantly changing waveform to keep it interesting, whereas a sustained electronic waveform tends to sound uninteresting. That means you have to build in that variation in other ways.

"Some of my tracks explore what can be done with certain types of synthesis, so the track 'X7' is really an exercise in seeing what can be done using FM sounds. Just as



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► analogue sounds are being used in dance music, FM originally came along because it was better at recreating certain types of real instrument than analogue, then samplers made FM somewhat redundant, but as with analogue, people missed the point that FM can make amazing sounds if you stop trying to imitate real instruments.

"Another track called 'Time Warp' includes some interesting tricks such as making something not sit on a pitch base throughout the track. What I did was arrange the pitch of the whole track to fall continuously, but not enough so you hear it as pitch-bend — probably around a semitone per half minute or something like that. You can't hear the pitch falling, but you experience a kind of instability as though the ground is falling away beneath your feet. It was achieved simply in *Cubase* by drawing a long ramp in the Controller window and using that to drive the pitch-bend on all the instruments.

"The other trick was to use a flanger set up statically so that it didn't sweep. This has the effect of panning all the different overtones to different positions because of the comb-filtering effect, then part-way through the song I moved it to another position by changing the delay slightly, which suddenly changes your view on the music. Of course working with a sequencer such as *Cubase* makes this very easy to achieve technically using plug-ins which can be automated. I think MIDI is misunderstood, because to some people it's all about notes or GM sounds, but to me, the most important part of MIDI is the controller aspect."

More extreme modulation and distortion techniques seem to be used to hide even the identity of the electronic sources themselves, to make them deliberately new and different. There are no string pads, in fact few soft pads

## The Pros And Cons Of Dance Music

There seem to be some parallels in David Vorhaus' current work with the more adventurous aspects of dance music and related genres. I was keen to find out what he thinks dance has given us that is positive, and in what ways he finds it counterproductive.

"Dance music sees analogue synths being used at last for what they should be used for," he says, "but what I think is unfortunate is that the genre has become very fixed, so one has to have a particular set of sounds. In some ways that's worse in that modern equipment is being used to imitate early synthesizers rather than acoustic instruments, and to me that's equally ridiculous. Is that a 303 sound or a 909? I find that totally pointless and we

sometimes fall in love with the idea of a sound rather than the sound itself. Some people will tell you that you have to get a Moog for the definitive Minimoog sound, but that's just a load of bollocks. What people have forgotten is that what really turned them on when they heard a Moog for the first time was that they'd probably never heard a synthesizer before, and its that experience of hearing the first electronic bass sound that is the turn-on, not the actual instrument that's being used. If you then reproduce that sound on a Supernova or something, people will tell you it's not the real thing, even though it is every bit as good or better than the original. It's just that it doesn't give you the same buzz as when you first heard it 30 years ago."

at all, and a lot of the sounds have a challenging, almost industrial edge to them. "It's not a conscious thing," says David. "It's just something I do automatically to try to make things more interesting. There's no point in still doing the things you did 30 years ago. I guess part of the reason the latest album sounded the way it did is because record companies still insist on forcing you into a pigeonhole, so they demand to know what label they can stick on your music. So I called it 'Dark Ambient', because if you don't have a label, you get listed under 'Miscellaneous'. It means I won't be getting on *Top Of The Pops*, but I felt the category was broad enough that I could redefine it in ways that I couldn't redefine other genres, such as country and western — much as I'd like to! There's a lot of scope for experimentation and on one track, 'Dark Matter', anything that is recognisable is out — no harmony, not pitch, no rhythm. It's so dark, you can't even see the stars! Some of the other tracks are more accessible. There were one or two guitar notes and riffs, but it's mostly electronic. I use

voices a lot too, but not as conventional vocals. I always use a lot of voices, and if somebody having an orgasm in the background is used as part of one of the waveforms, it makes the sound more interesting without the listener actually knowing what they're hearing."

That certainly isn't going to help get David on to *Top Of The Pops* — although it's always possible he might get banned from Radio One and become an instant hit... "Actually that was the idea on my first album, *White Noise 1*," laughs David. "There was a track where I created a synthesized electronic orgy and then combined that with the sounds from a real one. I recall we actually had half a dozen people 'at it' and we were going round with a microphone! We used it in loops and stuff, but as it turned out, we only managed to get banned from Harrods! A shame really."

## Working Methods

David's music rejects a lot of conventional ideas about structure, but how does he set about creating it? "I have no basic rules on recording methods," he says. "If I'm recording a commissioned piece for somebody, then it has to follow their guidelines and may be put together very differently from something I'm composing for an album. A typical example is the theme I did for *Equinox*, which had to tie in with the graphics and hit certain cue points. Everything was very mapped out, so I use making albums as a way of exploring new things and the rules kind of evolve as I go along. I tend to get a lot of sounds together first, keep the ones that fit, reject the ones that don't, and often a musical idea will evolve out of the sounds I start with. I also use a lot of controller data alongside my loops. I tend to use an album as a means of exploring new equipment or software, and the album is really a culmination of what I can do with the stuff. At the moment I'm at the stage of exploring the equipment — and I guess *Reaktor* is the new thing." SOS

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The vintage gear accumulated by David Vorhaus over the years includes an EMS Vocoder 2000 and Synthi A synth.



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Chris Carter

**U**nless you've been hiding under a rock for over 30 years, are only eight years old or have picked up this magazine thinking it was about yodelling, then you must at least recognise the name Bob Moog, probably the most famous name in electronic music. Although the Moog Music company and its once-famous Minimoogs and modular systems are no more, Moog himself has survived on the fringes of the industry, and since the early '90s, his Big Briar company has been busy producing Theremins and other such esoterica for the discerning electronic musician.

In recent years, Big Briar have produced the award-winning Moogerfooger range of analogue effects and processors. These oddly named units are all direct descendants of the original Moog systems' analogue circuit

# Big Briar Moogerfoogers

Since 1999, Bob Moog's Big Briar company has been making analogue filters and effects pedals based on his original Moog module designs. Now, there's a central control unit, so that you can use them all together as a complete processing system.

## Pedal-based Voltage-controlled Processing System





designs and contain many of the basic building blocks of modular synthesis. The Moogerfooger processor family now comprises five: the MF101 low-pass filter, the MF102 ring modulator, the MF103 12-stage phaser, the MF104 analogue delay, and the CF251 control processor. Exciting times are also ahead for Big Briar, as they're about to relaunch the legendary Minimoog as the Minimoog Voyager, a new analogue/digital hybrid version of the original.

For the moment, though, it's the Moogerfoogers that concern us. The four effects processors each live inside chunky oversized 'stomp boxes', approximately nine inches by six by three, made of steel with real hardwood end cheeks and traditional Moog-style knobs, rocker switches and tri-colour LEDs. Around the back of each unit is a multitude of jack sockets for interfacing with other Moogerfoogers, the CF251 control processor, footpedals, MIDI-to-CV units, or other analogue gear. All the Moogerfooger units are powered from standard 9V wall-wart adaptors, and although it is obvious from the stomp box design that they're all primarily intended for the guitaring fraternity, I have a sneaking suspicion they are going to find themselves hooked up to quite a few keyboards, samplers and mixers too. Being a keyboard type myself, that's exactly what I used for this review.

### MF101 Low-pass Filter

If, at this point, you are experiencing feelings of *déjà vu*, that's because Paul White first reviewed the Moogerfooger low-pass filter in SOS in April 1999 (see [www.sound-on-sound.com](http://www.sound-on-sound.com)).



[sound.com/sos/apr99/articles/mooger.htm](http://sound.com/sos/apr99/articles/mooger.htm)). However, for those of you without that review to hand, I'll briefly go over the basic functions.

As you can see from the pictures above, the layout (which is pretty much the same on all the units) is relatively basic with just five or six knobs and a couple of rocker switches. The circuitry comprises a switchable analogue two-pole (12dB-per-octave) or four-pole (24dB-per-octave) low-pass filter with knobs for Cutoff frequency, Resonance and Drive (input gain). The filter can be controlled by an internal envelope follower with adjustable envelope amount and a switchable envelope Response (fast/smooth). A Mix control is included for blending the filtered and unfiltered sounds.

The rear of the MF101, like all the Moogerfoogers, offers an unusually high number of sockets for a 'stomp box'. In this case, there are jack connectors for mono audio in and out (naturally), plus an Envelope Follower voltage-control output and voltage-control inputs for Cutoff, Mix, Resonance and Amount. The voltage-control inputs can accommodate any standard 0 to +5V variable control source, such as you would find on the majority of ancient and modern modular synths.

As analogue low-pass filters go, the Moogerfooger can't really be faulted, but then again this is a Moog design, so you'd expect that, wouldn't you? I certainly did. And with the right material, I doubt you'd be disappointed. But to get the best out of this filter (like most filters, really) you need to give it something rich in harmonics, such as a raw square, sawtooth or pulse waveform. Distorted guitar and complete mixes are also good sources for low-pass filtering. The four-pole setting is my favourite and has a warm, deep quality, while the two-pole setting



The MF101 low-pass filter.

gives a slightly brighter but still very pleasant sound. Cranking up the Drive and Resonance controls emphasises the 'Moogy' quality of this filter, and turning the Resonance knob to maximum causes the filter to self-oscillate. The word 'sweet' springs to mind when listening to this VCF, although you have to keep your eye on the input level LEDs to avoid serious overloading.

The envelope follower option, which imposes the amplitude of the input signal on the filter cutoff, is useful in certain circumstances, though I have to admit I didn't use it much in this review and instead opted for manual knob sweeps and external voltage control. It could be a useful tool for guitarists, however, as it follows the amplitude of your playing. The case isn't so clear-cut for keyboard players, though, as auto-envelope following (as opposed to true keyboard triggering) can be a bit of a hit-and-miss affair.

I would like to have seen a basic LFO (low-frequency oscillator) included in this unit for sweeping the filter range, but this is a situation where the LFO in the CF251 Control Processor could be patched in (more on this later).

### MF102 Ring Modulator

The Ring Modulator has the same physical layout as the filter, but is an entirely different beast and contains all the features you need to create classic metallic, discordant ring modulator sounds and effects.

In case you don't know what a ring modulator does, it basically takes two different signals (known as the Carrier and Modulator) and creates new signals at frequencies based on the sum and difference of the Carrier and Modulator frequencies (for more on ring modulators, see part 11 of Gordon Reid's Synth Secrets, in SOS March 2000, or surf to [www.sound-on-sound.com/sos/mar00/articles/synthsecrets.htm](http://www.sound-on-sound.com/sos/mar00/articles/synthsecrets.htm)).

In the MF102, any sound you feed into the audio input becomes the Modulator, while the Carrier is usually an internal VCO with a switchable sine/square wave output, although there is also an audio input which allows you to disregard the internal VCO and supply your own Carrier as well. If you do use it, the internal VCO can in turn be modulated by an internal LFO or an external voltage. Controls

SOUND ON SOUND

Big Briar Moogerfoogers

pros

- Excellent, authentic analogue sound.
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- Can be used in combination to make a basic Moog modular system.
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cons

- Mono only.
- There's no true effects bypass; circuitry is always active.
- Expensive.
- 'Stomp box' design may not appeal to everyone.

summary

A very respectable range of simple-to-use, great-sounding analogue effects units, with a higher-than-usual quota of interface sockets for a stomp box. Include the Control Processor in the equation and you have a rudimentary Moog modular system. Nice, but undeniably pricey.



## BIG BRIAR MOOGERFOOGER SYSTEM



The MF102 ring modulator.



- are kept to a minimum with a Frequency knob, Frequency range switch (Low & High), the Sine/Square switch for the VCO, a Rate knob with LED, and LFO Amount. The balance of treated and untreated audio signal can be adjusted with a Modulator Mix control and a Drive knob governs the level of the audio input.

Around the back are sockets for mono audio in and out, voltage control inputs for LFO Rate, LFO Amount, VCO Frequency and audio Mix, and control-voltage outputs from the LFO and Carrier (VCO).

There's also the aforementioned Carrier In socket. All in all, it's a comprehensive range of facilities.

It's not all roses, though. One slight irritation is that the MF102 includes an undocumented automatic noise gate on the audio signal, or 'squelch circuit' in Moog terminology. The reason for including this feature is understandable; it's to help suppress oscillator breakthrough (ie. the unwanted presence of the original Carrier in the output signals); an unavoidable side-effect of using analogue circuitry. The problem is that there is no control over how the noise gate functions, and it can cut off the tail end of some soft sounds. Despite this, oscillator breakthrough is still occasionally audible with little or no signal present!

This is undoubtedly the Moogerfooger with the greatest potential for sonic mangling, and, unlike the low-pass filter, you don't have to be selective with your choice of material to get results. You may need to spend some time tweaking controls to get the best out of it, though; the Mix and Drive knobs, for instance, can drastically affect the depth of ring modulation.

The MF102 is quite capable of producing all the usual metallic clangs and harmonic sweeps, and you can also use it for subtle tremolo and slow modulation effects. Connecting the rear CV inputs to other Moogerfoogers or CV-capable systems opens up a whole new range of ring-modulating possibilities too.

### MF103 12-Stage Phaser

This processor contains an LFO and a switchable six- or 12-stage analogue phasing circuit. There are controls for LFO ►

## The Pedal-based Moog Modular?

When used in combination or connected together, the Moogerfoogers really shine and are not unlike a real Moog modular synth system, albeit a small one. The number of patching permutations and configurations is almost endless, and at one point I found myself using more than a dozen patch cords for a totally mad but great-sounding setup — and that was without using any expression pedals!

But unfortunately, using them in this way also highlights one of the major failings of the Moogerfooger 'stomp box' design — accessibility. As 'patched-in' guitar or desktop/keyboard effects units the design is fine; you just plug them in and play. The Moog literature describes using the units as a 'modular analogue synthesizer' and all those wonderfully versatile CV inputs and outputs cry out for experimentation, but when using several units together, the need to lean over

and patch via the rear panels becomes a major pain in the neck (literally). So why is the CP251 Control Processor unit — a model of logical design with everything accessible on one panel — the only Moogerfooger available in this configuration?

You can see what I'm driving at — I'd love to see all the Moogerfoogers also available in a true desktop modular design along the lines of the CF251, and possibly interlockable or stackable, for that real hands-on Moog modular patchability experience. I'd also be a very happy chap if there were a socket for a remote bypass switch, not just the expression pedal option, so they could be tweaked from a desktop or keyboard and still be foot-activated.

In short, I think Mr Moog should also give some thought to non-guitar-toting, non-stomping, electronic musicians. Go on, you know it makes sense!

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## BIG BRIAR MOOGERFOOGER SYSTEM

- Amount and Rate plus a High/Low rocker switch for the LFO speed, which is also indicated by a flashing LED. The Phaser section has a Sweep knob so you can change the phasing effect manually, a Resonance control for a deeper and more pronounced phasing effect and a rocker switch to select six- or 12-stage phasing. There is also an input Drive control, an Output Level knob and a tri-coloured LED to help you set the optimum audio input level.

I should briefly explain the differences between the two phasing modes. In six-stage phase mode the audio signal is fed through a comb filter which has three distinct frequency dips, or notches. There are intervals of about two octaves between these notches, and when the centre frequency is swept or modulated you get that classic analogue phasing effect, as heard from the most phaser pedals. The Moogerfooger takes this a step further and offers the option of doubling the number of frequency notches the signal has to go through. The result is a much more pronounced phasing, and is quite similar to

one-trick horse, with combinations of deeper and shallow and/or faster and slower phasing, it is also one of my favourites in the range. In either mode, but particularly on the 12-stage setting, it can impart a very analogue and extremely pleasing musical timbre to a sound. Unique amongst the Moogerfoogers, it also includes an additional inverted audio output. When used in conjunction with the normal output (with one panned hard left, and the other hard right), this can give a pleasant stereo phase-shifted panning effect.

### MF104 Analogue Delay

This type of delay unit is quite a rarity these days, as it uses old technology (by today's standards, anyway) that is no longer in production — namely 'bucket-brigade' integrated circuits. Big Briar have managed to track down the last remaining stocks of these special but once common items and are producing a limited edition run of just 1000 Analogue Delay processors. Coupled with the Moog name, this pretty well guarantees that the MF104 will become a collectable item.

The top panel layout is the same as the other Moogers, but instead we have controls for Delay Time, Feedback, Mix, Drive (input level with tri-coloured LED) and Output Level. Also included is a Loop Gain control and LED (of which more in a moment) and an Internal/External Loop rocker switch.

One drawback with analogue delays is that they have a much lower audio bandwidth compared to digital delays (often less than half). To most modern ears, they are therefore an acquired taste, and can sound muffled and decidedly low-tech. However, with the right kind of music, and in the right situation, such as when playing live or adding 'warmth' to digital instruments, they can be just what the doctor ordered.

Voltage control of many parameters is offered, including external control over mix, feedback and delay time. If you've not played with an analogue delay before, you might find tricks like sweeping the delay time on the fly without digital noise or stepping artefacts a real revelation. It may not be an effect that suits all types of music, but it's great for dub and experimental electronica. Used at the minimum delay time settings, the MF104 will produce flanging, while at the mid settings you can get it to simulate 'boingy' spring reverb-type sounds. The maximum delay is a respectable 800ms, and is eminently suitable for spacey Robert Fripp-type effects.

The Loop option is nothing to do with sampling and breakbeats, but allows you to re-route the delay feedback signal out of the audio chain and into an external processor, after which you can insert the effected signal back into the feedback path. If you use the Loop Gain control carefully (to set the gain of



The limited-edition MF104 analogue delay.



The MF103 phaser.



the rarely heard so-called 'barber pole' effect, in which the phasing seems to continually rise (or fall) without end. But as with all phasers, the effect is only really apparent if the phase frequency is continually moving, either being modulated by the LFO, via the external CV input, or being swept by hand.

Although the MF103 is really only a

the signal sent to the loop) and choose the right kind of external processing, the results can be quite unusual. For instance, if the Loop option is used to send to and return from the Ring Modulator, and a sound is played into the Delay processor, the original signal is heard as it should be, but the delayed echoes are increasingly ring-modulated with each repeat. The Loop feature works best with an external effect that has a pronounced effect on the sound, such as the phaser or ring modulator, but it doesn't work so well if you use the low-pass filter.

### CP251 Control Processor

This unit is the odd one out of the Moogerfooger family, in looks and features. As you can see from the picture on the next page, it doesn't have the same sloping 'stomp box' style of the other units, and although it is approximately the same size, it is also quite a bit heavier. It can also be used on its back or standing upright, in which case the power plug can be inserted in a second 9V socket on the base plate — a thoughtful design touch. The CP251 is divided into roughly eight sections: a four-input mixer, a lag processor, an LFO, two attenuators, a noise generator, a sample & hold module, and a four-way-multiple group of jack sockets.

Although the instruction manual states that this is solely a control processor and has no audio input or output sockets, this isn't



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## BIG BRIAR MOOGERFOOGER SYSTEM



The CP251 control processor.

► strictly true, as the CP251's noise source can be connected to the audio inputs of the other Moogerfoogers, and the four-input mixer and attenuators can also be used with audio signals. However, it is true that the CP251 is primarily intended as a voltage-control source or modifier for the CV inputs and outputs of the Moogerfooger processors, or other analogue or voltage-controllable gear.

Unless you've come across modular synths before, some of the CP251's features may be unfamiliar, such as the sample & hold module, the lag processor and the attenuators. The attenuators are simply for reducing the level of a CV signal, although unusually the degree of attenuation itself can also be controlled by another CV source. The lag processor provides a means of slowing down a fast-changing control waveform such as a square wave. Two knobs adjust the rise rate (the leading edge) and fall rate (the trailing edge) of the incoming signal. This is a handy feature for changing the shape of basic waveforms that are controlling other Moogerfooger CV functions; for example, a square wave could be modified into a normal (or inverted)

sawtooth or triangle waveform.

The four-input control signal mixer does what it is supposed to, but only inputs 1 and 2 can be attenuated; inputs 3 and 4 are mixed at their maximum level. However, the mixer output stage includes a

Master Level and an Offset control for shifting the mixer output control voltage in a positive or negative direction. A useful inverted output is also included.

Despite the fact that the sample & hold module only has two inputs ('In' and 'Trig'), two outputs and no knobs, it is a very useful control-voltage source. Before the modular-synth novices amongst you get too excited, I should point out that this module doesn't offer digital audio sampling; instead the term refers to the process of sampling the moving or random voltage applied to the input and then outputting that signal until a new voltage is sampled. The sampling action commences when a trigger signal crosses a preset threshold at the trigger input. Depending on the sample and trigger source the outcome is a random stepped effect at a constantly changing rate, and is most often heard controlling a VCF or VCO.

The sampling source for the S&H In socket is an internally patched connection to the Noise generator output while the Trig input socket is internally connected to the LFO square wave output, but both these connections can be overridden by inserting a jack from an external CV source. S&H Out 1 carries a normal CV signal while Out 2 reaches the outside world via a special low-pass filter which smoothes out any signal peaks. The filtering feature on Out 2 is also directly related to the LFO/S&H trigger speed — the faster the rate, the smoother the CV output. The S&H module works well, although I'd have liked a variable threshold control on the Trig input. The separate Noise socket generates a

straightforward random white noise signal suitable for feeding into the audio input of other Moogerfooger audio processors.

The four-way multiple module's jacks are all connected in parallel and allow CV inputs or outputs to be used by more than one destination, which is exactly what you'd expect it to do. Finally, there's also an LFO, which is a fairly basic affair with independent sine and square outputs, although it also has a voltage-controllable rate.

### Nice, But At A Price

Apart from a few idiosyncrasies like the lack of a true bypass function (the circuits are always active) and the decidedly mono bias the Moogers get a thumbs-up from me. As I said earlier, my favourite effects are the phaser and the ring modulator, but my ideal setup would be to use all of them as a rudimentary Moog modular system (see box on this earlier in this article), and I'm sure the less cash-strapped of you reading this will take that route. And this leads me on to the most common criticism I heard while I had the Moogerfoogers for review; their price compared to other manufacturers' processors. I have to say that this is also my only serious concern. Admittedly, the range oozes quality and is obviously aimed at the professional gigging musician, but the complete set is going to set you back a not-inconsiderable £1540. And that gives rise to another dilemma — would you use a £500 limited-edition analogue delay pedal as a stomp box on some manky old stage? Personally I wouldn't dream of it, but that's just my opinion.

And there's the rub — ultimately the decision is up to you. If money is no object, then you should know that the Moogerfoogers sound great, are well built and have an adequate, if basic, feature set. On the other hand, to me at least, £300 is a lot of money to pay for a mono phaser, no matter who made it. **60S**

### information

MF101 £219; MF102 £219; MF103 £299; MF104 £499; CP251 £299. Prices include VAT.

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### Voltage-control Inputs

The voltage-control inputs on all the Moogerfooger audio processors use three-conductor, ring/tip-type jack sockets. The ring terminal is supplied internally with +5V and if the right kind of expression pedal is correctly connected to the voltage-control inputs (details are in the instruction manuals), it can be used as a constantly variable control source.

The CP251 Control Processor also includes eight of the same ring/tip sockets (in the LFO, mixer, sample-and-hold module and the attenuators), and thoughtfully, the sockets are coloured red. The informative instruction manual suggests that these should provide the experimentally inclined with a wide range of control possibilities.



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# Roland Fantom

## FA76 Keyboard Workstation



Korg's Triton has dominated the workstation synth market for several years, but the past 12 months have seen challenges to this position firstly from Yamaha, with their Motif, and now from Roland. Does the new Fantom have what it takes?

Paul Nagle

**W**ith the introduction of last year's XV5080 module, Roland further refined their vision of the ultimate S+S (ie. sample-based) studio workhorse. This synthesizer bundled together some of the finest sounds and effects Roland have yet produced: the pick of the JD, JV, XP and XV series. Adding the ability to replay samples in





Roland, Akai, WAV and AIFF format was another welcome step forward.

As a long-time owner of Roland's earlier top workstation, the XP80, I watched with interest for what would come next and was, therefore, delighted when offered the chance to review the Roland Fantom. Despite its name, the Fantom is neither shadowy, dark nor mysterious. Instead, it's a sturdy, no-nonsense music workstation brimming full of quality sounds and featuring a 64-voice

multitimbral synth based on XV-Series architecture. It boasts a built-in D-Beam controller, an arpeggiator and drum pattern generator, plus a large screen, a classy 76-note keyboard and onboard effects featuring 24-bit reverb, chorus and 90 multi-effects algorithms (including COSM amp models and RSS 3D processing).

Running my hand over the brushed titanium surface, I was struck by the almost military appearance of the FA76. In its sleek, rounded metal frame there is more than a hint of *Terminator*-style android or grim Russian submarine. Happily, under that cold surface beats the Roland heart we know so well — but can they repackage it one more time and turn up a winner? This is the bit where we say 'let's find out'...

### Contrasting Views

Prior to receiving the review model, I had already encountered a Fantom in a music store in Denmark (no, not Denmark *Street*... Denmark the country). As I knew little about it at the time, I assumed that it offered a Triton or Trinity-like touch screen. Perhaps I had been enjoying the pleasures of Copenhagen rather too much but, after I had prodded it enthusiastically (but unsuccessfully) for quite some time, a sales assistant materialised and guided me gently, but firmly, away. In my defence, I should say that, even though I now know this is just an 'ordinary' display, I *still* have to hold back the urge to touch it, such is the impact the 320x240 screen makes.

Underneath the display, and slightly wider than the screen itself, there is a row of eight soft keys. As they do not line up exactly with their onscreen graphical counterparts, it takes a little while before you hit the right one reliably every time. Thin grooves in the raised plastic panel surrounding the screen help a little in guiding your fingers to the correct key. The manual describes how the display has a finite lifespan so Roland have wisely provided a backlight-saver function. Once this is activated, the screen goes dark when the synth is not in use for a specified time, springing back into life when you start to play, tweak, or when MIDI is received.

### Fantom Touch

The 76-note keyboard has a very pleasing action: quite firm and very 'hammerable'. Given just how playable it is, I found myself wishing that Roland had dared to be just a little radical and revolutionary and bestowed polyphonic aftertouch upon the Fantom, rather than the channel aftertouch it has. The other performance tools on offer include the traditional Roland waggly stick, which combines pitch-bend with a perpetually inadequate, shallow-travelling modulation. The D-Beam is much more interesting,

SOUND ON SOUND

**Roland Fantom £1699**

**pros**

- Large, informative display.
- Great basic sounds and effects.
- Digital output.
- D-Beam controller.
- Easy-to-use sequencer.

**cons**

- No sampling, external audio input to effects or sample import facilities.
- Just two slots for SRX-series expansion boards, and only one for a SR-JV card.
- As its competitors offer more features for the same price, or less, the Fantom may have a difficult time ahead if it hopes to be a major player in the workstation market.

**summary**

A keyboard-based workstation based on the XV series of synthesizers, the Fantom is both straightforward and classy-sounding. Whether it does enough to put it up there with competitors such as the Korg Triton and Yamaha Motif, however, depends on whether the ability to use your own samples or process external audio is important to you.

allowing you to tweak the filter, level, and modulation in real time, and additional user-assignable control is offered in the form of four knobs and four buttons.

As you can see from the pictures accompanying this article, the expected workstation transport and navigation controls are all present, and there are dedicated buttons for the arpeggiator and the rhythm pattern section. The Menu button is used to access all the in-depth stuff, such as patch edit, effects, system functions, disk utilities, and so on. Several keys have multiple functions accessed via the Shift key, including Jump and List. Jump can be used to select tones or to move the cursor quickly around the display, and can be used in conjunction with other buttons such as D-Beam On/Off, in which case it displays the parameters being controlled (or the MIDI Controller being transmitted) and also the range and polarity. List is context-sensitive, showing lists of Performances, Effects, Patches and so on.

The rear panel boasts a 24-bit stereo digital output (co-axial and optical connectors are provided) and four audio outputs that may be configured as two stereo pairs or as four individual mono outputs. Bearing in mind the quality of the onboard effects, this is probably going to be enough, and I know many of you will be especially pleased to see the digital output. A headphone socket, MIDI In, Out and Thru, and three pedal inputs (Hold and two assignable control inputs) complete the connections to the outside world.

Staying with the exterior a moment longer, the Fantom has a floppy drive too. This is



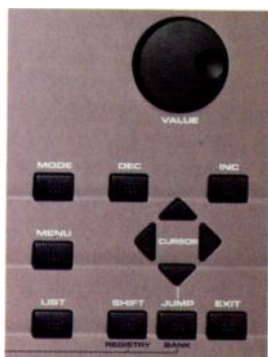
## ROLAND FA76 FANTOM



The Fantom offers a reasonable degree of I/O and connectivity for a workstation, including sockets for the connection of three footswitches, stereo digital out (on either optical or co-axial connectors), the usual MIDI trio, and four analogue outs (one main stereo out and two further mono assignables).

► something Gordon Reid looked for in vain when reviewing the XV5080 (see SOS November 2000 or [www.sound-on-sound.com/sos/nov00/articles/rolandxv5080.htm](http://www.sound-on-sound.com/sos/nov00/articles/rolandxv5080.htm)), as he wished to make use of his 3.5-inch DSDD library of samples. However, the Fantom cannot import samples at all, so its drive is purely used to load and save Patches, Performances and Songs. In that context, a floppy drive is sufficient and with it, I was able to import songs and patches from my XP80. Incidentally, I observed that importing a bank of patches in this way left all the user-assignable knobs and buttons set to null. I hope that a future OS upgrade might allow some default setting for them instead, perhaps one matching the functions of XP80's sliders.

Unlike the XP80, the Fantom lacks that handy means of dialling up patches, a numeric keypad. Instead, Roland have provided several ways to locate patches including the aforementioned List button, which shows ranges of them on screen and a



The main LCD navigation controls, sound- and mode-selection buttons, including the all-important List button, are located at the right end of the Fantom.

Category function, with no less than 38 different categories from which to choose patches. There's yet another, even friendlier, method of recalling your own selections too and, in deference to the world's most powerful nation and its problems with difficult spellings, Roland have named this method 'Favorite Sound'.

### Favourite Things

As with all good features, the 'Favorite Sound' function is simplicity itself to use — you simply register in it the 64 patches you like best. These are arranged in eight banks of eight patches so that they can be recalled instantly. 'Favorites' are shown along the

bottom of the display and you select any of them using their corresponding soft key. To store the current patch as a new 'Favorite', hold down the Shift (aka Registry) key and the soft key of your choice. In typical computer fashion, a message asks you to confirm that you wish to store this. Unlike a computer, though, the screen shows no 'Cancel' option, so if you change your mind at this point, you have to use the Exit key — one of only a few deviations from 'screen-focused' operation. To select a different 'Favorites' bank, hold the Jump key and any of the eight soft keys. This system works so well it should be compulsory on all synths with more than 128 patches!

The Fantom has many more than 128 — in fact it has 1024 patches (640 Preset, 128 User and 256 GM2 sounds) in all. As if this weren't enough (strangely, it never is...) and if the 64Mb of waveform memory (over 1000 waveforms!) doesn't have everything you need, you can expand using two SRX-Series wave expansion boards and just one from the SR-JV80-series. Of course, this single slot would be insufficient if you wanted to upgrade from one of Roland's earlier workstations and had several JV boards already.

### Modes

The Mode button presents on-screen options to select Patch, Multitimbre or Performance modes. It's not quite as instant as the dedicated buttons on the XP80, but pride in the Fantom's screen has obviously led Roland to base everything around it. In fairness, it's still pretty speedy and intuitive.

In Patch Mode, the four-tone structure remains at the root of Roland's architecture, although each tone can use two waves now, to accommodate stereo sources. I don't propose to say much here about the Fantom's S+S synthesis. This is not laziness on my part; it simply reflects the fact that Roland continue to rely on their well-tested S+S techniques, and haven't changed anything in terms of the programming architecture of the synth for a while. For the best recent explanation of how

it all hangs together, see the XV3080 review from SOS July 2000 (or head for [www.sound-on-sound.com/sos/jul00/articles/rolandxv3080.htm](http://www.sound-on-sound.com/sos/jul00/articles/rolandxv3080.htm)). To be fair, Roland can feel justified in repackaging the same engine for some time to come, as there are so many patches around, and it seems that most people do prefer to use what already exists. I wonder just how many JV1080 owners do program their own sounds?

Given that the biggest single stride forward is the implementation of stereo waveforms for each tone, it is surprising that the majority of the Fantom's onboard waves are rendered in traditional mono — especially as those waves that are in stereo seem more spectacularly 'alive'.

In Performance mode, up to 16 patches



can be layered or split by key position. There are a number of ways to specify note priority and voice reserve too: features designed to make those 64 notes of polyphony go as far as possible, which are often omitted from modern multitimbral instruments. I would have liked an easy way to define velocity zones. Instead, Roland have implemented a 'velocity offset' function that is

### Key Features At A Glance

- Display: 320x240-pixel backlit LCD.
- Controls: D-Beam; programmable knobs (x4); programmable buttons; combined mod lever/pitch-bend.
- Maximum Polyphony: 64 voices.
- Wave Memory: 64Mb (1,083 waveforms).
- Wave Expansion (SR-JV type): one slot.
- Wave Expansion (SRX Series) two slots.
- Preset Memory: 640 Patches (banks A-E) plus 256 General MIDI 2 (GM2) Patches; 16 Rhythm sets (plus nine GM2 sets); 16 Multitimbres; 64 Performances.
- User Memory: 128 Patches; 16 Rhythm Sets; 16 Multitimbres; 64 Performances.
- Effects: 90 types of multi-effects in Patch mode; up to three different multi-effects (selectable from 50 types) can be used simultaneously in Performance/Multitimbre mode; global Chorus (two types); global Reverb (four types); global EQ (two-band on each of four outputs).
- Sequencer: 16 tracks; one song only in internal memory; capacity 120,000 notes; maximum 9,998 measures; 480 ppqn resolution; MRC Pro and Standard MIDI File type 0 and 1 Song-import facility.
- Arpeggiator: 88 Styles.
- Preset Rhythm: 50 Styles, 12 Patterns.
- Weight: 14.8kg.



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## ROLAND FA76 FANTOM

- far less intuitive when layering different patches.

When in Performance mode, the Fantom does a good job as a master keyboard controller, whether for internal sounds or external modules (or both simultaneously). You can transmit Bank Select, Program Change, volume and pan information, define how each part will respond to MIDI Controllers, and so on. It's comprehensive enough without being over-engineered.

Finally, for simple multitimbral use, up to 16 patches can be set to separate MIDI channels in Multitimbre mode, which is ideal for sequencing.

## Sequencer

Perhaps the biggest beneficiary of the large display, the onboard sequencer offers everything you need for quick and easy recording without tears or head-scratching. With its capacity of 120,000 notes, it offers extensive recording and editing options to rival some of the (more basic) commercial sequencer programs.

Real-time recording can be as simple as selecting the patches you want, picking the track to record on and hitting the Record button. Then you just decide the count-in period, and away you go; what could be easier? As an alternative to real-time recording, a beautifully implemented step-time mode allows you to enter notes, chords and riffs with very little effort.

Once you've created your song, it must be saved to floppy — when you turn the power off, it's history. Usefully, Roland have added a new command to boost the disk management routines: Disk Copy. This is a simple utility that computer users would take for granted but is important when trusting your masterpieces to a humble floppy disk. As only one Song can be resident in memory at once, to call up several Songs (up to 99 if you can fit them on your floppy) in a particular order, a 'chain play' mode is provided.

Quantise may be performed either during or after recording, and has enough options for creative use but never so many that you get lost. Indeed, all the edit options seem well



The inclusion of a floppy drive (remember them?) on the Fantom may seem old-fashioned, but as you cannot import or export samples, it provides a good way of transferring or saving Performance and Patch data, which is relatively compact and doesn't need much storage space.

## On Display

The generous LCD, as I've already noted, looks great and provides lots of information at a glance. When in Patch mode, you can see which tones are active, the status and settings for the effects processors, any transposition or octave shift, the current settings of the four user-assignable knobs and buttons, and of the D-Beam.

In Sequencer mode, the display becomes even more important, with a small, but perfectly serviceable song representation which calls to mind early versions of *Cakewalk* or *Mastertracks Pro*. Musical bars with data are represented as filled blobs and, in Track Edit mode, up to 15 lines of individual MIDI events are shown, which you can edit, delete, copy, and so on. In Performance mode, the display provides a simple graphical representation of the layers and keyboard zones used. Curiously, a small keyboard graphic even shows the notes you are playing, which might be

handy if for any reason you are unable to see the large keyboard under your nose...



The main display and its eight associated 'soft buttons'. It's a shame they don't line up under the appropriate onscreen control tabs!

chosen to give you functionality without the pain, unlike on most software sequencers.

My only gripe is that you cannot just hit Record during playback. Roland's advertising blurb describes the sequencer as 'always active' but it transpires that this just means you can use it whether in Patch, Performance or Multitimbre mode. If linear-style track recording is not for you, or you simply prefer to assemble your songs from shorter building blocks, up to 100 Patterns can be stored and then recalled from within a song's phrase track. Having specified the order of Pattern playback, you can overdub on top of this too, but always remember that the Patterns themselves are not written into the song, merely pointers to them. If any Patterns change, a song using them changes accordingly. A Pattern can also be triggered repeatedly from a single key using Roland's RPS mode (Real-time Phrase Sequence); up to eight simultaneous sequences may be played back at once.

Finally, if those sequencer transport controls don't excite you, you have the option to start and stop your song using the D-Beam. The wonders of science, eh?

## Sounds Aboard

There are five banks of Presets, A-E, giving a total of 640 factory patches. In addition, 256 preset General MIDI 2 patches offer more GM sounds than I would personally ever need (in fairness, they are as good as any GM sounds I've come across). User memory offers just 128 locations for patches plus 64 Performances, 16 Rhythm Sets and 16 Multitimbres. This seems a little stingy, but then I suppose many workstation users focus on having a host of quality factory patches in ROM.

Some of the supplied patches are very good indeed, so I was surprised to discover that I couldn't get excited about any of the

preset Performances at all. For some of my favourites, take a look at the 'Favourite Patches' box elsewhere in this article.

Arpeggiator & Drum  
Pattern Generator

A single dedicated button on the left of the control panel activates the arpeggiator. The in-depth parameters appear on-screen if you activate it while also holding down the Jump key. I was pleased to note that if you use Shift and the arpeggiator button, arpeggiation starts in 'Latch' mode — that is, it keeps playing when you release the keys. The button flashes to indicate Latch is active, which is nifty.

This arpeggiator is rather splendid, offering as it does no less than 88 styles including simulations of guitar strums, harp-stroking, walking bass lines and the like. Each style has several variations, and you can add accents, shuffle and more. Even better,

## Favourite Patches

Amongst the Patch banks, a small selection of my favourites were:

- PRB 002: 'XV Steel Gt1' — a very playable steel guitar with realistic pitch-bend via aftertouch.
- PRE 063: 'Borealis' — a wavesequency pad with D-Beam control over level.
- PRE 079: 'Vocals Boys' — takes me back to my own choirboy days!
- PRE 080: 'St Choir' — simply glorious.
- PRE 095: 'Celtic Harp' — plucking good.
- PRC 008: 'Oboe mf' — a very expressive solo.
- PRB 039: 'COSM Searing' — a better electric guitar than I'm used to hearing on a keyboard. Just wish I could do it justice!
- PRA 017: 'Sparkle Piano' — the pianos on offer seem to vary from rather dull to marvellous. This one is a delight.

To hear MP3 examples of these Patches in action, surf to the SOS SoundBank at:

[www.sound-on-sound.com/soundbank.asp](http://www.sound-on-sound.com/soundbank.asp)



## Test Spec

• Fantom OS version reviewed: v1.11.

you can specify the order in which the notes are played, from the simple up, down, up and down and random modes to the more exotic glissando, chord, 'Auto' and 'Phrase' modes. There are two Auto modes, and they alter playback priority according to the highest or lowest notes held at any point. In Phrase mode, an arpeggio phrase is extrapolated from a single note (typically, this involves fifth and octave intervals). Perhaps the only thing lacking is a fully user-definable arpeggiator, but with so much on offer already, that didn't trouble me too much.

Rhythm Patterns are, in essence, specialised arpeggios designed for auto-accompaniment. They are active over a single octave, starting at a base note you specify in Performance Mode (they don't work in Patch mode). In fact, one of the advantages of the Fantom's 76-note keyboard is that you could easily choose a zone for arpeggios, another zone for a rhythm pattern and still have room for some additional parts to play. There are 50 Rhythm Pattern styles to choose from with each note in the octave providing a useful variation. By playing the keys you can alter the rhythm as it plays, add fills, percussion, hi-hats, and so on. The patterns loop round, and are cancelled only when you take your hands off the keyboard. To keep them looping regardless, activate the Rhythm play using Shift and the Rhythm button.

## Effects

There are no fewer than 90 types of multi-effect available in the Fantom, including COSM modelling types (for example guitar-amp simulations) and RSS 3D processing. In Multitimbre and Performance modes, up to three different multi-effects are available. These are selected from a slightly reduced list of 50 effect types (as shown in the Sound/Parameter List manual) and if you place a complex, processor-hungry effect in slot MFX-A, the other two slots cannot be used.

In addition to multi-effects, reverb and chorus/delay are always available. There is no space for the complete list of multi-effects, but they include almost everything you would want in a workstation. Thus you'll find overdrive, distortion, phaser, enhancer, compressor, chorus, flanger, delay, pitch-shifter and reverb. Then there are combination effects (for example distortion plus flanger), formant filters, a ring modulator, shuffle delays, various lo-fi processors, a beat slicer, an isolator, and the so-called '3D' effects (chorus, delay, flanger and auto-panners). The list goes on and on.

For the most part, these effects are excellent; a few of particular interest are the 3D effects, the amp simulator and my own favourites, the formant filters. These provide vocal-style filtering with a range and tweakability to transform almost any input patch into something cool, interesting and vocal-like. Multi-effects templates — 96 in total — are provided for rapid setting up so that you don't need to delve into individual parameter menus. Dial up 'Drum St Comp', for example, for a ready-optimised stereo compressor patch ideal for drum processing. Or there's the wild 'SynchroSlicer' which uses the Slicer effect to rhythmically chop up source material. With this, each step in a 4/4 bar gets its own level, and you can step through each of the levels at the current tempo.

The ever-useful List button aids effects selection and is a marked improvement over spinning the alpha dial. The icing on the cake is a final two-band EQ section provided for each of the output jacks. The quality of the effects is incredible overall; it's just a shame that there's no provision to process external signals through them.

## Control

Extensive real-time control over both effects and synthesis parameters is possible as Roland have tailored popular ones such as cutoff and attack time to respond to MIDI control changes rather than SysEx. Additionally, Matrix Control is a facility in each patch where up to four modulation sources can be routed to destination parameters of your choice. The sources available include a selection of pitch-bend, aftertouch, velocity, key follow, tempo (either that of the internal sequencer or an external source), LFO 1, LFO 2, any of the envelopes, or a variety of MIDI Controller numbers. By assigning a Controller number to the source and then mapping that MIDI controller to one of the four user-assignable buttons or knobs, you can create a wide range of modulation possibilities.

Multi-effects parameters can be controlled in a similar way: again four slots are available. They can lead you into some quite mind-bending soundscapes, especially if your source is a MIDI Controller such as the D-Beam. You can also use these assignments to allow an LFO to vary the rate of another LFO, or the filter envelope to vary the amount of distortion, for instance. Call me an anorak if you like, but I love this kind of thing because it offers the potential to breathe extra life into performances.

## Conclusion

The Fantom is a very capable workstation, robustly made and possessing a certain

## Missing In Action — Sampling Facilities

With no audio input, no sampling option and no onboard RAM capability (meaning no importing of WAV files or anything like that), the Fantom seems disadvantaged in the Big Workstation Features League, as both Korg's Triton and Yamaha's Motif, the Fantom's clear competitors, incorporate sampling. Who is right only time will tell. I think the argument that people prefer dedicated samplers or even computers for sampling is one that makes some sense, but it would be dangerous to apply that line of thought too strictly to the workstation concept. After all, every individual component of a workstation could, in theory, be done better by dedicated units.

spartan physical charm. Yet it is limited from the outset by the omission of audio inputs, sampling capability or sample import. It may be that these are facilities you don't personally need in an instrument of this type, and Roland's PCM expansion card route might be your preference anyway. Certainly the Fantom arrives with a sound that is already a standard in many studios throughout the world, and it can import patch and sequencer data from earlier Roland workstations, too, which opens up a vast number of excellent ready-made patches. However, if you wanted to trade up from one of Roland's older workstations, the single 'old-style' SR-JV expansion slot is rather limiting and adding just two SRX-series slots doesn't feel over-generous either. If I'm starting to sound like a judge on *Pop Idols*, it's simply that I find it impossible to consider an instrument like this in isolation. Realistically, you can't ignore the advances other companies have made with their workstations over the last few years.

Nevertheless, the Fantom is a great-sounding, solid piece of kit, based firmly on an existing (and successful) family of instruments. The keyboard, D-Beam and the screen are all a pleasure to use and those effects sound great. The digital output is welcome, the sequencer more than adequate and I had great fun with the arpeggiator and rhythm patterns. Ultimately, if you are looking for a new music workstation and have your sampling needs covered elsewhere, you should include the Fantom in your list of instruments to audition. **SOS**

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- Bass reflex porting for enhanced lows
- Ultra compact and highly portable
- Speaker inputs, metal hardware



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# SPL Kultube Stereo Compressor



SPL's new surround-ready stereo compressor offers clever programme-adaptive compression, as well as decompression and tube-saturation functions.

Photos: Mike Cameron

## Paul White

Anyone even vaguely familiar with SPL products will know that they never approach equipment design in quite the same way that everyone else does. More often than not, their departure from the norm bears worthwhile and musically interesting results. So, when SPL said they had a new stereo compressor called the Kultube, I was prepared for rather more than just a stereo compressor with a tube in it. And it didn't take long to discover that it had hidden depths.

Housed in a 2U rack case, with familiar 'let's all look at the valve' grille set into the gold front panel, this particular compressor features a pair of multi-pin master/slave link connectors that enable multiple units to be

side-chain linked for multi-channel surround mastering applications. Analogue I/O is via both balanced XLRs and jacks, and there's a slot to take an optional digital I/O card.

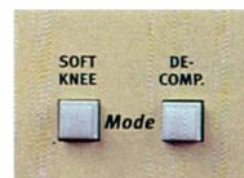
The Kultube's circuitry utilises a newly designed gain cell to replace the more usual VCA, claiming to offer a new benchmark in low distortion and transparency, while at the other end of the signal chain is a variable-drive valve circuit designed to put back as much distortion as you like, from the merest hint of warmth to obvious dirt. This tube circuit is designed to maintain a constant output level when the detented Tube Harmonics control is being adjusted so you can hear the effect of the tube 'flavouring' without having to constantly re-adjust levels. Using the digital I/O will obviously limit the audio bandwidth, but analogue-to-analogue, the frequency response of the Kultube extends from 10Hz to 150kHz within 3dB.

The compressor section has switchable hard- or soft-knee operation and what appears to be a perfectly conventional set of Threshold, Ratio, Attack, Release and Make-up Gain knobs. The large moving-coil meter can be switched to show either gain reduction, input level (when the compressor is bypassed) or output level. Only one meter is needed to show gain reduction, because the compressor is dedicated to stereo operation. A button selects the digital input as an alternative to the analogue ins when the optional 24-bit/96kHz digital I/O card is fitted. There's also provision to control the Kultube from an external side-chain key

input fed in via a rear-panel jack and activated by means of the front-panel Key On switch. A Key Listen facility is included, allowing the user to monitor what the compressor side-chain is 'hearing'. This all seems quite normal — until you spot some of the other buttons which tell you that all is not quite what it seems.

## Decompression & Progressive Time Control

Firstly, there is a Decompress button that flips the compressor circuit to act as a gentle expander, able to increase the dynamic range of overcompressed material. In this mode the Make-up Gain knob controls 'make-down' gain, where turning it clockwise reduces the output level. The manual suggests that this mode is useful for



Though a soft-knee mode can be found on other units, the decompression is a very unusual extra.

putting life back into overcompressed samples and suchlike. To facilitate more subtle compression, such as you'd use in a mix, or gentle expansion of the dynamic range of a sound source, the Ratio starts out at a gentle 1.2:1.

The expansion function is unusual, but the Progressive Time Control (PTC) buttons are, to my knowledge, something quite new. When both these buttons are out, the Attack

**SOUND ON SOUND**

**SPL Kultube £999**

**pros**

- Easy to set up.
- Very musical compression characteristics.
- Effective tube harmonic enhancement.

**cons**

- It isn't cheap!
- No high-resolution output metering.

**summary**

Once again SPL have taken an existing concept and implemented some genuine improvements that are relevant musically as well as technically.



**“Some tube drive facilities do little to improve the sound, but I found the Kultube’s to be amongst the most musical I’ve heard and I’d definitely use it to death.”**

and Release controls work as normal, but when the buttons are in, their functions change and the attack/release times are dynamically adjusted depending on the dynamics of the input signal.

If this were just a regular automatic attack/release mode, it would be useful, but hardly unique. However, when the PTC button relating to the Attack control is engaged, the knob relinquishes direct control over the attack time and instead governs the degree to which transient sounds are compressed by interacting with the auto circuitry. The manual tries hard to explain exactly what is going on, but never quite succeeds, so I called SPL for a comment and received this explanation from their Managing Director, Hermann Gier.

“Working conventionally, if you set fast attack times to gain more loudness, the compressor will work with fast attacks all

the way through the song, which can cause things like layered sounds, complex mixes and vocals to sound pretty rough or even distorted. This makes it difficult to achieve more loudness without negatively affecting the sound.

“Switching the Kultube’s PTC Attack button on, the compressor will use the

attack time dialled in via the Attack control only when the source requires it, but when the auto circuitry detects that a slower attack time is needed, the attack time is automatically increased accordingly. This helps maintain maximum loudness while reducing the risk of distortion and roughness, yet still allows fast-attack sounds to be compressed appropriately. In other words, with PTC, the attack control sets the fastest attack time that the auto circuitry can use when it encounters fast transients, rather than leaving it to decide everything for you. For example, you could set a longer attack time to allow fast

### Optional Digital Converter Board

This board is designed to be installed in place of the blanking plate at the top of the Kultube’s rear panel. Though the option wasn’t available for review, documentation from SPL shows that it offers both stereo A-D conversion and stereo D-A conversion, with a choice of XLR and phono digital I/O connectors and an extra pair of balanced analogue XLR outputs. This means that you can use the A-D conversion for feeding your digital recorder, and the D-A conversion for

feeding the output of your digital mixer to your monitoring system, for example. The card would also allow you to insert the Kultube into a digital mastering chain.

Resolutions of 16 and 24 bits are supported, and the A-D conversion can be carried out at sample rates of 44.1, 48, 88.2 or 96 kHz. In addition, both converters can be clocked either to incoming digital data or to word clock, at sample rates from 32 to 96kHz.



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## SPL KULTUBE



► transients to slip through unprocessed — something a conventional auto circuit can't do."

When the Progressive Time Control button relating to the Release control is active, the release knob sets the average release time, which is then dynamically modified according to the automatic release circuitry. In other words, the actual release time is determined both by the auto circuitry and your choice of release time, which offers most of the benefits of auto and



Progressive Time Control combines the benefits of automatic and manual time-constant adjustment.

manual release-time adjustment simultaneously. From an operator's point of view, this results in a stereo compressor that's very easy to set up, as most of the controls are absolutely familiar.

### In The Studio

As a compressor, the Kultube is both predictable and flattering. It's quite hard to get a bad sound out of it, even using the purely manual attack and release settings, and though it does have a larger-than-life sound at more intensive settings, it doesn't choke the signal or rob it of transparency as some lesser compressors seem to do. The hard-knee mode is more assertive than the soft-knee mode, as you'd expect, but even when you overcompress to the point of pumping, the result is still musical and predictable, making it possible to use compression as an effect as well as for controlling levels. It is quite possible to use a single channel of the Kultube to process an individual track via a mixer insert point, but its real strength lies in its ability to handle stereo mixed material in a musically sympathetic way.

Bringing in the PTC buttons makes less subjective difference than you might imagine, especially if you've already manually set the Attack and Release controls

to match the material being processed, but the differences are there if you listen. In addition to taking the guesswork out of setting the attack and release times, the overall density of the sound increases slightly and percussive transients sound a hint crisper. Some sound sources show up these benefits more readily than others, but it's definitely a useful addition, especially when processing complete mixes. As for the decompression mode, I found the ratio needed to be kept below 1.5:1 for natural-sounding results. With a little experimentation it added a welcome degree of life to squashed material.

The Tube Harmonics control

can add a huge amount of weight and density to drum loops without appearing to distort the sound. Used on vocals or other discerning sounds, the colouration is more obvious at high harmonic settings, but it's still possible to get the control up to half way or beyond before you realise the sound is being processed. At lower settings everything just sounds bigger and richer as though it's being compressed and enhanced at the same time. Some tube drive facilities do little to improve the sound, but I found this to be amongst the most musical I've heard and I'd definitely use it to death if I had it in my studio full time.

### Kul Or What?

The Kultube isn't a budget compressor, but you only have to use it for a short while to realise why. It is easy to control, musically flattering and flexible enough to handle any kind of material. The PTC is a clever way of extending the usefulness of a typical automatic mode, while the tube enhancement works beautifully to give

everything a big, expensively dense sound, without losing focus or integrity. The design also shows a degree of forward thinking in the interfacing department, such as the ability to slave multiple units for surround processing, though I would imagine that most people working in this area would want independent control over the subwoofer dynamics rather than having it linked to the five main speakers.

Is there anything I didn't like? I have no complaints over the sound, but I think a permanent stereo LED output level meter might have been useful, as moving-coil VU meter ballistics aren't ideal when trying to optimise signal levels in a digital system

As for who needs a Kultube, I'd say it would appeal not only to mastering engineers, but also to those serious project studio owners who don't use commercial mastering facilities and who'd like to get their masters 99 percent of the way there at the mixing stage. The tube enhancement is also a godsend for adding weight and life to a song that

was recorded and mixed entirely on digital equipment or to vocalists who feel their voice just doesn't sound solid enough without a little help. You don't have to look too hard to find an excuse to buy one! **EOS**

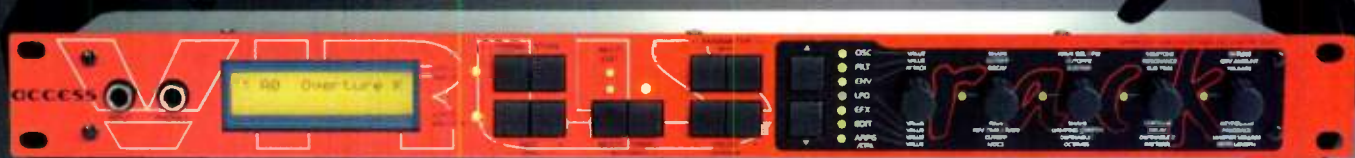


The Tube Harmonics control adds valve distortion products without increasing the overall signal level, so you can easily hear how the sound is really changing.

### Information

**E** Kultube, £998.75; optional digital board, £388.93. Prices include VAT.  
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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 its 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 4.5 software.

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sub) for real  
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World Radio History



# Plug-in Plumbing

Paul White

**W**hen home recording first took off in a big way, most of us started out with a four-track recorder, a simple mixer and a spring reverb, and then we started saving up for a compressor. Once we got the compressor we had plenty of time to read the manual and to learn everything about it before we could afford the next piece of kit, which was probably a gate or a delay unit. As each piece of kit was added, its possibilities were fully explored, so our studios held very few mysteries for us.

Today's virtual studio is very different. One day you may be a guitarist with just a little experience using a friend's Portastudio, and the next day you take delivery of a computer loaded up with *Logic Audio* or *Cubase VST* or one of the other cutting-edge sequencing packages, complete with fully automated MIDI and audio mixing environment and a whole folder full of VST plug-ins, the hardware equivalents of which you may never have even seen before. The word 'daunting' springs readily to mind.

If you find yourself in this situation, you could do a lot worse than visit the *SOS* back issues on our web site and check out the numerous articles that explain the functions and applications of the various effects and signal processors, especially EQ, compression and reverb, as these form the cornerstone of signal processing. After that, try the different plug-ins one at a time and try to get to know what their key controls do. Most are relatively straightforward if you read up on the basic principles first and, fortunately, most plug-ins have a limited number of controls, whereas hardware multi-effects boxes often have an overwhelming number of adjustable parameters, especially some of the more sophisticated reverb units.

Even once you've got that far, however, it may not be obvious whereabouts in the signal chain to connect these plug-ins, and

what order to put them in when you want them to process the same signal. That's the focus of this article, so if you've found yourself asking these questions, the answers will shortly be revealed.

## Effect Or Processor?

First comes the old 'effect or processor?' chestnut, which is so fundamental that I make no excuses for revisiting it here. Both hardware and virtual mixers allow you to connect plug-ins via insert points in channels (and sometimes in groups/busses) and via one or more aux send/return loops. The send/return loop allows a single effect to be shared amongst as many mixer channels as you like, with a control in each channel determining the amount of effect to be added. Reverb is the most commonly used send/return effect, and the send/return configuration allows you to add more reverb to some tracks than others. The reason we need to differentiate effects and processors is that, while either can be used in an insert point, only effects should normally be used in a send/return loop.

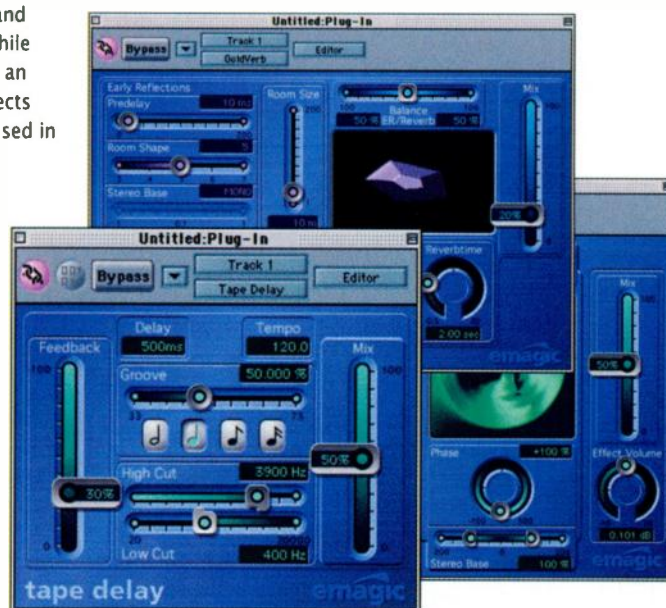
In general, effects are delay-based, and encompass reverb, delay, echo, and pitch-shifting, as well as modulation treatments such as phasing, flanging, chorus and vibrato. (Though pitch-shifting may not seem to be delay-based, it actually works by chopping the audio up into tiny slices, delaying them by a small amount, changing their playback rate and then splicing them back together.) Effects processors almost always feature a mix

The flexibility of the effects assignment in modern MIDI + Audio sequencers can be daunting, so here's some advice on how to sort out the routing and order of your plug-ins for common recording and mixing tasks.

control to balance the 'dry' (unprocessed) and 'wet' (effected) signals, so, in the case of reverb, you can adjust the level of the reverb added to the original sound.

When using an effect in a send/return loop, however, the direct channel path for the dry sound is through the mixer channel, so the effect should be set with its mix control at 100 percent wet (effect only) so that only the effected sound is added when the channel (post-fade) send control is adjusted. If, on the other hand, an effect is used in a channel, group or master insert point, the wet/dry balance is set up using the mix control on the plug-in itself.

Processors have no mix control, because no dry signal is used — the output is entirely processed. The most common processor is EQ, but gates, compressors, panners and resonant filters are also processors. If there's no delay element and no mix control, it's pretty certain that you've



Plug-ins with Mix controls can be used both in a send/return loop configuration, where the control would normally be set to 100 percent wet, and in a channel insert point, where the control would be adjusted to taste.

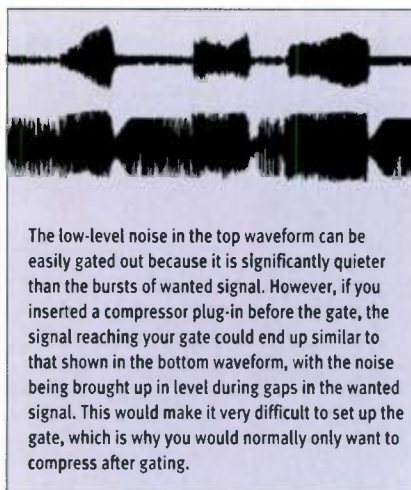


got hold of a processor. Because it is not desirable to add the processed sound to the dry sound, processors are only used in insert points. If the dry sound were to be added, it would at best reduce the intensity of the process and, in the case of a digital mixer, it could result in a static flange-like effect, because of the tiny time differences between the dry and effected signals.

This will be familiar territory to many of our regular readers, but it is a vital point to get across, and while there are some workarounds that contravene these basic rules, you should endeavour to stick to them until you gain enough experience to understand the implications of breaking them.

### "Order! Order!"

Often we want to use several plug-ins in the same signal path, but it pays to think about the order in which these will be used. For example, if you want to combine a gate (to clean up pauses in a signal) with reverb, it's pretty obvious that the gate should come before the reverb. This way any small discontinuities caused by the gate clipping the ends of wanted sounds will tend to be



masked by the sustaining effect of the reverb. If you were to reverse the order of the plug-ins, your unwanted noises would be stretched out by the reverb and, unless the reverb was very short, the reverb tail might actually fill all the pauses that you originally intended to gate. Now you have the dilemma of adjusting the gate to allow the reverb tail through without chopping it off short (in which case the chances are your

unwanted noises will also get through) or adjusting it to kill the noise and suffering your reverb tails getting chopped off.

Putting the gate first clearly gives you a much easier ride and produces the end result you were looking for without affecting the reverb tails in any way at all. As a rule, you'd only put a gate after reverb if you wanted to create a deliberate gated reverb effect, but, as most reverb plug-ins can emulate gated reverb, it's probably better to take the easy way out and let the reverb plug-in do all the hard work.

How about combining a gate and a compressor? On the face of it they should work either way around, and to an extent they do, but when you think about what's happening, it soon becomes obvious that one way is better than the other. When you are setting the threshold on a gate, the ideal situation is one in which the quiet sections to be gated are much quieter than the loud sections that will open the gate. The job of a compressor is to reduce the level difference between the loudest and quietest sounds, so if you were to compress before gating, it would make setting the gate threshold more difficult, because it would

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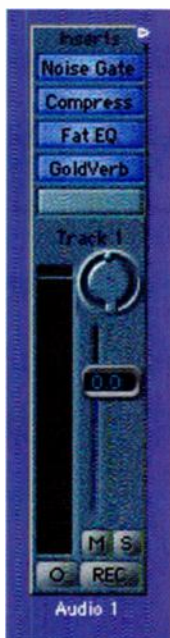
- reduce the contrast between the loud and quiet sounds.

So far, then, we've established that gates come before compressors and reverbs, but which way around do you connect reverbs and compressors? The answer is that you can connect them either way, but the result will be subtly different. If you put the compressor before the reverb, you'll get the most natural result, as the dry sound will be reduced in dynamic range before reverb is added, but if you put the compressor after the reverb, you'll compress the reverb tail itself, which will have the effect of trying to pull up the reverb level as the reverb decays. This actually alters the shape of the reverb decay curve, and whether that is a good thing or not is a purely artistic decision.

## Where Should You Insert The Equaliser?

What happens when we bring EQ into the equation? Well, you might think it would help to put EQ before a gate, because, if there's a lot of high-frequency boost that's adding noise, the gate will take care of it. However, if the EQ plug-in is properly designed it won't produce noise when the input is silent anyway, so there isn't a great deal of difference in noise performance whichever way around you connect them. However, some EQ settings may emphasise the difference between loud and quiet sounds, whereas some may tend to reduce them, so use this as the decisive factor instead. Which way around makes the gate threshold easier to adjust? For example, if you have a signal where the pauses are full of high frequency hiss and you want to EQ some top out of the signal anyway, doing this prior to gating will reduce the level of the hiss making it easier to set the gate threshold.

This seems like a clear choice, but things become a little more confusing when compression is one of the effects in the chain, because putting EQ before compression produces a rather different result to putting EQ after compression. To illustrate this point, imagine a signal that's been EQ'd to add a lot of bass boost so that the kick drum part now seems a lot louder than it originally did. If you follow this with a compressor, the compressor will dutifully apply more gain reduction to the louder parts, in this case the kick drum, and it will tend to level out the sound, thus undoing some of the work of the EQ. Bright sounds occurring at the same time as the kick drum will also be pushed down more in level, so the



For chaining plug-ins in most normal applications, a good all-purpose order is that shown here — first gating, then compression, EQ, and finally any delay-based effects, such as reverb.

actual outcome is more complex than it might at first appear. In certain circumstances, putting EQ before compression can produce musically interesting and useful results that are quite different to compressing before you equalise. As you might imagine, if you compress before

equalising, the EQ will act on the compressed signal and EQ it normally without affecting the way the compressor works, so the effect of the EQ is likely to be clearer — in most cases, I find this way round produces the most musically useful result.

If I were to combine gating, EQ, compression and reverb (or delay), my preferred order would tend to be gate, compression, EQ and then reverb/delay, though I might try swapping the EQ and compression just to see which gave the best result.

If distortion is one of the effects, then you really need to think about what you want to achieve. Distortion dramatically reduces the dynamic range of a sound, so gate it first if gating is necessary. Compressing before distortion will increase the average level of the signal, so decaying sounds will tend to distort for longer with pre-compression, whereas compressing afterwards may do very little, as the signal

is already quite heavily squashed. In fact, compression following distortion may only have an audible effect at the starts and ends of notes when any noise will tend to be further exaggerated.

Distortion adds lots of new harmonics, so EQ and filtering will have more effect if placed after the distortion than before it. The same is true of flanging, which produces a strong comb-filtering effect that can be very dramatic on heavily distorted signals. By all means try putting the distortion after the EQ/filtering to see what effect you get, but don't expect it to be as spectacular. The classic exception to this rule is guitar wah-wah which is traditionally used before the guitar amplifier and hence before any distortion.

Heavy distortion produces a lot of high-frequency harmonics that can actually be quite unpleasant, so following it by some high-cut EQ or even a dedicated speaker simulator plug-in can help produce a smoother result.

## Breaking The Rules

As you can see, there's no absolutely rigid order in which to connect things, as the creative person will always find a way to combine plug-ins in a seemingly illogical order and yet still come up with a brilliant new effect. However, in everyday applications gating comes first and delay-based effects tend to come last. EQ usually follows compression, but not always, so try both options and see which of them works best for you in your particular situation.

When combining delay-related effects, there's plenty of room for experimentation, as most combinations produce musically interesting results, albeit different ones. Take flanger and reverb for example. If you put the flanger before the reverb, the myriad delays created by the reverb will tend to smear the flanger effect lending the reverb a strong shimmer rather than an overpowering 'whoosh', and the same is true of chorus if you want to create something more subtle. On the other hand, putting the modulation effect last will process the reverb output in a much more predictable way as the cyclic nature of the modulation effect won't be diluted by the complexity of the reverb.

The more familiar you become with your plug-ins, the more intuitive connecting them together will be. While it's worth learning the basic rules, you should also take time to experiment, so that you can see what can be achieved by breaking them! SOS



The sounds produced by distortion plug-ins such as these will depend on where they appear within a chain of plug-ins.



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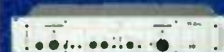
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Moving from last month's theoretical bass drum synth patch to its practical application on affordable analogue synths, we also take a look at how the world's most famous drum machines produce this fundamental rhythm sound...

Gordon Reid

Last month, we analysed the bass drum, ending up with a patch that synthesized all the important elements of its sound (see Figure 1(a), right). Given a synthesizer of appropriate power and flexibility, there's no reason why you shouldn't use this to create a wide range of powerful kick drum sounds. Indeed, with careful choices of VCO pitches and waveforms, filter characteristics, and contour rates, you can use this to synthesize a huge range of realistic and electronic percussion instruments.

Unfortunately, few of us have access to a synth capable of reproducing this patch, so I'm going to simplify it by replacing the FM generator in the upper-left corner with a noise source. When filtered appropriately, this will simulate the dense cluster of mid-frequency partials that the FM section generated. If I also assume that the pitch CV input on the VCO will have some form of level control, I can dispense with the attenuator and redraw the patch as Figure 1(b), shown right.

Unfortunately, simplified though this is, it's still too complex for the majority of analogue synthesizers. A Minimoog can't reproduce it, neither can a Roland SH101, an ARP Axxe, a Sequential Circuits Prophet 5, a Memorymoog, or even the semi-modular Korg MS20 and ARP 2600. But it's well-known that people do coax superb kick drum sounds from all of these synths — so how do they do it? That's what we're going to find out this month.

## Bass Drums On The ARP Axxe

The ARP Axxe is perhaps the simplest of the synths named above, offering just a single oscillator, a single LFO, a single filter, and a single contour generator. I have drawn the block diagram for this synth in Figure 2.

# Synth Secrets

## Practical Bass Drum Synthesis

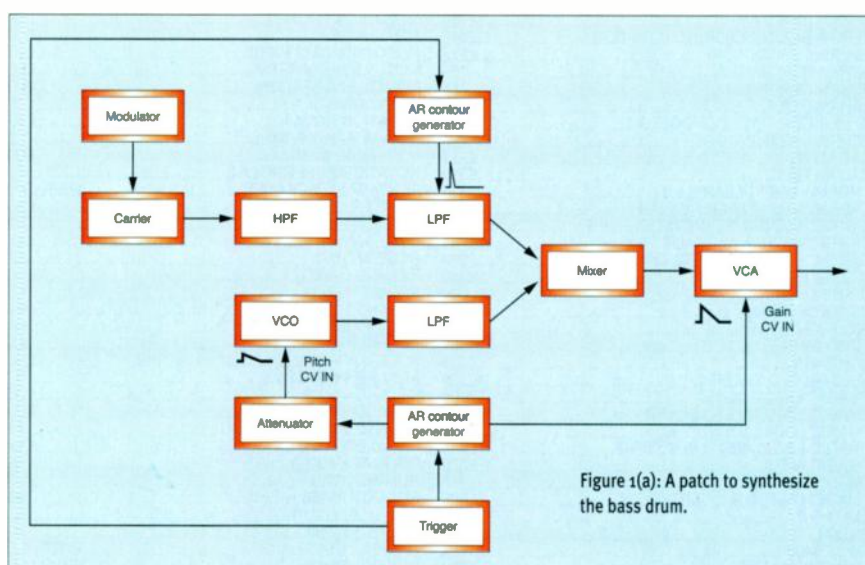


Figure 1(a): A patch to synthesize the bass drum.

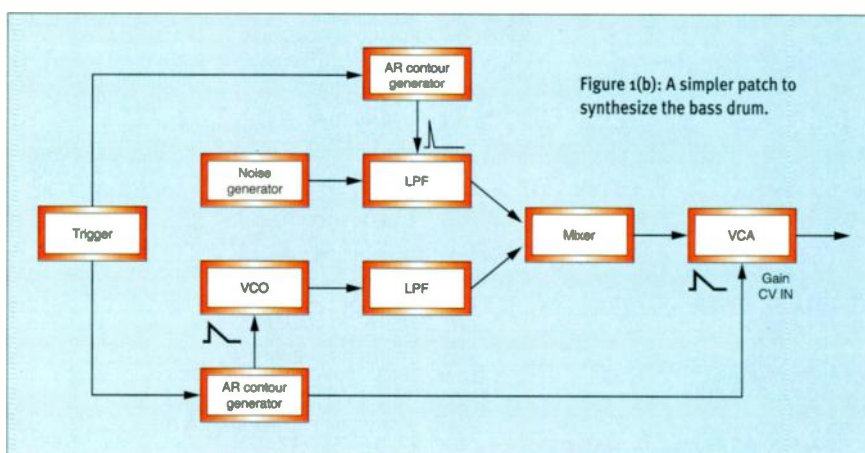


Figure 1(b): A simpler patch to synthesize the bass drum.

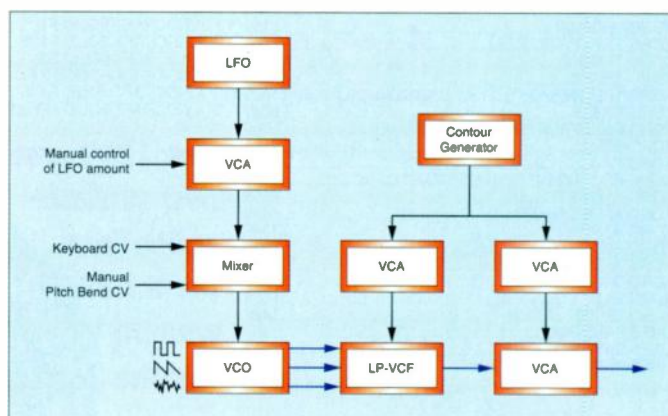


Figure 2: A block diagram of the important elements of the ARP Axxe.



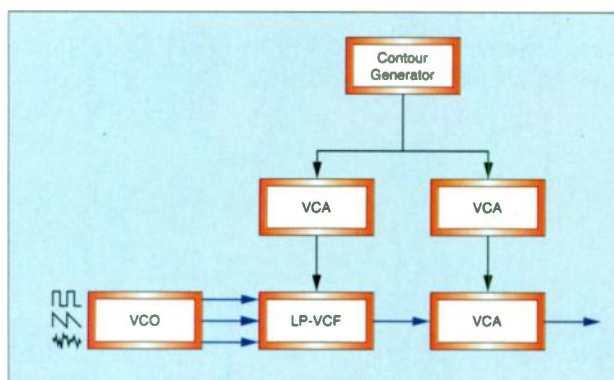


Figure 3: The elements used in the ARP Axse bass drum patch.

Clearly, this lacks some of the modules present in both Figures 1(a) and 1(b) so, if we're going to be successful programming a bass drum on this, we're going to have to cut a few corners.

Let's start by getting rid of the things that we don't need. Nowhere last month did we discuss low-frequency modulation, and the Axse's LFO won't oscillate at audio frequencies, so we can discard this and its associated VCA. Likewise, it's unlikely that we'll need pitch-bend, and we don't need to consider the keyboard CV, so these and their mixer can also disappear into the ether. That leaves a classic VCO/VCF/VCA signal path shaped by a single contour generator and two VCAs (see Figure 3, above).

Comparing this to Figure 1(b) — let alone 1(a) — you might imagine that there's little we can do to recreate the kick drum sound we want. But don't give up... all is not lost.

The most important thing that Figure 3 lacks is the ability to sweep the pitch of the VCO. However, the Axse does offer a way to generate a tone with a downward sweep; we program this by setting the filter resonance to maximum, and using the contour generator to control the cutoff frequency. Since the Axse's filter oscillates at high resonances, it produces something akin to a sine wave, and it is this that will sweep down in pitch as the contour progresses. So, knowing the contour we require (see Figure 4 below for a reminder) we can now set up the ADSR and VCF sections on the Axse's front panel, as shown in Figure 5, above right.

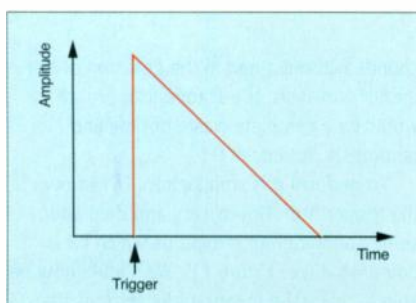


Figure 4: The pitch contour for the kick drum sound.

Scanning Figure 5 from left to right, you can see that the filter resonance is at its maximum, and that the amount of ADSR sweep applied is approximately 50 percent. There's no theoretical reason for choosing 50 percent... it's simply the setting that sounds good to me. You should also note that the filter's initial cutoff frequency is at its minimum,

ensuring that the sweep ends at a very low frequency. For the same reason, there's no keyboard CV applied, and the LFO-to-VCF control is set to zero because we do not want the frequency to 'wobble' as it sweeps downwards.

Looking at the ADSR contour generator itself, you can see that (for reasons that I hope are obvious) the Attack time is zero. The Decay and Release times of approximately 50 percent are again empirical — they sound right to me — and they're the same length, so that the sound is consistent whether you keep the key pressed or not. Finally, the Sustain level is zero because the pitch of the drum always swoops down; it never 'sustains' at a single pitch.

Now, what about the amplitude curve of the sound? Last month I explained that that the pitch contour and the amplitude contour are likely to be the same, differing only in amount. This is very fortunate because, if it were not so, we would require a second contour generator, and the Axse does not possess this. We therefore define the VCA response using the settings in Figure 6 (right). As you can see, we apply the full range of the ADSR to the VCA, and there is no initial VCA Gain, because this would stop the note decaying to silence.

Now for the cluster of middle

frequencies in the kick drum sound. If we possessed more oscillators and signal paths, we could generate these in keeping with the scheme in Figure 1(a). But we don't, so we can't. The best we can do it to add the sawtooth and/or square waves plus some noise to the audio input of the filter. In theory, the saw and square add more harmonic content to the sound, and the noise adds something to emulate the cluster of enharmonic modes in the mid and upper frequencies. However, little of the signal presented to the input survives the path through the filter, so the output is largely unaffected by these signals.

We're now in a position to complete the Axse kick drum patch (see Figure 7). Apart from what I've already mentioned, the only other thing to notice is that the Transpose switch is set to '-2 Octaves' so that the frequencies of the sawtooth and square waves are in the lowest register. And that's it... a beautifully simple and elegant patch which produces the classic 'analogue' kick drum sound. What's more, you can make it sound

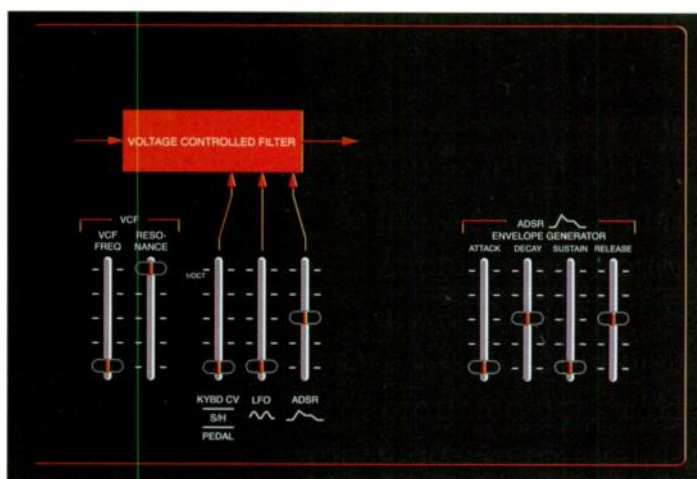


Figure 5: The VCF and ADSR settings for the Axse kick drum sound.

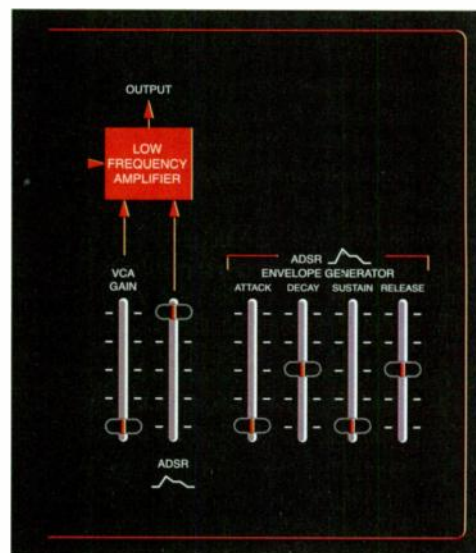


Figure 6: The Axse's VCA and ADSR settings.



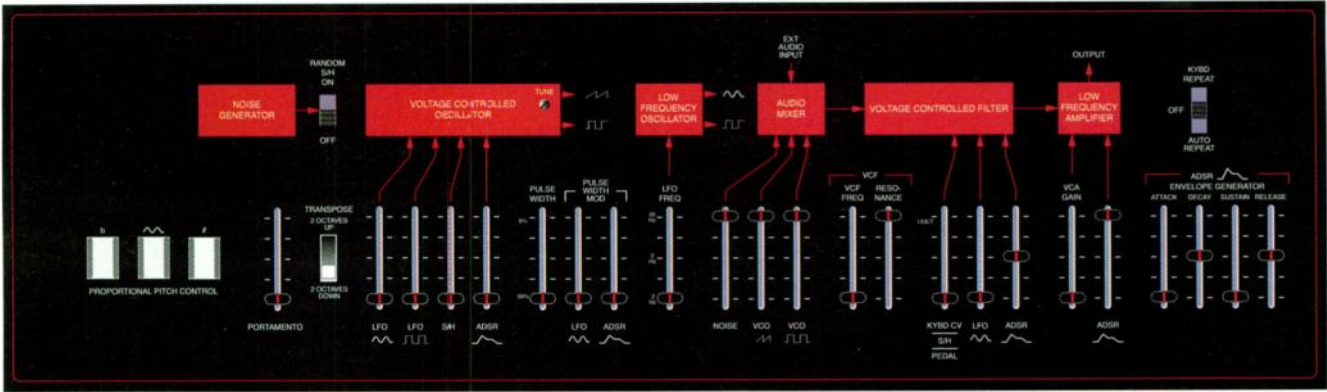


Figure 7: The Axxe kick drum patch.

► more realistic (ie. like a real drum, not a beatbox) by reducing the filter resonance a tad, thus allowing a little of the VCO through the VCF. This adds a subtle tonal quality that sounds much like the shell of the kick drum. Then, if you set the trigger to 'Auto Repeat', and the LFO frequency to 2Hz, you have a killer 120bpm beat that that's every bit as usable as those generated by dedicated drum machines.

Bass Drums On The  
Roland SH101

The Roland SH101 offers a similar architecture to the Axxe, so it's not surprising that its kick drum patch is almost identical to the one we have just discussed. Sure, there are differences in the values of the settings, but these are merely a consequence of the different circuitry used. The philosophy of the patch is identical, and it yields very similar results.

So, we again set the VCF resonance to maximum, the cutoff frequency to minimum, and (in this case) the 'VCF Env' amount to about 60 percent. Likewise, the Decay and Release settings are in the region of '6'... and provided that all the other sliders are at zero, that's all there is to it, as shown in Figure 8 (right). If anything, this patch has more punch and depth than the Axxe's. This shouldn't be too surprising; ARP synths are renowned for their bright and fizzy sounds, not for warmth and thickness.

Tweaking Figure 8 yields numerous other bass drum sounds. For example, you can introduce some 16' sawtooth and/or the sub-oscillator to introduce a tonal quality to the sound. To do this, you increase the appropriate faders in the mixer, then reduce the 'VCF Env' amount and raise the cutoff frequency just far enough to let the lowest harmonics pass. You'll then need to adjust the contour to get just the right amount of 'ringing'. The result (shown in Figure 9 above) looks similar to Figure 8, but it has a distinctive quality that sets it apart from the previous patch.

If you program Figure 9, you will find that it is incredibly sensitive to tiny changes in the cutoff frequency, and moderately sensitive to changes of the Envelope amount and ADSR settings. This means that there are numerous variations on the theme, allowing you to create anything from huge, booming drums to tight, snappy ones. So, before leaving the SH101 behind, I'm going to take you back to

percussion sound imaginable, and you'll love it!

How Close To Theory?

At this point, we should be able to look back to Figures 1(a) and 1(b) and see that the theory and our patches are broadly in line with one another. After all, if the Axxe and the SH101 were producing excellent bass drum

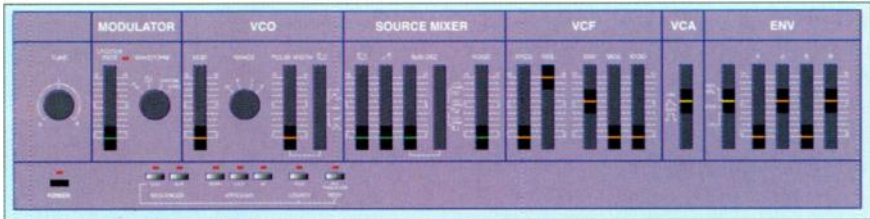


Figure 8: The SH101 kick drum.

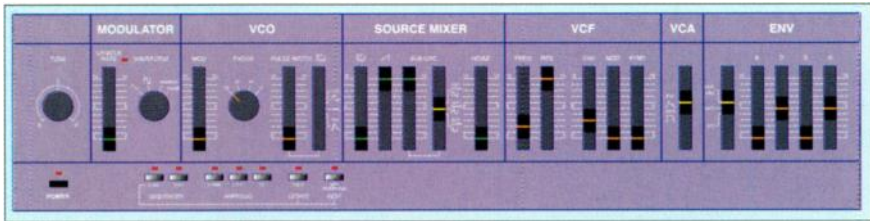


Figure 9: Another SH101 kick drum.

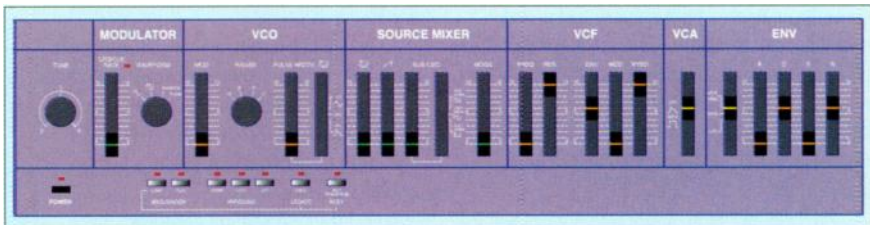


Figure 10: The SH101 SynDrum.

Figure 8, and make just one change, increasing the 'VCF Kybd' (keyboard tracking) fader from zero to 100 percent (see Figure 10). If you do this, and play the notes at the top of the keyboard, you'll find that you have recreated the SynDrum, an early analogue percussion instrument dating from the late '70s. This makes the characteristic 'ray gun' sound that littered the electronic music of the era. It's perhaps the cheesiest

sounds without a nod in the direction of last month's analysis, the academic approach would be a complete waste of time and rainforests. And it isn't.

To perform this comparison, I'll remove the trigger from Figure 1(b), and then add some annotation to remind us which bit is doing what (see Figure 11). We should now be able to relate the theory to the settings that we have chosen.



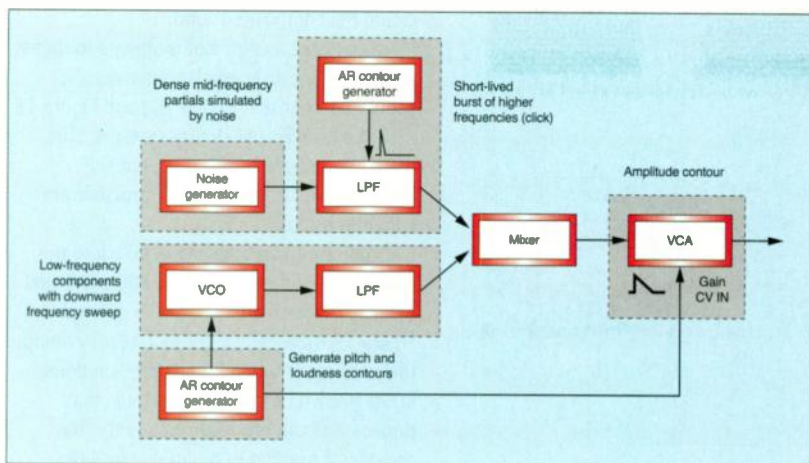


Figure 11: Analysing the components in Figure 1(b).

Let's get rid of the easy stuff first. In each synth, the ADSR is providing the AR contour, and the audio VCA is responding to this as required. But what of the 'low-frequency components with downward frequency sweep'? This is the clever bit, where we replace the VCO and filter combination with the self-oscillating filter.

Next, we come to the noise module simulating the mid-frequency partials. We use the synths' noise generators for this but, as already noted, little of this sound passes to the output because of the action of the filter. Fortunately, this doesn't seem to matter, implying that the absence of the mid- and upper- frequencies does not impair our perception of the bass drum sound.

This may seem to be in marked contradiction to my statements about the importance of the mid-range partials in the bass drum sound in last month's part of this series, but I suspect that there are valid reasons for this. Firstly, audio engineers now tend to emphasise the low frequencies of the bass drum sound — whether the instrument is acoustic or synthesized. Secondly, I don't trust analogue synths, and I suspect that there are numerous low-amplitude, higher-frequency components present in the final sound (sure, we didn't ask for them, but they are introduced by distortion in the

overdriven, oscillating filter and the VCA). Thirdly, we are so accustomed to electronic drums that we no longer fully appreciate the sound of a real bass drum. You can verify this easily. Load a high-quality concert bass drum sample and compare this to your synthesized sound. Now you can hear where the real mid and upper frequencies have gone.

Finally, there's the high-frequency click, and again we benefit from a sonic short cut. Because the attack of the ADSR is very rapid when the Attack is set to 0, the VCA creates a discontinuity at the start of the sound. For reasons we need not worry about, this discontinuity contains (or more properly is) a very short burst of high-frequency noise, and it's this that produces a click when the sound is triggered. I'm forever reading complaints on various on-line forums from players who bemoan the click at the start of their sounds, and write to ask whether their synths are faulty. Likewise, I've lost count of the number of times that I've answered this, explaining that it is the desirable consequence of truly snappy contour generators and VCAs.

Anyway, we can now redraw Figure 11 to show the manner in which the Axse and SH101 produce the bass drum sound, creating Figure 12 (shown on the next page) in the process. This may look quite different from Figure 11, but the principles of the sound are identical, and it is this that allows us to develop patches for synthesizers more limited than Figures 1(a) and 1(b) would otherwise require.

## Classic Bass Drum Sounds 1: The Roland TR909

No discussion of analogue bass-drum sounds could possibly be complete without studying the way in which Roland created the most used (and over-used) drum sounds of all time. These are, of



Roland's TR909 drum machine.

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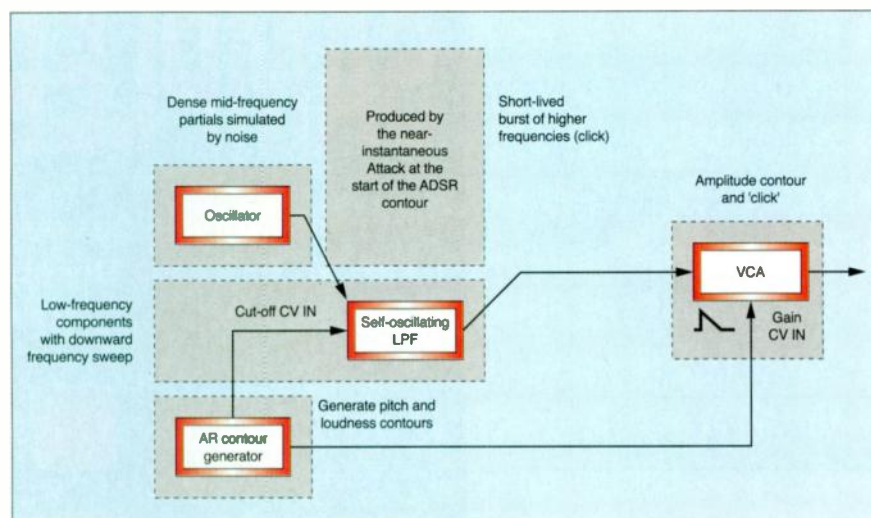


Figure 12: How the Axe and SH101 recreate the sound of Figure 1(b).

► course, the bass drums generated by the TR808 and TR909.

We'll start with the TR909, because this is the one that most closely follows the principles that we have discussed (see Figure 13 — and before anybody writes in to say that this doesn't look like Roland's schematic... you're right, I've laid it out differently).

Starting with the upper signal path, you can see that the

oscillator produces a sawtooth wave whose pitch is defined by EG3, which has an instant Attack and slow Decay. The output from the oscillator then passes through a waveshaper. This removes almost all the overtones, transforming the sawtooth into something very close to a sine wave. This in turn passes through a VCA controlled by another contour generator (EG1) that provides the required AR envelope (the amplitude of EG1's Attack and its Decay rate are modified if the Accent voltage augments the Trigger).

So far, so good... so let's now turn our attention to the lower audio path. This starts with a noise generator whose output passes through a low-pass filter to remove the high frequencies. The output from this is mixed with a short pulse (essentially a click) provided by the pulse generator, and the sum of the two is contoured by a VCA controlled by EG2. Finally, a mixer combines the output from both the upper and lower signal paths to

create the composite sound.

It may take a couple of moments to digest Figure 13, but once you have done so, it should be clear that Figure 1(b) and Figure 13 describe remarkably similar systems. Sure, there are detailed differences, but the fundamental ideas and patch structure are common to both.

Some synth fanatics dig deeply into the electronics of their TR909s to add additional controls for each element of the patch in Figure 13. However, if you don't fancy doing this, you could buy an Analogue Solutions BD99 (shown below left), a module that duplicates Roland's original circuitry, but provides a number of additional facilities.

For example, you can tune the basic pitch of the VCO (something that was not possible on the TR909). You can also control the amount of 'click' heard at the start of the note (the Attack level of EG2) and the Decay time for the sound (the Decay rates of EG1 and EG2). You can even apply varying amounts of Accent using the input provided, and control the pitch of the VCO using a CV.

Of course, none of this alters the basic principles we have discussed... these controls simply allow you to change some of the parameters that define the exact nature of the sound. But what a difference this can make. Many percussion instruments share common principles, so you can leave the domain of bass drums far behind, and use the BD99 to produce sounds such as toms and congas too.

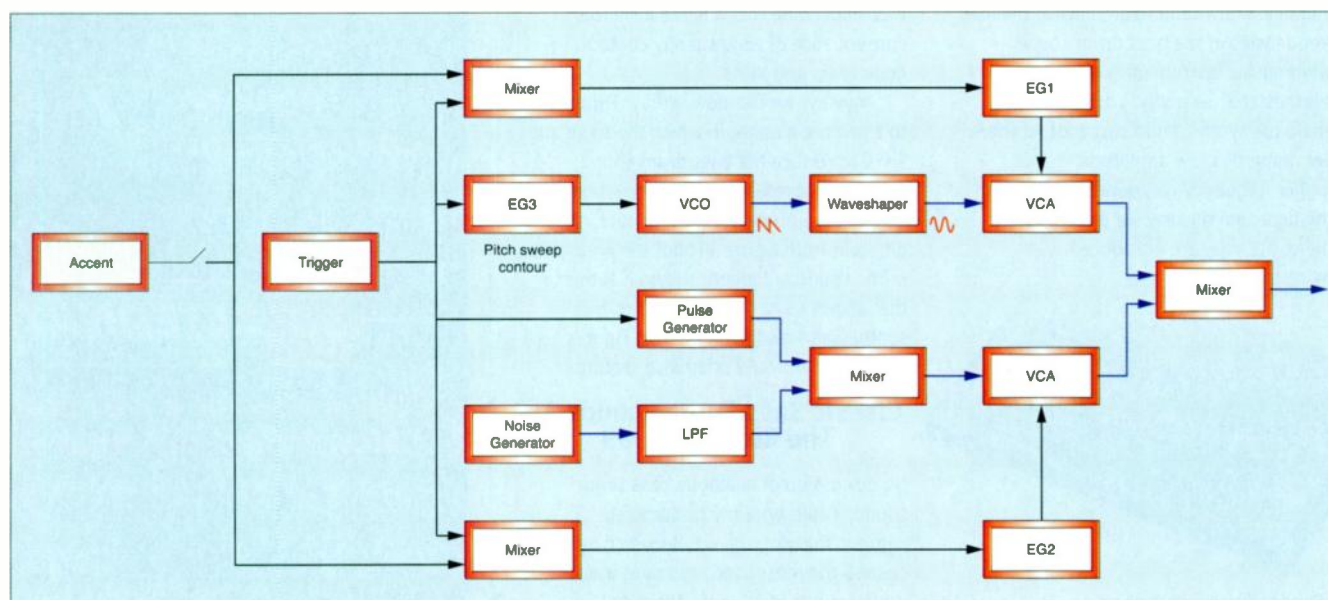
## Classic Kick Drum Sounds 2: The Roland TR808

Given that many people lump the TR808 and TR909 together, you may be surprised to discover that they generate their sounds in



Analogue Solutions' BD99 909 kick drum synth module.

Figure 13: The Roland TR909 bass drum.





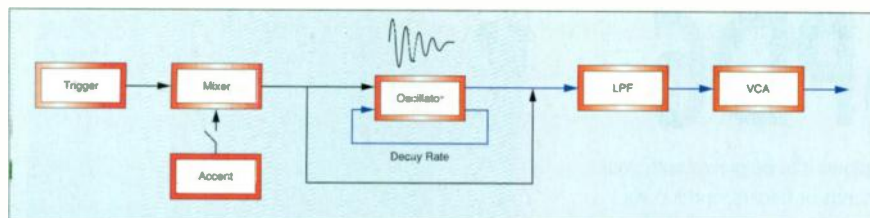


Figure 14: The Roland TR808 bass drum.



The (inter)face that launched a billion kicks: the TR808.

entirely different ways. Indeed, whereas the TR909 kick drum is virtually a synthesizer in its own right, the TR808's is a far simpler — and in many ways far cleverer — bit of electronics.

Figure 14 (above) shows the block diagram for the TR808 bass drum and its slightly more advanced Analogue Solutions progeny, the BD88. As you can see, it lacks the multiple signal paths we have discussed, has no noise generator, and no contour generators. So how does it produce the sound we want? To answer this, we must look at the type of oscillator used in the circuit. It is called a 'Bridged T-network', and it is quite unlike any oscillator that we have encountered before in Synth Secrets.

Consider the oscillators in your analogue synthesizers, whether monophonic, polyphonic, paraphonic... or whatever. All these synths' oscillators produce

their outputs continuously, and whether we hear them or not is determined by the action of VCAs controlled by contour generators which are themselves initiated by triggers, as shown in Figure 15 below (if you connect the output from a conventional oscillator directly into a PA system, it will howl at you unceasingly until you pull out the plug).

Now cast your minds back to junior school. Did you annoy your teacher by holding your ruler hard against the desktop before flicking it to go "boooooiiiiigggggg"? If you did, you were using an oscillator that, once excited, produced a sound that decayed to silence, yet did so without *any* contour generators or amplifiers.

It should come as no surprise to learn that some electronic circuits respond in the same way. The Bridged T-Network in the TR808 and BD88 is one such circuit, so we can replace Figure 15 with the simpler diagram that is Figure 16 (below right).

With an oscillator of this sort, you can use positive feedback to determine the decay characteristic of the sound. If you increase the amplitude of the feedback too far, the decay will extend to infinity, and we will be back where we started, with a continuous oscillator.

Understanding this, we should now be able to decipher Figure 14. The Trigger kicks the oscillator into life, initiating the audio signal (the presence of an Accent increases the impulse and, through the action of some very clever circuitry that we will not discuss here, also makes the sound punchier by accentuating the start of the note). Next, some of the Trigger+Accent signal — which is, of course, a brief CV

pulse — is added into the audio signal path to emulate the beater hitting the membrane of the drum. The combined signal then passes through a low-pass filter that allows you to remove higher frequencies, thus subduing the amount of click if desired. The final VCA then amplifies the signal and feeds it to the output.

Finally, it's worth noting that, by accident or design (I'm not sure which), the TR808 kick drum oscillator goes slightly flat at long decays, which is exactly what's required to make the patch sound convincing. Earlier Roland rhythm products (such as the CR68 and CR78) did not do so, and this is one reason why analogue drum machines sounded so much better from the TR808 onwards.

## How Low Can You Go?

So there we are... the secrets of analogue bass drums laid bare. And, although the TR808 bass drum circuit shows that there is more than one way to skin this particular cat, we've never strayed too far from the theories laid down last month. All of which goes to show that, if you understand the nature and fundamental characteristics of a sound, you can take a good shot at recreating it on any synth. Moreover, as Roland discovered with the TR808 and 909, you may even develop a sound that will become a sonic masterpiece in its own right. Now, wouldn't that make it all worthwhile? SOS

Figure 15: The conventional signal path: trigger, envelope, oscillator, and amplifier.

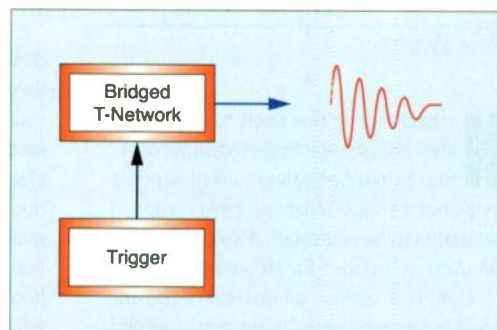
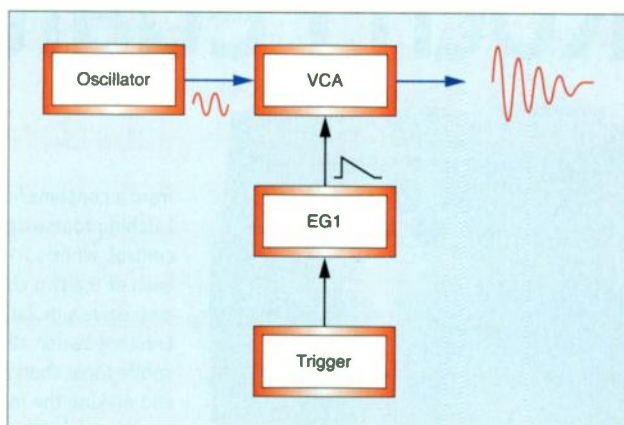


Figure 16: An oscillator that decays to silence on its own.



Analogue Solutions' BD88 TR808 kick drum module.



# Roland SPD6

## Percussion Pad

Paul White

**T**he SPD6 MIDI percussion pad features 113 internal drum sounds, with six rubber playing pads and can run from an optional power adaptor or from batteries, with a life of up to 20 hours. A sensitivity switch

allows it to be played with your hands or fingers, and it comes with 16 preset drum kits and 16 user kits. You can connect two footswitches to trigger an additional kick drum sound and to switch between open and closed hi-hat settings. The pads themselves seem to use piezo transducers and are more sensitive in the middle than at the edge, but they're reasonably forgiving of sloppy playing.

All the connections are on the rear panel. Here you'll find the sensitivity switch, volume control, a MIDI Out socket and a pair of audio outs. The kits are divided into acoustic, electronic, latin and special effects, and most of the sounds come from other Roland products. My only criticism is that there are too many silly special effects, such as creaking doors, thunder, and car skids. Many of the drum sounds are electronic, so if you're after rock, pop or jazz kits, the choice is pretty basic. You can assign new sounds to any or all of the pads (but not edit the sounds themselves) and change the MIDI note number output when a pad is hit. Additionally, the

velocity response curves of the pads can be changed, though some of these operations are pretty arcane.

It seems Roland assume that the SPD6 will be used only to trigger other sounds, because there's no MIDI In to trigger its internal sounds. Furthermore, the sound engine has only four-note polyphony; you soon hear note stealing on fast fills. The lack of a MIDI In is a curious omission, but overall, the SPD6 succeeds as a compact, simple and affordable drum pad system that can be used live or to program parts into a sequencer. **SOS**



Photo: Mike Cameron

### SOUND ON SOUND

#### pros

- Easy to play with sticks or hands.
- Good-quality sounds.
- Mains adaptor or battery use.

#### cons

- Limited polyphony.
- No MIDI In.

#### summary

A handy, compact drum pad system ideal for programming percussion parts into a sequencer or for taking along to jam sessions.

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# Koch Pedaltone



Paul White

**H**oused in an impressively tough stainless steel chassis, the Koch Pedaltone uses four twin-triode valves, one of which is in the output stage, enabling power amp saturation to be replicated. A speaker simulator is included for recording or DI'ing.

Eight jack sockets on the rear of the unit provide enough flexibility for most live and studio requirements, though power comes

## Tube Guitar Preamp

from a consumer-style external adaptor. Latching footswitches cater for performance control, while 11 knobs set up the sound for each of the two channels and for the power amp drive simulation. A rear-panel Channel 1 Enhance switch allows you to introduce a subtle tonal change, adding a little more top and making the mids sound slightly scooped, for that 'more Stratty than Strat' rhythm sound.

The overdrive characteristics and playing dynamics of the Pedaltone are, unsurprisingly, very similar to those of a tube amp, and clean sounds with just enough drive to add a hint of jangle are nicely authentic. For recording, I feel the overdrive sound is somewhat let down by the speaker simulator — the mid-range is pretty authentic, but there's no real bottom-end kick even with bass EQ boost, and the high end has a somewhat fizzy edge which might (generously) be interpreted as sounding slightly American.

### SOUND ON SOUND

#### pros

- Flexible two-channel control layout.
- Amp drive emulation is very good.

#### cons

- External PSU inappropriate for live performance.
- Speaker simulator lacks depth and allows a little too much buzzy top end through.

#### summary

A well-made preamp that sounds great through a small guitar amp, but less effective when DI'd.

Played through a guitar amp, however, even at very low levels, these problems are swept aside and the results can be extremely good. If you record using a small amp miked up, the Pedaltone therefore makes an excellent front end, but for DI recording I'd prefer the results from a good modelling preamp. **SOS**

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**T**he subject of this month's Readerzone, somewhat unusually, doesn't have a home studio at all, but instead has chosen to concentrate on location recording — and with his modest Portastudio-based setup he's achieving a degree of local success in the heart of Somerset. Gary Amos has been close to the music industry before, as manufacturing manager of what was once the Philips CD factory in Blackburn, and is, in fact, a professional engineer — well, a chemical engineer, anyway! Gary takes up the story.

"It all started as a joke, really. Some friends in our Somerset village said they were forming a band and I offered to be their roadie! Before I knew it I was in a garage on an industrial estate, sorting out microphone leads and allowing my friends to relive their youth by playing at being a '60s and '70s cover band. As things progressed, rugby club, pub and birthday party gigs came along, and I found myself as their 'sound engineer' and general dogsbody, replacing blown transistors, making stage wiring looms, and so on.

"Early on, to make myself useful during weekly rehearsals, I started to tape the village-hall practice sessions in order to



Gary at home with his simple location setup.

## Gary Amos

# Readerzone

(diplomatically) help the band improve, playing back songs over the PA. Then *Sound On Sound* was discovered and I was amazed at how inexpensive multitrack recorders had become. So I invested in a Tascam 424 MkII Portastudio."

The purchase of the 424 marked the start of a real addiction to live sound recording for Gary, though he's had a long-standing interest in music.

"Judging by the *SOS* reader surveys, at 46 I must be at the upper age range of people starting out with this hobby. I did have a go at recording some 20 years ago, but good equipment was really out of reach financially. I briefly took piano lessons in my late '30s, but I only got as far as Grade Two, and I became disillusioned when I saw how fast my daughter was progressing with her lessons. Hi-fi has also been an interest for me, right from my student days. To save money back

then, I built my entire system from kits, and I still build my own loudspeakers.

"Subconsciously, I suppose I always had an interest in recording, as I used to listen for good arrangements and effects in a lot of the progressive '70s music. I used to buy records more for their recording quality, whether they were rock, folk or classical."

### (Almost) Absolute Beginner

The 424 cassette multitracker has been reviewed in *SOS* a number of times and, despite being an entry-level machine, is capable of producing very good sonic results. Gary explains how he used it: "Typically, drums were sub-mixed through the band's Yamaha powered PA mixer via an aux into one channel, with auxiliary two used for vocals, and the bass and lead guitar would feed the remaining two channels on the four track. At live gigs, with the auxes used to

feed the four-track, the PA headphone output had to be used as the vocalists' stage monitor feed, but you could, with care, get some acceptable recordings with a nice '60s feel. Two-hour evening practice sessions might yield only one good take, but eventually, using the band's Zoom effects unit and a second-hand Alesis 3630 compressor, I was able to produce some passable demos on cassette. We used the services of a friend in the village who was a self-employed pro in the music business to master and duplicate our first CD. The band were delighted, though I don't know what *SOS's* Demo Doctor would have thought! Fortunately, Michael Law, the person who duplicated our first CD, has been very helpful and acts as my personal demo doctor. Having been in the business for 25 years, working with well-known artists, he can

### Main Equipment

- AKG C1000 (x2) and AT3035 mics
- Alesis 3630 compressor
- Joemeek VC3 preamps
- Tascam 788 digital Portastudio
- Traxdata CD writer



provide an instant critique of my recordings.

"My early attempts at mixing usually resulted in over-emphasised vocals, with everything swimming in reverb. Weekly practices running a PA and recording, with the weekend to mix down in the lounge at home, soon started to develop into a routine. I could turn around six songs onto cassette or CD for band members to listen to before the next practice. I've read a number of books on recording, and I've taken note of the *SOS* technique pages, but you soon find that there's no substitute for experience. You learn an awful lot about live sound just with basic equipment and amateur musicians."

Encouraged by the good results he was finding it possible to produce, Gary began to think of adding more equipment.

"Eventually I purchased my own AKG C1000 microphones for drum overheads, and we bought an SM58 and an Audio Technica Pro25 kick drum mic out of band funds, to supplement the very basic Peavey stage mics. The recording quality improved. A Traxdata consumer CD recorder completed the basic recording setup, and then routine production of CDs at home was possible via my hi-fi. With no more than £1000-worth of gear, I could easily make demo CDs at a quality that was consistent with the musicians' capabilities. Experimenting with a four-track, effects unit and compressor was a great way of learning the basics. I'm glad I started out on simple analogue equipment before going into the digital domain."

## Orchestral Manoeuvres

Having developed a taste for location recording, and with an interest in most genres of music, Gary decided to have a go at an orchestral recording. The AKG C1000s had been purchased with this in mind, as well as for drum overheads. Once more, Gary was making sure he got maximum use from every bit of his equipment.

Luckily, when he approached the Somerset County Orchestra, based in Taunton, their committee were keen to have a recording of their Christmas concert based on dance music through the ages.

"The programme varied from chamber, concerto and orchestral, through light music, to a modern composition including rock instruments, plus a 100-strong school choir! This was a challenging multi-mic job, really, but my modest setup at that time could only stretch to simple direct-to-stereo recording. In fact, I used the 424's preamps feeding the CD recorder, to get a 16-bit digital recording. Tapes were used as a back-up, but the dynamic range of the music was beyond the capabilities of a cassette multitracker!

"In the end, the recorded sound quality was excellent. I had the luxury of working in a



Almost everything Gary needs fits on a small mobile trolley: his Tascam digital eight-track, Joemeek VC3 preamps, and CD recorders. Gary has even recorded in stereo direct to the Traxdata CD recorder on location.

proper control room in a brand-new arts centre, and a little help from the resident sound engineer. I used the C1000s as a coincident stereo pair, situated about 2m behind the conductor at about 2.5m height. They captured the sound well, albeit with too much emphasis on the brass section, a thin string section, due to the number of violinists, and a rather distant choir. The varied programme was a superb learning experience.

"The master CDRs were mixed down via the Zoom unit, to add a bit of artificial reverb to the dry acoustics. Editing from CD to CDR had to be done with very basic facilities. Edit points, fade-outs, and so on, had to be noted on a sheet of paper as the two master recordings were compiled onto a 70-minute CDR master. I had a local duplicating company produce 30 copies, and I used the *Expressit* software to produce labels and inserts at home. I even sorted out the MCPS royalty payments!

"The orchestra were amazed at the sound quality. The conductor would have liked the balance changed — the brass section tend to drown the strings — but I had to explain that this was not a multi-mic Deutsche Grammophon recording! Given the sound quality of the amateur orchestra, the recording was entirely adequate, and it was a good souvenir for the members of the orchestra and public."

## Going Digital

Gary next became involved in a project which has proved to be a long-term proposition, working with Lucy Stroud, a local songwriter whom he saw performing in his local pub and invited to support one of the band's gigs.

"I produced a live recording for her, on the 424, and then we recorded 10 new songs at a village hall, simultaneously onto the the 424 and CDR, using one track for vocals and one for guitar. It was a low-budget, stereo, 16-bit digital recording, purely for demos to give to pub landlords. We're now doing a higher quality album project with new equipment.

"I'd started to outgrow the 424, and I felt that digital multitracks were becoming affordable. After a lot of research I settled on the Tascam 788, because it had the right features at the price for the way I work. This, coupled with a couple of Joemeek VC3s and the new Audio Technica 3035 microphone, gives something very close to a professional sound.

"Lots of the articles in *SOS* have inspired me to have a go at recording a wide variety of instruments and musical styles. My basic approach has been to scour the local papers for details of gigs and concerts, and then ask if I can record the concert, at no charge, to learn microphone techniques and get used to a wide variety of acoustics. Most musicians



► are delighted to have a recording of their live performance. It's quite remarkable what you learn from doing each location recording.

"The big change in facilities and sound quality now that I'm using quality preamps and the 788 has enabled me to produce CDs



The AKG C1000 mics are central to Gary's location work, helping him capture everything from vocalists and drum kits to orchestras, jazz bands and a Brazilian percussion ensemble. He's now expanded his mic collection with the AT3035 large-diaphragm condenser, ideal for vocals.



from an organ concert at Wells cathedral, a lute and recorder recital, a string quartet, jazz band, a soul band, and the Samba Sulis Brazilian percussion ensemble from Bath. Of course, I'm also continuing the longer-term album project with Lucy Stroud.

"I'm now routinely using a new lottery-funded village hall for recording. It has excellent (if lively) acoustics, but you can use them to good effect by placing the musicians and microphones carefully. Sticking to one main venue is very useful — I'm used to the hall and its acoustics, and I can record drums without needing to put any reverb on at all during mixdown. You just have to be careful and not get too much spill into the mics. The hall also has the advantage of being in a rural situation, well away from any noise. We do get the odd roof creak, due to thermal expansion — usually in the quietest passage of a song! — but it doesn't happen too often. The downside is setting up the gear for each session and that's where the simplicity and portability of a Portastudio and the Joemeek preamps gives me an advantage."

With such a simple setup, does Gary never yearn for more sophisticated gear, or even the convenience of computer-based editing? His answer is unequivocal.

"I have no wish to spend my

time with MIDI and computers. I prefer working with real people and live sounds to sampling and sequencing, even though I do have *Cakewalk* and a Yamaha keyboard. I suppose it must be my age. Music technology has brought us some great sounds, but it can make things so clinical that the human element is neglected. There's a lot of satisfaction to be had by tracking down and recording someone with (say) a real harpsichord rather than using a setting on a synth. And because I make contact with such a wide variety of musicians, I can use their

services on the album project, too. I was able to get a Latin percussion backing on one of the songs by offering to do a recording for the Samba Sulis ensemble.

"For the money, the Tascam 788 is an excellent piece of gear. People might look down their noses at Portastudios, but the sonic results have been good enough to please professional musicians. They even sound good on £2000+ hi-fi systems. The main market for my efforts is band demos and very limited runs of

CDs for musicians, so why would I need anything more?

"There are some compromises — such as only having six simultaneous inputs, getting digital distortion with some programme material well below the metered 0dB level when mixed, and some effects limitations. But they force you into improving your own recording techniques. I'm sure you learn more by striving to get release quality recordings out of semi-professional gear. Anyway, the equipment I have is probably far superior to what was used on some of the pre-'70s music I listen to. An engineer in the 1960s would have given anything for eight tracks, let alone digital mixing, editing and effects! Moving to a digital hard disk system shows you that the

## Complete Gear List

- AKG C1000 mics (x2)
- Alesis 3630 compressor
- Audio Technica 3035 large-diaphragm condenser mic
- Home hi-fi for monitoring and mixing, with Arcam Delta 90 amplifier and home-made Wilmslow Audio Volt Studio monitors
- Joemeek VC3 preamps (x2)
- Shure SM57 dynamic mic
- Tascam 788 digital portastudio
- TEAK SCSI CDRW (for multitrack backups)
- Traxdata CD writer
- VDC starquad OFC cabling (at least 100m)

Plus access to band's PA and mics



When Gary upgraded to digital from his Tascam 424 analogue cassette Portastudio, he stuck with Tascam, finding that the 788 eight-track had "the right features at the price" for the way he works.

main limitation is in your own sound engineering abilities, rather than the equipment."

## Future Perfect

Gary's compact setup has been chosen with great care, bearing in mind his levels of expertise and his requirements at each stage. He's a great example of what enthusiasm and a flexible, optimistic attitude can achieve, with a location recording sideline going from strength to strength, and even a recent local newspaper feature to raise his profile — and he still manages to hold down a conventional job. "I would love to become a recording engineer full-time — just like many other readers, no doubt! But realistically there is still so much to learn, and in the short term finishing a good quality-album project with Lucy Stroud is my main aim. It may only sell

a few hundred copies at her local gigs, but I'll get more of a sense of achievement out of that than I did running a CD factory making 200,000 chart CDs per day! Maybe the hobby would be less enjoyable if I had to earn a living out of it anyway. Eventually I'll have to solve the problem of driving my wife and teenage children mad hearing mixdowns in the lounge of my 'sad' music, but at the moment there is no space for the traditional home studio." **SCS**



Some of the CDs Gary has recorded and helped to produce. He even does the artwork!





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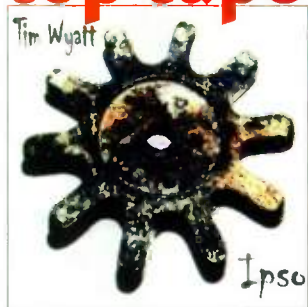
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## top tape



### Tim Wyatt

**Recording Venue:** Home.  
**Recording Equipment:** Apple Mac G3 running Emagic Logic Audio MIDI + Audio sequencer with various plug-ins, Rode NT1 microphone, Mackie 1202 mixer.

Keyboardist Tim Wyatt is rather fond of 7/8 time signatures, and even manages to construct a rap around one on the third mix of this demo! His trick on both the 7/8 tracks I checked out is to leave the listener blissfully unaware that an unusual time signature is actually being used. This is achieved by careful drum programming, editing of loops, and repetition of a simple piano and bass riff, as you can hear if you check out his mix of 'Questions' on the SOS web site. It's only when Tim moves from the excellent verse rap and strong chorus built around a Connor Reeves sample (downloaded from the Internet) that we're into muso territory. Even then, the clever use of chord voicings and key changes holds the interest and conspires to give a magnificent dynamic lift when the chorus vocal breaks back in. Technically, the drums start to sound over-compressed at this point, and the sound lacks the warmth in the lower-mid range that is provided by the strings in the verses and choruses. However, that doesn't prevent

this from being an exciting musical moment.

Listening closely to the first track on the CD, I was impressed by Tim's production skills, especially when it came to the vocals. Not only is this a brilliant vocal performance, but the general equalisation and compression is well handled. The Rode NT1 definitely doesn't have this amount of presence, so Logic's native EQ was probably used to add presence (typically at around 5-8kHz for voice). I also noticed that the lower bass has been rolled off, to allow space for the fat kick-drum sound to dominate. In some sections of the mix there is no bass synth or sampled bass, and the kick drum part of the drum loop has to be strong enough to hold its own — which it is. In this track, the 7/8 rhythm that Tim's fond of is more of a 4/4 followed by a 3/4. Considering that the song was originally recorded in 4/4, he's manipulated the vocal line remarkably well to fit the new time signature, using one of Logic's editing options. I'm also impressed with the way Tim treats the voice during the mix: in one 20-second section he lengthens and shortens reverb

## How To Submit Your Demo

Demos should be sent on CD, DAT, Minidisc or Cassette to:  
**Demo Doctor, Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambridge, CB3 8SQ, UK.** Please enclose a band/artist photograph and/or demo artwork (which we may

use here and on our web site to illustrate your demo review). Including contact information, such as a telephone number, web site URL or email address, will enable anyone who is interested in your material to contact you.

decay, applies telephonic EQ and cuts to dry, without drawing attention to it all. (The most effective way to cut to dry is to mute the reverb effects return, as this doesn't leave any potentially noisy channels open.)

This is an excellent CD from a good musician with interesting production ideas. Hopefully his search for remix work will be successful. ■



### Mark Barnwell

**Recording Venue:** Home.  
**Recording Equipment:** PC running Steinberg's Cubase VST MIDI + Audio sequencer, Yamaha DSP Factory soundcard, Behringer MX2642 desk, AKG C451 and C3000B microphones.

Mark's classical and Flamenco guitar playing is the basis of all the tracks on this CD and is supported by extra instrumentation on three of the mixes. 'Surco Latino' is the one featured this month on the SOS web site. Melodically, it bears an unfortunate passing resemblance to the classic 'I Will Survive', but is an instrumental track. On his composition, Mark has kept the instrumentation simple, going for a conga loop and bass line chosen from the *Latin Groove Factory* and *Liquid Groove* CD collections, with mic'd up rhythm and solo guitar parts overdubbed to the groove. The classic I/IV/VII Latino bass line locks in well with the stereo conga loop, and even though it's a pattern that remains constant throughout I'd suggest adding to what's already there, rather than looking for a different loop. Extra percussion, such as shaker, scraped torpedo and claves, could be brought in gradually, and the odd timbale fill wouldn't go amiss either. This would improve the dynamics in an arrangement which simply gets to a certain level quite quickly and stays there. The

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gentle sound of waves breaking on the beach introduces and leads out of the piece, but it could also be used in the middle under a low-key percussion section where the guitars drop out. This breathing space from the constant guitar would then create a lull, from which the reintroduced guitar could dynamically lift and build towards the end of the arrangement.

Double-tracking of the rhythm guitar would also work on this track. Panned hard left and right, the slight timing disparities between the resulting guitar parts would be more interesting to the ear, and would also give the impression that the conga pattern had more rhythmic variation than is actually the case. On the subject of the guitar,

## Doctor's Advice: A Case For Outboard Reverb

Listening to Wayne Rowley's orchestral compositions (see 'Quickies' section), it was obvious to me that he actually needed one Concert Hall-style reverb across the entire mix rather than the separate ones built into the sound modules. When diverse manufacturers are involved, supposedly similar reverb settings are often nothing of the kind, particularly in terms of decay length

and tonal character, and of course samples don't always have a 'dry' alternative. On this particular project, given that so many sounds were being triggered via MIDI, recording the sources as audio to the PC and using a plug-in reverb was not an option. Even mastering to the PC and using a plug in-reverb across the mix (where software allows) removes the opportunity for individual send gain

control to the reverb from source signals. The solution leads us back to the simple outboard reverb unit and line mixer (Wayne actually says he's looking to purchase a Lexicon MPX200 and already has a Spirit Folio mixer). So don't throw out that old reverb unit just yet — you may occasionally need it to emulate a single acoustic space for multiple sound sources!

Mark's Juan Hernandez Flamenco model is well played and recorded throughout. Undoubtedly Mark has used the AKG 3000B to mic the guitar, and although this is a budget condenser with a tendency to accentuate the mid range of frequencies, the sound is

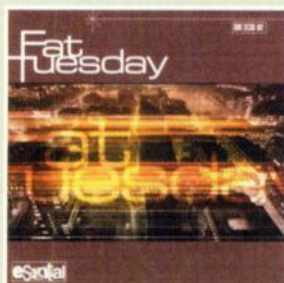
remarkably natural. It appears that no compression has been used, but Mark has still managed to control the 'Golpe' strokes, where the guitar is rhythmically struck on the soundboard. These percussive strikes can sometimes be a lot louder than the plucked string notes, and consequently

hard to deal with. Mark may have used some gain editing in *Cubase VST*, but as the string decay goes across these sections I imagine that he has simply kept control of the dynamics naturally. After all, the CD demonstrates that his playing is excellent in all other areas. ■

## QUICKIES

### Jules

Jules have had problems getting a loud mix recorded to CD without clipping. Largely, this is down to the lack of compression on the vocals, which they like to place high in the mix. I'd suggest getting a combination vocal compressor and equaliser, so that some of those 1kHz mids can be softened too, but as they can already do this to a certain extent with their VS1680, perhaps what they need is the character of a valve unit. As for the mixes, the voice is too loud for my taste, and the keyboard parts need to come up. This may be the reason why the instruments sound 'muddy' — they're simply not loud enough. ■



### Fat Tuesday

No one can doubt the musicianship and performance energy on this CD, but the mixes need attention. The vocals are distanced, by both their low level and the reverb used, on most of the songs. If they were

mixed louder and dry they would give the band a far more contemporary sound — especially on the tracks by this technically competent combo that mix jazz fusion and rap. Elsewhere, drums tend to dominate, at the expense of the often more interesting keyboard parts. I imagine the CD reflects the sound of the band live, but it falls short on studio production skills. ■

W [www.fat-tuesday.net](http://www.fat-tuesday.net)

### Muffin

Decent songs and a good voice make this a pleasant listen. The Audio Technica 4033 mic suits the mellow female vocal, giving it a pop presence in addition to maintaining warmth. As for the backing, it's adequate but could do with more work to make the songs really come to life. The drum loops chosen (from Propellerhead's *Reason*) are OK for a demo but fairly pedestrian, and need augmenting with percussion, real or programmed. More modern-sounding loops would bring the production up to date too. Programmed synths are used extensively, and some of the sounds are lacking — the trumpet and acoustic guitar sounds, for example, which could be replaced by the real thing, as there's nothing wrong with the musical parts. If the band want to stick with synths, why not look to something like Stevie Wonder's *Talking Book* for inspiration? This album features fantastic soul synth sounds that would work on a modern album. ■

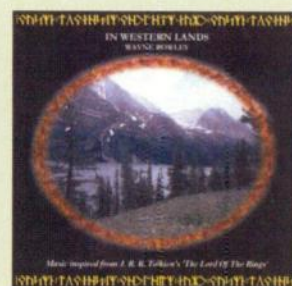
W [www.friedeggstudios.freerve.co.uk](http://www.friedeggstudios.freerve.co.uk)

## Stress Technology

There's a punchy start to this progressive dance CD, courtesy of a good sample ("Get stuck in straight away", in good female BBC English) and an insistent bass line which morphs neatly, after one and a half minutes, into another punchy groove. A different sample of the spoken voice is used later on, but this time it's so heavily shrouded in delay that the meaning is lost — a shame, as the first one is so funny. Good, forcefully fat synth sounds abound, from the Korg Trinity, EA1 and Sequential Prophet 5 analogue synth. Two musical shorts lasting just over 45 seconds are placed between the three main tracks, and I liked this idea, although the first of these shorts could have been developed into a longer arrangement and the second had a rather sudden fade. Overall, this is a very well-assembled CD, with the occasional technical lapse. Track five, for example, is pretty noisy, and surely some form of denoiser inside their *Sound Forge* software could have been used to sort it out. ■

## Wayne Rowley

Wayne's musical homage to Tolkien's *Lord Of The Rings* takes the orchestral route, but employs Kurzweil and Roland JV1080 orchestral sound ROMs to achieve his effect. One tip I can pass on is that strings always sound more expensively recorded with a little 1.5kHz taken out, and I felt the flute could do with a slightly slower attack, but the brass is excellent.

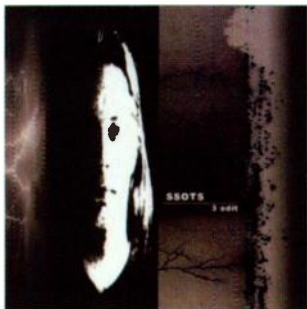


I was a little disappointed with the timpani reverb decay time on the opening track, which you can clearly hear cutting off suddenly, when it should have been similar to that applied to the other sounds (see the 'Doctor's Advice' box for more on this). However, I was impressed with Wayne's compositional skills and his ability to create atmospheric transitions smoothly with both key and instrument changes. One piece morphs from a typical blockbuster movie theme, utilising the excellent *Symphony Of Voices* sample CD, in combination with strings, into tense, heartbeat drums and a bass synth-driven section. Here the aggressive string strikes and reverb are an excellent choice to quicken the pulse rate as a prelude to an action sequence. Wayne hopes to break into film and TV work, and this generally excellent CD demonstrates that he is perfectly capable of producing the goods. Now he needs to get out there and make the contacts. ■

W [www.mp3.com/WayneRowley](http://www.mp3.com/WayneRowley)



This month we begin a regular Music Producers' Guild demo focus, featuring reviews from an MPG panel of producers, songwriters, musicians and managers.



## SSOTS

**Recording Venue:** Unknown.  
**Recording Equipment:** Fostex DMT8 digital 8-track, Yamaha effects, Audio Technica mics, Alesis SR16 drum machine, Yamaha keyboards and bass, Musicman and Washburn guitars, Pioneer CD recorder.

**Tony Platt (TP):** "I didn't really understand what they were trying to do; the style went from possibly year 2000 to somewhere back in the 1980s. I didn't think it was musically spacious or melodically pleasing."

**Steve Parr (SP):** "I quite enjoyed it. Nice use of drum dynamics, sadly not very well recorded. It was murky and had very little definition. It could be improved by keeping tighter control over the bottom end. They're not EQ'ing things in quite the right way to pull out the frequencies or give a nice, constant, big sound."

## The MPG Panel

**Andy East** is a former engineer and session player who runs his own artist management and consultancy company; **Jona Lewie** is the Ivor Novello award-winning songwriter whose 'Stop The Cavalry' is a perennial Christmas favourite; producer, engineer and composer **Steve Parr** is an expert in surround mixing; veteran producer **Tony Platt**'s numerous production and engineering credits include Bob Marley and The Wailers and AC/DC; **Jason Yarde** is a freelance composer, arranger and saxophonist who also produces and performs.

**Jason Yarde (JY):** "I thought it sounded like good film music without the pictures."

**TP:** "But if you're going to do something filmic, there's no point in the pictures still being in your own head. The music has got to make the pictures come to life. And it didn't say anything to me at all. The industry today is moving into multimedia, so if somebody wants to make music that suits images, they're going to have to do the images as well. They'll have to put the package together and give it a purpose."

**Jona Lewie (JL):** "This demo suggests that they want to work in the media, but if they are pitching for film or TV the tracks are far too long. If you're creating a showreel, you need short, precise tracks — 30 or 40 seconds — that demonstrate light and shade. Nobody in a TV production company wants to wade through 11 minutes of music."

**SP:** "Isn't there an argument for all demos being about a minute long?"

**JL:** "I thought the first track was quite arresting. Towards the end it began to wane a bit, but I thought their composition and dynamics were quite good. It's either lacking a picture or a vocal. If there was a vocal, it would add some images lyrically. The second track is very ambitious, like the Mike Oldfield epics of the '70s. There are probably good bits there — if you're prepared to sit down and listen to it. That's going to be their problem."

**SP:** "What about the design on the package?"

**JL:** "Certainly an effort has been made."

**TP:** "I think it's the same as the music. I don't think it's committed in any particular direction."

**AE:** "It's a shame they didn't put a label on the CD. They've gone to all that trouble with the packaging and the jewel case and there's no label on the CD. It's the first thing I noticed." ■



## Pleasant Stitch

**Recording Venue:** Various studios.  
**Recording Equipment:** None listed.

**JL:** "I wasn't taken by it. Great effort with the presentation, but probably all a bit of a hype. I thought the vocals were a bit Björky, but not so good. The fourth track was the most interesting."

**TP:** "I think the sequence of songs tells you a lot. There would be no point signing a band on the basis of the fourth song on their demo. They've put it there because they don't think it's really great. You might try to convince them that's the best one, but they'll still be thinking the first one is the best. They've made a bad decision, and that's probably the first of many."

"The package is a bit too much. There is too much dialogue, and half of it is nothing whatsoever to do with the music. I thought her voice was really horrible. Cerys from Catatonia strikes me the same way, but although I don't like her voice, the way they *present* her voice works for me. This girl's voice does the same thing, but there is nothing around it to soften the impact."

**SP:** "Very American voice."

**AE:** "That's because they *are* American! I thought there was nothing inspiring or original there. I felt my shoulders going up, because it was irritating me. The packaging was OTT. It's almost like they're trying to hype it up by giving you too much packaging." ■

## Surf Babies

**Recording Venue:** Unknown.

**Recording Equipment:** Emu Proteus 2000 synth, Emu ESI32 sampler, Alesis Nanopiano and Nanobass modules, Fostex DMT8 8-track, Alesis Quadverb effects, Marshall JMP1 preamp, Sony DAT, Phonic PCL3200 compressor, Fender Stratocaster.

**AE:** "A novel idea, but I don't think he's quite captured the true surf guitar thing. Maybe it's because Arnos Grove is landlocked! I think the problem is that there is only one of him."

**TP:** "I think it's a brilliant idea which he's done really badly. On the first track, I don't know whether he has truncated the guitar sample, but it's not right."

**AE:** "He needs to do more research into the surf sound. Whether it's sampled or played, it's not working. The reverb's all wrong — it's not Fender Spring reverb. But with a live band, it would have novelty value, if it was done properly."

**TP:** "If there were two guys in Hawaiian shirts with guitars and a computer in the middle, that would be fantastic in a 'Doctor And The Medics' sort of way. He's got a great idea but no confidence."

**AE:** "Maybe he's the mastermind but he needs the security of collaborators?"

**TP:** "There is lots of novelty music about, and Spinal Tap took that to the extreme. All the sword and sorcery nonsense Iron Maiden did, for example, is laughable, but they took it so seriously that everybody believed it. To sell something like that, you need to go that far. Then everybody wants to be part of it."

**AE:** "T-shirts, the whole marketing thing. The potential's there to have a field day." ■





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## Is MIDI due for an overhaul?

At last — another person who laments the lack of development of the MIDI protocol (I refer to 'Sounding' Off by Eddy Robinson, in the December issue of SOS). When will manufacturers realise that to get the optimum performance from our sound modules, keyboards and samplers we need a much faster way of communicating with our gear.

As a composer of New Age, dance and electronica music, I've found the simultaneous use of many continuous controllers, as well as SysEx, a stumbling block in more complex compositions. Often I have to record synth parts as audio tracks to free up MIDI ports — but, as Eddy points out, this is a limiting way to compose.

The moment you record a part, it is 'fixed' — OK, you can chop up the audio, or run it through one of the hundreds of plug-ins now available, but what happens if you want to change a note, or change key? When writing music, do we want to spend our time dealing with audio editors? Or do we want to concentrate on music, groove and feel?

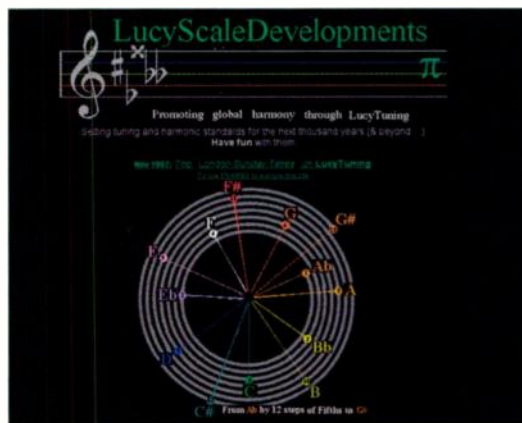
MIDI allows us to be spontaneous, but not spontaneous enough. A madly sweeping and evolving pad may sound great from your keyboard, but getting the frenzy of knob-twiddling that makes up that sound into the sequencer can be a nightmare, especially if the keyboard in question deals with the much hated-NRPNs.

Reading Eddy's article reminded me of a news story I read some years ago. Some kind-hearted gentleman had devised a new MIDI protocol. Although similar to the current protocol, it was based on ternary rather than binary language, giving far greater control. This, along with a standardisation of continuous controllers (the new protocol wouldn't be limited to 128), would revolutionise MIDI recording. Maybe then software manufacturers would start to write programs that give us as many MIDI tools as we have audio tools.

**Robin Corbet**

## Music software needs a tune-up

As a long-term researcher into tuning, I'm finding that software designers and programmers have yet to implement the MIDI tuning dump on consumer music programs



Alternative tuning the LucyScale way.

such as *Logic*, *Cubase*, and so on. I would be very grateful if you could use your influence to encourage them to provide closer tuning resolution than the present one cent increment. Closer tuning steps enable users to more accurately produce the low-frequency beating between pitches which generates the alpha and sub-alpha frequencies seen in brain-wave patterns. It seems that improved granularity is now practical, and all that is needed is a push from potential users and yourself to inspire the sampler and music software companies to incorporate it into program updates.

You can find more information on the effects of low-frequency beating on our web site at: <http://www.harmonics.com/lucy/lscd/tempo.html>

Thank you in anticipation.

**Charles Lucy**  
**LucyScale Developments**

## Live music petition suggested

I have just been looking at the SOS Off-Topic forum, at a thread concerning live music and its recent decline. One of the factors blamed for this is the cost of an entertainments license to pubs. I haven't researched how true this is, but common sense would suggest that it certainly wouldn't help matters, so here's the plan.

Among the readership of *Sound On Sound* there must be a loyal following who would be into the idea of petitioning the government to get this archaic licensing regulation revoked or altered in some way. This would mean that more pubs could put bands on, more people would get back into/be educated in the live music scene, there would be more opportunities to play, more interest in playing, more potential readers for SOS, more gear sales for your advertisers... I could go on.

I appreciate how busy you guys are, but I

think that this idea could have real mileage for all the music industry. If you think it could be worth pursuing but don't have the manpower to follow it up, let me know and I would quite happily do some or all of the legwork.

**Barrie McDermid**

## BeOS not dead yet

I read with interest the BeOS article in the Cutting Edge section of December's *Sound On Sound* [covering the purchase of Be Inc by Palm and the consequently uncertain future for BeOS]. However, BeOS is still on life support. A number of

operating systems are being ported over to Linux or similar OS bases, including BeOS ([http://www.osnews.com/story.php?news\\_id=215](http://www.osnews.com/story.php?news_id=215)), Windows ([www.lindows.com](http://www.lindows.com)), and the good old Amiga operating system ([www.amithlon.com](http://www.amithlon.com)). Although there are difficulties, work is progressing. With any luck, BeOS will return.

**Malcolm Ramage**  
**Technical Consultant**

## Resistance is useless

Beware recommending a resistance measurement of a loudspeaker voice coil as a guide for impedance: I think the result will be confusing (Q&A December 2001). Because a loudspeaker is an electric motor of sorts, once it gets going, it produces a back EMF, which raises the apparent impedance well above the DC resistance. As a very rough guide, the DC value is usually 30 to 50 percent of the AC impedance value. Without applying this correction, your correspondent will almost certainly misjudge an 8Ω speaker to be 4Ω.

Great magazine — keep up the good work. But where was Big George's heralded extended rail against all that is wrong in the music business?

**Richard Brice**

**Paul White replies:** The back EMF when DC is applied is only momentary. The difference between the meter reading and the true impedance is simply because a loudspeaker is a reactive load, but the approximation is usually good enough to tell whether you're dealing with 4Ω or 8Ω.

As for Big George's "extended rail", it appeared in our January issue, as you may have seen by now, and featured news of the reaction of the Department of Culture, Media and Sport to his recent letter to them. See our web site for the full text of the DCMS reply. **SOS**



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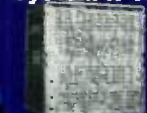


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**Repetitive Strain Injury (RSI) could curtail your musical career, so it's well worthwhile taking a look at these web sites to find out how you can avoid it.**

**Amanda Lowe**

**M**usicians, especially those who use computers, have a comparatively high risk of developing Repetitive Strain Injury (RSI), a debilitating condition which can bring musical careers to a swift and painful end. RSI is the damage to muscles, tendons, nerves, and other soft body tissues which comes about when you perform the same small task again and again. 'Small tasks' include many of the seemingly innocuous activities involved in operating a typical desktop computer, or in practising a musical instrument.

It's easy to blame age, rheumatism, or 'overdoing it a bit' for the RSI symptoms (typically aching hands/fingers, increasing clumsiness, or loss of strength), which is why the condition is often not treated early enough. RSI is far easier to prevent than to cure, so it's worth knowing about ways to minimise the risks. With this in mind, here are some web resources which can answer typical questions about RSI, whether you're looking for prevention or treatment.

## Be Informed

For a start, it's well worth finding out a bit about RSI. You can contact the UK RSI Association through its web site at [www.rsi.org.uk](http://www.rsi.org.uk) — they sell an information pack, but the site itself has precious little information other than their contact details. Much more useful for web-based information is [www.rsi-uk.org.uk](http://www.rsi-uk.org.uk), which is the home page for the RSI UK mailing list. Not only is there the facility to subscribe to the mailing list itself, but you can also read a selection of articles and an FAQ on the subject. US-based general information sites can be found at



The site of the Los Angeles RSI Support Group.

the US-based Cumulative Trauma Disorders Resource Network ([www.ctdrn.org](http://www.ctdrn.org)), and the Los Angeles RSI site ([www.geocities.com/la\\_rsi](http://www.geocities.com/la_rsi)).

## Easing The Strain Of Computing

If you feel so inclined, there are many ergonomic gadgets that can help ease the strain of using a computer. There are various keyboard designs that can help in avoiding awkward postures, but your keyboard location and your typing technique is as important as the keyboard design. A great general-purpose resource on keyboard selection and use is the Typing Injury FAQ site ([www.tifaq.org](http://www.tifaq.org)), which lists a number of alternative ergonomic keyboard options, as well as offering advice on how to use them to their best advantage.

In addition to giving information on keyboards, the site

also provides detailed information on alternative pointing devices, if your mouse is causing you pain. These include touchpads, trackballs and graphics tablets, and are worth looking into, as are the many useful accessories which are covered, like wrist rests and foot rests.

If you're doing a lot of typing, you might want to consider an alternative way to input text, in order to cut down the time you have to spend at the keyboard. The C=Pen ([www.cpen.com](http://www.cpen.com)) is one option; this lets you scan printed text and transfer it as a file to your computer. Alternatively, if you already own a scanner, you could check out one of the Optical Character

**“It’s easy to blame age, rheumatism or ‘overdoing it a bit’ for the RSI symptoms , which is why the condition is often not treated early enough.”**

Recognition (OCR) packages, such as *Abbey Finereader* ([www.abbey.com](http://www.abbey.com)) or *Adobe Acrobat Capture* ([www.adobe.com](http://www.adobe.com)), which allow you to scan printed pages and convert them to editable files automatically. Voice recognition could also be worth considering if your hands are already causing you pain, although these usually require dedicated training, and the technology is very much in its infancy.

If you have difficulty analysing your own physical playing habits, or if you've discovered a problem but don't know what to do, don't despair. Try the Musicians & Injuries site, at [www.engr.unl.edu/ee/eeshop/music.html](http://www.engr.unl.edu/ee/eeshop/music.html), to begin with, as this not only gives a reading list, but also provides loads of on-line information and links specific to musicians, broken down into sections covering individual instruments.

Although sites like this provide a great deal of information, sorting out performance problems can often involve in-depth postural reassessment, and there are a number of techniques available which can help you to do this. One of the most popular is the Alexander technique, which is concerned with re-educating your body to rid it of bad habits picked up over the years. It is based on a thorough knowledge of anatomy, as well as using Yogic relaxation principles. A large amount of information about the Alexander technique can be found at the Alexander

## RSI Newsgroups

- misc.health.injuries.rsi.misc
- misc.health.injuries.rsi.moderated

## Working On Your Playing Technique

If you play an instrument, you should spend some time studying how you sit or stand when playing — a full-length mirror can help here — in order to identify any areas of tension or unnecessary pressure. You should always try to find the most comfortable way of achieving results. If your playing style is uncomfortable, or causes you pain, you should try to change how you do it.



At the typing injury FAQ site, you can find out what may be wrong with your keyboard or typing technique and read about the alternatives to conventional computer keyboards.



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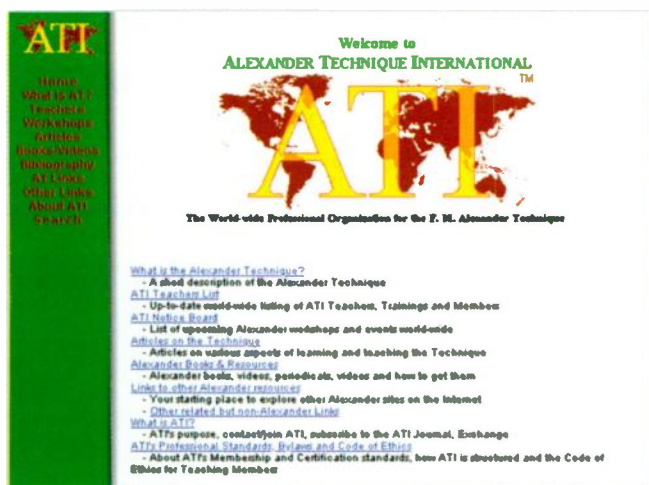
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The Alexander Technique is one of a range of 'body re-education' measures which some musicians have found helpful in combating strain injuries.

- Technique International site ([www.ati-net.com](http://www.ati-net.com)), as well as lists of books, videos and periodicals which can be of use. The Alexander technique does take a certain amount of commitment to master, and if you're serious about taking it up you really need a teacher who can guide you. Fortunately, Alexander Technique International also has a large and up-to-date listing of Alexander technique instructors throughout the world, with 75 listed for the UK alone.

Yoga is another technique that can help you take control of your own body. You don't need to be able to twist your feet around the back of your head, but some of the Yoga stretching techniques are of particular interest to anyone concerned about RSI. A good site to visit is [www.mydailyyoga.com](http://www.mydailyyoga.com), which has a whole section dedicated to RSI stretches, complete with animated pictures showing them in action. Once you have found a few favourites that suit you, try to include them in your daily routine and you'll soon feel the benefit. Bear in mind, as well, that the relaxation and meditation elements of Yoga can also reduce your levels of stress, which will in turn decrease your risk of developing strain injuries.

Tai Chi also has an excellent reputation as a good form of relaxation, as well as a gentle form of exercise consisting of a series of movements performed

slowly and methodically. You can find lots of information about the many applications of Tai Chi at the UK's Tai Chi Union site (<http://dSPACE.dial.pipex.com/taichi>), and there is a good list of books, videos and links at [www.thetaichisite.com](http://www.thetaichisite.com). Like the Alexander technique, however, Tai Chi is also best learned from a teacher, because trying to learn 'The Form' (as the series of movements are called) from books, videos or web sites can be very difficult. Locating a teacher couldn't be easier, though, using the world map at [www.airtel.net/hosting/fjvelasco/mapindex.html](http://www.airtel.net/hosting/fjvelasco/mapindex.html). I found 77 teachers for the UK alone.

And these aren't the only techniques available which are known to aid prevention of, and recovery from, RSI. There's also the Feldenkrais ([www.feldenkrais.com](http://www.feldenkrais.com)) and Trager

([www.trager.com](http://www.trager.com)) methods, Roling ([www.rolf.org](http://www.rolf.org)), Hellerwork ([www.hellerwork.com](http://www.hellerwork.com)), and Pilates ([www.pilatesfoundation.com](http://www.pilatesfoundation.com)), so you ought to be able to find something to suit you.

## Alternative Remedies

If you would prefer a more passive form of body awareness, hypnotherapy can be very effective, not only at reducing the pain of any existing RSI, but also for instilling good postural habits, relaxation techniques, and stress management. Surf to the British Society of Clinical Hypnosis web site ([www.bsich.org.uk](http://www.bsich.org.uk)) to find a reputable practitioner in your own area.

Homeopathic remedies will be popular with some musicians, and there is a list of RSI-specific suggestions at [www.homeoint.org/site/price/workers.htm](http://www.homeoint.org/site/price/workers.htm). It's also worth

mentioning that cod liver oil (when coupled with rest or moderation) is known to help your body to return to normal functioning after RSI symptoms have developed. You don't have to drink it and have that awful taste in your mouth all day — you can buy it in capsule form. And, speaking of oils, a low-fat diet can intensify the symptoms of RSI. It would be wise to consult a doctor or dietician if you suspect that your diet might be aggravating RSI.

## Work Soft, Play Soft

The main thing to remember from day to day is that you have to pace yourself and take breaks regularly. At least every hour or so, take a couple of minutes and have a stretch. It's worth bearing in mind that even perfect working ergonomics can cause problems if you stay too still for long periods of time, so shift position

frequently. Your hands are one of your most important work tools, so respect them, don't overstretch them, and make life as easy as possible for them. SOS



Specific Yoga stretches can help prevent and ease RSI. Check them out, with useful animated examples, at [www.mydailyyoga.com](http://www.mydailyyoga.com).

## RSI Symptoms To Watch Out For

Dealing with RSI early is critical to limiting the damage it can cause, so it helps to be able to spot symptoms in yourself or others. They include general soreness, numbness, coldness, tingling, loss of strength, tightness and clumsiness. The symptoms can all manifest themselves in the hands, wrists, forearms, fingers, shoulders and neck. These symptoms can easily be mistaken for symptoms of localised fatigue (aches, pains, trembling, and loss of strength), but fatigue symptoms increase as the activity

increases, and disappear shortly after activity stops, whereas RSI symptoms often persist after resting.

If you are experiencing a tingling and numbness of the thumb, index, and middle fingers, you may be experiencing an RSI-related condition known as Carpal Tunnel Syndrome. These sensations are often more pronounced at night and can wake you up. Carpal Tunnel Syndrome can progress to developing a burning sensation, cramping and weakness in the hand. You may find yourself frequently

dropping objects and experiencing sharp shooting pains in the forearm. Chronic Carpal Tunnel Syndrome can also lead to wasting of the hand muscles. Tendonitis is another common RSI-related condition caused by inflammation or irritation of a tendon, and is often mistaken for arthritis.

If you are experiencing any of the symptoms described above, pick up the phone and book yourself an appointment to see your doctor. By the time RSI symptoms are apparent, damage is already being done.



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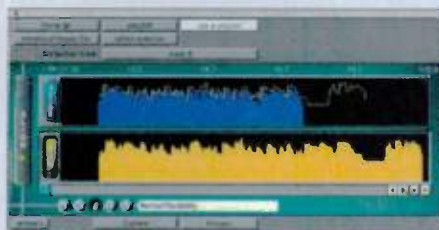
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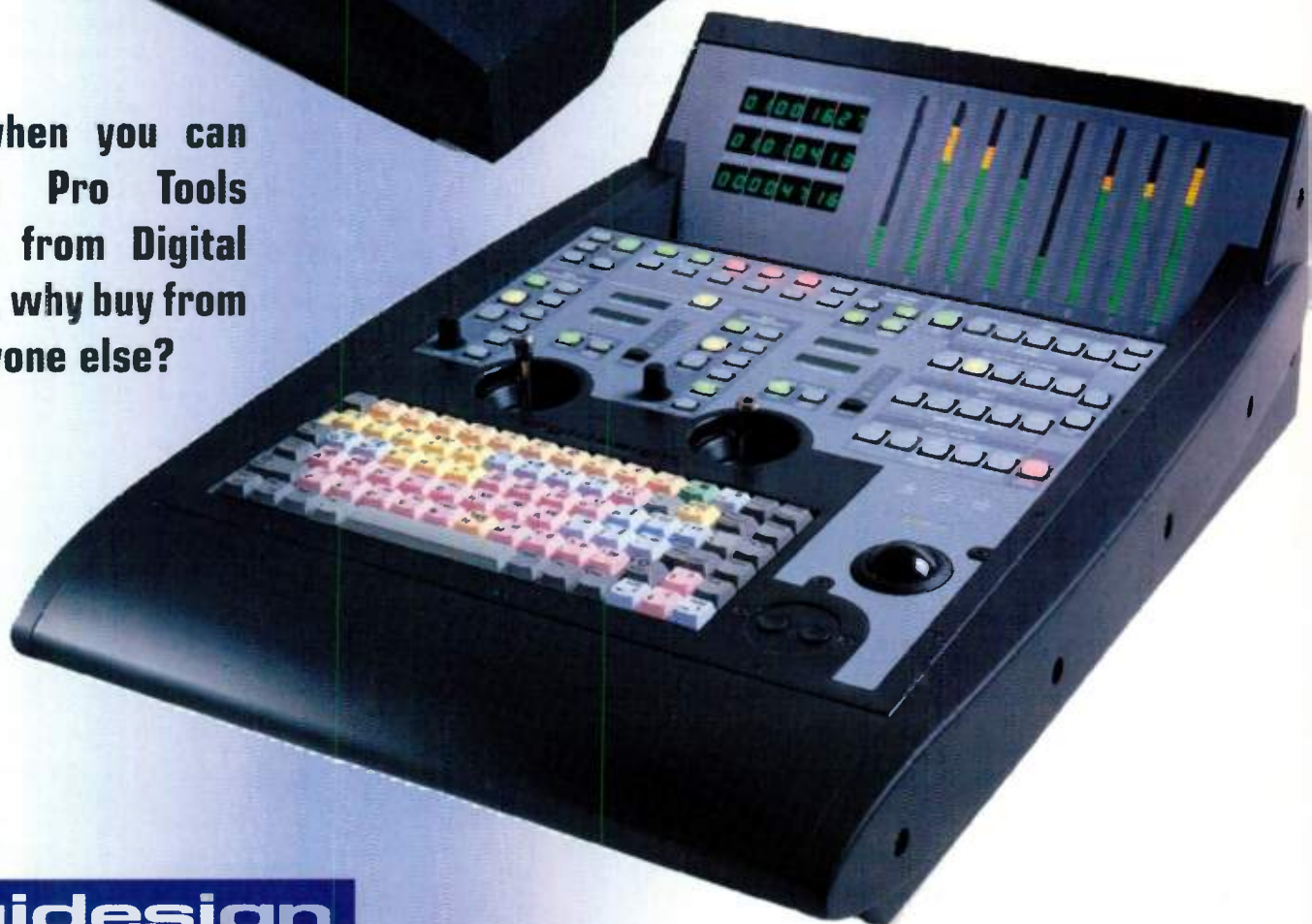
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## Fix it in the mix, with our useful Pro Tools mixing and automation tips.

Simon Price

This month we reach the mix stage in our discussion of traditional multitrack recording, so it's time to examine some Pro Tools-specific mixing concepts and techniques.

### Mix Basics

In the jargon of traditional mixing consoles, Pro Tools' mixer is a bit like an in-line design: in fact, the same channels and faders used during the recording process are also used to manage audio coming back from the disk. If you've selected 'Linked record/playback faders' in Preferences (this feature ensures that whatever level you set for a track during recording will also apply to the track when it is

played back), you'll probably already have a reasonable level balance carried over from when you were recording.

The multitrack recording mixer template I provided in December's Pro Tools Notes shows some aux channels being used as group faders (sub-mixes). One is for the drums, so you can use the track faders to set the level of the drums (if you're using them) with respect to each other, then adjust the overall level of the drum kit within the mix using the group fader. The same method can be used for setting up a balance between mic'd guitar and and D'i'd guitar tracks, for example.

As Pro Tools' mixer is (obviously) a digital one, it's important to ensure that none of the individual tracks, groups, or the master fader go into the red — digital distortion is not something we want on our mix. To be sure that none of the tracks are clipping, disable Pre-fader Metering in the Operation menu. The channel meters will now show the true levels after the signal has passed through any plug-ins and the channel fader. Set the Master fader so that the loudest part of the song is as close to the red as possible. Don't use the Master fader to set your monitoring level, as this will affect your final mixdown! Also, note that the insert sections on Master faders are post-fader, so if you're using insert processing on the Master, the true final output level is reflected on the output level metering of the last insert rather than the Master metering. Look at this, rather than the Master level metering, to see if you're going into the red.

### Bringing In Effects & Processing

Once you have set up some kind of working balance between your tracks, you may want to start thinking about signal processing. In Pro Tools, this can mean using internal plug-ins, linking to outboard hardware, or

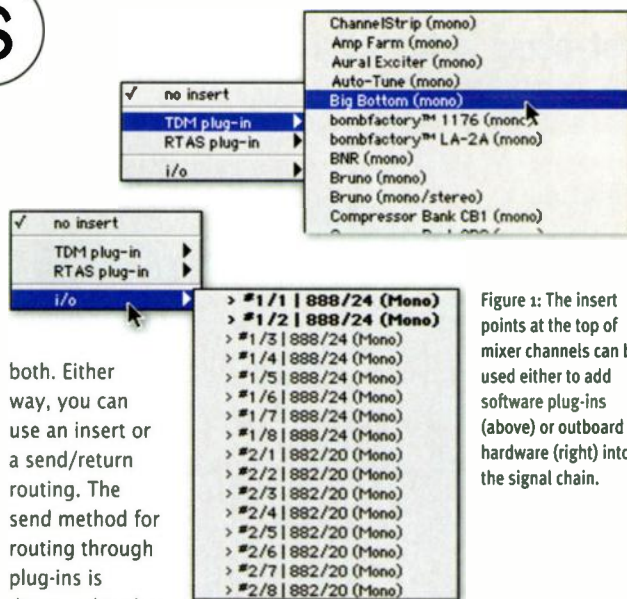


Figure 1: The insert points at the top of mixer channels can be used either to add software plug-ins (above) or outboard hardware (right) into the signal chain.

both. Either way, you can use an insert or a send/return routing. The send method for routing through plug-ins is discussed in the FAQs below.

Inserting a plug-in directly on an audio track couldn't be easier: just click on an insert point in the channel and choose the desired effect. To insert an outboard processor in-line with a track, you need to cable it to spare I/O connections on your interface unit. (Bear in mind that if you, for example, use output 1 you have to connect back into input 1 — and so on). Then click an insert point and choose an interface (I/O) connection instead of a plug-in (see Figure 1, above right). To use a hardware processor in a send/return configuration, connect the hardware unit, use a mixer send to split the track off to it, then bring the wet signal back into the mix via an aux input track (like a send/return structure in a normal mixer).

At some point you'll probably want to use automation in your mix, whether to achieve something as simple as tweaking the vocal level here and there, or as complex as changing the whole mix during certain sections. Automation in Pro Tools is a big subject, and I plan to cover it in depth in a future Pro Tools Notes. In the meantime, the following section covers the basics.

### Mixing FAQs

#### What's the bare minimum I need to know to start using automation?

To record, and thus automate, channel parameter changes (fader, pan, mute, solo, send controls), first switch the channel into Auto Write mode (using its Automation Mode button), then hit Play and do your stuff. If you need to re-do something, you can drop in and out on existing automation using Auto Touch mode, which plays back earlier automation until you move the channel fader, at which point it begins to overwrite subsequent data. When you let go of the fader, the previously recorded automation takes over again. To drop in without the automated parameter gliding back to the levels set by previous passes when you let go, use Auto Latch. This, in effect, 'drops in' but doesn't 'drop out' again. However, if there is automation data later in the track which you

want to preserve, don't use Auto Latch — or, at least, stop recording before this automation data is encountered. To record automation moves for plug-ins, enable the relevant plug-in controls by clicking 'Auto' on the plug-in's window. The Automation Enable Window (see Figure 2, left) lets you select or protect the different

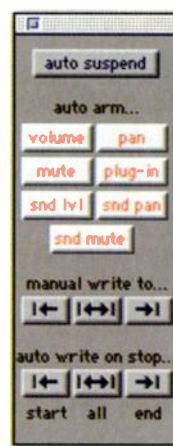


Figure 2: The Automation Enable Window, where you can globally arm or disable recording of certain parameters.

#### Quick PT Plug-In Tips

Since PT 5.1, TDM systems are able to use both TDM and RTAS plug-ins, which could get TDM users out of a tight spot if they've maxed out their DSPs. However, to use plug-ins of both formats on the same track, one must place the RTAS inserts before the TDM ones (higher up on the screen). Luckily, version 5.1 also introduced the ability to rearrange plug-in order by dragging and dropping.

Some stereo plug-ins have separate parameter controls for left and right channels. To link both sides when making changes, hold down the Shift key while you make adjustments.

Although there are only five insert points on each track, if you're going really plug-in crazy and need more, simply route the track to an aux input to get another five.

All Pro Tools systems include the Trim plug-in, which provides an extra 6dB of gain. However, on really quiet recordings, try using a Time Adjuster plug-in (TDM systems only) instead, with the delay set to zero, because this plug-in includes a gain control with a whopping 24dB boost.



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## parameters to be automated. What's 'Snapshot' automation? I don't see any menus for it.

Snapshot automation refers to the process of writing a static mixer setup across a section of your track. You might want to do this, for example, when your song has sections that vary dramatically in sound or instrumentation. Think of the standard Nirvana song structure: "this is the gentle bit; this is the buildy bit; this is the loud shouty bit!" Using snapshot automation in this case, you could set up all the levels, mutes, voice and guitar processing, and so on, for each section, and write them as the foundation of your mix. Simply use the Selector tool to highlight across the area where you want to write your snapshot — making sure the selection extends across all the tracks you wish to include. Enable playback looping, and click 'Auto Suspend' on the Automation Enable Window. You will now be able to loop around the section, setting up the mix as you want. When you're happy with it, stop, and choose 'Edit > Write Automation



Figure 4: Digidesign's Maxim plug-in, a mastering processor that includes both maximisation and dither.

to all Enabled Parameters', then take off 'Auto Suspend'.

## What's the deal with aux inputs and sharing plug-ins?

Aux inputs are channels that are not used for playing audio recorded to disk. They are versatile and can be used as sub-mix groups, 'live' input

channels, or effect returns. Their most common use is for sharing plug-ins between several tracks. Most of us don't have a powerful enough computer to apply plug-ins willy-nilly, but we can still give all the tracks access to one or two really good reverbs. Create a stereo aux input track and bring up your plug-in on this

track (with its 'dry/wet mix' set to 100 percent wet). Set the input of the track to one of your internal stereo busses. Now create sends on each track that you wish to add reverb to, choosing the same stereo buss going to the aux input. The send level will now adjust the amount of each track going through the reverb.

## What about mastering plug-ins and dither?

Plug-ins billed as 'mastering processors' are mainly maximiser or dither effects, or both. A maximiser reduces peaks in the mix, and uses the headroom this frees up to boost the whole level of the song (see Figure 3, left). Dither is a perceptual trick used when creating a digital-format master, creating the impression that the digital representation of the waveform is more accurate than it theoretically should be. Anyone who's used dither in a graphics package to smooth the boundary between two colours, or text against a background, will have seen the same effect in the visual sphere. SOS

## Phase Correction: Using The Time Adjuster Plug-in

Craig Anderton's 'Direct Dilemma' piece in SOS July 2001 goes into detail about phase correction, which is something you may need to attend to in certain mix situations. As usual, I'm presenting a 'Pro Tools Appendix', as opposed to a general discussion of the topic.

If your multi-mic recording technique is as shoddy as mine, you'll need to correct the small timing differences between different (related) tracks to reduce the 'comb filtering' effect heard on the combined sound (the classic example is when spill between drum kit mics causes phase problems). There will certainly be a discrepancy — which Craig's article focuses on — when you've recorded both a DI and mic feed from a guitar or bass. Finally,

on TDM systems you occasionally have to correct for the tiny delays caused by going through a plug-in.

Pro Tools ships with the Time Adjuster plug-in (see Figure 4), that provides a small delay (0.1 to 45ms), along with a phase-invert button. By putting this plug-in across the 'earlier' signal (which would be the DI'd one in the case of the mic-d/DI'd bass example), you can follow the tried-and-tested method of phase alignment. Play both tracks, panned centrally, and click the phase-flip button on Time Adjuster. Then play with the delay slider until you find a point where the combined level drops significantly, un-flip the phase and you're done. LE systems don't have the Time Adjuster, but the Short Delay plug-in is equally effective. With Short Delay,

you should hold down the command key when dragging the delay slider, to achieve finer resolution.

Alternatively, you can take an editing approach by moving the recorded audio into alignment manually. Start by zooming in to an extreme level where you can see the individual peaks and troughs of the waveforms. Locate a point where you can see where the waveforms should line up on the different tracks — a transient such as a drum hit or guitar pluck is best. Now, triple-click with the Selector in the track you want to move. This selects everything on the track, ensuring all regions are moved together. Now switch to the Grabber tool, and shift the audio until the waveforms are aligned (see Figure 5).

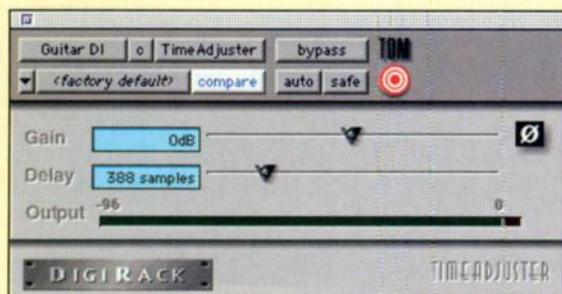


Figure 4: The Time Adjuster plug-in, which can be used for correcting phase discrepancies.

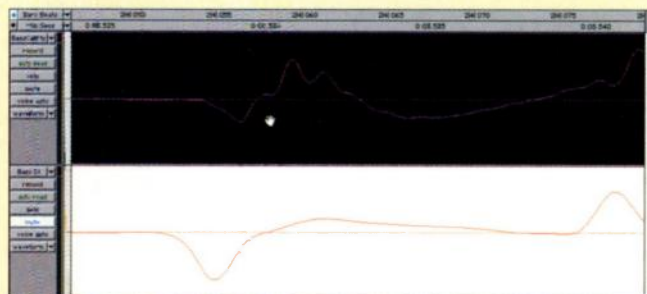


Figure 5: Waveform Alignment. Here I've identified a matching peak in both the mic'd and DI'd recordings, and can use the Grabber tool to shift them into sync.



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The Controller Editor. The left-hand pane shows the Controller types available for the selected Part (in this case a MIDI part), while the right displays any Controller data.



Cubase's automation data is stored in a single Audiomix Part for the entire Song, so data for all the VST Mixer Channels is available in the same Controller Editor window.

Paul Sellars

When one thinks of sequencing in *Cubase*, one tends to think in terms of recording, programming and arranging 'musical' events, such as notes, chords, melodies, and so on. However *Cubase* is also capable of recording, creating and editing data that is not musical in the traditional 'crotchets and quavers' sense of the word at all. This information is usually called MIDI Controller (or 'Continuous Controller') data and, in later versions of *Cubase*, it has its own dedicated Editor.

## The Controller Editor

The Controller Editor is similar to the Controller strip that runs along the bottom of the Key Edit window, except that it allows a good deal more flexibility. It can also be used to create or edit automation data on Mixer tracks, making it an invaluable tool to precisely control any virtual 'flying faders' or automated effects you may want to use, in either the MIDI or audio mixers.

The Controller Editor is opened by selecting a Part or Track, and then choosing Controller from the Edit menu. If you select an ordinary MIDI Part or Track, any edits you make will be written directly into the relevant Part(s) as normal MIDI

Controller data. If you select a Mixer Track or Part, your edits will be written into the relevant Part(s) as *Cubase* automation data. If you select an Audio Part or Track, your edits will be written into an Audiomix Part on a Mixer Track, and if no such Track or Part exists, one will be created.

The Controller Editor window is divided into two panes. The left-hand pane displays a list of all the data types currently available for editing. For a MIDI Part or Track, this will be a short list of common data types (Pitch-bend, Program Change, Volume, and the like), together with a more exhaustive list of other MIDI Controllers. For a MIDI Mixer track, there'll be a list of all objects (knobs, faders, and so forth) in the currently active Mixermap. For Audio or Audiomix Parts or Tracks, there'll be a long list of every automatable object in the VST Channel Mixer, including Channel, Group and Master faders, Send levels, EQ parameters and many more.

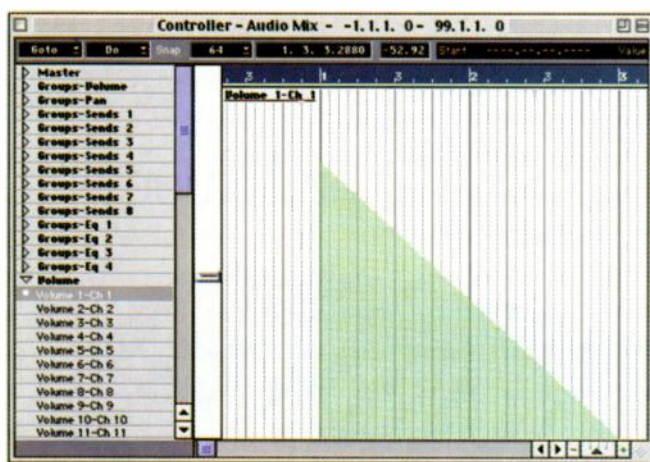
## Controlling Mix Automation

To begin with, let's look at how you can use the Controller Editor to add some simple but useful automation to your mixes. With the Controller Editor you can quickly and easily create smooth, linear fades for multiple mixer channels, with a finesse that would be quite impossible to achieve by recording fader movements live.

First, set the Song Position Pointer to the point where you

want the fade to begin. Select an Audio Part or Track, choose Controller from the Edit menu and, once the Controller Editor window has opened, select '64' from the drop-down Snap menu. Next, find Volume in the left-hand pane, and click on the triangle icon to expand the submenu. In the list that appears, click on Volume 1-Ch 1 to display

the Controller Editor window ('0.00' represents 0db, or unity gain for the mixer channel). Hold down Option (Mac) or Alt (PC), and drag the cursor to the bottom of the window at the point where you want the fade-out to end. When you release the mouse button, a smooth 'ramp' will be drawn between the start and end points of your fade-out.



The cross-hair tool allows you to draw straight lines within the Controller Editor, creating smooth ramps like this.

controller data for the volume fader on Channel 1 of the VST Channel Mixer (if you have already renamed the channel, the name you chose will appear in the list instead).

Open the Toolbox (right-click on the PC, Control-click on the Mac) and select the straight line tool (the one that looks like a cross-hair). Place the cursor at the Song Position and move it up or down until '0.00' is displayed in the small box to the right of the cursor position box, at the top of

Open the VST Channel Mixer, click on the Read button at its left-hand side and press Play on the Transport Bar... and watch in amazement as the fader on the first channel of the VST Channel Mixer travels smoothly down from '0.0' to '-∞! To copy the fade to other mixer channels, return to the Controller Editor window, select the normal pointer from the Toolbox, and click and drag a rectangular selection over the controller ramp you just created. Next press Control+C (PC) or

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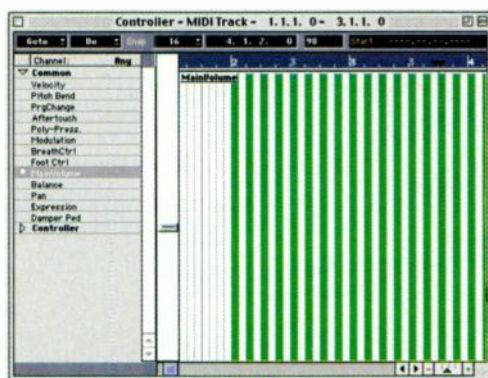
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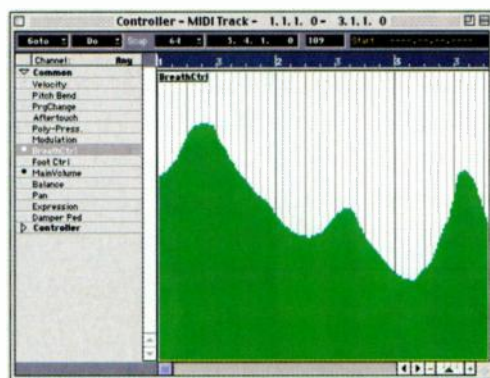
- Command+C (Mac) to copy the ramp to the clipboard, and click on the name of the Channel you want to copy the fade to (for instance, 'Volume 2-Ch 2'). Move the Song Position Pointer back to the point where you want your fade to begin, and press Control+V (Mac: Command+V) to paste in a copy of the ramp. Paste in copies for every mixer channel you want included in the fade-out, and there you have it!

If you want a fade-out to apply to an entire mix, you can save time by just creating controller ramps for the two VST Master Mixer faders ('Master Left' and 'Master Right' in the Master submenu). However, controlling different channels independently allows you to be a bit more creative about it: try gradually fading out everything but the lead and backing vocals, for example, to create an *a cappella* ending. The only thing you need to be careful of is that if you're using a compressor over the Master buss, it will fight any attempts to fade out using the main Channel faders, with unpredictable results.

The same technique can be easily applied to a variety of other mixing tasks. Smooth, automated panning effects can be created by expanding the Pan menu in the left-hand pane of the Controller Edit window, selecting the channel you wish to edit (they appear with names like 'Pan 4-Ch 4'), then creating a Controller ramp as before. Notice that when Pan Controllers are being edited, the right-hand pane of the Controller Edit window is divided by a horizontal line. This line simply serves a guide to indicate the centre point in the stereo field, with right-hand panning above the line, and left-hand panning below.



Here, the Controller Editor has been used to 'gate' a MIDI synth using the MainVolume parameter.



Synth parameters such as filter cutoff can also be automated from the Controller Editor, provided you know which MIDI Controllers your synth or sampler responds to. Here, Breath Controller data is being used to create filter sweeps on an Akai S2000.

Try automating EQ frequency and gain, or experiment with gradual changes in effect send levels to create dynamic, evolving mixes that gradually warp from one state to another in the course of a song. The possibilities are practically limitless!

## Automating Instruments

Of course, the Mixer is not the only thing you can automate in the Controller Editor. Most MIDI instruments respond to standard MIDI Controllers, and you can take advantage of this to come up with some interesting effects. For instance, there is probably a dozen different VST plug-ins devoted to creating gate effects (in fact Steinberg themselves now include one with *Cubase VST 5.1*), and those chopped-up, rhythmic 'on-and-off' gating effects have become a standard weapon for dance producers. However, you can use the Controller Editor to create identical effects without having to use up a channel insert, and without adding any additional load to your CPU.

Let's assume you have a MIDI Part triggering a string-pad sound

in your synth or sampler, and you want to apply the effect to this. Select the Part, open the Controller Editor and, in the left hand pane, click on MainVolume in the Common submenu. Then set the Snap value to (for example) '16', and select the pencil tool from the Toolbox. At the point where you want the gating to begin, hold down Alt (Mac: Option), and click at the top of the Controller Editor window. A large rectangle will appear, indicating that MIDI Volume has been set to maximum (127) and then left there. Move the cursor to the right by one 16th note, and click at the bottom of the Controller Editor window. The rectangle will be 'flattened', leaving one narrow column of Controller data. Move the cursor forward again, and repeat the process as many times as required (copying and pasting will save time) until you have filled up the Part. Now, when you play the Part back, your string pad will automatically be gated into 16th notes, in perfect time. Another advantage of this method is that the effect will automatically adjust to any tempo changes in the

Song, whereas some effect plug-ins will not.

## More Modulation, Please

We can make the gated Part sound even more effective by adding some filter modulation. In order to do this, you'll need to know which MIDI Controller is used to control filter cutoff in your synth or sampler (consult your manual or the manufacturer's web site for more details). In the following example I'm using my Akai S2000, which is set so that Breath Controller data is mapped to filter cutoff. However, any MIDI Controller can be used. If, for example, you were using a synth which had MIDI Controller 31 mapped to filter cutoff, you would select '(Control 31)' in the Controller submenu; if modulation controlled filter cutoff, you'd select 'ModWheel', and so on.

Having chosen the appropriate Controller, set Snap to 64, select the pencil tool from the Toolbox, and place the cursor at the point where you want filter modulation to begin. Then, while holding down Alt or Option (on the Mac), simply draw a smooth curve — or just a random wavy line you like the look of — and release the mouse button. Play back the Part to hear how it sounds. If you're not happy with the end result, you can always go back and draw the curve again, or try using the straight line tool.

Have fun. SOS

## Cubase Tips

► To roughly 'stereo-ify' a mono audio Part, just paste a copy of the Part to an adjacent Track and, in the Inspector, move its start position backwards or forwards by a couple of ticks. Then pan one copy hard left, and one hard right. This can really help 'fatten up' some vocal parts.

► If, like me, you can't stand the harsh beep that serves as a default metronome click in *Cubase*, use the MIDI Click option in the Metronome dialogue instead. Keep a nice hi-hat or stick sound loaded up in your sampler to serve as a less jarring alternative.

► If you're a user of VST Instruments, it's well worth taking the time to visit [www.kvr-vst.com](http://www.kvr-vst.com). This excellent site allows you to stay up to date with all the latest freeware downloads and to read impartial user reviews of commercial instruments before parting with any hard-earned cash.



# Millennium Music PIII Xtreme Audio System

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**M**illennium have specialised in building computers for the music industry for over eight years. All of their systems are put together in-house ensuring that hardware and software components are carefully selected and combined to best suit the needs of the musician. The hands-on computer-building regime also means that Millennium technicians know each individual system extremely well, which makes it possible for them to offer excellent technical support and advice on future upgrades and enhancements. If a customer specifies the components for their own system then Millennium will still install and test all software and hardware to ensure it is suitably configured for audio recording.

Millennium's computers can be designed and soundproofed to run almost silently or they can be racked using a rigid 4U chassis with suspension-mounted drives and an adjustable PCI/AGP card retaining bridge. Remote diagnosis and re-configuration via a standard modem is also an option for new Millennium PC buyers, which means that one of the company's engineers can dial in to the system to troubleshoot any problems. One month's free telephone support is available as standard to all new owners.

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black rackmount, black tower, all aluminium, or standard beige desktop or tower.

The beige tower system Millennium are kindly giving away as this month's prize is a PIII Xtreme which retails for £999. The system ships with Steinberg's *Cubasis VST v3.0* software for audio and MIDI recording, and with M Audio's highly-regarded Audiophile 2496 card. The PIII's spec includes a 1GHz processor, 128Mb RAM, 20Gb hard drive, 17-inch VGA monitor, a CD-ROM drive and Win 98SE.

*Cubasis VST 3.0* features up to 48 audio channels and 64 MIDI tracks, a professional mixer and 16 real-time effects. Sounds are provided by a universal sound module and a virtual synth, bass and drum machine. The interactive tutorial instructs new owners on how to use the program's numerous facilities which include sound editing, printing scores, producing videos and burning CDs in surround sound.

The Audiophile 2496 is a four in, four out digital recording interface that is installed in the PCI slots at the back of the PC. The 2496 refers to its 24-bit/96kHz processing, although the system also supports 8, 16 and 20 bit depths and sample rates from 96kHz down to 8kHz. Together with analogue I/O, the PCI card also provides S/PDIF and MIDI



I/O. Frequency response for the system is specified at a respectable 22Hz - 22kHz,  $\pm 0.4\text{dB}$  while the dynamic range weighs in at 100.4dBA for both inputs and outputs. The 2496 also includes a powerful digital mixer/router, and offers control over SCMS. Drivers comprise *Windows 95/98*, *ASIO/ASIO2*, *Mac*, *GSIF*, *DirectX* and *Windows NT/2000*.

To enter this competition, you need to fill in the entry form included on this page and post it to the address on the coupon. (Alternatively, you may enter via the electronic form on the SOS web site.) Please make sure you answer all the questions and complete the tie-breaker. We also require your full address and daytime telephone number. Your entry must arrive with us by the closing date of **29th March 2002**. SOS

## the small print

1. Only one entry per person is permitted. 2. Employees of SOS Publications Ltd, Millennium Music, 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

Which one of the following do Millennium offer for free to new customers?

- a. Back support ☐
- b. Card support ☐
- c. Lead support ☐
- d. Telephone support ☐

What is the name of the 24-bit 96kHz M Audio card?

- a. Nail file ☐
- b. Audiophile ☐
- c. X file ☐
- d. Rockford file ☐

Which one of the following is not a finish option for a Millennium system?

- a. Black ☐
- b. Beige ☐
- c. Rubber ☐
- d. Aluminium ☐

## Millennium PC Tie-breaker

According to 1960s TV sci-fi programmes like *Star Trek*, computers of the future will be covered in flashing lights and will make strange beeping noises. What do you think those strange lights and noises will do or say? **Answers in 30 words or less please.**

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Would you like to receive more information on Millennium Music products? If yes, please tick this box. ☐

Post your completed entry to: **Millennium Music PC Competition February 2002**,  
Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ, England.



More tips on using DX Instruments, and some nifty things you can do with the *Tape Sim* plug-in. In addition, a great way to audition audio loops before you import them, along with advice on how to create audio crossfades.

Craig Anderton

As usual, there's quite a bit going on in the world of *Sonar*. There aren't any new updates this month, but that's okay — I'm still absorbing the last one. However, new instruments and plug-ins continue to appear, and it looks like the DXi standard is here to stay. Let's investigate further.

## DXi Progress Report

When a company tries to launch a new standard, as Cakewalk did with the DX Instrument spec, it always takes some time for that standard to gain support — assuming that it ever enjoys any support at all. Fortunately, the number of DX Instruments continues to grow. Last month SpeedSoft announced their DXi version of *VSampler*; now Native Instruments has introduced the *FM7* FM synthesis plug-in, which works with both VST 2 and DXi standards.

I helped write the *FM7* manual, so I'm very familiar with it — it's a great instrument to have available for the *Sonar* platform. If you're a fan of FM synthesis, you'll flip over the algorithm creation page. You're no longer limited to the set of algorithms traditionally supplied with Yamaha synths, but can pretty much feed any operator back to any other operator, and even route the signal through filter and distortion 'operators'. I tried the DXi version with *Sonar*, and it worked right away (unlike *Battery*, which needed another revision before it became 'Sonar-friendly') — good stuff.

Steinberg's *HALion* is another virtual instrument making a big splash. This VST 2 sampler reads *Gigasampler* files as well as Akai, WAV, SoundFonts, and other file formats. I've tested it with *Sonar* using FXpansion's *VST-DX Wrapper*, and it works fine. The only glitch I've found is that, when you tick the filter

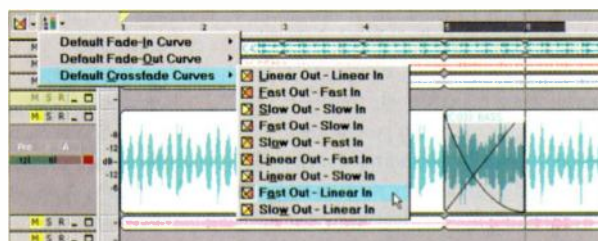
## Better Crossfades

One important, though overlooked, addition in *Sonar*'s version 1.3 is a far more flexible way to do fades and crossfades. You can now choose three different types of fade curve (linear, fast, and slow) and nine different crossfade curves.

Applying crossfades is quite painless. Click on the crossfade icon to the immediate right of the snap-to-grid icon, then click on the little arrow to the right of the crossfade icon, and select the appropriate curve from the drop-down menu. Move the cursor to the upper right corner of an audio clip to create a fade-out, or to the upper left corner to fade in. The cursor turns

into a little triangle, which you click and drag to define the fade length. For a crossfade, slide the two pieces of audio to be crossfaded together; the overlapping region will have the crossfade.

There's one caution. If you change your mind about a crossfade and slide one of the pieces of audio back so that it no longer overlaps, the crossfade curves will remain as a fade-in and fade-out on the two clips that used to overlap. If this is what you want, fine. Otherwise, always remember to use the undo command to get back to where you were before sliding the two pieces of audio apart.



The crossfade icon is in the extreme upper left-hand corner. Next to it is the drop-down menu with the various curve options; here, the Fast Out - Linear In curve is selected. The area it is applied to is shaded in grey.

response check boxes, the indicators don't match where you clicked (you're right — the indicators are wrong). Other than that, it was wonderful to open up *Gigasampler* files within *Sonar*.

You've also probably seen Martin Walker's *SOS* review of the FXpansion *DR008* drum synth/sampler, which also works as a DX Instrument. It's yet another useful and creative instrument; see PC Notes in December 2001 for more details.

So, between the growing support for DXi synths and the ability to run VST Instruments with a wrapper, matters are progressing nicely. Now, if only there were a way for DXi to handle multiple outputs... next version, please?

## DXi Strategies

Even the most macho computers can't run a sophisticated hard disk recorder along with loads of processor-hogging virtual effects and synthesizers. The best approach with virtual instruments is to convert the

outputs into digital audio tracks as soon as possible, even if they're only for a reference, as a hard disk track uses much less CPU power than a virtual instrument. Here's how to do it.

First, assign your virtual instrument to an audio track by right-clicking in the FX field and selecting an instrument. Then assign a MIDI track's output to the instrument track and record your part into the MIDI track. Now, solo both the instrument and MIDI track and play the part, checking for proper levels on the instrument track and on the buss it's feeding. As usual, you want to get as close as possible to 0dBFS, but without hitting it.

Once the levels are correct, select Bounce To Track(s) from the Edit menu. Tell the dialogue box what track number to use, and its source buss (ie. the audio buss fed by the instrument). Leave all the Mix Enable boxes




Here you can see Steinberg's *HALion* and Native Instruments' *FM7* playing back at the same time in *Sonar*. Even though I had to run *HALion* through the FXpansion *VST-DX Wrapper* to get *Sonar* to recognize it, the timing remained impeccable.


## Current Versions


Sonar v1.3.1 for PC




## Sonar Tips


 In the Loop Explorer window, there's a drop-down menu next to the Views icon that chooses Large Icons, Small Icons, List, and Details. You can also cycle among these choices by clicking repeatedly on the Views icon itself.

 Right-click on any audio meter to set its range (12, 24, 42, 60, 78, or 90 dB).

 You can set a default value for the volume, pan, aux send, and aux pan controls; whenever you double-click on the control, it will return to this value. Set the control to the desired default

value, right-click on it, and choose Set Snap-to = Current.

 The manual mentions three automation modes: Touch, Overwrite, and Auto Punch. However, the only one implemented in *Sonar* (at least up to version 1.3) is Touch. The others don't exist, so don't go nuts looking for them.

 If you have a start-up configuration that's particularly useful (eg. your preferred number of audio and MIDI tracks, aux busses, etc.), save it under the name 'normal.tpl' to have it appear whenever you open *Sonar*.

checked except for Master FX. Click on OK, and *Sonar* creates a hard disk audio track from the instrument output. For convenience, move this track in the Track Pane (click in the empty space to the right of the track's name, and drag) so it's close to the related instrument and MIDI tracks.

Now you can turn off the instrument by clicking on the little green indicator in the instrument track's FX field, thus letting the CPU breathe a bit more easily. Keep the MIDI part, though, because it requires virtually no memory or CPU power. This means that it won't

be a problem if you later decide to change the instrument part; all you'll have to do to update the part is mute the hard disk audio track, or erase it if you're certain you won't use it, re-enable the instrument by clicking on the button you used previously to disable it, and then edit or replay the MIDI part, following the steps above to create the new hard disk track.

## Processor Focus: Tape Sim

*Sonar* includes several plug-ins which, while not the most spectacular in the world, are generally quite usable. One of my

favourites, though — and certainly one of the most underrated — is *Tape Sim*. You can find this effect by right-clicking on an audio track's FX field and browsing through the Cakewalk Audio Effects. Here are a few tips on using this beast.

It may seem like tape simulation is something you'd want to use only for final mixes, so that the master has a 'crunched' tape sound, but I find it eminently suited to individual tracks. Kick drums can become really punchy, drum loops gain level by a sort of 'hard' compression, and effete basses can become aggressive and rude.

I find that it's best to keep the output gain low as you tweak your sound. The key control is Rec Level, which sets the level and 'hardness', while the Warmth control adds the 'crunch'. For a really crunchy sound, set Rec Level and Warmth to maximum, and pull back Input Gain until the degree of nastiness is just right. Finally, adjust the Output Gain to avoid clipping the track.

Experiment with the Tape Speed and EQ Curve controls; they affect the overall tonality. One of the best uses of the *Tape Sim* is with a kick-drum track, and the LF Boost switch is

Cakewalk's gift to dance-music kick drums. Dial up the right amount of distortion, then add LF Boost. The end result is a kick drum that can move mountains. Click the bypass switch from time to time to get a dose of reality. You might be shocked at how much you can raise the overall level without hearing objectionable levels of clipping.

## Sonar's Secret White Noise Generator

Before we get off the topic of tape simulation entirely, here's one last trick. It's time to unlock *Sonar*'s secret white noise generator. Select an audio track for the white noise, and call up *Tape Sim* in the FX field. *Sonar* won't let you process an empty track, so place some audio on the track. I usually copy a little piece of audio from another track, then paste it after the end of the song so it's out of the way. You generally don't want to hear anything playing while the noise is going.

Now press Play. On the *Tape Sim*, turn up the Hiss and Output Gain controls. Note that you will not hear hiss if Tape Speed is set to flat; I prefer the 7.5ips setting, but that's a matter of taste. Try 15 and 30 as well. You should now hear the hiss. I like to follow the noise with something like FXpansion's *Autopole*, and play with the LFOs and amplitude controls to create cool effects. Enable the track being 'processed' for recording, go into record, and you'll record the results. Amazingly enough, with a little filtering and reverb, you can generate some very useful sounds.

## Fade To White

And after touching on that relatively bizarre application, we'll sign off for this issue. Until next time, remember that machines don't kill music, people do. Where would guitarists be if they hadn't figured out to bend strings? Bend your software and your computer, too — push them as far as they'll go! SOS

## Get Your Groove On: The Multitrack Loop Explorer

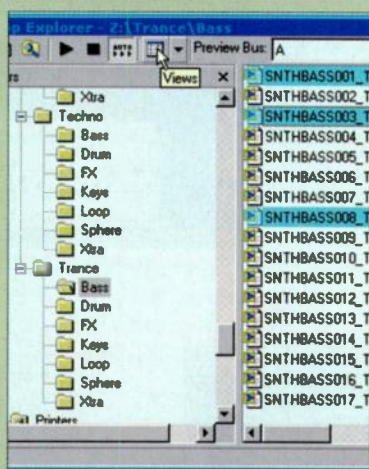
The Loop Explorer window's main function is to audition loops, which you can then import into the program and convert into Groove Clips. But you can also audition multiple loops simultaneously in this window. This is particularly good with 'construction kit' sample CDs that might have several loops for snare, hi-hat, percussion, and so on; you can test the parts together to see how well they work. Similarly, you could check out how a bass loop sounds with a particular drum loop.

Unless the loops are 'Acid-ised' Groove Clip loops, you're limited to loops of the same tempo if you want them to all play together. Also, you can't include loops from more than one folder. Nonetheless, multitrack loop exploration is still a very

useful technique. Here's how you do it: click on the first loop to select it and click the Loop Explorer's Play button; Ctrl-click to select or deselect loops.

I prefer to enable the Loop Explorer's Auto Preview button so that, whenever you select a loop, you hear it play with the others. If Auto Preview is off, then you need to hit the Play button every time you select a new loop if you want to hear it.

This works best for loops stored on your hard drive. Loops auditioned from CD-ROMs are OK too, but because they're slower, the audio engine may stop when you add another loop, necessitating a quick click on the Play button. After selecting all the loops you want to use, drag them *en masse* over to the track view pane.



Several loops have been selected in the Loop Explorer window. Clicking on the Play button plays them all at once. If Auto is enabled, additional loops play as soon as they're selected.



A step-by-step guide to generating custom Groove Templates from your drum loops, plus advice on notating note clusters. And, of course, the usual power-user tips...

Mike Senior

One of the most advanced features in *Logic* is its ability to analyse a drum loop and derive a MIDI Groove Template from it, so that your MIDI parts will gel with its groove. However, like most of the functions within the Sample Editor window's Factory menu, the interface for this is hardly intuitive, and I'm sure it stops a lot of people getting anything usable out of it. So this month, I'm going to show you the tricks I use to get the groove extraction process working for me.

## Setting Up

The first thing you have to do is import your drum loop into *Logic* and trim it to length. Once this is done, you can use *Logic's*

automatic tempo-matching function (I covered this in October 2001's column) to bring the loop into line with the Song's metric grid. You can use the playback loop facility to check that the audio loops smoothly, by highlighting the correct area in the time position bar (Screen 1).

Now double-click the audio region to open the Sample Editor window and choose Audio To MIDI Groove Template from the Factory menu. A floating setup window for this function will come up, and three graphs will appear below the audio of the loop. Reduce all the fields in the setup window to their lowest values, with the exception of the Smooth Release field, which I find is best set to about five percent (this initial setup can be seen in Screen 2). If you now look at the Audio graph under



the waveform, you'll see a cluster of little vertical lines for each drum hit (Screen 3). These show where the Factory function is detecting hits — obviously, with the algorithm's parameters set up as they are, there will be too many of these lines at the moment. Your goal is to tweak the parameters to produce only one detection point per drum hit.

## Cleaning Up

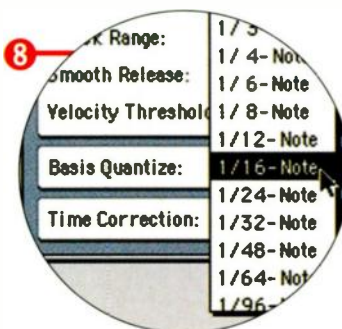
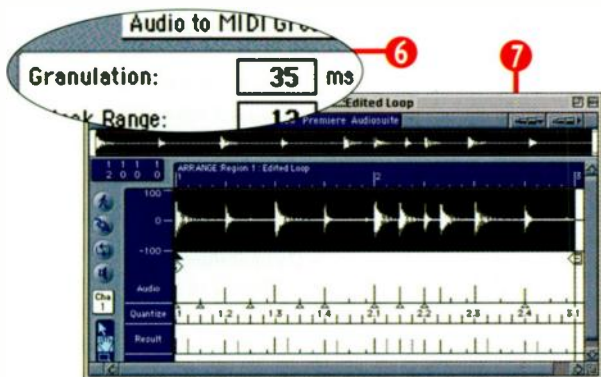
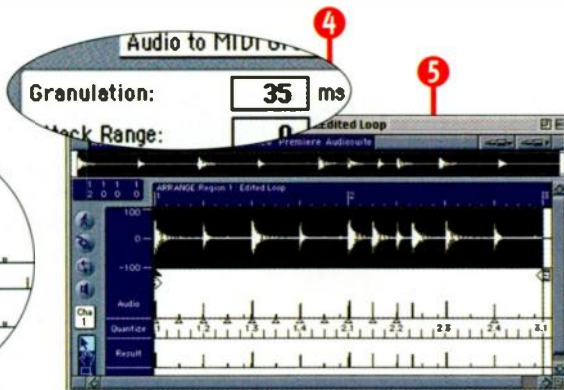
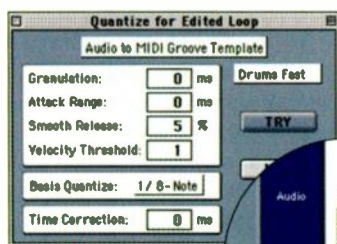
This is easier said than done, but here's my method. Increase the Granulation value (Screen 4) as high as it will go without causing the algorithm to completely miss any points — up to about 100ms at most. The detection-point clusters will have been narrowed

a fair bit (Screen 5). Now you should increase the Attack Range parameter (Screen 6) just high enough to reduce the number of detection points per drum hit to only one (Screen 7) — but only up to about 50ms at most.

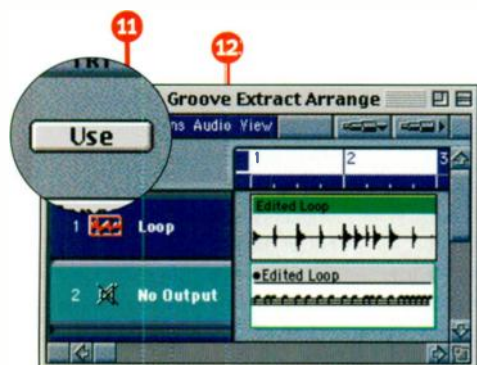
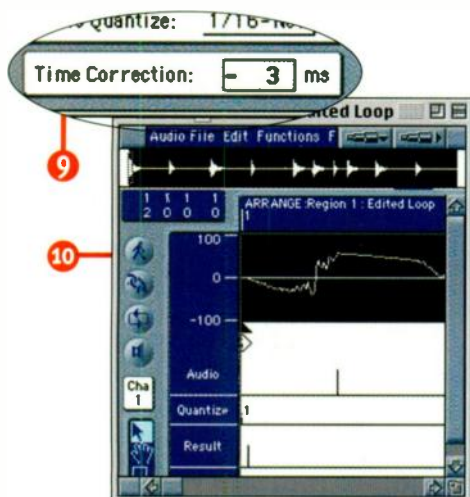
If you can't clean up all the clusters, try increasing the Smooth Release value a little more. If you find that a couple of false detection points are getting through no matter what you do, ignore them — we'll deal with them in a moment. Finally, reduce the Granulation parameter as far as you can before you start losing detection points that you need. If you still have any stray points, now's the time to click on them with the Pointer tool. This will cause them to be 'greyed out', and they'll therefore be ignored when it comes to creating the Groove Template.

The next thing to do is select a Basis Quantise value which is equivalent to the smallest beat division within the loop (Screen 8). This will make sure that there is a quantisation point for every beat division, even if there is not a drum hit on every beat division of the loop.

Finally, you should set a suitable Time Correction value (Screen 9). I find that the detection algorithm tends to detect drum hits very slightly late, so this parameter can be used to drag all the detection points in the Result graph closer to the actual start of the beat — you can see the effects of changing this parameter by zooming in and comparing the Audio and Result graphs (Screen 10).







## Generating The Template

Once all of this has been done, you should select an unused track in the Arrange window and then click the Use button (Screen 11). This does two things: firstly, it creates a muted MIDI object on the selected track in the Arrange window, putting in a note for

each of the detection points; and, secondly, it creates a new Groove Template based upon this MIDI object, named after the audio loop which spawned it (Screen 12). Now you can highlight any MIDI parts you'd like to process with the drum loop's groove and select this Groove Template. At this point the groove is unlikely to be completely on the money, though it may well be close enough to be usable. If it isn't, remember that you can tweak the Groove Template in real time by simply editing the notes of the muted MIDI object from the

## Logic Tips

If you use the Transport window a lot, try out the Position Slider available from its pull-down menu. This adds a little bar which shows where the Song Position Line is in the Song, and you can click the bar to move it. This means you can leave the main Arrange window zoomed in to see arrangement detail, and then use the Position Slider to navigate on a larger scale.

In the Score window you can double-click any of the Part Box buttons to create a small floating palette of its objects. Furthermore, if you hold down Ctrl or Apple on the Mac while you do this, the little window will be arranged vertically or horizontally — note that this facility

isn't available on a PC. Using a few of these little floating palettes should allow you to switch Parameters off in the View menu for most of the time, giving you a larger window in which to work.


There are times when you need a click to count you in for recording, but where having it playing along with you while you're recording is irksome. To sort this out, open up the Recording Options dialogue, from the Settings submenu in the main Options menu, and check the box labelled Click Only During Count-In (Record). Now the click will drop out after the count-in, whether you're using the Speaker Click or triggering a click sound over MIDI using the MIDI Metronome Click object in the Environment.

Matrix Edit window (I explained this in depth in December 2001).

## Tweak To Perfection

One way I find great for fine-tuning the Groove Template's timings by ear is to play a percussive sound using the muted MIDI object's note data. To get this to work you need first to unmute the object using the Mute tool (the little square one with the 'M' in it) and to put it on a track from which it can trigger a suitable MIDI instrument. Bear in mind, though, that the MIDI notes in the template may be on a number of different channels, so you'll have to make sure that the track instrument channelises the data, or else you'll have to edit the note data from the Event List or Transform window so that it's

on the correct channel.

Once you've got the Groove Template notes triggering a percussive sound, select the MIDI object and adjust the Delay field in its Parameters to get the best match — the MIDI triggering will usually be a little behind, because of the finite time MIDI sound modules take to react to MIDI Note messages. Once you've got things as close as you can get with this parameter, you can sort out any further rhythmic lumpiness by opening up the Matrix Edit window and shifting individual offending notes into line. 

## Current Versions

- PC: Logic Audio Platinum v4.8.1.
- Mac: Logic Audio Platinum v4.8.1.

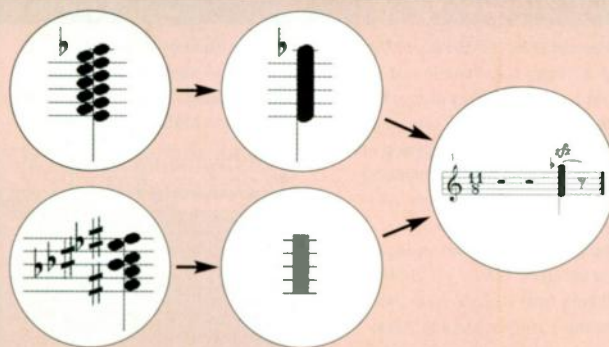
## Notating Note Clusters

If you've been trying to use Logic's Score window for any advanced notation duties, one of the things you may have been frustrated by is the lack of a method for notating note clusters. However, there is a way to do it. The first thing you need to do is create two quarter-note (or shorter) chords. The first should consist of the two outer notes of the cluster along with all the natural notes in between, while the second should comprise all the other notes with accidentals. I find it easiest to create these in the Matrix Edit window.

If you're not already in the Score window, then open it now. The first chord you have created will be used to create the visual cluster symbol. Select all the inner notes of the first

chord. Using the Attributes menu, select Independent (from the Independent submenu) and Hide (from the Stems menu). Once this is done, drag the square black notehead from the Part Box onto one of the selected notes.

The cluster symbol ought now to look correct. However, it won't play back any of the internal 'black' notes of the cluster. This is where the second chord you created comes in. Select all the notes in the second chord and perform the same Attribute-menu changes which you applied to the inner notes of the first chord a moment ago, with the addition of selecting Hide Accidentals from the Accidentals submenu as well. Next, drag the square grey

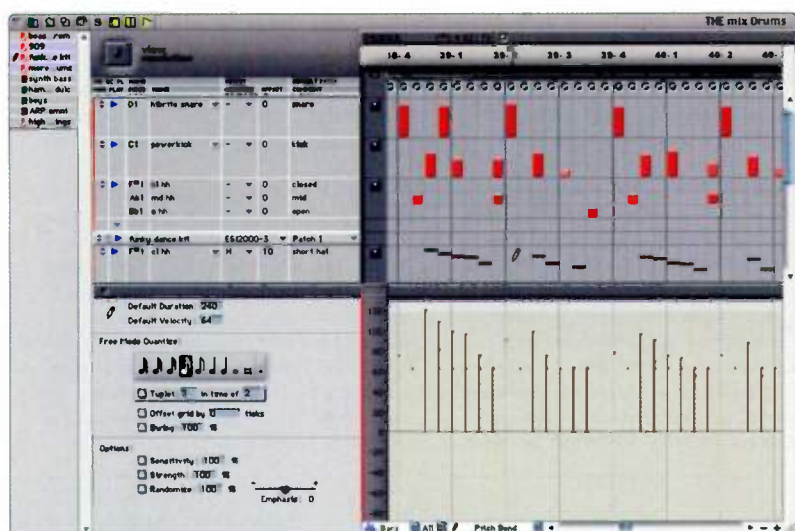


notehead (rather than the square black one) from the Part Box onto one of the selected notes to hide them.

As the final stage, combine the

two chords by dragging them onto the same beat within the Score window. You should now have a cluster which both looks and sounds the business!





A typical drum editor window — notice the note group for the three hi-hat parts, the 'Grid', 'Grid with Velocity' and 'Velocity with Duration' display modes, and the Pencil tool note settings at the top of the bottom left pane.

Octapad — you just play all your pads and DP3 learns what MIDI note number each is transmitting. It's quick, easy, and there's no messing around with keyboard or mouse data-entry.

## The Drum Editor & FreeMIDI

If you're a frequent user of the Drum Editor, you may have noticed that it's able to display drum names in the Note List, next to the MIDI note number information — but only for certain MIDI devices, and some drum kits. This information is drawn from the MIDI device's FreeMIDI patch list, but not all FreeMIDI patch lists have drum names preconfigured like this. However, you can add drum names to any patch list manually, and since the Drum Editor has a two-way relationship with FreeMIDI, these names will be saved in the patch list ready for the next time you use that particular drum kit. To give a MIDI note number a name (or to rename what's already there) you just hold down Alt key on your Mac keyboard and click in the note's 'Name' column. When the drums in a kit are named like this, you can use the Name column's little pop-up menus to quickly select drums by name rather than MIDI note number. You can even click in the name field of a blank row at the bottom of the Note List, start

from 'Selection' from the Drum Editor mini-menu. Thereafter, all grouped notes are covered by a single Play-enable button and appear

as a single, multiple-item entry in the Note List. Notes can be removed from a group by selecting them and choosing 'Remove Pitches From Group'.

Last month, I mentioned various ways of defining the list of MIDI pitches that the Drum Editor displays for each track. Yet another way is to select 'Learn Pitches' from the Drum Editor's mini-menu. When you choose this menu item DP3 'listens' for incoming MIDI notes, and creates an entry in the Note List for all note data that it receives. Pressing the Return key on the computer's keyboard then returns the Drum Editor to normal operation. Learn Pitches can be a boon if you're playing in percussion parts from electronic kits or, for example, a Roland

## Performer Notes moves on to the more advanced features of DP3's Drum Editor, plus more useful Performer-related tips, techniques and news.

Robin Bigwood

Last month, I looked at the basic operation of DP3's Drum Editor window, so now it's time to consider some of its more advanced features. One very nice touch is the implementation of Note Groups, a feature that exists to complement the way in which many drum machines and sound modules arrange drum sounds so that they are mutually exclusive, notably the various types of

hi-hat, so that only one drum in the group can sound at any one time. The idea is that you put sounds like this into a Note Group in the Drum Editor, and DP3 will then prevent you from programming a drum part which attempts to play two or more grouped drum sounds simultaneously. It's a convenience feature, certainly, but works really well.

To create a Note Group, you just select some notes in the Note List by dragging over their names, and then choose 'Make Group

## VST Wrapper v3

After extolling the virtues of Cycling 74's *Pluggo* plug-in suite and VST host in last month's column, I'm pleased to report that very soon, there should be a new version of a similar, complementary product, Audio Ease's *VST Wrapper*. As I write this column, in early December, I've already received a few different 'builds' of *VST Wrapper* v3 beta from Peter Bakker, one of the main programmers at Audio Ease, and it's looking very nice indeed. *Wrapper* v3 successfully addresses problems with 'tricky' VSTI plug-ins like Steinberg's *LM4* and *PPG Wave 2.V*, and Gmedia's *MTron*, whilst generally managing to be more stable and use less

memory. Best of all, perhaps, *Wrapper* v3 supports Steinberg's *Halion* sampler, offers multiple audio outputs via MAS busses, and

achieves near-sample-accurate MIDI. All this is offered by the current beta version, so the release version might well do even more.



Native Instruments' Absynth running under VST Wrapper v3.

I mentioned PSPAudioWare's *Vintage Warmer* plug-in last month, and a MAS version has now been released. Interestingly, though, it's really just the VST version 'wrapped' in a single-plug version of *VST Wrapper* v3. It would be nice if more VST plug-ins could be released this way, especially if it means that any VST/MAS compatibility issues are addressed by the plug-in manufacturer and Audio Ease before release of the plug-in.

To keep right up to date with *VST Wrapper* development, stay tuned to [www.audioease.com](http://www.audioease.com) and reports from the NAMM show, some of which should arrive in time to be included in the next issue of *SOS*.



## Quick Tips

- To keep the amount of information in the Drum Editor manageable, remember to use the Track Selector list to show and hide entire tracks in the Note List.
- By using 'Hide Selected Pitches' in the Drum Editor's mini-menu, you can cut down on unnecessary entries in the Note List. If you ever need them back again, just select 'Show Pitches for All Notes'.
- If you're using a MOTU audio interface with *DP3*, the system's latency is controlled by the Samples Per Buffer setting in the 'Configure Hardware Driver' dialogue box. Low numbers mean shorter latencies, but higher processor load.

typing in a drum name, and when you hit Return, *DP3* will choose the drum whose name is closest to what you've typed.

## Display Mode

There's one fundamental part of the Drum Editor that I haven't mentioned up until now — the Display Mode pop-up menus. These sit between the Note List and the Note Grid and determine how note data for a particular drum appears in the Grid. There are four options, the first two being 'Grid', which simply indicates the presence of a MIDI note at a certain position in the bar, and 'Grid with Velocity', which shows the rhythmic position of a MIDI note together with an indication — its vertical height — of how hard it's been 'hit'. You can change an individual note's velocity by clicking on it with the Reshape tool or writing over it with the Pencil tool. You can also 'sculpt' a row of notes with their velocities displayed by running the Reshape tool across them. The other two display modes both include duration information, along with rhythmic position and velocity. 'Velocity and Duration' mode indicates velocity by the vertical position of the note, and duration by its horizontal length. 'Free' mode is exactly the same, except that notes are no longer subject to the 'visual quantising' I talked about last month — you see exactly where they begin, their duration and velocity.

In all the display modes except for 'Grid', individual rows in the Note Grid can be resized by

moving the mouse pointer to the horizontal dividing line beneath each display mode pop-up menu and then clicking and dragging. Resizing is useful because it allows more accurate display and control of note velocity.

## Input Strips

Recording audio directly into a voice track in *DP3* is easy — you just select an input, record-enable the track, and away you go. Recording like this has a major drawback, though — your signal will always be recorded 'dry' (ie. with no effects processing), unless it's being routed through some outboard effects units on its way to *DP*. Putting MAS (MOTU Audio System) effects into the track's insert slots won't change anything, because they'll only affect signals during playback, not during recording. It's the same for the track's fader and pan knob too — their position won't make a scrap of difference to the way your signal goes onto disk.

With so many top-class MAS effects on offer, including quite a few that are ideally suited to being used during recording, it would be daft if you could only use them during playback and mixing of your material. This, of course, is not the case — you can indeed use them during recording, but it just takes a little longer to configure. Remember, though, that if you want to monitor your signal passing through effects plug-ins during recording, then for the sake of sanity you really need to be using *DP3* with audio hardware offering

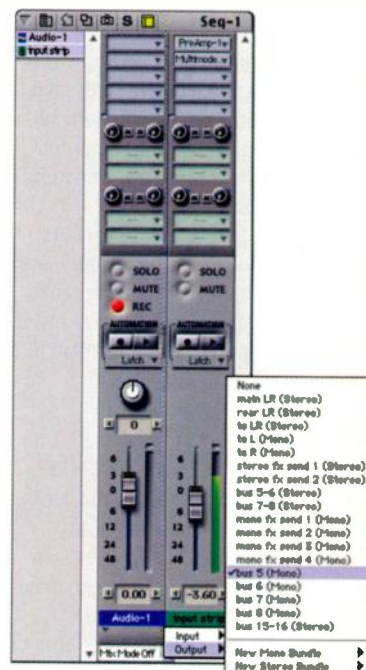
good latency performance. You can probably get away with using the Mac's built-in audio hardware via the Apple Sound Manager, though you'll get much better performance with any of MOTU's interfaces or some of the more up-to-date ASIO-based hardware.

If you're new to this sort of routing, try creating a new project with a single mono Voice Track and a single aux buss. The idea is to route audio to the voice track via the aux; then, if you put plug-ins on the aux buss, the signal will be nicely 'wet' by the time it reaches the record-enabled Voice track. The settings are simple — you just make the Aux's input one of the physical inputs from your audio hardware, and its output a buss. Set the input of the Voice track to the same buss you've selected for the aux output, and finally check that the voice track's output is set to the physical output (or output pair) on your audio hardware that you use for monitoring. There's one last thing to check — in the Audio Monitor window (which allows you to observe the signal levels getting to your audio hardware, amongst other things) make sure the little headphone icon in the window's title-bar is selected, so that it lights up. This is a shortcut for Audio Patch Thru, also accessible from the Basics menu, and essential if you want to monitor your input as it comes back out of the computer.

You should now be able to hear the output of your mic, guitar, stylophone or whatever, so now try putting a plug-in effect in one of the aux's insert slots. For instant gratification, try a reverb, but an infinitely more useful treatment for tracking purposes is the MAS *Dynamics* plug set to Compressor mode. Guitarists could also give *PreAmp1* a whirl — it's no Pod, but it's still better than a lot of pedals.

If you're recording a live gig (pop or classical), *MW Limiter* is a fine choice to help you get a healthy signal level onto the voice track at all times. It can't guard against overloads in your

hardware's AD converters, of course, but it can prevent signals hitting full scale within *DP* itself. Another useful treatment is using *Multimode Filter* with its modulation source switch set to 'Env'. This way, it tracks the level of incoming signals, and opens the filter according to volume of those signals; it's superb for auto-wah effects, especially on bass parts. Prosoniq's *NorthPole* VST plug-in also excels at this.



This is the simplest possible setup — external audio is routed into the Aux track (on the right), passes through *PreAmp1* and *Multimode Filter* before being routed via a buss (buss 5 in this case, as indicated in the pop-up menu) to the record-enabled voice track on the left.

Routing through effects this way allows you to really play with sounds and hear the results immediately. Providing you can achieve a workable latency, there's little need for outboard effects — in fact I now nearly always start *DP* projects by creating a few 'channel strip' auxes as described above. All incoming signals pass through one of these, before being routed to a voice track for recording.

Next month, I'll be describing some really intriguing possibilities using this sort of input routing. **SSS**



## The word is in from MacExpo and the AES show, and the word is that the OS10.1 apps are coming...

Paul Wiffen

Having suggested in this very column that Apple should get someone to talk about the features of Core Audio at the recent MacExpo, I suddenly found myself, at very short notice, doing exactly that, at a couple of presentations on the second day (remember that old Chinese proverb, "be careful what you wish for..."). Fortunately, I had the support and help of Freddie Mercury and Peter Gabriel to make sure that at least the musical side of my presentation was up to scratch. I was able to use the 5.1 surround sound mix of 'Bohemian Rhapsody' to illustrate the fidelity of 24/96, and all 120+ tracks of the 'Make Tomorrow Today' multitrack (from Gabriel's *Ovo* project), to show the need for multi-channel audio support at OS level. (Thanks to Justin Shirley-Smith of Queen Productions, and Peter himself, for making that possible.) I was also lucky enough to have Aspen Media bring along their excellent Magtrax 5.1 surround sound system to take care of the audio side of things.

### Then Three Come Along Together

The amazing thing for me was that 10 days before the MacExpo presentation, when I managed to convince Apple UK that it could be done, I had one OSX-ready audio app to demonstrate everything (Celemony's *Melodyne*, which has been OSX-compatible since it shipped, back in September). But two days before the event, after a flurry of emails and some long downloads, I found myself looking at a respectable crop of OSX betas and, in one case, a fully functional, downloadable freebie.

First of all, Steinberg came through with an OSX beta of *Nuendo*, although my receiving a web site URL from them so that I could download it only marked the start of my problems (getting access to it, not using it, I hasten to add). Persuading all 14Mb to come across the ISDN link at my office was a nightmare, as I kept getting kicked off after 45 minutes. Even at home that evening, where we have ADSL,

I kept getting an error at 12.1Mb. But next morning, when I decided to have one last try at downloading it, all 14Mb came across without problems. But my worries were not over. Although the *Nuendo* updater worked OK when I tried to run the OSX version, the PACE software reported extensions missing. There was a PACE updater in the program folder, but when I ran this, it wanted to take me to the PACE web site. However, once it got there, it could not access what it needed. Eventually, I thought of running the PACE updater under OSX instead of OS9 — and suddenly it found its way to the right place on the

PACE site. This produced a second updater on the OSX desktop, and when I ran this it downloaded further files from the PACE site. After hours of frustrated anticipation, I finally found myself running the OSX version of *Nuendo*, which was indistinguishable from the OS9 version I had been using.

I ran the 24-track recording of 'Bohemian Rhapsody' perfectly, and allowed me to give those attending my presentations a little glimpse behind the scenes at a modern classic, on a track-by-track basis. This was just the prelude to running the first ever public playbacks of 'Bohemian

## Montage: The Video Editor For Musicians?

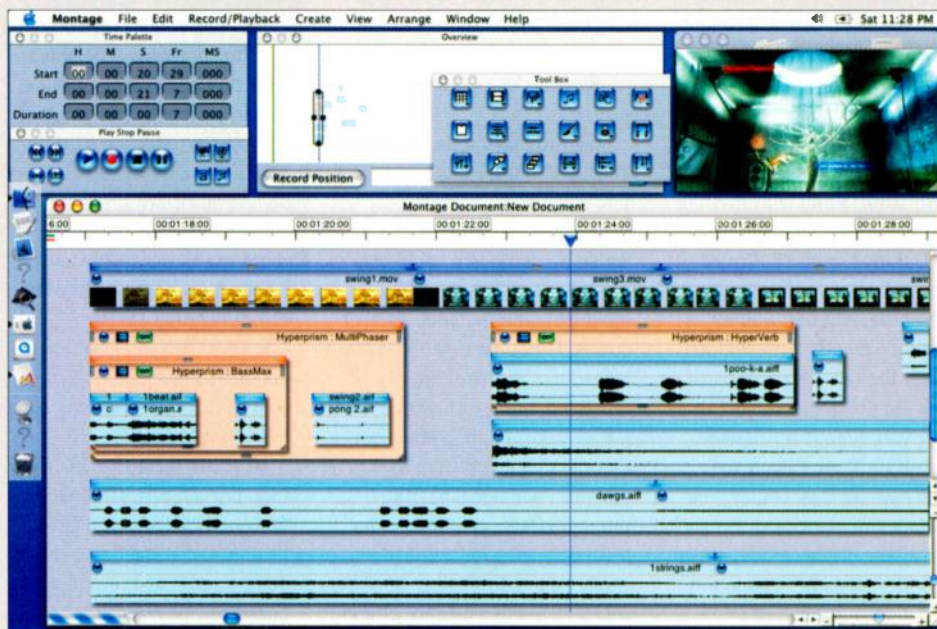
For years, I have been trying to persuade Steinberg or Emagic — or, indeed, anyone — to make a multitrack editor that allows video and audio (from a musical as well as a post-production standpoint) to be edited simultaneously. If you can live with just the charmingly-named 'butt' edits, a limited amount of video editing can be performed in *Nuendo*, but it gets very frustrating sometimes when you can't even create a very short dissolve or fade to black. So I got very excited when Ian Gilby emailed me a press release about Arboretum's new product launch at AES. It read as follows:

"In *Montage*, video, pictures, audio, MIDI and text are equally at

home. All media components share a single, infinitely expandable workspace, with movable clips that can be freely associated, edited in place and processed either individually or in groups."

Needless to say, the Arboretum booth was the first one I hit, long before the show opened. Despite the fact that he was still putting the finishing touches to the booth, Georges Jaroslaw took the time to show me enough to really whet my appetite. *Montage* has no tracks, just a grid system which you use to line up component parts of your project in time and sync with each other, using simple drag 'n' drop — all possible, he told me, because of the unique

nature of OSX (*Montage* will never run on anything else!). When I had some more time, I was back for the full demo. Drum loops effortlessly sync'd together were put through *Hyperprism* effects, complemented by string textures triggered via MIDI, themselves effected and mixed, then video clips were dropped onto key musical points and cross-dissolved with video effects, all while the composition was running. I must have this program! It's exactly what I need to edit the video footage and surround audio I recorded in the Czech Republic earlier this year. How can I be expected to wait until April, when they plan to release it? I feel a beta-tester agreement coming on!







Producing hit records and film scores is not all BT has been doing lately. BT's latest projects **"Breakz from the Nu Skool"** and **"Twisted Textures"** are sample libraries designed for other musicians to use in their own music productions.

Without a doubt, BT is one of the fastest rising artists in today's music scene. He has written the score for the #1 box office hit **"Fast and the Furious"**, as well as scores for **"Driven"**, **"Go"**, and **"Under Suspicion"**, produced and programmed N'Sync's latest single **"Pop"**, released his own album **"Movement in Still Life"** (which received rave reviews), and most recently released the double re-mix album **"R&R"**.

Peter Gabriel, who BT collaborated with on his Millennium 2000 score, recently told the Los Angeles Times **"BT mounts mesmerising journeys with his compositions. He is not only a virtuoso programmer, but an extremely gifted musician..."**



**"Breakz from the Nu Skool"** is the first sample library in BT's signature collection, and features cutting edge breakbeats hand mangled through hundreds of plug-ins, stomp boxes, pressed to vinyl, you name it! From Kyma to Reason, **"Breakz From the Nu Skool"** streams through on all frequencies of subconscious awareness. **"Best of all, these collections are sample accurate! This means no more flaming as you stack loop upon loop. Drop them into any audio program and you're off and sprinting"** says BT.

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► Rhapsody' and 'Death On Two Legs' in 5.1 surround.

Then I was able to demonstrate the capabilities of *Melodyne* with the lead vocal and guitar solo from this masterpiece, removing any doubt in anyone's mind that the demo was being faked, as the singer is not available for re-recording. Of course, it was no surprise to anyone who has already checked out this software that it can change the melody and phrasing of any vocal or monophonic instrument line. Still, it was a delight to see the jaws dropping at a Mac show, where half the people had wandered in out of curiosity, or a barely-concealed desire to share a *Wayne's World* moment! If ever OSX has a killer app, this is it (it only runs under 9.x if a later version of Carbon Lib than 1.3.1, which makes X's goodies available to OS9 apps, is present in the Extensions Folder).

A real surprise was to find, courtesy of our publisher (the only one in history who seeds columnists with press releases on receipt), that TC Works, without any prompting from me, had put a full OSX-compatible version of *Spark* on their web site for free download. OK, so I was fighting musicians in the US to download it at the same time, hence the snail-like download, even via the new ADSL in my Swiss flat. (I spoke

with someone who had got in before the rush and he had it in seconds; mine took half an hour, but who cares when you are no longer paying by the minute?). To have this staple of my OS9 work available so early in the transition to X, and not to have to pay for it, is phenomenal.

The final joy was to discover that the latest version of *Peak*, also downloadable, is also OSX (or, to be more accurate, 10.1) compatible! Sadly, although already shown a few months back, at the summer MacWorld in New York, a beta of *Logic Audio* running under X was not available, but this can't be too far away either. Add these to the 'Classic compatible' apps, such as Native Instruments' *B4*, which can be run side by side with OSX apps, and suddenly OSX starts to look like a really serious musical environment.

### Where's The Hardware?

Of course, there are still a few pieces needed to slot into the puzzle. The main one for most professional applications is hardware interfaces for audio I/O. The MIDI situation is a little better, with OSX drivers from Midiman already downloadable. To date, I am unaware of any audio interfaces which work under X. So, for the time being,

inputting and outputting audio is somewhat restricted. However, the real-time sample-rate conversion in Core Audio means that you can work with files whose rate and resolution surpass the hardware capabilities currently available. Core Audio simply downsamples the rate and downsizes the bit resolution automatically. Thus more limited hardware, like the 16-bit converters in the Mac, can play files back without the user having to spend ages doing off-line conversions, then having to import those for use in the arrangement — and then, after any editing, reassign the original, higher fidelity files. I've had to do this a few times, and it's a nightmare! So if you copy a project to a Titanium PowerBook, using FireWire Target Mode (Apple + T as you reboot), which is lightning-fast for those huge 24/96 audio-file transfers, you can edit and mix the project on headphones anywhere — as long as you have those fantastic Bose Noise Cancelling headphones which Apple were using at the show. Then you can email just the tiny main project file back to the studio with your new edit or mix.

### A Non-Musical OSX Experience

When insomnia strikes in New York City, you've finished your Apple Notes column (which is due before you get home), and you don't fancy going out on the street with the crazies, what do you do? Well, while out there recently for the AES show, I found myself in a hotel room with an Ethernet Internet connection, a brand-new PowerBook and a new email account. What would I do but try to get online! I prepared myself psychologically for a hideous phone bill, as I girded my loins for the struggle to get connected which this stuff has always entailed in the past.

Not this time! Apart from needing to dial England to get the necessary details to type in from my new IT guardian angel at Apple, it hardly cost anything at all. I was on the Internet in seconds, thanks to the free version of *Internet Explorer* which comes with OSX, and the mail program in X enabled me to send this article about 10 minutes later, thus meeting my deadline and staying on the right side of my *SOS* sub-editor! **SOS**

## Lord Of The (Modular) Ring

My old friend Thierry Carron, of Mil Productions, turned up for MacExpo and showed me the latest beta of his new product, *Modular Ring*, which is more fun than anyone should be allowed to have on a computer. It's basically a set of 21 sound, sequencing and processing modules (although this number seems to grow every time he shows it to me). The modules are connected by the drag 'n' drop MidiShare system — which the Mac music cognoscenti acknowledge as the only way of moving MIDI around inside pre-OSX Macs with the

timing and sync'ing precision needed, but which could never compete commercially with the big boys like OMS. (Rumour has it that the technology involved will be supported in the next rev of OSX). *Modular Ring* gives you all the different elements you might need for a musical production (drum machine, synth(s), sequencer(s), arpeggiators, sampler(s), and so on), in a set of bite-sized pieces which make learning each bit a breeze.





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## There are now so many versions of Windows that choosing the best one for your needs can be difficult. This overview places them all in context.

Martin Walker

**A**s this month's PC Musician is devoted to Microsoft's latest (and, many say, greatest) operating system — Windows XP — I felt that it was about time I discussed the whole Windows family and placed them into a historical context. At no time in PC computing history have so many different Windows platforms been used simultaneously, and with

musicians now variously running Windows 95, 98, 98SE, ME, NT 3.51, NT 4.0, 2000, and XP, it's hardly surprising that there's so much confusion and misinformation about which one is the best choice.

Essentially, two completely different platforms have evolved — one originally intended for the home consumer or small business, and the other for the somewhat different requirements of the larger business that networks multiple PCs so that

information can be shared between them. The prices of the Windows versions, along with their range of features, type of hardware and software support, and even robustness and stability, are largely dependent on which of these two platforms they support.

If you've bought a new PC for home use in the last 18 months or so, the chances are that it arrived with Windows ME (Millennium Edition) pre-installed. This is the final release in a long line of operating systems primarily intended for home use. Microsoft first announced their Windows operating system way back in 1983, but the first time it offered multimedia features was with the release of Windows 3.0 in October 1991, followed in April 1992 by

Windows 3.1. This was the first serious platform for the PC musician, although with most of us running processors like Intel's 386DX, with a 25MHz clock speed, it was largely a MIDI-only world.

As its name implies, Windows 95 came three years later and, like most upgrades, was evolutionary rather than revolutionary. A few musicians with older PCs still run Windows 95, as its hardware requirements are fairly modest by today's standards, but few developers are even bothering to check nowadays whether or not it's compatible with their software. I still have a Pentium 166MHz PC running Windows 95 and a word processor, so there's life in the old ►

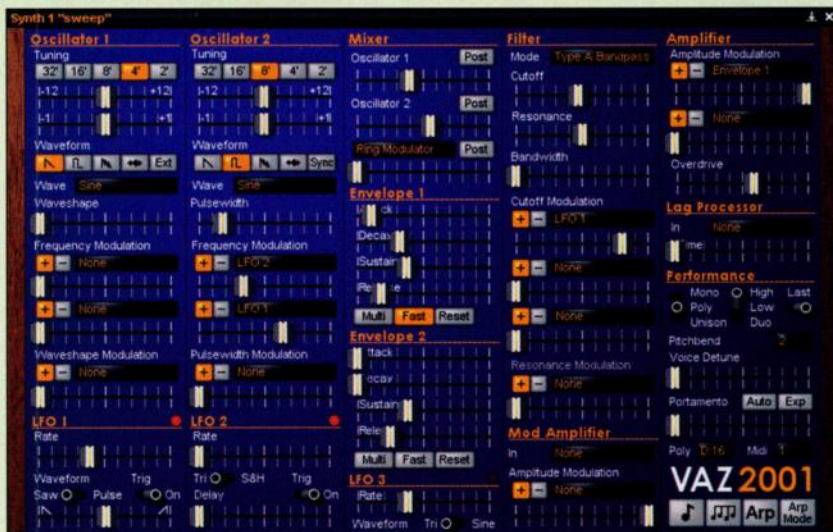
## PC Snippets

• Software Technology have released the long-awaited newcomer to their VAZ (Virtual (sic) Analogue Synthesiser) family of software synths. Like VAZ+ and VAZ Modular (reviewed in *SOS* March 2000), VAZ 2001 can be run in stand-alone mode. However, it also ships with VSTi and DXi versions that run inside a growing number of compatible host applications, such as *Cubase VST*, *Logic Audio* and *Sonar*. Up to 16 synths can be run simultaneously, for multitimbral use, each with a choice of analogue, sample, or live-audio input sources, with up to 16-note polyphony and their own dedicated polyphonic sequencer. A 16:2 mixer with channel inserts and two aux sends lets you combine their sounds and add DX and VST plug-in effects. At £129, VAZ 2001 should certainly be popular, if it builds on the family tradition of rich and squelchy analogue sounds.

**W** [www.software-technology.com](http://www.software-technology.com)

• Yamaha have released stand-alone versions of three PLG editors previously only available when running their *XGworks* sequencer. For those of us using *Cubase*, *Logic* or *Sonar*, this is good news, since it means we can run them neatly alongside our choice of sequencer, to edit sounds while they are playing back in context. The three cards now being supported in this way are the analogue-modelling PLG150AN, the FM synthesis PLG150DX, and the harmony/vocoding PLG100VH board. The editors all run on Windows 95, 98, ME, 2000, and XP, are between 6Mb and 7Mb in size, and support the aforementioned PLG cards when installed in the SW1000XG soundcard, Motif keyboards, MU-series sound modules, or Kenton's Plugstation. (The stand-alone 'VL' editor suitable for the PLG150VL is still available on the web site below.) Sadly, they all load and save sounds in proprietary formats, rather than accepting standard SysEx files, but it's still an excellent start.

**W** [www.yamahasyth.com/download/plg150/s\\_utils.htm](http://www.yamahasyth.com/download/plg150/s_utils.htm)



The latest member of the VAZ family provides up to 16 polyphonic synths simultaneously, with a choice of squelchy analogue or sampled sounds, and runs in stand-alone, VSTi and DXi modes.

• The handy *Cacheman* utility that I first discussed in *SOS* July 2000 is now up to version 5.0 and benefits from a graphic makeover and a set of informative Wizards to guide users through the various system parameter optimisations, including the most suitable sizes for the Disk Cache (vcache), Name, Path, CDRom, and Icon caches. It also features a Memory Recovery facility that can reclaim RAM by swapping unused parts of inactive software to the hard disk. You can either have this done automatically every few minutes (not wise during hard disk recording) or on demand. There are also yet more miscellaneous settings, including some specifics for Windows NT4/2000/XP, and others for Win 9x/ME. This complete rewrite of *Cacheman* has changed it from freeware to shareware, but it's only a modest \$10 to register. Author Thomas Reimann hasn't disabled any

features, so it's up to you to fork out, although only registered users will get email support and advice.

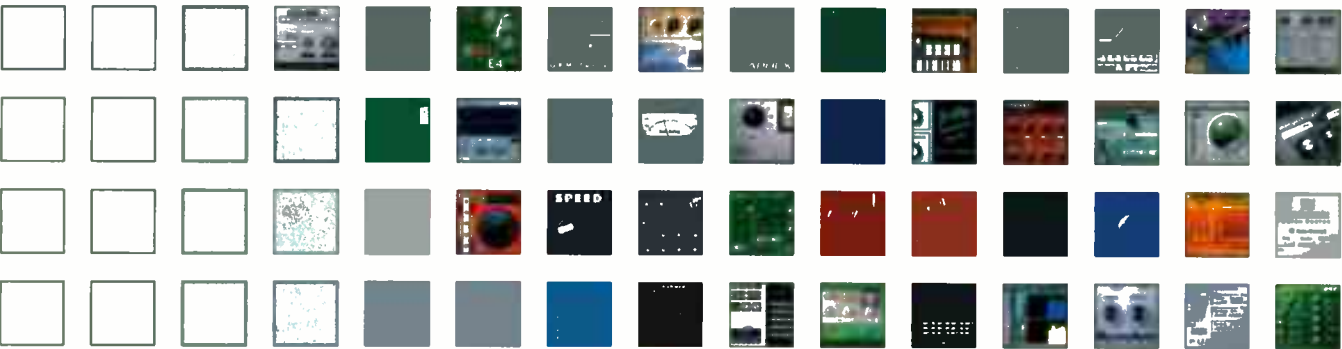
**W** [www.outertech.com](http://www.outertech.com)

• The first release from new developers Taudinvar will be of interest to anyone struggling to trigger multiple synths from a single MIDI keyboard. *MIDIAngelo* is a simple-to-use graphical MIDI mapper that runs on Windows 98, ME, 2000, or XP, and lets you define any number of note regions and transposition values, each one pointing to a different MIDI Instrument, channel, or even interface. It's ideal for triggering multiple synths via different regions on a single keyboard, or for setting up complex layering effects. A free demo version is available for download, while the full version costs just \$36.

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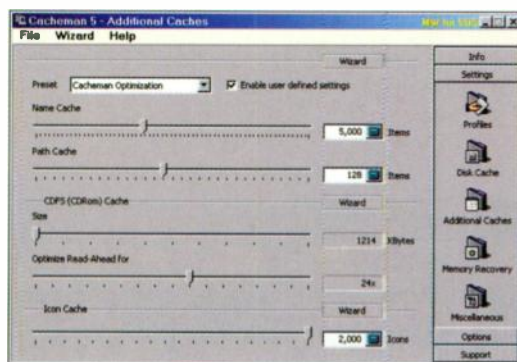


► dog yet. However, this OS is of little use to the modern musician, especially as it has a major flaw — an upper limit of 11 MIDI devices. That figure may sound huge to the beginner, but can soon be exceeded after installing one of the popular eight-in/eight-out MIDI interfaces alongside a soundcard.

The 11-device limitation was removed in Windows 98, and its successor, Windows 98SE (Second Edition) the following year. This pair also introduced us to *Internet Explorer 4*; the dubious delights of the Active Desktop; multiple monitor support to spread the information we wanted to see across several screens; a quick and easy way to add peripherals 'on the fly' without having to switch off the PC and find a screwdriver, in the form of USB (Universal Serial Buss); and FAT32 — which removed the previous 2Gb size limitation and offered a more efficient way to organise data on the hard drive.

With hard disk sizes increasing in leaps and bounds, doing away with this limit finally removed the need for them to be split into multiple partitions — although, as many of us have subsequently discovered, using multiple partitions still provides several advantages, not least the ability to run several instances of Windows on a single drive. Many musicians still use Windows 98, and the SE version seems to be preferred, particularly by those who wish to take advantage of USB peripherals.

The final evolutionary stage in this product line is Windows ME (Millennium Edition) which, as its name suggests, appeared in 2000 (September, to be exact). ME included *Internet Explorer 5.5*, the skinnable *Media Player 7*, *Windows Movie Maker*, and *System Restore*, and for the first time it dispensed with DOS during its boot procedure. Although Windows ME is generally acknowledged to be the most



With more informative Wizard-based advice on the best way to optimise various aspects of your PC system, *Cacheman 5.0* is hard to beat (see 'PC Snippets' box on previous page).

stable version on the consumer/small business platform, by many musicians who've tried it, none of its features are indispensable for the musician, and the majority (including me) seemed to stick with Windows 98SE.

### Business As Usual?

Meanwhile, Microsoft had designed a completely different platform for business users. Windows NT (New Technology) 3.1 was introduced way back in July 1993, after Windows 3.1 was introduced for home use, and was the first version to support the less restricted 32-bit programming model. It was also designed from the ground up to be as stable and security-conscious as possible, to make it more tempting to businesses who needed to run it 24 hours a day, seven days a week. It was followed by NT 3.5 and NT 3.51 in 1994 and 1995 respectively, and then NT 4.0 in 1996.

Many musicians were tempted by this platform's promise of stability, especially considering the number of times that Windows 95/98 applications seemed to crash the whole computer, requiring a complete reboot. By comparison, the NT family ran each application in its own section of 'protected' memory, so that even if one should crash, your PC could close it down safely and carry on regardless. The big problem was the lack of multimedia support: because of the business nature of NT, few soundcard drivers were written for it, and little

music software was ever converted to run on it.

Windows NT 5 was so long in preparation that by the time it was released Microsoft had renamed it Windows 2000. However, it was still an operating system primarily designed for business use, sold at business prices (the cheapest Professional

version was launched at £250, and it cost £170 as an upgrade from Win 95/98). However, it did have more multimedia support (a more recent version of DirectX 7.0), and supported multiple CPUs, for those who needed more processing power. It also sported a different 'look' — one that was subsequently used for Windows ME on the 'consumer' platform, which further confused everybody.

Many musicians have been tempted to move from Windows 98 to Windows 2000, largely by the twin promises of greater stability and dual processing. However, it's not the easiest jump to make, as Windows 2000 really needs its drivers in WDM (Win32 Driver Model) format and, until recently, WDM soundcard drivers have been in somewhat short supply. Some music

software applications, particularly the Tascam *Giga* range, were not compatible without a major rewrite.

Which brings us bang up to date, with the launch of Windows XP. This is the long-awaited consumer version of the NT family, created with more attention to the needs of the home user — such as increased built-in support for soundcards and other multimedia products and a reduction in security features — but still promising the much-vaunted stability of the NT range. For the musician, the major difference between the Home and Professional Editions is that only the latter supports dual processing.

You can read all about XP's new features in this month's PC Musician feature, but one fact is probably more important than any other: Microsoft are very keen that we all eventually migrate to either Windows XP or Windows 2000, so that eventually they only have to support a single slab of code, rather than two complete families as in the past. Given this, and the fact the Windows 95/98/ME range will slowly be allowed to die out, all music developers will finally be forced to release suitable soundcard drivers and software updates. It's no longer a question of either/or, but when! **EOS**

### Tiny Tips: CD-ROM Software Installation

**Disabling the Auto Insert Notification of CD-ROM and CD-R/W drives** is advisable for the musician, to avoid polling every few seconds by Windows, to see if a new CD has been inserted. Most drives return an answer directly, although some blink their LED first, so you may spot this flashing every few seconds. If you're playing back audio, these interruptions may only cause an annoying glitch, but if you're recording audio they could result in ruined takes.

However, there's no denying that this tweak makes installation of applications from CD-ROM more tedious, since you have to find and run manually the file that Windows would otherwise have launched automatically. Which file would it

have been? In most cases it's called *Setup.exe* or *Install.exe*, and you can use the Windows-R shortcut to run it and start the install procedure. However, the necessary file might be buried inside folders, particularly if there are demos of other products on the CD-ROM, and a graphic front end. The secret to easily finding the file that Windows would have run is that it always looks for, and then runs, a file named *autorun.inf*. If you find this, using *Explorer*, right-click on it, and choose 'Quick View', you can read its contents. You should find a line starting with 'open=i\*', followed by the name of the file that would have opened automatically. Once identified, this file can be run like any other program.



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# Working Class



## Korg M1 Digital Synth Workstation

**Mark Vail**

In a marketplace where a synth that sells a few tens of thousands of units is considered a success, one that reportedly sold 250,000 surely exceeds a manufacturer's wildest hopes. Such an instrument was the Korg M1, the widely-beloved Sample + Synthesis workstation that can rightly be called the most popular synth of all time. Released in 1988 at a UK retail price of £1499, it was manufactured until 1995 — and seven years is a very long time in music technology. Although Korg won't verify the quarter of a million figure I've just mentioned, they do tell me that 100,000 were manufactured during the first two years of the M1's life, serial number 100,000 having rolled off the production line in November 1990.

Why such enormous success for this particular instrument? As you'd expect, there was more than one reason...

### In The Beginning

Sampling, that mainstay of modern music, was growing in popularity at the time of the M1's gestation, but DRAM (Dynamic Random Access Memory) chips were very expensive,

**The all-time best-selling synthesizer, Korg's M1 laid the groundwork for synths that followed. We go behind the scenes to reveal the secrets of its success.**

which helped to make samplers quite expensive too. Although the M1 isn't a sampler, its ROM (Read Only Memory) contains four megabytes of musically useful and downright stunning 16-bit PCM (pulse code modulation) tones. Included are superb drum and percussion hits — a first for a sample-playback synthesizer — and exotic instruments that previously hadn't been heard by many in the mainstream. The M1 also has onboard effects, which are more diverse and of better quality than those found in the near-contemporary (and very successful) Roland D50. In addition, the M1 has a built-in eight-track MIDI sequencer with battery-backed memory. This sequencer might not be as user-friendly as the slightly earlier Ensoniq ESQ1, but it's enhanced by the inclusions of pattern construction and drum machine-style loop recording. Perhaps none of the M1's basic facilities was completely unique to it, but they were specified and combined in a way

which obviously gave it an edge.

For its time, the M1 had a very good feature list, and it's not bad even now: a 61-note keyboard that senses both key velocity and aftertouch, a joystick for pitch-bend and modulation control, 16-note polyphony, eight-part multitimbral operation with dynamic voice allocation, and 86 16-bit sampled waveforms within that 4Mb ROM memory I mentioned earlier.

User memory can be flexibly allocated, between program, combination, and sequencer storage: you can choose to store either 100 Programs, 100 Combis, and 4400 sequencer events, or 50 Programs, 50 Combis, and 7700 sequencer events. A Combi (Combination) consists of up to eight Programs, allowing you to assign different sounds in layers or split zones, or set up voices on specific MIDI channels for multitimbral sequencing applications.

Two card slots are provided as a means of quick and simple memory expansion. One



slot accepts RAM cards for storing and directly accessing Programs, Combis, and sequence data. The other takes PCM cards containing alternative waveform data. Plenty of third-party companies provided support of this kind — I've listed them in the 'M1 Variations & Add-Ons' box.

## 'World' Music: The Sounds Of The M1

The M1 shipped with one hell of a sound set — and it was unusual in that it had the *same* sound set for every country it shipped to. The situation had previously been that manufacturers commonly shipped their new synths and samplers with sounds pertinent to specific countries. As Jack Hotop, Korg's premier sound programmer, and a man who played a key part in the M1's development, told me: "In the old days, a new synthesizer would come out and programmers in Italy, Germany, the UK, and the United States would create sounds for it. Everybody would say, 'I know the market in my country, so

**"The M1 shipped with one hell of a sound set — and it was unusual in that it had the same sound set for every country it shipped to."**

we should put my sounds in this synthesizer.' Consequently, Korg would have to ship their synths and samplers loaded with sounds created specifically for England, Canada, and so on. We weren't really unified. Then Korg Inc. in Japan bought Unicord, the US distributor, and formed Korg USA. Now we were one big happy family."

Korg founder and chairman Tsutomu Katoh, and his son, Seiki, then decided that each instrument should ship with the same factory sounds, regardless of its destination. The company assembled an international team to develop the M1's sounds. As well as Jack, the group featured Peter Schwartz, a composer, keyboard player, programmer,

and musical director who's worked with David Bowie, Cher, Enya, Madonna, the Pet Shop Boys, and Hanson. (Not only did Peter clean up the M1's strings and vibes sounds, he also helped to create other crucial timbres.) The team was completed by Athan Billias, Ben Dowling, Robby Kilgore, Jim Bescher, Michael Geisel, and Michele Paciulli.

On paper, the lists of 100 multisounds and 44 drum and percussion samples in the M1 seem quaint now, given the current state of digital synthesis and the gallons of gigabytes of sampled sounds in the known universe. Still, the sounds Jack and the gang squeezed into the M1's modest 4Mb of sample ROM played a key part in making the instrument a phenomenal success. ▶

## Korg History

Korg's synth-making history goes back further than you may have imagined. The company started doing business as Keio Electronic Laboratories in 1962, and their first product was the Disc Rotary Electric Auto Rhythm machine, or Doncamatic DA20 (c. 1963). The Korg name — an amalgam of Keio (pronounced Kayo) and organ — first appeared on an experimental keyboard that had programmable voices in 1968. Fifty DA20s were produced. March 1973 saw the birth of the miniKorg monophonic synth, whose popularity convinced Korg founder Tsutomu Katoh that he should commit more resources to synthesizer development.

During the mid '70s, Korg brought numerous synths to market. The dual-oscillator 700S monophonic came out in May '74, followed by the duophonic 800DV Maxi-Korg in March '75, the 900PS preset synth and SB100 Synthe-Bass in November '75, the dual-oscillator 770 monosynth in September '76, and the M500 preset synth in September '77. None of these instruments set the world on fire, either in terms of the numbers sold or their synthesis capabilities. (They're extensively profiled in *SOS's* April '98 Retrozone feature.)

The big turnaround in Korg synthesizer success came in December 1977 with the introduction of the PS3100 (see Retrozone February 2001) and PS3300 modular polyphonic synths. These were serious, powerful, and expensive



Korg's sought-after PS3100 was a late-'70s success story.

systems that challenged modular synths from ARP, Moog, Roland, and other manufacturers. Korg followed up in kind with the PS3200 modular polyphonic in December '78, but catered for a wider modular user base in May of the same year by unleashing the popular patchable MS10 and MS20 monosynths (see Retrozone November 1996), and the patchable MS50 monosynth module in January 1979. Other Korg synths that appeared in 1979 included the decent-sounding KP30 Sigma preset monophonic performance synth and the pricey Trident synth/brass/strings machine (see the July '95 Retrozone).

November 1981 saw Korg release a pair of interesting synths, the Mono/Poly and Polysix. While the former could function as a monophonic or four-voice polyphonic synth, the latter provided six-voice polyphony and complete programmability for an unprecedented price of only £899. The Polysix was replaced in 1982 by the Poly-61, which listed for about the same in the UK but included numerous

enhancements.

Then came MIDI. Korg's first synth to support this earth-shattering development was the eight-voice Poly-800, which appeared toward the end of 1983. Costing a mere £529, the Poly-800 was a fully programmable synth at a breakthrough price. With only a four-octave keyboard, it was tiny and lightweight. Korg even had the foresight to make it battery-powered, and fitted side-mounted buttons so that you could slap on a guitar strap, sling the keyboard around your neck, and carry it as if it were a guitar. The Poly-800 was a very popular item, with a reported 100,000 being sold. Its companion, the EX800 synth module, came along in '84.

Three years before the coming of the M1, Korg launched the DW8000 (see Retrozone December 1998), a hybrid eight-voice synth that, like the previous DW6000 (Korg's first hybrid), combined digital oscillators with analogue VCAs and VCFs. The DW8000's keyboard sensed velocity and aftertouch, and had a built-in digital delay line.

In 1986, Korg unveiled their first sampler (which was also a synth), the DSS1, profiled in November 1997's Retrozone. Korg's Jack Hotop remembers it well: "The story of the M1 really begins with the DSS1. Finally Korg had come out with a sampler. But it was in the mid-'80s, during the heyday of samplers. The Akai S612 and the early S900 rackmount samplers were popular, as were the Sequential Prophet 2000, Emu Emulator II, Fairlight CMI, and Synclavier. All of a sudden there came a flood of samplers from Casio, Korg, Kurzweil, and Roland. Every sampler you could name had more memory than the DSS1. They had at least half a meg, when the DSS1 only had 256k! But the DSS1 also had some magical stuff: two built-in DDLs that you could route signals through in series or parallel, programmable EQ, and variable bit resolution down to two bits. It also had crossfading on the oscillators, you could draw single-cycle waveforms using a value slider, and it would let you create waveforms by plotting harmonics numerically — not unlike additive synthesis. But the DSS1's interface intimidated some people, and there weren't many resources available for learning about sampling techniques."



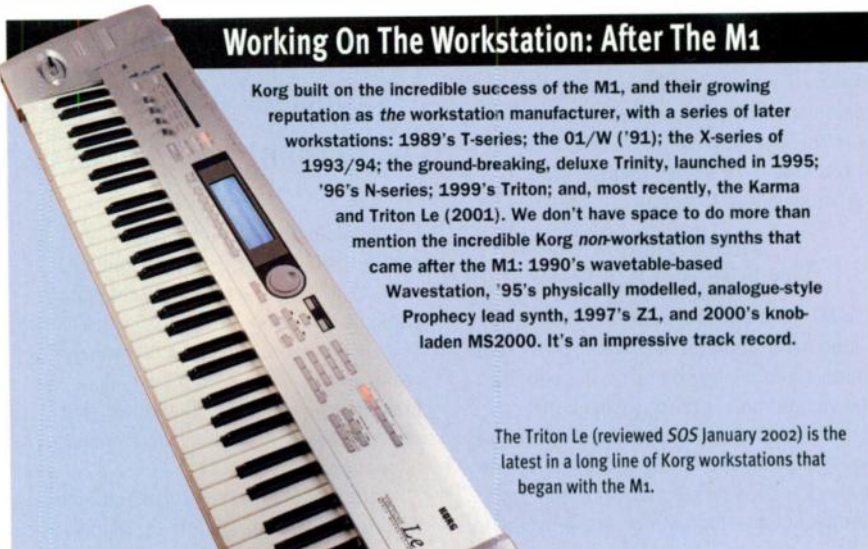
► If we were to categorise these sonic offerings, we could come up with four groups. There are sampled attack transients, followed by single- and multi-cycle loops or lengthier multisampled loops; single-cycle sustained waveforms that lack attack transients; percussive attack samples; and some rhythmic loops. In plain English, you get timbres such as acoustic piano, luscious strings, realistic acoustic guitar, eerie woodwinds, exotic sitar and kalimba, a wind-chime pattern, a vibrant hammered metal pole, and killer drums. "You don't need lots of memory for certain types of sounds," Jack explains. "Short loops will work for flute, trumpet, French horn, marimba, and Clavinet, leaving you more memory for choir and low piano notes, which need more memory and crossfading."

At times the sound collecting went smoothly, but the pace was frantic, due to production deadlines. "I bought a pan flute in Yokohama," Jack reveals, "and Athan, who had been living in Tokyo, found a huge sake bottle to sample. It made a really low tone

**"The M1's ROM contains four megabytes of musically useful and downright stunning 16-bit PCM tones."**

that was deeper than most other blown-bottle samples. Athan used to play flute, so he played the pan flute and blew across the top of the sake bottle for samples that are in the M1."

New York session musician and synth programmer Robby Kilgore, who's worked with Carly Simon, Riuichi Sakamoto, Michael Brecker, Steve Winwood, Steps Ahead, Laurie



Anderson, and many others, delivered big time when the sound team was in search of a proper bass timbre. "We needed a slap bass," Jack recalls. "Robby Kilgore said, 'I play bass.' But the strings on the bass were dead, so they didn't slap well. We needed something zingy, but we couldn't get zingy. So Robby pulled out a pick and started playing the *Guns n' Roses* theme with muted pick bass. It was magical. You still hear the M1's Pick Bass a lot today. In the end, we found a good slap bass in the Korg DSM1 library, from a split bass-and-brass program."

### Nuts & Bolts

Individual M1 programs can use one or two oscillators. The former is required if you want to trigger 16 notes at a time, although Korg's effective implementation of dynamic voice allocation, which will quickly reassign silent oscillators as needed, can often compensate for taxing polyphony requirements. Single-oscillator sounds generally aren't too thin-sounding either, thanks to the M1's complex sampled

waveforms and onboard chorus and reverb effects.

You can adjust the volume balance of the two oscillators in a double program, and detune the second oscillator using interval and fine-tune parameters. In addition, the attack of the second oscillator can be delayed by up to five seconds, for further complexity.

Each oscillator is paired with its own digital low-pass filter and filter envelope. The filters aren't resonant, and sweeping their cutoff won't sound as smooth as it would with analogue filters. However, those aren't major irritations, as the sound set is harmonically rich enough to offset the lack of resonance, and the effects can mask any swept-filter graininess.

Separate LFOs are provided for vibrato and filter modulation, and in a double-oscillator voice you can assign each LFO to modulate either or both voice channels. It's also possible to program each LFO's rate to be modulated independently by joystick movements.

One thing that makes the M1 particularly special is Korg's implementation of modulation sources. Jack Hotop explains: "I went to Japan eight times for the M1, starting in late '86. I got to work directly with Korg's great engineers, who aren't just guys running around in lab coats. They're musicians, too, and it shows in their work. When I first met with them about the M1, I asked them to provide more resolution for the LFOs at minimum and maximum values, and to add envelope intensity. Peter and I asked them to allow both positive and negative velocity values for crossfading, and velocity and keyboard tracking control for the envelope segments. We felt these were crucial enhancements for bringing short samples to life. The envelopes are the legs that our programs stand on, the arms that





## C16 MIDI control box

Rather than struggling with a mouse or fiddly step-time entry, you would probably prefer to play notes using a music keyboard. In much the same way, dynamic control, such as mixing or sound-bending is much better with hands-on hardware controls.



The **C16** has sixteen 60mm sliders. These sliders may be assigned to a variety of MIDI control functions, which are held as one hundred templates (*Targets*). The large number of presets (ninety-eight) means that **C16** is ready, out of the box, to do most of the jobs that you are likely to want it to do.

The **C16** has one MIDI IN and one MIDI OUT. It automatically merges the MIDI data it receives with the data it generates.

The **C16** has extensive support for GM, GS and XG. It can generate MIDI *Controllers*, *NRPNS*, *RPNS*, *Aftertouch*, *Pitch Bend*, *Notes* and the majority of SysEx parameter change messages.

If the messages you need are not available from a preset *Target*, two programmable User *Targets* locations allow for custom settings. *Mac* and *Windows Target* editor programs may be downloaded free from our website. Details of the built-in *Targets*, and many User *Targets* for download, are also on the site.

The **C16** is 210mm x 135mm x 55 mm and has a built-in mains power supply.

**C16 MIDI Control Unit ..... £148.75**

## Low cost thru units

Some MIDI gear may lack thru sockets. Chains of three or more MIDI devices may corrupt data. Our thru units can solve these problems for you.

The handy **V3** is a battery-powered one-into-three thru box. The **V4** has one input and four outputs, and is line-powered. The **V8**, which has two inputs and eight outputs (arranged as two banks of four), is supplied with an external mains adaptor. The **V10** is a mains-powered one-into-ten unit.



The mains-powered **W5** has independent source selection for each of its five outputs.

**V3 MIDI Thru Unit ..... £12.95**

**V4 MIDI Thru Unit ..... £19.95**

**V8 MIDI Thru Unit ..... £35.95**

**V10 MIDI Thru Unit ..... £39.95**

**W5 Dual Input Thru Unit ..... £48.75**

## Amazing MIDI to CV

The low-cost **Little MCV** lets your MIDI system control your classic analogue monosynths.

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 a 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**

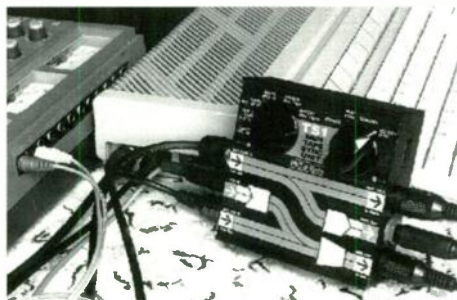
## TS1 for SMPTE to MTC

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.

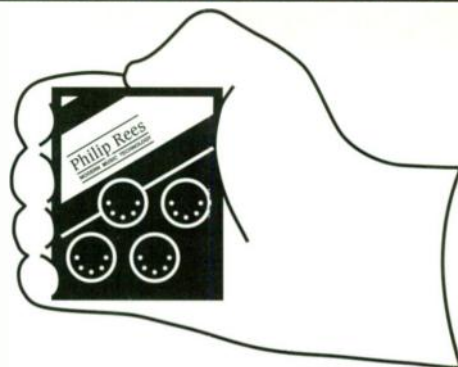
The **TS1** is ideal to use as a tape sync unit with any decent analogue multitrack tape machine. When you start, stop or shuttle your tape back and fore, **TS1** tells your MIDI sequencer to play in time, just as if your MIDI voices were extra tracks on the tape.

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

### Merge box value

You can't combine MIDI signals just by joining the wires together. Merging MIDI data is a job for a microprocessor, like that in the **Little 2M** merge box.

This well-specified and compact unit is powered via one of its MIDI IN lines. Thus, it requires neither batteries and nor an external power adaptor.



**Little 2M MIDI Merge Unit .... £39.95**

### Long distance MIDI

We make two models of MIDI line driver. These devices overcome the fifteen metre (40ft) cable length limit of standard MIDI hardware, by converting the signal to a differential (balanced) format and back again.

The **MLD** system is unidirectional and consists of a mains-powered transmitter and line-powered receiver. It is able to work over cable runs up to a kilometre. This model features high-precision waveform restitution and electrical noise rejection.

The **MTR** has a more limited range, quoted as 150 metres, but this model is bidirectional.



The system consists of one mains-powered transceiver and one line-powered transceiver. This model requires a cable with four conductors.

**MLD MIDI Line Driver ..... £89.95**

**MTR MIDI Line Driver ..... £99.00**

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## M1 Variations & Add-Ons

Soon after releasing the M1 keyboard, Korg introduced the M1R. It's a great 2U rackmount unit — it's what I own — that went out of production in 1992, three years before Korg stopped making the M1.

In 1990 Korg brought out the M1REX, an expanded version of the M1R that comes with 8Mb of 16-bit PCM samples from Korg's T-series, and a ROM card containing 100 Programs, 100 Combinations, and 44 drum sounds. The EXK-M1 and EXK-M1R were ROM memory expansion kits for upgrading the M1 and M1R with T-series sounds.

If the M1's limited sequencer memory cramps your style, Cannon Research's 1989 Frontal Lobe would please you no end.

Developed by Michael Cannon, the Frontal Lobe provides an extra 13,000 or 62,000 events, depending on the model. It also fortifies the M1 with a 3.5-inch disk drive for sequence, program, and combi storage. In '91 Cannon came out with the Version III Frontal Lobe, a 16-track sequencer that could address 32 MIDI channels via dual ports and was available with 9,000- and 49,000-event capacities. Also in '91, Cannon released the PCM Channel, which allows the M1, M1R, M3R, and T-series synths to play samples stored on Frontal Lobe disks.

One of the neatest products introduced at the March 1991 Musik Messe in Frankfurt, Germany, was the Zadok SAM1. Made in the Netherlands, the SAM1 could read samples stored on disk in Korg DSM1 and T1, Akai S950 and S1000, and Digidesign Sound Designer formats, allowing you to play the sound data on a Korg M1, M1R, M3R,

The M1 is still alive and well on the web, with plenty of sites offering new sounds and support.

T-series, or Wavestation synth.

As the M1 flourished, third-party companies developed tons of sounds for it. Among them were Eye & I, Greenhouse Sound, InVision Interactive, Kid Nepro, Livewire Audio, Patch/Works, Pro-Rec, Soundsations, Sound Source, Synthware, Technosis, and Valhala. Most of them aren't around any more, but a few have survived, such as Eye & I ([www.voicecrystal.com](http://www.voicecrystal.com)), Kid Nepro ([www.kidnepro.com](http://www.kidnepro.com)), and Pro-Rec (<http://users.aol.com/proroc>). The Northern California company InVision specialised in enhancement ROM boards for synths including the Emu Proteus 1. (An InVision Protologic board lives inside my Proteus, and I wouldn't have it any other way.) InVision's Plus+1 ROM Wave upgrade

for the M1 was so good that Korg offered an M1 Plus with the upgrade pre-installed.

Internet support for the M1 still thrives. Browse these for sounds, documentation, and more:

[www.geocities.com/korgmt](http://www.geocities.com/korgmt)  
[www.webcoast.com/drevil](http://www.webcoast.com/drevil)  
[www.multimania.com/alexisch/sysex.htm](http://www.multimania.com/alexisch/sysex.htm)  
<http://nextdch.mty.itesm.mx/~rlopez/M1>  
[www.geocities.com/SiliconValley/Way/5891/index.htm](http://www.geocities.com/SiliconValley/Way/5891/index.htm)  
[www.hitsquad.com/smm/programs/M1LibEd](http://www.hitsquad.com/smm/programs/M1LibEd)  
[www.geocities.com/SunsetStrip/Studio/8574/index.html](http://www.geocities.com/SunsetStrip/Studio/8574/index.html)  
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► they reach out with. These changes would make our programs as expressive as possible."

Korg's engineers didn't settle for simple ADSR envelopes. Along with the usual attack, decay, sustain, and release rates and levels, the filter and amplitude EGs include parameters for attack level, break point, slope time, and release level. Added to the pitch EG's envelope parameters are start and release levels; there's no sustain-level parameter because the key's basic pitch determines that level. All three EGs can be programmed to respond to key velocities by varying the overall envelope level and time. In addition, the filter and amplifier EGs can be set to track to key position for different types of response.

### Built-In Effects

When you dig into the M1's effects section, you'll find a considerable amount of power — especially considering that the concept of putting multi-effects processors inside a synthesizer was a very fresh one at the time of the synth's creation. Among the effects algorithms are reverbs, early reflections, stereo delays, chorus and flange, tremolo, two-band shelving EQ, distortion, an exciter,

a Leslie simulation, and numerous multi-effects combinations. Both series and parallel signal-routing configurations are available for the two processors.

Since the M1 has only the two effects processors, all of the Programs assigned to a Combi can't have access to the same effects they used in Program mode — a shortcoming which dogged early workstation synths from more than one manufacturer. However, routines are provided for copying effects parameters from one Program or Combi to another, and there are specialised Combi effects in which each processor runs two effects algorithms simultaneously, such as delay and reverb. If a dual-algorithm Combi effect is assigned to each of the two processors, you could construct a four-Program Combi in which each Program has access to its own effect. Usefully, any program in a Combi can be set to bypass the effects entirely.

### They Got Rhythm

Anyone who's taken the time to properly mic an acoustic drum kit can surely appreciate the convenience of a synthesizer loaded with great drum sounds — and the M1 was the first. You can store four

independent drum kits, each made from up to 30 different sounds assigned to specific MIDI note numbers. Since the M1 has four outputs, drum or percussion sounds may be assigned to specific outputs for external processing.

One of the best drummers I've ever played with assembled a great kit comprising two Roland Octapads and an M1. Thanks to the great M1 sounds, Korg's flexible drum-kit setup possibilities, and the way he programmed his kits, he could immediately switch from one set of timbres to another. Few can tell that the drums in our recordings weren't acoustic.

### Sequencer Ups & Downs

The M1's sequencer, admittedly, imposes some significant limitations: you have to define a song's time signature up front (and it can't be changed later), only two, three, four, five, or six beats per measure are allowed, and a song can't exceed 250 bars in length. However, on the up-side, enough memory is provided for 10 songs and 100 patterns; automated punch-in and -out are supported; data on up to eight incoming MIDI channels can be recorded simultaneously; you can sneak program



changes into any of the eight tracks; there are editing utilities for copying, inserting, deleting, erasing, and quantising measures; and step-editing allows you to change the pitch, duration, and velocity of notes. Quantising can be applied during or after note input, and resolutions range from a quarter-note to 1/48 of a quarter-note — essentially no quantisation, as that's the rate at which the M1's clock runs.

Yes, the M1's sequencer is limited in comparison with what we have today — but it's easily good enough to allow you to get valid work done.

### Not The End of The Road

Jack Hotop sums up the M1's importance to the music industry: "The M1 had a lot of innovative features for its day. It had sampled PCM sounds in ROM, a built-in sequencer, and a good variety of digital multi-effects. We also gave it immediate memory expansion via card slots. Insert a RAM card and you could access more banks of sounds. If you wanted more samples, you could plug in a PCM card that you could carry in your pocket."

Was the M1 the original workstation? "Workstation, schmirkstation. The Ensoniq ESQ1 gave you sounds and a sequencer; that was a workstation. How about the Kurzweil 250? That was sure a workstation. They were fine instruments, and they were part of the evolution. It isn't a contest. What is a workstation? It's the evolution of keyboard instruments. It's also the integration of man, music, the sounds of the world around us, and technology. We've seen everything from the harpsichord, pianoforte and pipe organ to the Prophet 5, Oberheims, Jupiter 8 and DX7. These are the stations where we work. They're *all* music workstations. But is it work? Why don't we just call them playstations? Because Sony already did, that's why!"

If you're in the market for a powerful and still-popular vintage digital synth, consider the M1. It packs lots of goodies that make it a great musical tool. If you were lucky enough to own one — and smart enough to keep it — you'll know how special it is. **SOS**



# got MIDI?

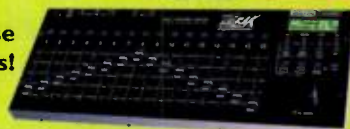
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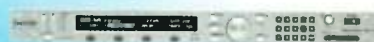
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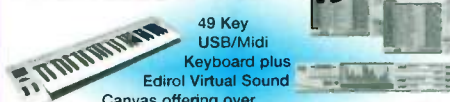
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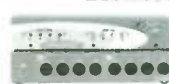
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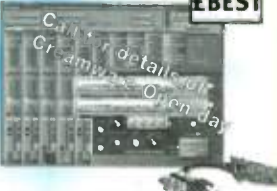
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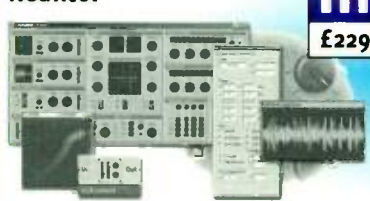
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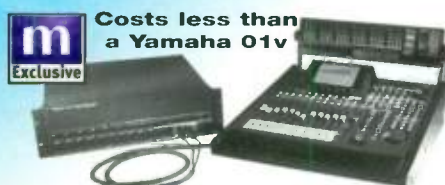
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**ALESIS MIDIVERB III**, box, manual, power supply, £100. ☎ (after 6pm) 020 8715 2198 (Surrey).

**ALESIS MIDIVERB IV**, excellent effects module with great delays, reverbs and phasers, includes two banks of 127 effects patches, £160; Alesis Quadrawer, reverbs, vocals, flangers, auto pan, good condition, £100. ☎ Lee 079 6029 8247 or email blue@amazon80.freeserve.co.uk (Huddersfield, West Yorks).

**ALESIS QUADRAVERB GT**, very good condition, boxed, manual, PSU, £100 ono. ☎ Mark 01903 205383 or email mark@mpcohen.force9.co.uk (Worthing, West Sussex).

**ALESIS XT20 ADAT**, 850 hours, serviced at 500 by Alesis, excellent condition, £700; Joe Meek VC1 studio channel, mint, £225; AKG Solid Tube, mint, £275. ☎ James 020 7207 7788 (London).

**ALLEN & HEATH SESSION 8 16:8:2** mixer some faults, £50. ☎ 020 8691 9916 or email benedict999@aol.com (London).

**ALLEN & HEATH SYSTEM 8 16:4:2 16-channel mixer**, made in the 1980s, great sound but now unwanted, £120. ☎ 01229 582912 or email thisandthat@postmaster.co.uk (Ulverston, Cumbria).

**APHEX C2 AURAL EXCITER** with 'Big Bottom', hardly used, now using plugins, box, manual and receipt, £120. ☎ 020 8715 2198 (New Malden, Surrey).

**ART TUBE MP** single-channel professional valve-mic preamp, 48v phantom powered XLR/mix ins, brilliant as instrument DI-box, very portable, £99. ☎ Todd 01892 534051 or email tbrunner@btinternet.com (Tunbridge Wells, Kent).

**AVALON DESIGN 737 SP valve mic** preamp/compressor/EQ for sale, boxed as new with manual, limited home studio use only, genuine reason for sale, £1100 ono. ☎ Rick 01223 571535 or email rickbarracough@yahoo.co.uk (Cambridge).

**BOSS SX700** mint, boxed with manual, £100. ☎ Tim 079 7353 1919 or email teepee@dircon.co.uk (London).

**DIGIDESIGN 888/24 Pro Tools** interface for sale, £1200. ☎ Gerald +35393 35440 (Galway, Ireland).

**DIGITECH STUDIO QUAD v2 stereo**, fully programmable, four ins, four outs, with power supply and instructions, sounds amazing, never gigged, for quick sale, hence, £185. ☎ 079 0352 2957 or email vampyresbyte@aol.com (Preston, Lancs).

**DRAWMER LX20 dual** compressor/expander/gate with sidechain, looks like new with manual, £100. ☎ 020 8558 0903 or email kitchensink@btinternet.com (London).

**DRAWMER MX40** classic four-channel gate with punch feature, £220 ono. ☎ Stefan 0161 881 8149 or email lifer@bigfoot.com (Manchester).

**ELECTROVOICE MC150 microphone** and cable, great dynamic vocal/instrument mic with cable, £50. ☎ 079 7007 5157 or email gearsale@hotmail.com (Birmingham).

**FOSTEX D80** recorder eight-track digital hard disk recorder, excellent condition with remote control, extra hard disks and manuals, £375. ☎ Chris 079 7390 6180/01733 565012 or email c.huddleston@virgin.net (Peterborough, Cambs).

**FOSTEX DCM100, 1U rack mounting** line-level mixer; eight stereo inputs, two stereo effects loops, bass/treble on each channel, all MIDI controllable, £100. ☎ Kevin 020 8555 3409 or email kevin.perry@virgin.net (London).

**FOSTEX R8** eight-track reel-to-reel tape recorder, good condition, recent service, £180. ☎ 01865 553244 or email dustball@btinternet.com (Oxford).

**FRM AUDIO compressor**, a really, really nice compressor, brand new, boxed, house move forces sale, £136. ☎ 01621 786274 (Essex).

**JBL L100** classic monitor speakers, three-way with 12-inch woofer, adjustments for mid and top, oldish but sounds great, £650 for the pair. ☎ 01329 238522 (Hampshire).

**MACKIE CR1604 VLZ mixer**, immaculate, £490. ☎ 01273 823364 or email athill@genie.co.uk (Hove, East Sussex).

**MOTU MTP2** serial MIDI interface for Mac, not USB, eight in, eight out plus SMPTE, manual, leads, drivers, £130. ☎ 079 0529 3333 or email neil-quinn@supanet.com (London).

**PHILIPS DCC730** 18-bit digital tape deck, three tapes, also plays analogue cassettes with Dolby B/C, ideal for mastering or overdubbing, hardly used, boxed, £95. ☎ 077 1172 2904 or email toby.charwood@atprojects.co.uk (Haywards Heath, West Sussex).

**RODE NT1** microphone, excellent condition, soft case, home use only, £85; Roland SRV3030 dual-channel reverb unit, user editable patches, 100 preset patches, excellent condition, home use only, manual, £120. ☎ Ian 01892 514240 or email ian@stroppynet (Tunbridge Wells).

**ROLAND DJ2000** never used, still boxed, £500. ☎ Gary 077 6524 1539 (Glasgow).

**ROLAND SRE555** chorus echo, top-of-the-range roland tape echo from the '70s, full working order, excellent effects, £395 ono. ☎ Steve 020 7734 4760 (London).

**ROLAND VG88** virtual guitar system, absolutely mint condition, hardly used, boxed as new, £599. ☎ 01268 779790 or email peter@street2000.fsnet.co.uk (Rayleigh, Essex).

**SHURE PSM 600** in-ear monitoring system, pro transmitter, body pack, earphones, brand new condition, £499. ☎ Leigh 079 4183 7823 or email scarletdivision@tunes.freeserve.co.uk (Leytonstone, London).

**SONY PCM2500 DAT recorder**, AES, S/PDIF, S/DIF digital and balanced analogue interfaces, hardly used since recent service, excellent condition, £425. ☎ 01494 528277 or email iestynrees@hotmail.com (High Wycombe, Bucks).

**SONY TCD100** portable DAT recorder, in mint condition, used just four of five times with excellent results, lots of extras, £430. ☎ 077 7347 1658 (Croydon).

**SONY TCD D7 DAT**, portable, original adapter and optical cable, very good condition, £200 ono; Fat PCP330 Procoder vocoder, 11 filter banks, sibilance, manual, as new, £175 ono. ☎ 020 7272 5009 (London).

**SOUNDCRAFT GHOST 32-channel** automated mixing desk, in good condition, £1600. ☎ Jamie 020 8374 0340 or email ground\_rec@hotmail.com (London).

**SOUNDRACS MR SERIES 24:8:2** professional desk, meter bridge, excellent EQ, two sweepable mids, six aux, post and pre fade, eight groups, some crackly faders, £350 ono. ☎ 020 254 7778 (London).

**SOUNDCRAFT SPIRIT 24:8:2**, Tascam Twindeck, Absolute monitors, Alesis ADAT XT, Sony DAT, Roland Sound Canvas Pro, Samson amp, JL Cooper Datasync, computer, Soundcards, manuals, Alesis effects, £3800. ☎ 01296 336581/077 5185 5079 (Bucks).

**SOUNDRACS TOPAZ MACRO** plus 24-channel mixing desk, lovely warm sounding EQ, £160. ☎ Kev 078 7654 1860 (Guildford).

**STUDER A80 RC MkII master**, £750; A807, three-speed, £450; Vintage A62 stereo, £550; Revox PR99, £750; B67 MkII, £750; A810 four speed, £550, Nagra T-audio, £1800. ☎ 01246 275479 (Derbyshire).

**STUDIOMASTER DIAMOND 16:2**, excellent condition, home studio use, full working order, £100. ☎ 01305 259589 (Dorchester, Dorset).

**STUDIOMASTER MIXDOWN GOLD** 16:8:32, six auxiliaries, good condition, £285. ☎ Ben 020 8691 9916 or email benedict999@aol.com (London).

**TANNOY LANCASTER** studio monitor speakers with 12-inch dual concentric Monitor Gold chassis unit, excellent sound and condition, £300. ☎ John 01509 416770 or email john.ablitt@biffa.co.uk (Quorn, Leicestershire).

**TANNOY SRM15X** large studio monitors, also a V800 stereo amp for sale, beautiful system, will sell for £700. ☎ Gerald +35393 35440 (Galway, Ireland).

**TASCAM 424 MkII** four-track, eight inputs, good EQ, mint, boxed, manual, £150 ono; Boss GT5 modelling guitar multi-effects, manual and gig bag, £250. ☎ Jason 0113 288 8437 (Leeds).

**TASCAM DA20 DAT machine**, mint condition, boxed with manual and original packaging, £200. ☎ Ian 01432 760613 (Hereford).

**TASCAM DA60 Mk2** timecode DAT machine, 10 hours use, great mastering machine, condition as new, £1200. ☎ Adam 078 8799 0204 (Luton, Beds).

**TC ELECTRONIC 2290** delay system, perfect condition, £750. ☎ 0121 422 8221 or email musikletta@aol.com (Birmingham).

**TC ELECTRONIC Finalizer Express**, immaculate condition, home use only, £500. ☎ Tim 079 7353 1919 or email teepee@dircon.co.uk (London).

**TELEDYNE AR48** classic monitor speakers, pair, passive, mint condition, £170. ☎ Shin 079 3205 8250 (London).

**TL AUDIO EQ1** stereo valve EQ with two mic preamps, £600. ☎ 01324 621011 (Falkirk).

**WEM BASS CABINET**, loaded with two vintage 15-inch Celestion Greenbacks, the cabinet is very well built and heavy, £100. ☎ 01865 553244 or email dustball@btinternet.com (Oxford).

**YAMAHA EMP100**, never used, manual, £60. ☎ 020 8694 2316 or email dj.flex@virgin.net (Lewisham, London).

**YAMAHA 01V** digital mixer, mint condition, virtually unused, boxed with manuals, £825 ono. ☎ Jason 01246 434864 (Sheffield).

**YAMAHA 01V** digital 24-channel mixing desk, two months old, absolutely brand new, boxed, £900. ☎ Ali 078 1516 4892 (Huddersfield, West Yorkshire).

**YAMAHA 03D** for sale perfect condition with ADAT interface card on-board, fantastic for small studio or serious home project, nearest offer secures, £1250. ☎ Jonny 01229 833406 or email mail@jonnywilliams.co.uk (Barrow in Furness, Cumbria).

**YAMAHA PROMIX 01 18-channel** digital desk, built-in effects, fully automated, excellent condition, manuals, £450. ☎ Chris 079 7390 6180/01733 565012 or email c.huddleston@virgin.net (Peterborough).

**ZOOM 1202**, 44.1kHz stereo 19-inch effects unit, reverb, delay, chorus, flange, pitch, EQ, power supply included, £50. ☎ 020 8691 5955 or email otherness4@hotmail.com (London).

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**AKAI** memory from S3000XL, also suits S2000, MPC, and similar, 2x16Mb, still have packaging, £25 each. ☎ (after 6pm) 020 8715 2198 (Surrey).

**AKAI S01** sampler complete with manual and disks, mint condition, £180. ☎ John Egan 01782 312823 or email johnegan@lineone.net (Stoke-On-Trent, Staffordshire).

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AKAI S1000 with manual and a small library, offers considered, £150. ☎ 01772 457770 (Leyland).

AKAI S2000 32Mb memory, SCSI, v2 operating system, hardly used, with manual, £260. ☎ 020 8694 2316 or email dj.flex@virgin.net (Lewisham, London).

AKAI S2000 32Mb pristine, hardly used, box, manuals, need space in my studio, no offers please, £250. ☎ 077 7038 0600 or email charlie@softsounds.co.uk (London).

AKAI S3000XL 32Mb, very good condition, all cables, £390. ☎ Kev 078 7654 1860 (Guildford).

AKAI S3000XL sampler, industry standard sampler, 32Mb of RAM, SyQuest hard drive/disks, manuals, good condition, £500. ☎ Lee 079 6029 8247 or email blue@amazon80.freeserve.co.uk (Huddersfield, West Yorks).

AKai S3000XL 32Mb and E816 effects, two identical units, home use only, as new, £550. ☎ 01924 474597 or email mark@woodstec.freeserve.co.uk (Batley, West Yorkshire).

AKAI S3000XL, brand new, boxed, 16Mb, house move forces sale, £450. ☎ James 01621 786274 ☎ James 01621 786274 (Essex).

AKAI S3200XL 16Mb sampler with extra filter board fitted as standard, comes with 1GB Jaz SCSI drive, hardly used, very good condition, £550. ☎ 0191 415942 or email TimeLord808@aol.com (Washington, Tyne & Wear).

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EMU E6400, boxed as new, all manuals, minimal home use only, buyer to collect from Oxford, £550. ☎ Luke 077 4896 3952 (London).

EMU EMAX II 3U rack, eight outs, 2Mb RAM, SCSI, manual, display backlight intermittent, no ears, otherwise OK, £130. ☎ 0117 951 1987 or email rp\_foley@hotmail.com (Bristol).

EMU ESi32, eight outs, Turbo board, SCSI board, full memory, box, manual, excellent condition, £400. ☎ Chris 079 0420 9049 or email sp0tta@hotmail.com (Buckhurst Hill, Essex).

EMU ESi2000 18Mb memory, large EMU sample collection, easy manual, excellent filters, perfect condition, £320. ☎ 01875 612196 or email fraserfriffield@onetel.net.uk (Tranent, East Lothian).

ROLAND SP808EX remix workstation, in-built 250Mb Zip expansion board with separate outs, less than a year old, Roland three-year warranty, mint, £750. ☎ James 020 7207 7788 (London).

YAMAHA A4000, excellent condition, 36Mb RAM, SCSI CD drive, manual, six months old, must collect, £550. ☎ 01524 401491 (Lancashire).

YAMAHA A5000 pro sampler, boxed with all manuals and in perfect condition, no extra hard drives, £600 ovno. ☎ Craig 01684 296853 or email djmanchurian@aol.com (Tewkesbury, Gloucestershire).

YAMAHA SU10 portable phrase sampler with ribbon controller, sample CDs, manual and PSU, £75. ☎ Fab 077 2182 8898 or email post@baf-simple.freeserve.co.uk (Rotherham, South Yorkshire).

YAMAHA TX16W classic 12-bit sampler with Typhoon 2.0 OS, eight outputs, 8Mb, interesting swaps considered, £200 ovno. ☎ Stefan 0161 881 8149 or email lifer@bigfoot.com (Manchester).

## sequencers

ROLAND MC500 Mk2, mint condition, with O/S disks, I no longer use it, clear out time, complete with all three manuals, £100. ☎ Simon 078 1321 1651 or email mr5string@hotmail.com (Newark, Notts).

ROLAND MC505, as new in box with manuals, bought in error, £450. ☎ 020 8802 0591 or email john@indra.fsworld.co.uk (London).

VISCOUNT RD800 MIDIfile player, transpose, tempo change, disk drive, £65. ☎ 077 8578 6830 or email clive@the-davenports.freeserve.co.uk (Stockport, Cheshire).

YAMAHA QY70 sequencer, perfect mobile song-writing tool, hundreds of phrases, sounds and patterns, small built-in keyboard, boxed as new, manuals, £225. ☎ 079 7035 5043 (London).

YAMAHA RM1X one year old, immaculate condition, box, manuals and PSU, £270 ovno. ☎ 077 8866 3755 (Manchester, West Yorks).

YAMAHA RM1X sequencer and synth module, many dance sounds, reluctant sale, £250. ☎ 079 6092 4178 or email avill02@attglobal.net (Slough, Berkshire).

YAMAHA RM1X Groovebox/sequencer/sound module, in very good condition, not gigged, box and manuals, £325. ☎ Richard 01225 443742 or email richard.george@diapix.com (Bath).

## drum machines

ALESIS SR16 drum machine, very good condition, includes manuals and PSU, £80. ☎ 079 4756 4195 or email norman1@ndirect.co.uk (London).

BOSS DR5 versatile drum/rhythm machine, good condition, power supply and manual included, £75. ☎ 01793 693723 or email saltgreen@hotmail.com (Swindon, Wilts).

BOSS DR660, 255 preset sounds with Classic 808 and 909 kits, never used, boxed with manual, £110. ☎ 020 8694 2316 or email dj.flex@virgin.net (Lewisham, London).

NOVATION DRUM STATION, in immaculate condition, as new, boxed, manuals, £155. ☎ Vicke 079 7451 2074 or email veiraduckworth@aol.com (Oldham, Lancs).

OBERHEIM DMX, the original hip-hop drum machine, excellent condition, £295 ovno; Emu SP12 Turbo drum machine, classic Emu sampler, fully working and in excellent condition, £575 ovno; Roland TR808 classic drum machine, has been owned for over 10 years and is in excellent condition, manuals, £495. ☎ Steve 020 7734 4760 (London).

ROLAND TR505 drum machine for sale or swaps, £50; Roland TR77 drum machine, excellent condition, £100. ☎ 01202 249759 or email TrevorKhanu@aol.com (Bournemouth, Dorset).

## personnel

ENGINEER/SONGWRITER, 18-track 24-bit studio with MIDI and mastering, access to 48-track Neve, SSL and surround studios. ☎ 079 5765 8877 (London).

EXPERIENCED AND DEDICATED keyboard player urgently needed to complete line up of five-piece band, male or female. ☎ Simon 078 1321 1651 or email mr5string@hotmail.com (Newark, Notts).

LIVE ENGINEER and mixing wizard seeks new and interesting work, experienced at front-of-house and monitors, cool under pressure. ☎ 0141 574 7094 or email cheerprod@yahoo.co.uk (Glasgow).

PRODUCER/SONGWRITER seeks production partner for commercial pop/dance projects, have own pro studio and material, London/East Anglia preferred. ☎ Gary 01502 724222/078 0371 6416 (Suffolk).

STUDENT WORK EXPERIENCE wanted by 17-year old A-level student, looking for work experience between 18 and 22nd February, any studio work please, can travel to home counties. ☎ Michael 079 0328 8750 or email kidtokewl@hotmail.com (Sevenoaks).

SYNTH WIZARD required to form song orientated trip pop/electronica influenced band, should be ambitious and have vision for analogue/atmospheric sounds, aged 21 to 30. ☎ 020 7538 2073 (London).

## miscellaneous

18U FLIGHTCASES for sale, rackmount cases, heavy duty, wheels, removable front and backs, sturdy and in very good condition, four for sale at £500. ☎ 079 6111 0151 (London).

ALESIS DATADISK SQ floppy MIDI datafiler and sequence playback unit, 1U, mint condition, hardly used, manuals, £150 ovno. ☎ Steve 020 8445 0290 or email stevnos@eudoramail.com (Finchley, London).

G MEDIA PHAT BOY MIDI controller, never used, CD-ROM and manual, £100. ☎ 020 8694 2316 or email dj.flex@virgin.net (Lewisham, London).

GREYHOUND 19-INCH rackmount flightcase, 20U, aluminium, flightcase, detachable front and back, four removable wheels (two lockable), £190. ☎ Steve 01405 762699 or email Chandsey1751611231@aol.com (Goole).

HOSA QUARTER-INCH jack insert cables, two meter, many unused and in original packaging, £5 each. ☎ (after 6pm) 020 8715 2198 (Surrey).

IOMEGA 100Mb Zip drive, SCSI, cable and three new 100Mb Zip disks, £40. ☎ 079 6792 0089 (Hinckley, Leics).

KORG MICROTONICS expansion chip for DW800 synth to expand to 256 sounds and make it two-part multitimbral £50 or part-exchange for musical item. ☎ 01202 249759 or email TrevorKhanu@aol.com (Bournemouth, Dorset).

OVER 30 seven-inch reels of half-inch recording tape made by Pyral of France, all unused, £50 each or £130 for the lot. ☎ 01329 238522 (Hampshire).

PEAVEY HYSIS 2XT speakers, £340; Peavey HYSIS 118XT speakers, £325; Peavey 16 in, four out stage box, £165; C Audio GB602 amp, £300; C Audio GB402 amp, £250; Inter M M70D amp, £170; mint condition. ☎ 079 5034 6171 (Leicester).

ROLAND DCB cable to link a Juno 60/Jupiter 8A with a Roland MSQ700, mint condition, rock solid timing, £20. ☎ Gavin Hughes 0117 908 5588 or email gavinhughes5@activemail.co.uk (Bristol, Avon).

SKB 12U pop-up mixer flightcase in mint condition, only six months old, would suit Yamaha 01V/Mackie 1604 VLZ, includes rack ears, worth £50, cost £360, will sell for £175. ☎ 01432 760613 (Hereford).

## computers/software

APPLE 9600 350MHz and Apple 20-inch multiple scan display, mint, 256Mb RAM, 4Gb hard drive, six PCI slots, 12 RAM slots, 8Mb video, internal 100Mb Zip, keyboard & mouse, OS9.1, lots of software, £500. ☎ 079 5895 5562 or email adrianfinn@mac.com (Bristol).

APPLE G3 Powerbook, 333MHz, 196Mb RAM, 4.5Gb, 14.1-inch TFT, 56k modem, CD-ROM, USB, SCSI, PCMCIA, second battery, mouse, case, extras, £750. ☎ 01273 269826 or email webmaster@proteus.org.uk (Brighton, Sussex).

APPLE G4 POWERBOOK 400MHz, 500Mb RAM, 20Gb hard drive, very good condition, six months old, under warranty, with Cubase VST 5 and AKSYS software, USB-Midi hub, £1800. ☎ James 079 0024 5541 or email james@distraction.com (Glastonbury, Somerset).

APPLE MAC 233MHz, 224Mb RAM, 4Gb hard drive Ultra SCSI card eight-speed Yamaha CD-RW, Audiomedia III soundcard, two port USB, OS9.2, modem, £550 ovno. ☎ 0113 282 5283 (Wakefield).

ATARI 1040 STE and mono monitor, expanded to 4Mb, £100. ☎ Will 01803 215386 or email willrip@kayefr.freeserve.co.uk (Torquay, Devon).

ATARI 1040 STFM 2.5Mb upgraded with mono monitor, mouse, Cubase and other software, £75. ☎ 01772 457770 (Leyland).

ATARI SM124 monitor, hardly used, £55 ovno. ☎ Kieran 0131 443 1445 or email kierancheung@gmail.com (Edinburgh).

CREATIVE LABS SOUNDBLASTER Live! Platinum, Steinberg Cubasis, Wavelab Lite, Recycle, S/PDIF VO, MIDI VO, mic and line inputs, perfect condition, £60. ☎ 01875 612196 or email fraserfriffield@onetel.net.uk (Tranent, East Lothian).

DPT SCSI RAID card, three-channel (42 devices) PCI wide SCSI card; comes with 4Mb cache, expandable to 64Mb, £150. ☎ Kevin 020 8555 3409 or email kevin.perry@virgin.net (London).

ECHO GINA 20-bit professional soundcard, two in, eight out, 20-bit PCI soundcard, breakout box, manual, drivers and updates, great card but I just want to upgrade to a 24/96 Gina, £160. ☎ Paul 0161 881 0243 (Manchester).

GADGET LABS WAVE 8:24 eight in, eight out 24-bit pro digital recording interface, PCI card, external 1U box connector, driver, PSU and user guide, £165. ☎ 077 8578 6830 or email clive@the-davenports.freeserve.co.uk (Stockport, Cheshire).

KORG 1212 audio card, 12 in, 12 out, analogue, S/PDIF, stereo analogue, hardly used, £90. ☎ Van 079 6092 4178/079 6092 4178 or email avill02@attglobal.net (Slough, Berkshire).

KORG 1212 NO PCI soundcard ADAT optical, digital NO, perfect working condition, £120. ☎ 01268 779790 or email peter@street2000.fsnet.co.uk (Rayleigh, Essex).

LEXICON NUVERB with TDM Nubus Lexicon Nuverb, latest software, TDM daughter card for integration, sound of a 300L in Pro Tools, offers around, £300. ☎ 077 1379 1963 or email diginero@hotmail.com (London).

M AUDIO DELTA 66 PCI soundcard, four in, four out analogue plus digital S/PDIF VO, has ASIO 2 drivers, boxed with manual, as new, £180. ☎ Kevin 020 8390 9419 or email kevin@kcs.softnet.co.uk (Surbiton, Surrey).

M AUDIO LAGOON PC card eight in, eight out ADAT card with S/PDIF and MIDI, still boxed, DSP chip on board, mint condition, cost £320, quick sale for £199, no offers. ☎ Karl Johnson 078 7057 2183 or email karljohnson20@hotmail.com (Wakefield, West Yorks).

MOTU MIDI EXPRESS USB version, very good condition, £200. ☎ 01803 855864 or email sunsetstudio@beeb.net (Bridham).

NATIVE INSTRUMENTS REAKTOR 2.3, excellent software for virtually any sound, £95. ☎ Fergus 020 8677 2469 or email fergusanderson@hotmail.com (London).

OPCODE STUDIO 64XTC, very powerful 4x4 MIDI interface with ADAT, SMPTE and Word Clock sync options, blackburst video input, £90. ☎ Alex 078 8190 3521 or email ukcoolat@aol.com (Nottingham).

PC TOWER PENTIUM 233MMX, 128Mb, 6.4Gb CD re-writer AWE Gold soundcard, Steinberg Cubase VST v5, Wavelab, Rebirth, Recycle, plug-ins from Waves, TC, £495. ☎ Simon 077 9618 4984 (Farnham, Surrey).

PENTIUM III 866MHz/256Mb (133) RAM, Echo Gina, IBM 30Gb hard drive, Windows XP, Matrox G400 dual head, 17-inch monitor, £550. ☎ Pete 078 5547 3458 or email pete@nativeologic.com (London).

STEINBERG CUBASE 3.01 for Atari, boxed with manuals and dongle, £65. ☎ 01772 457770 (Leyland).

## wanted

AKAI MPC2000XL wanted, must be 32Mb with or without any expansions, or will part-exchange for Akai S950. ☎ Jay 020 8977 7193 or email Thegonz007@hotmail.com (Teddington, Middlesex).

ALESIS MIDIVERB II power supply wanted. ☎ Rob Endicott 01323 520029 or email rob@csident.com (Eastbourne).

ARP QUADRA wanted, anything considered but prefer fully operational. ☎ 079 7675 0683 or email baby\_tog@hotmail.com (London).

BEHRINGER COMPOSER PRO wanted, must have manual and PSU and be in good condition, will pay £60. ☎ Nick 079 4193 6753 or email nick.hall6@btinternet.com (Derby).

BEYERDYNAMIC DT150 headphones wanted, must be in very good condition. ☎ Martyn Scott 023 9256 8155 or email martyn\_scott@uk.ibm.com (Locks Heath, Hampshire).

CLAVIA NORD LEAD 2 rack or keyboard wanted, will pay £450 or £600 respectively or even more if the condition is good, will collect in the London area. ☎ Michael 079 3154 7510 or email schuey100@lineone.net (London).

DYNAUDIO BM6A active monitors wanted in but mint condition and in full working order, would prefer seller to bring them to me, will pay £600. ☎ Simon 078 1619 6393 or email simon.wilkinson@ntl.com (Bingham, Nottingham).

ELKA SYNTHEX and Arp Solina String String wanted, can pay cash and collect. ☎ Ian 01432 760613 (Hereford).

EMAGIC EXS24 software sampler wanted for Emagic Logic Platinum and Apple Mac, must be genuine version. ☎ Louis 079 4654 8681 or email plz@btinternet.com (London).

EMO SYSTEMS DI box wanted, single or double. ☎ 0161 848 9756 or email lyn@lento.freeserve.co.uk (Manchester).

EMU PROTEUS 2000, must be in perfect condition with manual, cash waiting, £350 or more with card ☎ Nigel. ☎ 077 1130 8881 (Brentwood, Essex).

FATAR OR STUDIO LOGIC full-size weighted keyboard, must have sustain and expression peddle inputs. ☎ Andy 01633 613342 or email andy@prmmusic.co.uk (Newport, South Wales).

HOLLIS TRACKMAN software for Atari wanted, must include punch-in footswitch and otehr extras, no silly prices please. ☎ Charlie 01964 537054 (East Yorkshire).

YAMAHA A5000 wanted, preferably with output expansion and hard drive, cash waiting. ☎ Stefan 0161 881 8149 or email life@bigfoot.com (Manchester).

YAMAHA CS50 wanted, can pay cash and collect, also analogue synths wanted, can pay cash. ☎ Ian 01432 760613 (Hereford).

YAMAHA DB50XG sound synth daughter board for sale, £40. ☎ Jason 01246 434864 (Sheffield).



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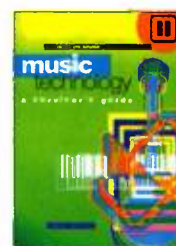
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This popular 2nd Edition takes a very practical approach to demystifying the various techniques used to record and produce contemporary music. The techniques described in this book are equally applicable to the home studio, and are described in plain English, clearly illustrated with diagrams. *Recording & Production Techniques* takes the reader through planning a recording session, getting the best performance from the artists, and producing the best possible mix while making creative use of effects and processors. It concludes with a

valuable section on master tape formats and an overview of the various processes involved in duplicating CDs, cassettes and vinyl records.

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#### Live Sound For The Performing Musician

by Paul White

285 Pages

No matter how talented a performer you are, if the sound out front isn't up to scratch, you won't win over your audience. Even relatively inexpensive equipment can produce exceptionally good results — if only you know how to use it... *Live Sound For The Performing Musician* is a practical guide to equipment and sound for small to medium-sized gigs. It covers everything from choosing PA equipment and backline amplification, to selecting the right type

of microphone and finding your way around a typical live sound mixer. Also discussed are stage monitoring, effects and processors, tuning, DI techniques, radio mics, basic wiring information, amplifier and loudspeaker principles... and even performance tips.

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## Creative Recording II: Microphones, Acoustics and Sound-proofing

by Paul White 231 Pages

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. Subjects include: microphone types, instrument and vocal miking, practical soundproofing measures and basic acoustic treatment.

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## Creative Recording I: Effects and Processors

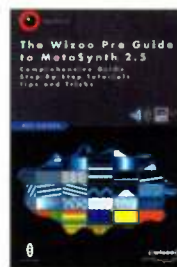
by Paul White 285 Pages

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. Chapters include The Mixing Console, Patching & Patchbays, Equalisers, Digital Delay Effects, plus many more.

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## Wizoo Pro Guide to Metasynth 2.5

by Len Sasso 202 Pages

The Wizoo Pro Guide to MetaSynth 2.5 will take you on a guided tour of Metasynth's unique composition and sound design features. A step by step guide and easy to follow tutorials show you how to compose and graphically design sounds in the

magical Image Synth. Learn to use Metasynth's powerful Filter and Effects Palettes to edit your sound files. Design waveforms from scratch using the Wave Table Editor and the Procedural (FM) Synthesizer. Includes CD-ROM with 51 audio tracks, presets, samples, filters and more. These tutorials are easy to follow, fun to use and loaded with ideas for things to try on your own.

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## Wizoo Guide: VST Plug-Ins

by Ralf Kleinermanns

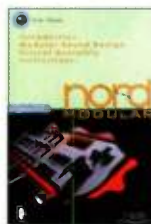
258 Pages

Whether you're into mastering, creating sounds or arranging, work with Windows or Macintosh, or use a DirectX or VST interface, this book will show you which plug-ins will beef up your VST system best. The majority of the 258-page book is actually a guide to the grooviest plug-ins for a widely diverse range of applications. In addition to this comprehensive overview of software, the hippest plug-ins are covered in a dedicated section featuring an in-depth explanation written for musicians, with reliable ratings and practical tips that

will help you come up with happening results. The CD-ROM (PC/Mac) features over 50 demo versions of plug-ins and over 100 freeware plug-ins.

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## Wizoo Guide: Nord Modular

by Peter Gorges

178 Pages

Clavia's Nord Modular synth brought the concept of the freely interconnectable modular synthesizer right up to date, but despite its simple exterior, the inside is just as complex as the monstrous monophonic analogue synths of the '70s. To get any usable sounds out of the instrument without getting hopelessly lost requires expert guidance, which is where this guide comes in. This book offers 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, this is a must-have for all Nord Modular owners.

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## Wizoo Guide: FX

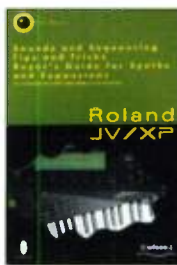
by Thomas Adam 142 Pages

Want the best effect settings for sound design and mixing? Make the most of your sounds and tracks with these 100 effects programs. Universally applicable, you can use these programs for effect devices, keyboards, mixers, plug-ins, and any other device or software featuring onboard effects. Every setting is

described at length and demonstrated by an audio example. An effects primer is also included. If you've ever pondered questions such as, "What is the ideal compression for a snare?", "How can I fatten up a puny pad?" or "How can I generate complex grooves using delays?", wonder no more: the answers are right here. Including CD-ROM/Audio with audio examples, AIFF files and freeware utilities.

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## Wizoo Guide: Roland JV/XP SYNTHS

by Udo Weyers.

154 Pages

This definitive introduction to the Roland JV/XP series of synths and expanders helps you to identify the right model and expansion cards for your needs. It helps you make the most of performances, patches and effects and includes a CD-ROM with audio demos, software demos and shareware. The contents include a survey of all related Models, Basic Terminology, Storing, Archiving, Dumping, Switching Patches and Performances via MIDI, Controlling Sound Parameters in real time, Creating Performances, Effects and Routing Programs, Programming Rhythm Sets, Editing and Optimising Patches, along with some

useful tips on using the XP Sequencer.

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## Wizoo Guide: The Perfect Music PC

by Rainer Hain

298 Pages

This book is for everyone who wants to make music on the PC, record it digitally, and burn it to CD. This indispensable guide will show you how a music PC works, how to avoid wasting money by clueing you in on which

computer, audio and MIDI components are best for what you have in mind. How to install your computer, Windows and expansions to maximum effect and tune these components so that you can make your musical ideas reality. How to troubleshoot your PC on your own and gain more tracks, effects and performance using pro tricks. How to find the updates, drivers and information you need on the Internet. This book includes a CD-ROM with PC tools, software demos and music shareware.

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## Wizoo Guide: Logic Audio 4 Macintosh

by Dave Bellingham

204 Pages

These up-to-date books for *Logic Audio* v4 Platinum, Gold and Silver show how to get the best from this amazing software. There are tips on how to select the best hardware/software for your *Logic* system and how to configure it. Learn how to record, arrange and process tracks in the Sample Editor; use the Digital Factory, effects and mixer automation creatively, plus a motherlode of top tips on how the pros EQ, mix and master CDs. Users of later versions of *Logic Audio* will still find a wealth of useful information and tips as most of the

functions described carry over into subsequent versions. An included bonus CD-ROM features audio and song files, shareware, demos, utilities and FAQs.

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## Wizoo Guide: Cubase VST Mac

by Ralf Kleinermanns

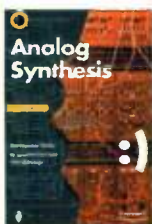
191 Pages

Cubase "Virtual Studio Technology" turns your mild-mannered computer into a fully loaded digital multitrack studio with integrated mixer and effects rack. This Wizoo Guide, officially approved by Steinberg, will help you come up with the kind of results you always wanted. Find out all about the best hardware for the job, how to boost the program's performance and make the most of plug-ins, EQ and mixer automation; plus a motherlode of professional mixing, mastering and routing tips. The mixed-mode CD-ROM includes audio and data examples of the tricks

described in the book, free plug-ins, and the best VST links on the Internet.

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## Wizoo Guide: Analog Synthesis

by Reinhard Schmitz

134 Pages

This book is a complete guide to the workings of analogue (and virtual analogue) synthesizers. It breaks these seemingly complex instruments down into their basic building blocks of oscillators, filters and envelopes, each of which is fully explained. There are tips on how to analyse synthesizer sounds, modify them or create your own from scratch. Advanced techniques such as complex modulation, MIDI control of virtual analogue and the use of MIDI controllers is covered in depth alongside audio examples on CD that

accompany the explanations. The CD includes examples from the Multimooq, OB-Xa, Nord Modular and other instruments.

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## Logic Audio FX Collection

by Ralf Kleinermanns

194 Pages

This 194-page book helps you make the most of all those lovely effects plug-ins that come bundled with Emagic's *Logic Audio*. There are 500 professional plug & play presets designed to cover all applications, from signal processing and sound design to mixing and mastering. There's a brief description of each preset; plus tips and tricks relating to each one and there are lots of audio examples on the included audio CD. If you would like to take virtual effects and processing that one stage further, this book is a must. For *Logic Audio* Silver, Gold and Platinum (Macintosh and Windows), Version 4 and higher. CD-ROM Mac/Win featuring 500 FX presets.

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## How To Set Up A Home Recording Studio (3rd Edition)

by David Mellor

144 Pages

Anyone setting up a project studio or a DJ studio will find this book a great place to start. It takes a highly practical 'nuts and bolts' approach to help you develop an efficient and productive studio. This 3rd Edition has been much expanded to include new chapters on studio equipment, computers in the studio, digital and hard disk recording, mastering and monitoring. In addition it covers soundproofing, acoustics, studio layout and furniture, with advice on the studio equipment you are likely to need. The practical theme is continued with sections on cabling, wiring looms and soldering, wiring of the patchbay, and the book ends with an invaluable questions and answers section, a glossary of terms and a useful contacts list.

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## Modern Recording Techniques (4th Edition)

by David M Huber & Robert E Runstein

495 Pages

This is a weighty, up-to-date textbook that address all the areas of the project studio recording market — digital recording, MIDI, microphone placement, signal processing and so on, both from a practical and theoretical viewpoint. Every part of the recording and mixing process is covered in a thorough and accomplished manner while the business side of things is also covered. There's even a comprehensive glossary of terms.

While approachable enough for the home recordist, more experienced recordists should find *Modern Recording Techniques* to be a helpful book as many of the technical aspects of recording are covered in considerably useful depth.

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## Music Engineering

by Richard Brice 357 Pages

If you are an electronics engineer who needs specific information about music reproduction or if you are a sound recording engineer who needs to get to grips with the electronic technology, *Music Engineering* is for you. With an accompanying 40 track CD illustrating effects and instruments, this useful book will

guide you through the world of recording techniques and audio effects. From Mics to Amps, Sequencers to MIDI and even video synchronisation, Newnes books are well known for their practical approach, looking under the covers at the technology behind a subject. Packed with illustrations, you'll wonder how you ever managed without it!

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## Home Recording Made Easy

by Paul White 205 Pages

Professional recording studios are crammed with stupendously expensive equipment that can be very complicated to operate. However, by choosing home recording equipment carefully, and by using it properly, you can create professional demos or even independent release quality recordings for very little outlay.

Everything you need to know in order to make your own recordings is presented here in clear, non-technical terms, with diagrams and with the minimum of jargon. If you use the information in this book, you will be able to make your own professional sounding recordings, no matter how tight your budget. This is in no doubt one of our best sellers to date.

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## Electronica Dance Music Programming Secrets

by Roger Brown 370 Pages

The art of programming brilliant contemporary dance music, Drum 'n' Bass, Techno, Garage, and Ambient Hip-Hop etc, are all introduced within the context of *Cubase* commands and features. But you don't need to own *Cubase* to learn from this amazing book, as most of the tips here can be used with any sequencer. The accompanying CD (PC & Atari) is packed with MIDI Files, plus audio samples for Drum 'n' Bass, groove templates, and demos of leading music software. The book includes chapters on: Bassline and Rhythm programming styles, *Cubase's* Logical Editor & IPS, *Cubase Audio*, and getting your creations distributed and sold. If you're into dance music sequencing, this book's unmissable!

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## Showcase International Music Book 2001

556 Pages

"The Bible of the music industry" — all the contacts you need in one handy volume. Thoroughly researched and totally updated, this is the book the professionals within the industry use to find studios, producers, manufacturers, record companies, publishers, management, promoters, venues, tour support services and so on. It covers the UK, plus sections of Europe, the Middle East, USA/Canada, Australia and South Africa. Accurate,

comprehensive information in a well thought out and easy to use format. Essential for anyone who wants to be well connected in the world of music, who wants to know who manages who, or needs to know where to send those demo tapes!

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## The Band's Guide To Getting A Record Deal

by Will Ashurst

176 Pages

Britain is once again the music business centre of the world, with more than 10,000 unsigned bands desperate for recognition from recording and publishing companies. All bands in this position, whether or not they have the requisite talent, are certainly missing one vital commodity: information. Without information you can waste 100s of pounds and enormous amounts of time by making the wrong moves. In a jargon-free, easy-to-understand, practical style,

*The Band's Guide* steers readers through every aspect of getting a foothold in the music business. From finding a manager, playing live to cutting a demo, this book can give the answers and the edge that you need. Can you afford to be without it?

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## Music Managers Forum

398 Pages

Produced by the Music Managers Forum, this guide to artist management shows you how to lay the foundations from which to build lasting commercial success. The role of the manager is carefully discussed, as well as the roles of those people with whom he/she will have to deal, including producers, agents, publicists, and the executives of publishing and recording companies. Emphasis is given to the many legal issues

involved, with pertinent and up-to-date illustrations. Appendices list UK and US music business societies, as well as all MMF manager members. Given the amount of information provided, this volume will be as useful to artists as to new managers.

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## Music: The Business (Essential Guide to the Law and the Deals)

by Ann Harrison

292 Pages

Answering all the questions, demystifying all the jargon, revealing the facts behind the headlines and the real figures underlying those multi-million pound deals. *Music: The Business* is the definitive guide to the UK's most happening industry. The only major book of its kind to comprehensively cover music law in the UK. This is the only non-legal jargon textbook that looks at all the leading cases (including Elton John, Robbie Williams and George Michael) and their

impact. Written by leading lawyer Ann Harrison, who heads up the Music Group at one of the most highly respected entertainment law firms in Britain, *Music: The Business* is the ultimate guide to all the issues facing this exciting industry.

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## Stuff The Music Business

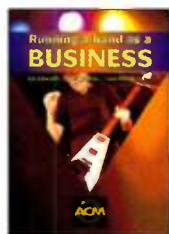
by Will Ashurst 183 Pages

The music business is undergoing seismic changes. Record companies are buying each other out, dropping bands, firing staff and cutting costs. For the struggling band or manager, it has never been more difficult to attract record company interest.

Using the opportunities opened up by the Internet, MP3 new music sites and direct sales; bands, managers and small labels can now bypass the major record companies and do it themselves. So don't wait for the business to sort itself out. Forget about the rejection letters and take control of your own career. Record, release, market and distribute your own albums and singles. *Stuff The Music Business* tells you how.

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## Running a Band as a Business

by Ian Edwards, Bruce Dickinson and Phil Brookes 145 Pages

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making band. How to choose band members and band name, project direction, establishing a business structure, getting the right management. Learn how to create press interest. Touring is a must, so make sure you do it right. Find out about merchandising, and how to get the legalities right in contracts — how to use them, and how to avoid rip-offs. 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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## Live Sound Mixing

by Duncan R Fry 176 Pages

This is a hands on, friendly introduction to all aspects of mixing live. It hails from Australia and is an SOS Bookshop bestseller. The author is an experienced live sound engineer and has packed his book with loads of superb information, diagrams and hints to take you from

basic principles through to troubleshooting when things go wrong. Contains 15 chapters: Basic Principles, Mixing Consoles, Equalisers, Cables and Connectors, Microphones, Effects, Signal Processors, Amplifiers, Crossovers, Speakers, Monitors, Setting Up, Mixing, Problems, and of course the useful Appendix.

Packed with diagrams and pictures of equipment, this book is essential reading for all live sound engineers.

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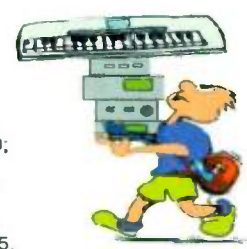
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
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
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
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## Is modern music more concerned with good sounds than with good ideas?

Mark Wherry

**G**ood music is a curse. I like listening to it as much as the next person, maybe more; but it's also something of a double-edged sword. With so much great music already written, why do we even consider producing music of our own?

Technology is also a curse. To paraphrase Brian Eno from a past interview, it's now so easy to produce music that we forget to ask ourselves why we're producing music. However, I'd go further than simply cursing technology, to say that technology has, for the most part, killed good ideas.

I remember a couple of years ago producing some artwork in *QuarkXPress* and someone seeing the final result and, assuming I'd used *Word*, asking me which wizard I'd used to create it! Which wizard? Has human creativity reached a point where nobody can produce something without resorting to a bloody wizard?

If you think it can't be the same for music, think again. *Sibelius 2*, for example, advertises a new auto-arrange feature where a piano part will be transformed into a full orchestral score, as if by magic, before your very eyes. However, unlike a real magician, *Sibelius* will repeat the same trick again and again, for anyone, anywhere, and at

any time. This may be a great asset in education, but how long before everyone's arrangements end up sounding the same?

It's easy to forget that the modern way of making music has only been a recent development in the grand scheme of things. The problem is that, along the way, how we record music has become confused with how we write music. Great music comes from great ideas, and not as a by-product of being able to create great sound. Music is about communicating those ideas. Maybe we look out of the window and see something amazing, or perhaps it's a feeling or response we want to express, which inspires us to communicate it in musical terms. But how many people draw their inspiration from a drum loop, or other sonic fragment as a starting point, for example? What message can we hope to engage our audience with, if the original idea comes from a sound that's basically meaningless?

Some interesting research has discovered that music can stimulate both the visual and sonic responses in our brain; purely visual art, by comparison, stimulates only visual responses. So, given the power that music clearly has, don't we have a responsibility to create something worthy of being listened to? And maybe this gives us the ultimate musical

litmus test: if we listen to our own music and it doesn't engage the imagination, is it really worthy of being played to anyone else?

Consider the feeling you get when a song really moves you. The songwriter has managed to capture an emotion, an argument, an idea, within the song, and communicate that to you as the listener. Forget mobile phones: *this* is how to get a message across.

So what makes me think technology has killed good ideas? The yardstick is simple: listen to some pre-technology music and the chances are that it will be filled with great ideas, maybe because of the struggle involved to make it happen. Compare that with the bucket loads of technology-dependent music around today and you'll notice that mostly it's not full of good ideas, only good sounds. Technology has made it far too easy to avoid having a decent idea, and we end up writing music with our ears and not our imagination.

So the next time you get down to the business of making music, ask yourself the reason behind the process. What are you trying to say? And what thought should the listener be left with after the track has finished? If we can't answer these questions, surely we're in danger of just adding another layer of sonic wallpaper to a room that's been redecorated far too many times already. **SOS**



### About The Author

Mark Wherry ([m.wherry@wizoo.com](mailto:m.wherry@wizoo.com)) is a writer, musician, lecturer, and occasionally outspoken music technology evangelist. He spends most of his time working with the German company Wizoo and produces the odd tutorial for Steinberg.

If you'd like to air your views in this column, please send your ideas to: Sounding Off, *Sound On Sound*, Media House, Trafalgar Way, Bar Hill, Cambridge, CB3 8SQ, UK. Any comments on the contents of previous columns are also welcome, and should be sent to the Editor at the same address.

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