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 ■ PC Musician Working with soundcards ■ TL Audio M3 Valve mixer ■ Readers' Demos Industry pros deliver their verdict
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World Radio History

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World Radio History

Paying Our Dues

Many people are now convinced that the future of recording lies predominantly in software rather than hardware. Admittedly, there are still some situations where dedicated hardware is more effective, especially where it is necessary to record a great number of tracks at one time, but in many instances the computer route is now the better choice in terms of facilities versus cost. And now that viable moving-fader control surfaces are starting to appear, complaints about the user interface and complexity of computer systems are becoming less valid.

With our increasing dependence upon software, however, it soon becomes evident that the fate of our virtual studio world lies in the hands of the very small number of companies (Steinberg, Emagic, MOTU, Cakewalk and Digidesign) who make the major recording applications, supported by a greater number of satellite developers producing plug-ins. If some disaster should afflict these companies, the repercussions in the project-studio recording world would be enormous, yet surely the current extent of software piracy must pose a serious threat to the economical stability of any software-based company?

We all know that using software that we haven't obtained legitimately is wrong, but for some people the appeal of getting something for nothing is too great to resist, which is why software designers are resorting to more powerful means of copy protection. But rather than seeing this as an intrusion on our 'rights', we should welcome it — because if they can reduce piracy, these companies will be able to dedicate more of their resources to bringing us the software we want at a price we can afford. Given the revenue that

is being leached away by piracy, is there any wonder that bug-fixes and upgrades are less frequent than perhaps some of us would like? At least one major player is about to unveil a new copy-protection system that uses military grade, multi-level encryption to thwart hackers, and perhaps the designers of other packages and of plug-ins will also be able to take advantage of more robust systems.

However, if such systems are successful, I hope that the companies in question do indeed use the additional revenue to offer more attractive prices to legitimate users, and to accelerate their bug-fix programmes. And if defeating piracy results in a doubling of sales, which isn't too wild a speculation, perhaps we can then expect a modest price drop as well as more frequent upgrades? Furthermore, we should expect, and in some cases demand, that copy-protection systems are not unduly intrusive or vulnerable. For example, at least one company is still supplying software with key floppy-disk protection for use on computers where floppy drives have been obsolete for two or three years! Similarly, master CD-ROMs (which I prefer because of their robustness) should not demand to be reinserted every week or two, but should ask to be presented at more reasonable intervals. I also have an aversion to 'challenge and response' systems, as they inhibit your freedom to move software from one computer to another, and if the maker of your software went out of business, you'd have no way to re-authorise software you'd legitimately bought. For these reasons, I feel that uncopiable CD-ROMs and dongles are the best systems for the user.

Ultimately our future in recording is inexorably linked with the viability of these companies, so it is in our own interest not to cheat them of their income.

Paul White *Editor*



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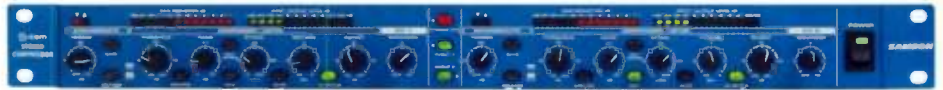
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A brush with mainstream success when he co-wrote music for the *Gladiators* TV series has made Simon determined to persevere with his garage-studio projects.



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Yamaha launch flagship digital desk: DM2000

To join their current range of DMC1000, ProMix 01, 02R, 03D and 01V digital recording mixers, Yamaha have just unveiled the DM2000, a commercial production console that runs at 24-bit, 96kHz as standard without any reduction in capacity, and offers a sophisticated degree of surround mixing and monitoring support. Though not unduly expensive by professional standards, this console sits one tier above the 02R in the range (it is not an 02R replacement) and is to cost in the region of £17,000 including VAT; a meter bridge and solid wood end-cheeks are included.

To satisfy the need for more inputs, the DM2000 comes with 96 mixer channels, eight mix busses and 12 aux send busses. There are 24 channels of mic/line inputs as standard, with optional expander cards (there are six YGDAI — Yamaha General Digital Audio Interface — slots) able to add more I/O in both analogue and a number of digital formats, including mLAN, TDIF, ADAT and AES/EBU. At the time of launch, the available mLAN cards will remain restricted to eight channels of I/O per card. The DM2000 also supports Apogee A-D and D-A cards, as well as the existing Waves Y56K effects plug-in card.

In order to integrate into a professional production environment, the console includes DAW controls; a dedicated template for Digidesign's Pro Tools is provided, with one for Steinberg's Nuendo under development. There's also a full machine-control section, including track arming facility. Dynamic and snapshot automation can be applied to virtually all console parameters, while the 25 long-throw faders are touch-sensitive and can be layer-switched to access the 96 channels. SmartMedia memory cards are used to save

Automix and scene data. Surround features include joystick surround panning, monitoring, bass management, and a downmix matrix. A range of 96kHz-compatible stereo effects and surround effects are available via the console's eight internal multi-effects processors, and these may be inserted into channels, and used via the Aux send paths.

True 96kHz conversion is used at both the A-D and D-A stages, and the mic amps have

familiar to previous Yamaha 0-series desk users, but the channel-strip section now includes a full set of dedicated controls to avoid 'paging', and there are also 16 user-definable keys, as well as a display over the faders that shows the individual channel status plus virtual control positions. There's also a lot more patching flexibility than on earlier models — all available inputs, outputs, effects and channel inserts can be assigned to any console channel or output,

while a direct out function enables any of the input channels to be sent directly to any other digital or analogue output. Similarly, the 24 busses (eight record/subgroup busses, 12 auxiliary sends, L/R stereo buss, and Solo stereo busses) are assignable to any output.

Driving all this wizardry is a processor section nine times as powerful as the existing 02R console, utilising Yamaha's newly developed DSP7 LSIs with 32-bit internal processing. For those who still demand more channels, cascade ports enable two DM2000s to function in



been redesigned to be much improved over earlier models. There are also two EQ modes available (Classic or Vintage), with four-band parametric EQ plus independent channel gates and compressors on every channel. In addition, the console includes six assignable 31-band graphic equalisers, onboard sample-rate conversion with a wide range of sync options, and a significantly improved word-clock generator. An optional remote with digitally controlled mic preamps will also be available, which should be welcome in the live sound arena.

The user interface will be immediately

tandem, with bi-directional communication between the consoles. The console comes with *Yamaha Studio Manager* software (for Macintosh and Windows platforms), for remote control of all parameters, and in a way this highlights the only disappointing operational feature of the console; its rather small, 02R-style monochrome display.

Yamaha confidently predict availability of the DM2000 for the first quarter of 2002.

Paul White

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New preset collection for TC Fireworx aims at dance market

A new collection of presets for TC Electronic's Fireworx multi-effects processor has been released by TC themselves. The processor, which was reviewed in June 1998, ships with a commendable 400 presets as standard, but TC have decided it would be a good thing to expand this set with presets aimed at the dance scene. Thus, the £99 DJ/Dance Producer preset pack has been released, on a PCMCIA card, featuring presets written by Bedrock, Orbital, and Norman Cook. The

new patches have been created with real-time control in mind, and all have parameters mapped to Fireworx's effects matrix, which can be tweaked via MIDI controllers, whether generated by your sequencer or a MIDI hardware controller box.

T TC Electronic UK Freephone 0800 917 8926.
E tcuk@tcelectronic.com
W www.tcelectronic.com



Behringer enter digital mixer market

German audio company Behringer have entered the digital mixer fray with their DDX3216. This desk offers full MIDI automation, with 32 inputs, 16 busses and eight sends, and flexible routing options. With the DDX3216, Behringer aim to provide digital mixing with an analogue feel, in a rackmountable package (a rackmounting kit is supplied).

Sixteen motorised channel faders, each switchable to control two channels, are fitted. Each channel also features four-band parametric EQ, compressor, gate, low-cut filter and phase invert; the first 16 channels are also equipped with a delay function. A-D and D-A converters are 24-bit, and 12 mic preamps are provided. Four effects processors have been specified, and can supply effects including chorus, delay, flanger, LFO filter, phaser, pitch-shifter, reverb, and tremolo. A range of analogue ins and outs is provided, so external audio sources and signal processors can be incorporated into a recording session, and expansion slots allow digital interfacing to be added as an option; cards are available which support ADAT, TDIF and AES/EBU formats. The desk's OS can be updated via computer, and a free Windows editor is available from Behringer's web site.

We've also received some good news regarding the rest of Behringer's range: the company have announced a worldwide 50 percent price reduction for many existing products — see their web site for more details.

T Behringer +44 (0)1932 588826.

W www.ddx3216.com

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Roland XV synth sound at much lower price

A new sound module based on XV5080 technology has been released by Roland.

The 5080 originally retailed for £1800, yet the 1U XV5050, which comes in a sleek silver package, offers many of the same features (and all of its presets) for £749. Polyphony is 64 voices, and each synth patch can include up to four elements. The synth is 16-part multitimbral, with support for the new General MIDI Level 2 standard, and three effects processors derived from the SRV3030 stand-alone processor are on board. A USB connector on the XV5050's front panel enables easy interfacing with a computer, and the sound set can be extended by installing any two of Roland's optional SRX Wave Expansion boards. The 5050 also features co-axial and optical S/PDIF digital outputs.

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W www.roland.co.uk

British software synth creates modular programming environment



A new stand-alone soft synth, available only for Mac, provides a modular analogue/digital synthesis system in what appears to be a friendly programming environment. CellSynth, from British developers Living Memory, is shareware, and costs US\$95 online. Essentially, you work with sonic building blocks — cells — to which you can add samples and DSP processors such as phasers, reverbs, filters, vocoders and so on. Full MIDI control is possible, and CellSynth's output can be recorded direct to disk, so that its results can be exported to other software. A built-in 'automation sequencer' lets you automate mixes and effects during a performance, and the software can be sync'd to MIDI clock, if desired. All the features of a large modular analogue synth are provided, including LFOs, oscillators, filters, envelopes, noise generators, sample-and-hold generators and mixing modules; additive synthesis, using up to 32 harmonics, can also be integrated into a patch.

W www.cellsynth.co.uk

Budget 16-track digital from Fostex

The latest in Fostex's long line of digital multitrackers is the 16-track VF160. The new machine retails for an attractive £899 including VAT, and offers 16 tracks of simultaneous uncompressed recording, two assignable compressors (plus master compressor), ADAT interfacing, dual effects processors, three-band EQ on all channels, 20Gb hard drive and a 99-event mix-scene memory. A full 16 faders are featured in the mixer section, and two of the inputs have phantom-powered XLR connectors for condenser mics. An internal CD-R/RW drive can be added for £199, making the VF160 an all-in-one recording, mixing and mastering package.

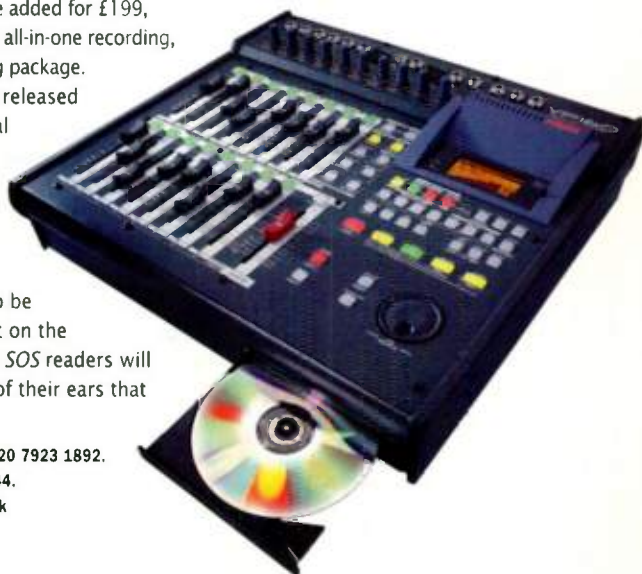
Fostex have also released a pair of professional semi-open stereo headphones, the £149 T50RPs, which, with a maximum SPL of 133dB, they claim to be amongst the loudest on the market. We hope no SOS readers will be so disrespectful of their ears that they test this claim!

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W www.fostex.com



Glyph offer matching drive for MOTU 828

Storage specialists Glyph Technologies made a smart move when they customised a hard-drive package to match Digidesign's Digi 001 recording system. Now they've done the same for Mark of the Unicorn's 828 FireWire audio interface. The new M Project 7200rpm hard drive matches the 828's livery, and is also equipped with FireWire — in fact, it can be daisy-chained from the 828 itself. It's also currently the only FireWire-equipped hard drive to be officially approved by MOTU — not surprisingly, since M-Project was developed in cooperation with MOTU. Of course, the drive can be used by non-828 owners, if they don't mind their livery not matching!

The 40Gb M Project drive retails for £582 including VAT.

T The Global Distribution Group +44 (0)870 464 0600.

F +44 (0)870 464 0601.

W www.glyphtech.com



Surround library now in 5.1 format

Renaissance Sound Technologies claimed a world's first with their Dolby Surround-encoded sound effects library, launched in 2000. Now they claim another one: a library encoded in 5.1 surround format. The collection, dubbed *Renaissance 5.1 SFX* consists of four CD-ROMs containing original surround recordings from the Dolby Surround library, remastered in 5.1 using Renaissance's proprietary psychoacoustic software. All files in the library are 24-bit/48kHz, and feature Digidesign *Pro Tools* file extensions, enabling *Pro Tools* users to load a 5.1 surround track as if it were a single file. However, the library is designed for all professionals involved in 5.1 surround productions, not just *Pro Tools* users.

Three of the CDs feature 3D environments, such as cityscapes, nature, people and so on, while the fourth disc is dedicated entirely to LFE channel information, providing tracks created with Renaissance's special sub-harmonics software tools.

The price of the library (on four CD-ROMs) is US\$395 direct from the web site below, and includes a royalty free buy-out licence.

W www.renaissancesfx.com

Christmas hire offer from FX Rentals

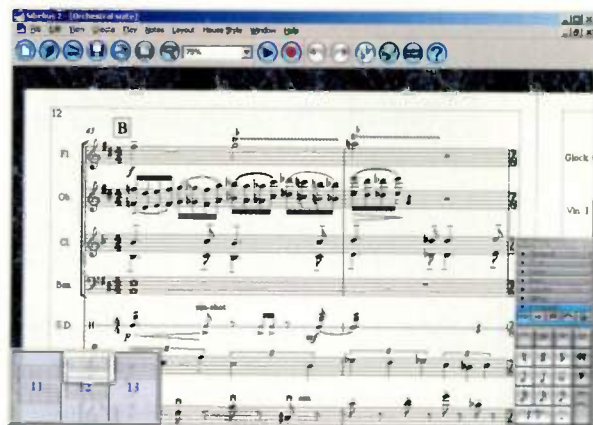
FX Rentals are making an unmissable offer if you're planning to hire any equipment over the Christmas holiday: basically, any equipment to be hired for the two-week period between December 23 and January 6 will be charged at two chargeable days per week rather than the normal four-day rate. Not surprisingly, FX recommend that you book early to avoid disappointment.

T FX Rentals +44 (0)20 8746 2121.

Price cuts for Doepfer products

EMIS, UK distributors for Doepfer's range of analogue synth and related products, have announced some price cuts. The MAQ16/3 analogue sequencer now retails for £425 (instead of £499); the Drehbank 64-knob MIDI controller is £275 (from £325); the Regelwerk MIDI fader box/analogue sequencer now costs £449 (from £499); the Schaltwerk pattern sequencer is down to £899 (from £999); the PK88 master keyboard is £499 (down from £525); the LMK2+ master keyboard costs £699 (from £749); the LMK4+ master keyboard is £899 (previously £999); and the SK2000 stage piano costs £599 (from £625).

T EMIS +44 (0)117 956 1855.



Major upgrade for Sibelius notation software

Sibelius Software have announced a major upgrade to their *Sibelius* Mac/PC scorewriting software. More than 200 new features and enhancements can be found in *Sibelius 2*, chief amongst which must be the use of artificial intelligence to arrange and orchestrate music automatically — we can't think of any other software that offers this facility. Every other aspect of the program, which now has a user base of over 100,000, has also been improved, from notation and playback to Internet publishing. Sibelius have also signed a deal with Macmillan Reference and Grove's Dictionaries to give *Sibelius 2* users trial access to the recently-launched on-line edition of *The New Grove Dictionary of Music and Musicians* (the new paper edition runs to 29 hardback volumes).

Sibelius 2 will initially be available for Windows, with a version for Mac OS following early in 2002 (the program will be compatible with Mac OS 8.6 and above, including Mac OS 10.1). The upgrade will cost £175 including VAT, but Mac users buying the current version (v1.4) will be entitled to a free upgrade when *Sibelius 2* for Mac OS becomes available.

Following its official launch at the Royal Academy of Music in November, *Sibelius 2* is on tour: free demos are being put on at various venues well into January. This magazine should be out in time to let you know about: December 16, Chappell of Bond Street, London; January 19, Brighton University; January 26, Bristol University; January 27, Royal Academy of Music, London. Contact Sibelius for tickets.

T UK Freephone 0800 458 3111.

W www.sibelius.com



Stand-alone filter aims to capture vintage MS20 filter character

The filters on Korg's MS20 classic analogue synth are to a large degree responsible for that synth's trademark sound. The synth itself remains desirable, and can be quite expensive, but modular synth specialists Analogue Solutions have had a look at how the filter works and have released a product they hope will offer something of that classic sound. We're not sure about the name — Filtered Coffee — but the spec of this 1U rack module looks good. The FC offers high- and low-pass filters, with dual LFOs, input level, and envelope-follower controls. Both filters feature cutoff frequency and resonance controls, plus fine-tuning controls for tailoring response to incoming control voltages. The rear panel features no fewer than 14 jack sockets for routing audio and CVs to and from other analogue synths and modular systems. It's even possible to link two FCs for stereo operation and auto-panning effects.

T +44 (0)1384 353694.

F +44 (0)1384 353694.

W www.analoguesolutions.com

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1402-VLZ PRO

14 total channels • 6 XDR™ premium mic preamps • 6 mono mic/line level chs. • 4 mono/stereo line level chs. • Extra ALT 3-4 stereo bus • 3-band EQ • 75Hz low cut filters on mono chs. • 2 aux sends per ch. • 2 master stereo aux returns with EFX to Monitor • Ctrl Rm/Phones source matrix • 60mm log-taper faders • Switchable AFL/PFL

1202-VLZ PRO

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Separate Tape to Main Mix switch with independent level control.

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New Digidesign plug-in standard supported by Native Instruments

Native Instruments have become the first software developer to release virtual instruments in both Digidesign's new HTDM — Host TDM — and their established RTAS formats. The *B4* organ, *Pro 52* vintage synth and *Battery* drum sample player are now available as the Native Instruments *Studio Collection Pro Tools Edition*; NI's *Spektral Delay* will also be available, separately, in both

formats. All plug-ins integrate into the Pro Tools environment (RTAS for Pro Tools LE and HTDM for TDM systems), and support total recall of settings, full automation, and multiple instances of each instrument or effect.

T Arbiter Group +44 (0)20 8970 1909.
F +44 (0)20 8202 7076.
W www.arbitermt.co.uk
W www.native-instruments.com

Wavetable synthesis convention

SOS Reader Paul Maddox has emailed us to pass on the word about a forthcoming event dedicated to PPG and wavetable synths. Due to take place on February 16, 2002, starting at 11am, at a venue near to Birmingham airport, the event essentially appears to be an opportunity for people to gain hands-on access to equipment from the PPG range — such as the Waveterm, PPG Wave 2.0, 2.2, 2.3 and so on — alongside related instruments from Waldorf and Korg. Also scheduled is a presentation about the progress of the Waveterm C project, which aims to create Waveterm functionality in a Windows program, plus a demo. Admission is free.

W www.wavesynth.com

Sony derive processing plug-ins from top-line Oxford digital desk

Processing algorithms derived from Sony's digital mixing consoles — the OXF R3 Oxford and the DMX R1 — are being made available in plug-in formats for other platforms. For example, Sony themselves have released an Oxford EQ plug-in for Digidesign TDM systems. This is based on the Oxford's digital EQ. The plug-in utilises TDM's 'double-precision' processing capabilities, and the research team implemented 48-bit processing for some parts of the algorithm. The EQ itself is five-band parametric, with separate high- and low-pass filters; four different types of EQ are available, emulating the performance of certain popular analogue devices. An optional George Massenberg Labs 8200 emulation is available for the Oxford EQ plug-in. Sony have set up a special web site for the distribution of their plug-ins (above).

We also hear that TC Works have entered into a collaboration to develop



Oxford-derived plug-ins for their PowerCore DSP card. The Sony plug-in for PowerCore should offer the same sort of functionality as that for TDM, since TC have provided their card with double-precision processing, and other technologies that should enable high-resolution performance.

W www.sonyplugins.com



Tascam launch cheapest ever Portastudio

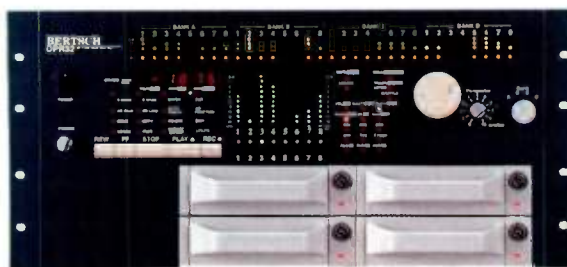
The latest in Tascam's long line of cassette-based Portastudios is the cheapest yet. The MFP01 has a list price of just £99, yet offers all the basic features necessary for making quick demos. A single mic/line input is provided, which can be routed to any track; track bouncing is possible, so you're not limited to four recording tracks. On mixdown, level and pan controls are available. The transport runs at normal cassette speed — 4.76cm/sec. A headphone socket is provided, as is input metering.

T Tascam UK Brochure Line
 +44 (0)1923 438888.
W www.tascam.co.uk

UK distribution for Bertsch digital 32-track

When we first mentioned the Canadian-made Bertsch Electronics DPR32 digital multitrack recorder, back in August 2001, no UK distributor had yet been appointed. That situation has now changed: X-Vision Audio will be handling UK sales and support for the DPR32, and forthcoming Bertsch products.

To recap, the DPR32 offers up to 32 tracks of simultaneous, uncompressed digital recording at 24-bit/96kHz, up to 64-track playback, full MIDI spec, a MIDI-automatable 36:8 digital mixer, 32 three-band parametric EQs, 32 gates, 32 compressors, 32 duckers/de-essers, and non-destructive editing. Four IDE removable



drive bays mean that up to 132Gb of storage can be on line at any one time. There are plenty of options for the DPR32 when it comes to adding digital interfacing and extra analogue connections, but the basic machine — featuring 16 analogue inputs, 32 analogue outs and an 80Gb hard drive — will retail for £6600 including VAT.

Bertsch have also announced the TAIL professional broadcast-quality mastering recorder. This device offers four-band stereo dynamics processing and is equipped with a 30Gb hard drive (equivalent to 46 hours of two-track audio). Waveform editing is provided, as are a sample-rate converter, dedicated faders, high-resolution LCD,

integrated CD-R drive, S/PDIF digital I/O, 16-bit and 24-bit recording modes, a level meter, and gain-reduction display, plus full MIDI implementation.

T X-Vision Audio UK +44 (0)1803 290313.
F +44 (0)1803 298333.
W www.xvision.co.uk
W www.bertschelectronics.com

cue and review



MUSIC MART

"In the AW4416 Yamaha has the most impressive and complete machine of its kind to date. This is a genuine world-beater."

Derek Johnson, Music Mart
February 2001.

THE MIX

"This is the best portable studio available, bar none."
"The biggest product to hit project recording in years."

Sean Vincent, The Mix
December 2000.

SOUND ON SOUND
Europe's No.1 Hi-Tech Music Recording Magazine

"The AW4416 is a fabulous machine. It does pretty much everything you could possibly want it to, with minimal fuss and plenty of flexibility. Everything about it exudes quality."

Hugh Robjohns, Sound on Sound
November 2000.

FutureMusic

"Yamaha's AW4416 represents a huge step forward for the audio workstation. It's the most complete studio-in-a-box to date and it comes with bags of professional features."

Oz Owen, Future Music
December 2000.

AW4416

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YAMAHA

www.aw4416.com

New sound-generating method named 'Pulsar Synthesis' by academics

It must be increasingly difficult for engineers and academics to conceive, let alone develop new forms of synthesis. Yet Curtis Roads and Alberto de Campo of the University of California Santa Barbara, in the USA, have done just that. Their system has been called Pulsar Synthesis (PS), and is at the heart of *Pulsar Generator*, a Mac OS application that's being marketed by CREATE (the Centre for Research in Electronic Art Technology) at UCSB.

PS offers a new way of examining and creating sound and is, at first glance, distantly related to granular synthesis, in that it works on small particles of sound. At the heart of the technology are 'trains' of sonic particles called pulsars, which can produce rhythms or tones, depending on a Train's fundamental frequency. Manipulating the pulsar via the software causes timbral and/or rhythmic changes over time, and the user is provided with control of up to three formants, each of which has its own spatial trajectory and amplitude envelope.

The technology has a sonic fingerprint that's reminiscent of certain aspects of vintage analogue synth sounds, but with enhancements including precise programmable control, waveform



flexibility, a graphical interface, and built-in digital recording. For a technical explanation of what's going on with PS, check out Roads' paper in the March 2001 issue of the *Journal of the Audio Engineering Society*. The less 'propellerhead' approach would be to have a look at the web site and maybe download the demo of *Pulsar Generator*; saving is disabled, and there are a couple of other limitations, but everything else works well enough for you to get an idea of whether this new area of sound design offers something for you. Unlocking the program costs a fairly paltry US\$49 (about £37), which isn't all that much to pay to gain access to something genuinely novel.

Pulsar Generator runs under Mac OS 8.5.1, 8.6, and 9.1, and is recommended for Power Macintosh 8600, 9600, G3, and G4 computers; it also works with any ASIO-compatible soundcard.

W www.create.ucsb.edu

PMC launch speaker stands

Monitor manufacturers PMC have launched a range of tubular stands to complement their family of compact monitors. All models in the Tube series of stands come in black with silver bases, and feature 6mm laser-cut and profiled steel top-plates, welded directly to a 100mm diameter steel column. The column is kept rigid by a 6mm base plate which is equipped with four hardened 8mm spikes, ensuring the monitor is stable at all times and well grounded to the floor. Each Tube is pre-tuned with a precise quantity of inert filling, and there are four models in the range, costing £200 including VAT for 48cm or 61cm stands, and £300 each for 91cm and 104cm stands.

T PMC Ltd 0870 444 1044.

W www.pmc-speakers.com

Cubasis Mac available for Tascam US428 users

Steinberg's *Cubasis* MIDI + Audio sequencing software is finally available in a version for Mac users of Tascam's US428 USB-equipped MIDI + Audio interface, reviewed in *SOS* May 2001. At that time, the PC version of *Cubasis* for the 428 was already available, with the Mac version promised.

W www.tascam.com/products/us428/downloads.php



Major Cubase update brings new instruments and effects

Following several months of interim updates, Steinberg have announced a serious full upgrade — v5.1 — to their *Cubase* VST MIDI + Audio sequencing software, for both Mac and PC platforms. This will be available as a free download (to registered users), and offers not only major enhancements but new effects and instrument plug-ins too. The update features code optimised for Pentium III and IV processors, and AltiVec enhancement for Apple G3 and G4 machines. The new VST Instruments are: *JX16*, a 16-voice, two-oscillator synth; *LM7*, a 24-bit drum machine with three



sound sets; and *CS40*, a six-voice software synth. No less than 11 new effects are provided, including new filters (such as the PhatSync pattern-controller multi-mode filter), a MIDI gate, ring modulator, vocoder, valve simulator, a sub-bass

processor, and the 'BitCrusher' bit-depth reduction tool. Also new is the *Mysterizer*, a multi-effects plug-in which is under mouse control via an on-screen X-Y pad, allowing real-time, intuitive manipulation of sounds and samples.

Steinberg's PC-only audio restoration software, *Clean*, has had a v3 upgrade. The software's core job is unchanged: it allows you to take audio from vinyl record or cassette, clean it up by removing hiss, pops and crackles, and burn it to CD (label and cover design software is also included). Even MP3 audio can be enhanced with *Clean*. New features include an interactive 'IntelliAssistant', which provides on-line help for the user during the digitisation, cleaning and burning process. Another new feature is Sound Morph, which analyses a section of audio from one recording and applies the chosen sound spectrum automatically to other CD tracks. Also new are TubeSimulation, which, as you might expect, emulates the sound of hi-fi vacuum tube amplifiers, and the option to use VST-format effects plug-ins.

The software retails for only £25, and is also available in the *Clean Plus* bundle, priced £70. This includes Steinberg's USB Phono Amp, which allows you to interface a turntable directly with your PC. The interface even draws power from the USB connection.

T Arbitr Group
+44 (0)20 8970 1909.

F +44 (0)20 8202 7076.

W www.steinberg.net



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Radiophonic pioneers regroup for special live performances

We've heard that a group of people who used to belong to the BBC's now-defunct Radiophonic Workshop are to reform for a special event. In a tribute to Delia Derbyshire — the electronic music pioneer and Radiophonic colleague who died on July 3, 2001 — Mark Ayres, Brian Hodgson, Paddy Kingsland and Peter Howell will recreate sound effects from the '60s, '70s and '80s in a new original score, created with the aid of new technologies and Macintosh computers. The piece, *Generic Sci-fi Quarry* will be premiered during three nocturnal performances with artists Rory Hamilton and John Rogers in March 2002. The artists will be contributing digital projections and optical illusions that evoke effects and locations from the likes of *Blake's 7* and *Doctor Who*. The event will actually take place in an Oxfordshire quarry, as part of the international art project, TV Swansong. A live audience will be present, but the event will also be broadcast over the Internet. TV Swansong are also commissioning seven other pieces that will be presented in rural and urban sites across the country, and webcast live.

W www.swansong.tv

Second-generation release for upgraded Drawmer digital processor



Drawmer's DC2476 digital dynamics processor (reviewed in *SOS* October 1999) was the first entry in the company's Masterflow range of digital products. It's also the latest release, in an upgraded 'second generation' form. This 24-bit/96kHz processor features multi-band compression, tube saturation and EQ, and is suitable for tracking, mastering, and live-sound applications. New features include sample-rate conversion (up or down between 32kHz and 96kHz), switchable word clock input/output, sample-rate selection, and absolute stereo output trim control. The last feature is aimed at broadcast users who need to keep within regulated output-level limits.

Drawmer haven't been neglecting their range of analogue processors. Their new DF330 Universal Noise Filter replaces the DF320 Single-ended Noise

Reduction System, which has been available since 1985. The new machine features automatic high-frequency restoration circuitry which aims to compensate for any HF loss during extreme noise reduction processing, and its new expander section incorporates Drawmer's 'programme-adaptive' technology which effectively smooths over the gaps during pauses in audio signal. Although the DF330's circuitry has been upgraded significantly, Drawmer have tried to keep the front-panel layout as similar as possible to that of the DF320, so that established users can swap over easily without having to learn a new way of working. And the price, £499 including VAT, remains the same as that of the DF320.

T Drawmer +44 (0)1924 378669.
F +44 (0)1924 290460.
W www.drawmer.com

Bass players offered amp-modelling processor by Digitech



Digitech are tempting bass players with an amp-modelling floor-mounted processor, the BP200. The new processor also produces multi-effects specifically for bass guitar.

Sixteen bass-amp and stomp-box models, plus 22 other effects, are offered by the BP200, and a built-in expression pedal can be assigned to the parameters of your choice (each effect includes up to three adjustable parameters). Two footswitches are also provided. Editing is via a six-character alphanumeric display and

three knobs. Apart from the effects and amp models, the BP200 also features a 'rhythm trainer' and chromatic tuner, and there are 40 factory presets on board, with 40 locations for user edits. Audio interfacing consists of a jack input, dual jack stereo out, headphone out, and a stereo input for jamming along to external audio. The BP200 retails for £179.95 including VAT.

T Arbitr Group +44 (0)20 8970 1910.
F +44 (0)20 8202 7076.
W www.arbitrergroup.com
W www.digitech.com

MPG Venue Network promises quality showcases for new bands

Record producers looking for suitable showcase venues for new, unsigned bands have asked the Music Producers' Guild (see our MPG-judged demo review feature on page 70 of this issue) to set up a network of reputable venues in Central London. MPG's response was to launch a series of acoustic showcases to help identify venues where new bands would be able to show off their talent to A&R representatives without being short-changed or poorly promoted. The first MPG Acoustic Showcase took place in October at the Royal Academy of Dramatic Art — this venue is apparently already proving popular with producers and record companies alike.

T MPG +44 (0)20 7371 8888.
W www.mpg.org.uk

Easy upgrade for Electrix Repeater

The Repeater MIDI-controllable performance loop sampler, from Canadian company Electrix, has had an OS upgrade. The new software is available from Electrix's web site, and can be easily installed via the Repeater's Compact Flash Card slot; loops created with the earlier operating system will be fully compatible with the update. Amongst the new features offered by v1.1 are the ability to erase loops via MIDI control changes, audio-triggered recording during playback, stereo level/mute control via MIDI Continuous Controllers, and the ability to use MIDI messages to advance to the next available Repeater track during recording. The unit's MIDI spec in general has been enhanced, as has sync to external clock.

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

Upgrades to Max/MSP multimedia programming environments

Cycling '74 have announced updates to their Max and MSP multimedia programming environments, to v4 and v2 respectively. Max 4 is the base program, and provides a basic environment for turning MIDI data or mouse movements, for example, into control information for external devices and other software; MSP 2, which is only available bundled with Max 4, adds audio extensions to Max, for detailed sound design, synthesis and sample manipulation. There have been a lot of enhancements, and the Max 4/MSP 2 combination now comes with nearly 400 programming objects, 1500 pages of documentation, and 88 tutorials. The improvements range from new customisable-colour patch cords to compatibility with ASIO, Rewire, and DirectConnect interfacing technologies, with the option to use Max 4/MSP 2 as a VST plug-in within compatible software. Both packages are currently Mac-only, though Windows, and Mac OS X versions are currently in development.

Max 4 costs US\$295, or US\$50 to upgrade from v3.x or earlier; the upgrade from Max 4 to Max 4/MSP 2 is US\$295. Max 4/MSP 2 itself costs US\$495, while the upgrade from Max v3.6.2 (or older) and MSP v1.7.2 (or older) to Max 4/MSP 2 is US\$135. The software is available, from the Cycling '74 web site, in downloadable or CD versions, though shipping costs will apply for orders of the CD. Note that buying, or upgrading to, Max 4/MSP 2 provides you with a free authorisation for the downloadable version of the company's Pluggo 74-strong collection of VST/MAS-format sound processing plug-ins.

W www.cycling74.com

Fairlight workstations gain VST compatibility

Fairlight, noted '80s super-sampler manufacturers, are still feeding the upper reaches of the audio market. Their core business revolves around high-spec, stand-alone multitrack digital audio workstations, such as FAME2 and Prodigy2, though the new DREAM (which stands for Digital Recording, Editing And Mixing) family includes the DREAM Console, a fully featured automated digital mixer which also integrates a 48-track hard disk recorder and editor. The company recently launched a Plug-Ins Manager system, which offlines plug-in processing to separate CPU hardware from that handling the main audio playback and recording in FAME2 and Prodigy2 systems, resulting in low-latency operation. A large collection of plug-ins is provided with the PIM, including 32-bit reverbs, dynamics processing and other creative effects, but one intriguing aspect of the system is that it can access VST-format plug-ins. Thus owners of Fairlight's top-flight audio production systems can access an ever-growing range of software processors, from Internet freebies to professionally-designed simulations of esoteric processors.

T Fairlight ESP +44 (0)20 7267 3323.

F +44 (0)20 7267 0919.

W www.fairlightesp.com.au



Howard Jones hits the road with Emagic

Howard Jones, the '80s hit-maker, is on a UK tour, as this is being written, with international dates planned into 2002. And the whole show will be run from an Apple G4 Powerbook running a suite of Emagic software, plus controller keyboards. Logic Audio Platinum v4.8.1 is at the heart of the system, working in tandem with the EXS24 sampler, ES1 software synth, and EVP88 vintage piano simulator; hardware also comes from Emagic, in the form of the AMT8 MIDI interface and EMI 2i6 USB audio interface. In fact, Howard reports that the live rig echoes the setup in his studio. Gigs are even being recorded, digitally, to another PowerBook backstage, which is also running LAP with an EM12i6 interface (see right): programmer Robbie Bronnimann notes that it's possible to burn CDs of a gig just played for people to buy when the gig is over. "We even have someone on tour creating original artwork and pictures for every gig!"

Howard and Robbie are working on a new collaborative electronic album for release in 2002, and the aim has been to produce the whole album using two identical Powerbook rigs, again loaded with Emagic products — including the new Logic Control control surface for LAP — along with some additional software from Native Instruments.

T Sound Technology +44 (0)1462 480000.

F +44 (0)1462 480800.

W www.soundtech.co.uk

W www.emagic.de



Classic mic-preamp circuitry in brand-new package

Universal Audio have released the new M610 mono tube preamp, which is essentially a mono version of their dual-channel 2-610 mic preamp with a simplified EQ section. It shares the 2-610's origins in Universal's 610 modular mixing desk, created by UA founder and audio designer Bill Putnam. The M610 uses the 2-610's circuitry,

valves and transformer design, and offers balanced XLR and unbalanced jack line inputs, as well as a phantom-powered XLR mic input. The £1410 unit is housed in a 2U rack package, and appears to be built like a tank.

T SCV London +44 (0)20 7923 1892.

F +44 (0)20 7241 3644.

W www.scvlondon.co.uk

W www.uaudio.com

All Sonic Foundry products now £299

Sonic Foundry's UK distributor, SCV, have announced a set of price cuts — or, rather, a price rationalisation across the SF range. Sound Forge v5, Acid Pro v3 and Vegas Audio were previously £379 each, while Vegas Video was priced at £599. All four packages now cost just £299 each, including VAT. It's not long before Christmas as I write this, so the move sounds like good timing to me!

T SCV London +44 (0)20 7923 1892.

Overture 2 score-writing software moves house

We've heard that Cakewalk have sold the Overture 2 and Score Writer scoring software packages to GenieSoft, a new company founded by Don Williams, the original and principal software designer behind both packages. GenieSoft will now be offering tech support for the software, as well as implementing a range of upgrades. Of the two packages, Overture 2 is the more upmarket, and is available for the Mac and PC platform. Score Writer offers many of the tools of Overture 2 but in a more affordable, PC-only, package.

W www.geniesoft.com

Lucky Jim bags TC Electronic hat-trick in SOS competition

Back in January 2001, SOS published a competition in association with TC Electronic (+44 (0)800 917 8926 www.tcelectronic.com) to give away a TC Electronic M•One dual effects processor, D•Two multitap rhythm delay, and Triple•C dynamics processor worth £1377.

The lucky winner was US-based SOS reader Jim Molloy, who lives on Long Island in New York. Jim (pictured right) makes a living as an Animator and 3D Modeller, but spends his spare time in his home studio where he records blues, rock and classical music. Primarily a keyboard player, Jim has been learning guitar recently, and has been putting the three TC processors to use on his new instrument. Congratulations to Jim for winning, and our thanks to TC Electronic for providing the prizes.

While we're on the subject of TC Electronic and competitions, you might like to know that sister processing company TC-Helicon are running another competition at the moment, this time from their web site. The prize is a TC-Helicon Voiceprism Plus Voice Modelling Processor (as reviewed in SOS November 2001), worth £1199 including VAT. To find out more, simply head to TC-Helicon's web site (address below), and click on the Competition banner at the top of the home page.

W www.tcelectronic.com
W www.tc-helicon.com



Sampletank virtual sound module now in free version

If you liked the sound of IK Multimedia's *Sampletank* virtual sound module from our review back in August 2001, you may welcome the chance to try it for the cost of download time. The special free version of the software, dubbed *Sampletank Free*, works with VST- and MAS-compatible software and offers many of the advantages of the full version of *Sampletank*, including 16-part multitimbrality, four effects per voice (selectable from 20 DSP effects), optimisation for PIII and G4 CPUs, up to 128-note polyphony, and multi-processor compatibility. The 'module' will be able to play a range of free instruments which are to be published and updated monthly on the *Sampletank* web site. Already available are an 'uncompressed' acoustic concert grand piano, a piano/string-section layer, a complete acoustic pop/rock drum kit, plus stereo-miked bongos with full hits and ghost-notes.

W www.sampletank.com

Sennheiser UK distributing Hughes & Kettner

Hughes & Kettner guitar amps and effects pedals are now being distributed in Britain by Sennheiser UK. The German range was relaunched in this country at the recent Music Live event in Birmingham. H&K's range of guitar and bass amps and combos feature solid-state, valve or physical-modelling technology, so any taste is catered for.

T Sennheiser Brochure Line UK
Freephone 0800 652 5002.



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2/3 Samplers & Accessories
4/5 Sound Modules
6/7 Keyboards
8 Accessories

OPENING HOURS

Our doors are normally open from 10am-6pm Mon to Sat (late until 7pm on Thursdays, or you can catch us on the phone from 8am-7pm, and often much later) XMAS LATE opening hours: Mon 17th - Weds 19th Dec 10am-7pm; Thurs 20th 10am-8pm; Fri 21st - Sat 22nd 10am-7pm; Sun 23rd 11am-4pm. Closed: Tues 25th, Weds 26th & Tues 1st Jan 2002.

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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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Turnkey Deal Guide

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The diagram illustrates the pricing structure for a Tascam Porta 02MKII. It starts with the manufacturer's price, then shows a 35% discount for a media deal. Further discounts are applied for product model name, product description, product details, and a supplementary offer. The final turnkey price is shown as £99.99. The diagram also includes a recommended retail price (RRP) of £119.99 and a turnkey product code.

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 Please call for details of other delivery types and prices for other areas.
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1 £10,000 of gear at RRP inc VAT. No purchase necessary for entry. Draw to be held July 2002. 2 Subject to eligibility. 3 Written conditions available on request. 4 APR 10% monthly, thereafter 34.9%. 5 Calculated at the prevailing rate of Barclays Bank PLC. 6 See bottom of following page for prize guarantees. 7 Choice is subject to availability, please specify preferences when ordering. Offer only applies to telephone orders for delivery made from this advertisement. Prices include 17.5% VAT and apply to current stock only. UK mainland carriage from ESI. Please allow 10 working days for cheque clearance. Errors & omissions excepted. In a small number of cases, some in-store prices may vary as to those advertised for mail order on the internet or in press adverts such as this.

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Engineered by Focusrite and Digidesign, Control 24 gives the ultimate combination of class A mic / line preamps and a tactile control surface derived from the research and development behind Pro Control. Access all of Pro Tools recording, editing and mixing functionality with the minimum of key strokes and greatly enhance the efficiency of your Pro Tools system.

- 24 touch-sensitive motorized faders • 16 Focusrite Class A Mic Preamps • Hands-on access to Pro Tools recording, routing, mixing and editing parameters • Comprehensive Control Room Section capable of up to 5.1 surround monitoring • Illuminated switches for Mute, Solo, Record Arm, Channel Selects and Automation Mode on every channel • Dedicated EQ and Dynamics switches on every channel • High-resolution LED display for transport location at a glance • Integrated submixer with 8 stereo inputs • Touch-Sensitive automation of plug-in parameters using faders via Plug-In Flip Mode

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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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Apple G4/733 inc 256 MB RAM, 40 Gb internal drive, CDRW, Format 17" Monitor, Digidesign 001 Including Pro Tools 5.1 LE

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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, DPPI

RRP £14929
£13999
MIX PLUS BUNDLE

DIGI 001 COMPUTER STUDIO

Digidesign's Pro Tools system have remained out of reach for most budget studios, but their stylish new 24bit interface box and software package offers 18 channel I/O with 8 analogue, ADAT and S/PDIF. This includes 2 phantom powered XLR mic inputs, monitor out, headphone section and even a punch without footswitch. The bundled software is the new Pro Tools 5.1 LE offering 24 tracks audio editing with RealTime Audio Suite plug-ins and MIDI sequencing.

RRP £879
£689

001 FACTORY BUNDLE ALSO AVAILABLE only £1199.99

EMI 2/6 USB AUDIO INTERFACE

Emagic's multi-channel interface connects via your computer's USB terminal and offers 2 analogue inputs and 4 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 usefully includes a digital I/O in S/PDIF coaxial format. Low latency operation with Emagic's drivers makes the EM12/6 ideal for soft synths and multitracking.

RRP £399
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TOOLBOX DIGITAL PRODUCTION STUDIO

You cannot afford to miss this great offer - almost 55% of the list price for Digidesign's Toolbox multitrack audio and MIDI recording and editing solution. Based around the successful Pro Tools LE 5.1 software combined with the great value Audiomedia III PCI card, offering 18 bit stereo analogue I/O and 24 bit S/PDIF digital I/O. These can be used simultaneously giving four inputs and outputs. The powerful real-time mixing and processing features of Pro Tools LE give you authoritative control over the whole recording, editing and post-processing tasks handling up to 24 tracks of audio at 24 bit or 16 bit, and 128 MIDI tracks at 9600pp, with full compatibility of Pro Tools session files as an industry standard format. It also includes a host of bundled Digirack real-time plug-ins, including trim, dither, de-esser, compressor, limiter, expander / gate, 4 Band EQ, multitap delays and Digidesign's D-Verb reverb, in addition to waveform displays for super accurate editing, multiple undo history, auto saving, integrated track import, region list navigation, multi-device MIDI recording, individual track offsets, event list editing and more. **Turnkey Exclusive - buy now while stocks last!**

RRP £199
£119

"The sales assistant could not be faulted"

M.J. (Kent)

2408 MkII AUDIO INTERFACE

A complete hard disk recording solution based around this 1U rack audio interface which provides 8 channels of inputs and outputs on both ADAT and TDFI digital multitrack formats, and its own analogue I/O using 24 bit converters, with a bonus front panel headphone jack. The 2408 Mk II hardware includes a PCI card to attach to the Mac or PC host which runs MOTU'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.

RRP £856
£856

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 its 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 Unit8.

RRP £159
£115

SAC-2K ASSIGNABLE CONTROLLER

A sleek hardware interface with eight 100mm motorised touch sensitive faders, eight white transmit controls and big 8 digit LED readout for location points. These 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!

RRP £1249
£1249

AMT8 USB MIDI INTERFACE

MIDI interface with 8 MIDI in sockets and 8 MIDI out sockets giving you 128 channels in 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.

RRP £348
£275

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 LTM™ Linear Time Base communication protocol LTM™ defines to sub-millisecond accuracy exactly when an 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.

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MIDIMAN MIDISPORT 4X4

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- Plug and play compatible with Windows
- MIDI Thru bypass function

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MIDIMAN MIDISPORT 8X8

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- 1U rackmount design
- Self-powered - requires no external power supply
- MIDI-activity indicators for each port

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£235

MOTU FAST-LANE

- 32 channel USB MIDI interface
- Hot swappable and expandable with a hub
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- Range of colours

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MOTU MIDI EXPRESS XT USB

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- 128 MIDI channels
- SMPTE to MIDI sync
- 16 speed 1U rack

RRP £339
£339

MOTU MTP AV USB

- Versatile USB MIDI patchbay interface
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- Digital audio - video sync via computer

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£569

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- 16 bit 44.1kHz converters
- High impedance guitar jack
- Built in headphone socket

RRP £179
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ROLAND UA-5

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- 1U half rack design

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- 1 in 3 out gives 48 MIDI channels
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- Customised

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MAC NUENDO

NUENDO MEDIA PRODUCTION SYSTEM

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A rock solid Nuendo system based on the industry standard Carillon AC-1 audio PC.



The Windows 2000 system features dual PIII 1Ghz processors, a massive 1Gb of RAM, 30 & 60 Gb drives, Dual 17" monitors, 20x speed CD writer, Nuendo 8 I/O interface and Midex3 LTB timing MIDI interface.

FROM £989.99
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TOTAL PRICE £4999.99
CARILLON NUENDO

MAYA SOUND CARD

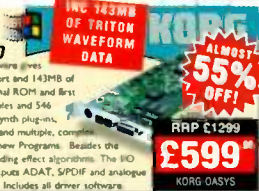
The AudioTrak Maya from EgoSys is a PCI soundcard for Windows 98 and offers full duplex record and playback operation, with 18 bit A/D converter and 20 bit D/A converters, for stereo analogue connections via phono plugs. There is also an SPDIF digital output supporting up to 20 bit data, and a 192 kHz jack socket for mic input. The card offers low latency and has ASIO2.0, MMX, DirectSound and Gigasampler drivers. To complement the overall packaging style, even the Windows control panel has a rather fetching Aztec II Incas pyramid brick design!



PRICE INCLUDES 2X2 MIDI INTERFACE!
FACTORY DIRECT £129.99
PACKAGE

OASYS V2 DSP SYNTH & FX I/O CARD

New owner full price, the new Version 2 software gives the Oasys V2 24 bit stereo PCM support and 143MB of waveform data - taken from the Triton's internal ROM and first three expansion boards, giving over 3900 samples and 546 multisamples. There are 16 new PCM-based synth plug-ins including features such as DSP rate envelopes and multiple, complex DS1-rate MIDI synced LFOs and hundreds of new Programs. Besides the modelling synthesis, Oasys also has 100 outstanding effect algorithms. The architecture gives a total of 12 inputs and outputs ADAT, SPDIF and analogue via built in 24 bit converters with low latency. Includes all driver software.



PRICE INCLUDES 2X2 MIDI INTERFACE!
FACTORY DIRECT £129.99
PACKAGE

WAMI BOX PCMCIA AUDIO INTERFACE

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



RRP £400
£339.99
EGOS-WAMIBOX

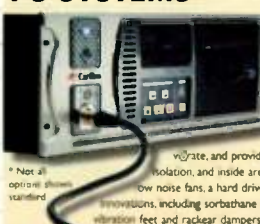
MONA 24/96 AUDIO INTERFACE

Translink built with four 24-bit 96kHz XLR mic inputs and TRS line jacks. Converts are 24 bit 96kHz with wide dynamic range and low distortion, and the built in preamps offer up to 60dB gain and 48V phantom powering. The rear panel has six analogue outputs doubled on XLRs and phono. Digital I/O supports up to 48kHz via SPDIF or ADAT, so the 96kHz mode is between the Mona's own A/D and D/A converters and the computer recording software. It also includes BNC wordclock for accurate transfers under an external master clock, and four channels of LED metering and includes a special version of Cool Edit Pro. Turnkey Exclusive - buy now while stocks last!



RRP £799
£499.99
EENT MONA

AC-1 AUDIO PC SYSTEMS



Carillon Audio Systems proudly present the first ever "Audio Computer", designed and built specifically for music recording studio use, where noisy fans, drives, RF interference and unreliable flimsy hardware are absolutely unacceptable! Their heavyweight steel and aluminum chassis is built to last, won't rattle or vibrate, and provides considerable sonic and electrical isolation, and inside are Carillon's own UltraMute PSU, plus super low noise fans, a hard drive sleeve, and many other noise killing innovations, including sorbothane anti-vibration feet and rackear dampers.

SEE CARILLON INSERT WITH THIS MAGAZINE FOR FULL DETAILS OF ALL THE SYSTEMS!
FROM £999.99
CARILLON AC1

828 FIREWIRE INTERFACE

The MOTU 828 package is based around the 1U rack audio interface with 18 simultaneous inputs and outputs, comprising SPDIF two channels, ADAT eight channels and analogue 8 channels using Neutrik combination TRS / XLR sockets with up to 0dB gain and phantom power for microphones. Connects via 12 foot firewire cable. Drivers for PC and Mac, but AudioDesk editor software is Mac only, giving several effects derived from Digital Performer which you can upgrade to at reduced cost.



RRP £849
£703.99
MOTU-828

US428 INTERFACE

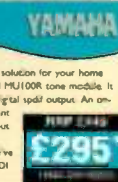
Tascam's US428 helps you bridge the gap between ease of use and most software packages designed for multi channel recording and mixing. You get 8 faders, with panpots and EQ pots and a master fader, plus a set of transport keys and also a large data wheel. These can be freely assigned to your software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



RRP £449
£349.99
TASC-US428

SW1000XG SOUND CARD

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



RRP £449
£295.99
THE SW1000XG

EXTRA 10% OFF
Available on fully guaranteed
Please ask your sales assistant for details

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Fax: 020 7379 0093 114-116 Charing Cross Road London, WC2H 0JR Web site: www.turnkey.uk.com In Eire Call: 01677 9377
Other offers may not be available when price is changing. We must be able to substantiate the quote and the goods must be available and in stock.

DIGIGRAM VX POCKET MKII

- A real mobile studio!
- PCMCIA Laptop audio card
- Balanced XLR stereo input
- SPDIF I/O up to 24 bit
- ASIO drivers for Mac or Windows



RRP £511
£404.99
DIGI-VXPOCKET2

ECHO GINA/24

- 24 bit PCI audio card
- 8 inputs & 8 outputs
- Full duplex operation
- ASIO and SPDIF I/O



RRP £429
£365.99
ECHO-GINA24

LYNX 2 4X4

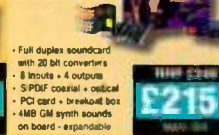
- Four channels of ultra high quality A/D and D/A conversion on a PCI card
- 24 bit at sample rates up to 192kHz, with balanced analogue I/O and AES3 or SPDIF with wordclock
- Expandable via LStream ports to handle ADAT or TDM for 8 extra channels



RRP £1000
£799.99
LYNX-2-4X4

GUILLEMOT MAXI ISIS

- Full duplex soundcard with 20 bit converters
- 8 inputs & 4 outputs
- SPDIF coaxial & optical
- PCI card - breakout box
- 4MB GM synth sounds on board - expandable



RRP £249
£215.99
GUILLEMOT-ISIS

MIDIMAN DELTA 1010

- 8 balanced analogue I/O
- SPDIF coaxial I/O
- MIDI in and out (16 ch)
- Wordclock I/O on BNC
- 24 bit 96kHz supported
- PCI card - 1U breakout
- Win98, ME, 2k, Mac & Linux



RRP £449
£499.99
MIDIMAN-DELTA1010

MIDIMAN DELTA 44

- 20 bit 96 kHz full duplex PCI card - breakout box
- 4x balanced TRS jack I/O
- Includes driver software
- Up to 128MB SDRAM
- Win98, ME, 2k, Mac & Linux



RRP £249
£194.99
MIDIMAN-DELTA44

MIDIMAN DELTA 10LT

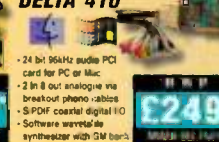
- Powerful PCI card with two breakout cable loops
- 10 in 10 out with 24 bit 96kHz converters
- 8 ch analogue I/O including two XLR mic inputs
- SPDIF coax & wordclock
- MIDI in/out flying leads



RRP £399
£399.99
MIDIMAN-DELTA10LT

MIDIMAN DELTA 410

- 24 bit 96kHz audio PCI card for PC or Mac
- 2 in 8 out analogue via breakout phono cables
- SPDIF coaxial digital I/O
- Software wordclock interface with GM hard



RRP £249
£249.99
MIDIMAN-DELTA410

MIDIMAN OMNI I/O

- Multichannel audio interface front end
- Adds 2 XLR mic preamp inputs with 48V and balanced line level inputs
- Inserts, gain pots, clip LED
- Allows mixer style routing for full duplex soundcards like the Delta 44 or 66



RRP £229
£179.99
MIDIMAN-OMNI-I/O

MIDIMAN QUATTRO

- External USB audio interface
- 4 audio channels in & out
- Balanced TRS jacks
- Out level knobs for channel pairs 1/2 and 3/4
- Direct monitor level also
- 1 MIDI in/out & 16 channels
- 9V PSU adapter



RRP £249
£224.99
MIDIMAN-QUATTRO

RME HAMMERFALL LE

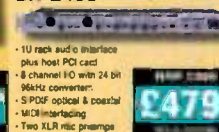
- Hammerfall LE comes without the daughterboard but may be upgraded later
- PCI soundcard with ADAT optical 32 and SPDIF 31
- 8 pin ADAT Sync socket
- SPDIF coax breakout lead
- Ultra low latency
- Windows 98, Mac and Linux drivers



RRP £269
£269.99
RME-HAMMERFALL-LE

ROLAND DA-2496

- 1U rack audio interface plus host PCI card
- 8 channel I/O with 24 bit 96kHz converters
- SPDIF optical & coaxial
- MIDI interfacing
- Two XLR mic preamps



RRP £479
£479.99
ROLAND-DA2496

ROLAND UA-100

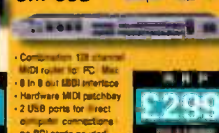
- USB interface for PCs running Windows 98
- MIDI & 2 in & 2 out (32 ch)
- Audio - 20 bit A/D & D/A on stereo & mic line jacks
- 70 built in multistage DSP for voice, guitar



RRP £299
£299.99
ROLAND-UA100

ROLAND UM-880

- Competition 128 channel MIDI router for PC, Mac
- 8 in 8 out MIDI interface
- Hardware MIDI patchbay
- 2 USB ports for direct computer connections
- No PCI cards needed



RRP £299
£299.99
ROLAND-UM880

ST-AUDIO DSP2000

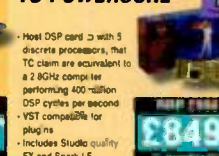
- Audio 180 digital recording system with PCI host card & 1U rack, 8 in 8 out interface
- Logic Soundcraft 24 software included
- 24 bit 96kHz converters
- Two XLR mic inputs, 48V
- SPDIF opt. coax & AES/EBU



RRP £349
£349.99
ST-AUDIO-DSP2000

TC POWERCORE

- Host DSP card with 5 discrete processors, that TC claim are equivalent to a 2 802Hz complex performing 400-million DSP cycles per second
- VST compatible for plug-ins
- Includes Studio quality FX and Spars LE



RRP £849
£849.99
TC-POWERCORE

TERRATEC EWS88D

- 24 bit 10 channel I/O PCI soundcard
- 8 channel ADAT digital I/O plus 2 ch SPDIF opt. coax
- Two independent MIDI ports for 32 and 64 channels
- Up to 16 three cards can be cascaded with single sample accuracy



RRP £349
£349.99
TERRATEC-EWS88D

TERRATEC EWX2496

- 24 bit 96 kHz stereo analogue I/O
- Optical and coaxial SPDIF I/O
- Includes 32, Gigasampler & DirectSound drivers
- Includes Windows 95 and Gigasampler LE host



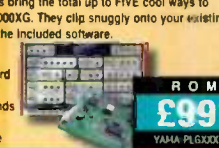
RRP £179
£139.99
TERRATEC-EWX2496

YAMAHA SW1000XG DAUGHTERBOARDS

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

Choose from:

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



FROM £99.99
YAMA-PLGXXX

EUROPE'S LOWEST

THE INDUSTRY STANDARD

Steinberg have written the UK's best selling music software since anyone 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 72 insert effects and eight aux sends per channel plus 8 global & 4 master insert effects, MIDI automation etc. VST realtime plug-ins have revolutionised music production.

Vast range of effects, synthesizers etc.

RRP £235

STEI-CUB5V5

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.

RRP £499

£365

STEI-CUB5PC

NEW STORM

VIRTUAL STUDIO V1.5

A revolutionary completely modular virtual studio. Storm gives you a whole range of professional composition tools including analogue synths, twin decks for mixing and scratching samples, samplers, beat boxes and with new modules downloadable off the internet possibilities are endless. Wrap it 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!

FACTORY DIRECT

£99

STEI-STORM

NEW EVERPACK

New from DUY, authors of such renowned TDM plug-ins as Digipack will now have a plugin 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.

RRP £399

£299

DUY-EVERPACK

LOGIC SILVER

Virtually affordable every level Logic Silver 4.7 gives you 24 audio tracks and 21 built in effects, with the usual customisable interface. Supports VST plug-ins, soft synths and offers scorewriting, printing and extensive MIDI programming facilities. Great value for money!

RRP £159

EMAGIC-LOGIC-SILVER

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, virtual instruments such as ES1, EVI98 or EXS24 and the live input effects processing.

RRP £299

EMAGIC-LOGIC-GOLD

LOGIC PLATINUM

Audio / MIDI sequencing with scorewriting and soft synth support. Version 4.7 handles up to 120 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 the input objects allow it to work as a live effects box for you. A popular industry standard.

RRP £549

£419

EMAGIC-LOGIC-PLATINUM

"Nothing could have been better"

J.S. (Oxford)

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!

RRP £599

£495

STEI-CUB32PC

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 FreeLiner 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.

RRP £799

£575

STEI-PRODPC

REAKTOR

SOUND GENERATION MACHINE

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

Version 3

RRP £249

£119

B4 SOFTWARE ORGAN

DYNAMO

EFFORTLESS REAKTOR-ING

Love the sound of Reaktor but don't want to dive into the depths of editing and creating your own synths? Then Dynamo is exactly what you need. Featuring a collection of 25 of Reaktor's most heralded instruments the Dynamo gives you a box of extraordinary sounds for an extraordinary price.

RRP £95

£95

EMAGIC-DYNAMO

BATTERY

SOFT SAMPLER

32 bit sampler for samples, including 20 bits and 54 instruments with 118 velocity layers, tuning, volume envelopes, pitch envelope, bit reduction, shaper, FX Loop and 6 modulation inputs per instrument. Standalone or plug-in operation.

RRP £129

£95

EMAGIC-BATTERY

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.

RRP £95

£95

EMAGIC-SPEKTRAL-DELAY

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 file format.

RRP £95

£95

EMAGIC-TRAKTOR

FM7

FM SOFT SYNTHESIZER

Native Instruments have produced a softsynth that can recreate 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.

RRP £159

£159

EMAGIC-FM7

ABSINTH

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 6 oscillators, and graphic wave drawing.

RRP £159

£159

EMAGIC-ABSINTH

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, mallets and reeds, all of various sizes and materials.

FACTORY DIRECT

£229

AACO-TASSMAN

BIAS PEAK 2.6 VST

2 channel digital audio waveform editing for Mac 26 built in effects, VST plug-in support.

- Waves AudioTrak 3.0 EQ, compressor and gate.
- Tool Line CD burning, over 30000 of drumloops and samples.
- MP3 encoding, click repair and many other processes.

RRP

£349

BIAS-PEAKVST

DUY GLOBAL

TDM plug-in bundle.

- RedSpider: over 220 FX!
- DrV Valve simulator.
- DrV Analog tape emulator.
- DrV Shape: mastering 3 band wave shaper.
- Max DUY: sound level normalizer.
- DUY Wide stereo imager.

RRP £599

£495

STEI-CUB32PC

ANTARES AUTOTUNE

Automatic intonation correction.

- Restores flat vocals.
- The plug-in that makes the famous sound good.
- Now available as a DirectX or VST plug-in.
- RTAS also available.

FROM

£89

ANTA-AUTO

CELEMONY MELODYNE

Pitch shifting and time stretching for Mac.

- Mouse mapping of individual notes, with real-time monitoring.
- Edit pitch, rhythm like a sequencer.
- Restore vocals, remove vibrato, support melodies.

RRP £619

CELEMONY-MELODYNE

DUY TOOLS TDM

Best of DUY's plug-ins in one big TDM bundle pack!

- DrV Valve - nine versions.
- DrV Tape - saturation.
- DrV Shape - equalisation.
- Max DUY - dynamics EQ.
- DUY Wide - stereo enhancer.

RRP £999

£619

DUY-TOOLS-TDM

EMAGIC ES2

The software answer to subtractive synthesis.

- Fat analogue tones, perc, 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.

RRP £189

EMAGIC-ES2

EMAGIC ESB TDM

Emagic System Bridge allows full integration of your native Logic plug-ins and soft synths within Digisigant's TDM environment.

- Ideal for using the EXS24 sampler with TDM.

RRP £259

EMAGIC-ESB-TDM

EMAGIC EVOC20

The main vocoder has 20 bands of filtering, with mono pitch tracking.

- Another variant offers a polyphonic carrier and a third includes a formant filter bank with stretch and auto controls.
- Accepts polyphonic MIDI input so it can be played.

RRP £139

EMAGIC-EVOC20

EMAGIC EVP88

Soft synth to emulate vintage electronic organs.

- Fender Rhodes, Wurliatzer and Hohner Electra.
- 88 note polyphony.
- Effects, EQ, tuning, drive.

RRP £169

£155

EMAGIC-EVP88

EMAGIC SOUND DIVER

Librarian synth editor.

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

RRP £179

£159

EMAGIC-SOUND-DIVER

PASSPORT MASTER TRACKS PRO

64 Track MIDI Sequencer.

- Import & Export Standard MIDI Files.
- Out, copy & paste sections of music with simple mouse click commands.
- Sync to multitracks, video, tape, and more.

RRP £150

£119

EMAGIC-PASSPORT-MASTER-TRACKS-PRO

PROSONIQ PANDORA

Incredible plug-in.

- Soft Wave Studio.
- Reduce or remove vocals from a track leaving only the reverb tail.
- Boost vocals by up to 100dB leaving other sounds untouched.

FACTORY DIRECT

£399

PROSONIQ-PANDORA

SONIC FOUNDRY ACID MUSIC

The music software hit of the year.

- Fantastic loop based production tool.
- Automatic tempo matching.
- Easy to use.
- 100's of loops included.

RRP £99

£69

SFOR-ACIDPHY

SONIC FOUNDRY SOUND FORGE 5.0

Stereo audio file editing up to 32 bit 192kHz, FX & video.

- New Version 5 has plug-ins including Acoustic Mirror.

RRP £199

£159

SFOR-SFORGE

PRICES GUARANTEE*



MIDIMAN-IA!

MidiMan's consistently strong and solid range of "In and Out" devices thrusts forward with the future proof USB MIDI interface, and 24 bit 96kHz PCI based hardware solutions.

AUDIOPHILE SOUND CARD

The MidiMann Audiophile 2496 is a PCI soundcard offering full duplex stereo in and out on both analogue phonos and S/PDIF coaxial simultaneously, giving four discrete channels of I/O. The card boasts 24 bit 96kHz compatible converters with a dynamic range over 100dB at +2dBV peak, and does not redither or sample rate convert your data, so bit for bit accuracy may be preserved with digital transfers. The breakout cable includes MIDI sockets.



RRP £179
£155
MMAN-AUDIOFIL

MIDI SPORT 2x2 MIDI INTERFACE



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

1 X 1 ALSO AVAILABLE only £49.99
4 X 4 ALSO AVAILABLE only £115.99
8 X 8 ALSO AVAILABLE only £235.99

RRP £99
£58
MMAN-SPORT2X2

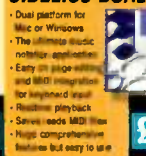
SONIC FOUNDRY SOUND FORGE 5.0 XP



• Stereo audio file editing up to 32 bit 192kHz, FX & video
• New Version 5 has plug-ins including Acoustic Mirror

RRP £95
£60
SFG5EXP

SIBELIUS DUAL



• Dual platform for Mac or Windows
• The ultimate music notation application
• Easy in page editing and MIDI integration for live/recorded music
• Realtime playback
• Saves loads MIDI files
• Huge comprehensive features but easy to use

RRP £595
£569
SIB-DUAL1200

SYNTRILIUM COOL EDIT PRO



• Still the best audio DAW on the planet bar none!
• 64 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
• Fingerprint discarding, convolution, FIR EQ etc.

RRP £199
£269
SCE-PRO

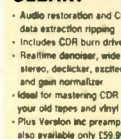
STEINBERG CUBASIS VST



• Simple MIDI sequencing
• 8 track hard disk recording
• A great introduction to music production
• Supports VST plug-ins and instruments

RRP £59
£59
STE-BASVSTPC

STEINBERG CLEAN!



• Audio restoration and CD data extraction ripping
• Includes CDR burn drivers
• Realtime denoiser, wide stereo, declicker, exciter and gain normalizer
• Ideal for mastering CDR of your old tapes and vinyl
• Plus Version line preamp also available only £59.99

RRP £69
£69
SCE-CLEAN

STEINBERG MASTERING EDITION



• Complete mastering plug-in solution
• Loudness Maximiser
• Spectraliser
• Equaliser
• Compressor, Phasemeter and Spectrograph

RRP £349
£299
SCE-MASTEREDU

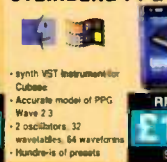
STEINBERG MODEL E



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

RRP £129
£125
SCE-MODELE

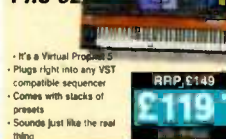
STEINBERG PPG



• synth VST instrument for Cubase
• Accurate model of PPG Wave 2.3
• 2 oscillators, 32 waveforms, 64 waveforms
• Hand-drawn presets

RRP £149
£129
SCE-PPG

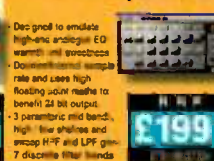
NATIVE INSTRUMENTS PRO 52



• It's a Virtual Prologue 5
• Plugs right into any VST compatible sequencer
• Comes with stacks of presets
• Sounds just like the real thing

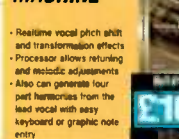
RRP £149
£119
NIP-PRO52

STEINBERG Q-METRIC



Designed to emulate high-end analog EQ, warm, well-specified, Downward-slope sample rate and uses high floating point maths to benefit 24 bit outputs
• 3 parameter mid band, high - low shelves and wrap HPF and LPF
• 7 discrete filter types

STEINBERG VOICE MACHINE



• Realtime vocal pitch shift and transformation effects
• Processor allows retuning and reverb adjustments
• Comes with stacks of presets
• Sound just like the real thing

RRP £109
£109
SCE-VOICEM

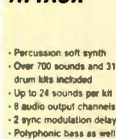
STEINBERG WAVELAB V3



• 32 bit 96 kHz Windows Audio Editor
• Plug in Architecture for Direct 2 and VST
• New multi-track Audio Montage window
• 30 waterfall analysis graphs and test signal generator

RRP £249
£249
SCE-WAVELAB3

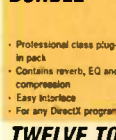
STEINBERG ATTACK



• Percussion soft synth
• Over 700 sounds and 31 drum kits included
• Up to 24 sounds per kit
• 8 audio output channels
• 2 sync modulation delays
• Polyphonic bass as well

RRP £129
£109
WALL-ATTACK

TC WORKS NATIVE BUNDLE



• Professional class plug-in
• Contains reverb, EQ and compressor
• Easy interface
• For any DirectX program

RRP £299
£299
STE-NATBUNPC

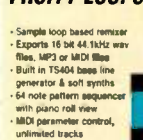
CAKEWALK HOME STUDIO V9



• Record, edit and playback 8 tracks of audio - MIDI
• 32 bit realtime effects
• Support DirectX plug-ins
• Piano roll MIDI sequencer
• Print sheet music notation

RRP £99
£69
THWEL-CADHOMSP

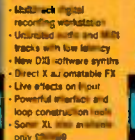
TWELVE TONE FRUITY LOOPS



• Sample loop based sampler
• Exports 16 bit 44.1kHz wav files, MP3 or MIDI files
• Built in T5040 base line generator & soft synth
• 64 note pattern sequencer with piano roll view
• MIDI parameter control, unlimited tracks

RRP £99
£99
TWEL-FRUITY

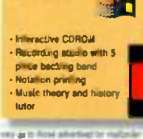
TWELVETONE SONAR



• Multi-track digital recording workstation
• Unlimited tracks and 16-bit tracks with low latency
• New DX2 software synth
• Direct X 2.0 compatible FX
• Live effects on input
• Powerful interface and loop construction results
• Sonar XL now available only £199

RRP £349
£229
TWEL-SONAR

VOYETRA DISCOVERING MUSIC



• Interactive COROL
• Recording studio with 5 piano backing band
• Notation printing
• Music theory and history tutor

RRP £70
£29
VOYE-DISCOVER

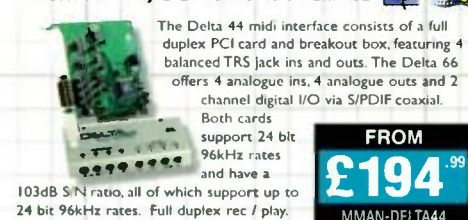
WAVES GOLD TDM BUNDLE



The ultimate collection of all current plug-ins from the supreme experts
• All the famous old compressors, reverb, stereo imagers that have built Waves reputation
• New PAZ analyzer and Enigma phase modulator

RRP £291
£100
WAVE-GOLD

DELTA 44/66 PCI AUDIO INTERFACE

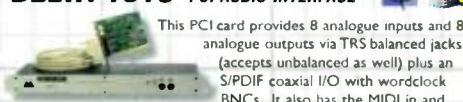


The Delta 44 midi interface consists of a full duplex PCI card and breakout box, featuring 4 balanced TRS jack ins and outs. The Delta 66 offers 4 analogue ins, 4 analogue outs and 2 channel digital I/O via S/PDIF coaxial.

Both cards support 24 bit 96kHz rates and have a 103dB S/N ratio, all of which support up to 24 bit 96kHz rates. Full duplex rec / play.

FROM
£194
MMAN-DELTA44

DELTA 1010 PCI AUDIO INTERFACE

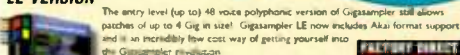


This PCI card provides 8 analogue inputs and 8 analogue outputs via TRS balanced jacks (accepts unbalanced as well) plus an S/PDIF coaxial I/O with wordclock BNCs. It also has the MIDI in and out and provides full duplex operation to any PC. The converters are in the outboard I/O rack and handle 24 bit 96kHz rates. Operating levels are +4dBu or -10dBV, and can achieve -100dB THD+N.

RRP £649
£499
MMAN-DELTA1010

OMNI I/O ALSO AVAILABLE only £179.99 - expansion box for Delta 44/66 featuring 4 balanced inputs (2 with phantom powered mic preamps) 4 stereo ins, aux send + return + dual monitor outs.

GIGASAMPLER LE VERSION



The entry level (up to) 48 voice polyphonic version of Gigasampler still allows patches of up to 4 Gigs in size! Gigasampler LE now includes Akai format support and is an incredibly low cost way of getting yourself into the Gigasampler revolution.

GIGASAMPLER SOFTWARE SAMPLER

At last, real sampling on a PC!!! Gigasampler performs all the functions of a hardware sampler and breaks the restrictions on sample size, handling anything up to 4GB! The included IGB piano demonstrates this perfectly, and loads in seconds. It's 16 part multichannel, polyphony up to 64 voices (CPU dependent). Gigasampler comes with the Sample Wrench editing suite, Akai format support and an audio capture facility. £249.99 GigaLE no IGB piano, Wrench, Akai or capture £149.99

FACTORY DIRECT
£199
GIGA-LE

GIGASTUDIO 96 SOFTWARE SAMPLER

All the great features of Gigasampler with extra polyphony (96 or 160 notes) plus a complete studio environment including mixing and effects with excellent quality reverb.

160 NOTE VERSION ALSO AVAILABLE only £439.99

FACTORY DIRECT
£69
GIGA-LE

FACTORY DIRECT
£259
GIGA-96

SONIC WORX 2



SonicWorx Studio 2 is a powerful audio wave editor including advanced functions such as multiple Undo/Redo with graphic edit history for easy viewing, auditioning and restoring all edit steps and a snapshot function for easy storing and reviewing of processed versions, and many routine and offline DSP capabilities.

POWER BUNDLE

Plug-in bundle featuring SonicWorx Studio 2 (see above) and SonicWorx Artix, which gives over 60 effects, including: Janglers, Atmosphere, Tubulator and Turbulence.

MAGENTA

Pitch resynthesizing for realtime use as a vocal or instrumental pitch shifter with formant control and advanced filters. Similar in concept to Roland's popular Variphrase technology, but now in a plug-in. Can even operate as a software synth for live audio input with a MIDI keyboard.

FACTORY DIRECT
£399
PROS-POWERBUN

FACTORY DIRECT
£299
PROS-WSTUDIO

FACTORY DIRECT
£99
STEI-MAGENTA

ORANGE VOCODER VST PLUG-IN

With the OrangeVocoder simulates a classic vocoder effect which has an intuitive virtual analog synthesizer unit, Formant EQ and Filterbank Reverb, all in one plug-in. Proton's advanced filter design technology and efficient coding for minimum drain on your CPU.

FACTORY DIRECT
£99
PRO-ORANGE

FACTORY DIRECT
£249
PROS-VSTBUN

FACTORY DIRECT
£299
PRO-REALTIME

REALTIME PACK

Four top VST plug-ins for Mac or PC: "Ambisonic" - 3D panner, "Dynamics" - multiband compressor & optimizer, "Roomulator"-reverb, and "Vocoder"-vocal enhancer.

FACTORY DIRECT
£299
PRO-REALTIME

EUROPE'S LOWEST



GET IN THE MIX!

FOLIO NOTEPAD 10 INPUT UTILITY MIXER

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

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 mix 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!

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.

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.

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.

DM24 DIGITAL MIXER

Tascam's new professional digital mixer offers 24 channel 8 bit mixing at 32 bit floating point supporting 24 bit 96kHz signal throughput on both analogue converters, digital I/O and all onboard DSP. This mixer is the long awaited answer to affordable 96kHz digital mixing and a dual partner for Tascam's M2424 HDH. It has 16 mic inputs, 100mm faders, 4 band fully parametric EQ, compressor, expander / gate and delay on each channel, full automation, transport buttons, 2 effects busses inc. Analogue and TC Works licensed effects, and includes 24 ch DSD, dual AES/EBU and twin SPDIF plus two 8ch aux slots.

O2R DIGITAL MIXER

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

01V DIGITAL MIXER

Yamaha's fabulous new 01V replaces the ground breaking ProMix 01 and is basically a highly cut down 01D for a lot less money! As well as a working one off peak job, the 01V also features 16 analogue inputs plus 9 digital ins and outs via optional cards in either ADAT, TDM or AES/EBU formats. There is 4 band fully parametric EQ for all the main inputs, 2 stereo mix effects processors, moving faders, dynamic EQ, automation, and of course, summing sound quality. Initial stocks are very limited - get your order in now!

EXTRA 10% OFF
Available on fully guaranteed
"B" Stock versions of many products

D8 DIGITAL WORKSTATION

For the last few years, Korg's high end SoundLine 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 less than the size of a shoe box! The D8 records up to 9 tracks onto its built in SCSI drive, has dig ins and SC3 ports in standard, a whole range of built in digital FX, and even a guitar level input to do away with DI boxes. In stock and on demo at Turnkey - call now for further details.

DA302 DOUBLE DAT

The DAT deck 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 makes 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 SCSI copycode 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 line clearance deal means it's the only sensible DAT choice on the market - buy now while stocks last.

VS-1880GX HARD DISK MULTITRACKER

We have secured a strictly limited supply of Roland's top of the range non-linear hard disk recorder at an incredible price! The VS-1880GX has an integrated 20:1 digital mixer which can record 8 tracks simultaneously and playback up to 18. It can store up to 288 virtual tracks. The 1GB hard drive would mean the equivalent of 135 minutes of uncompressed 16 bit, but the Roland engineers did yet further by its various degrees of data compression, offering longer times with higher modes of recording quality for its 24 bit sixteeners. Digital I/O is two channel S/PDIF and the VS1880 includes EQ, effects and graphic editing facilities. Buy NOW - before it's too late!

DPS16 STUDIO DIGITAL PERSONAL STUDIO

Another excellent Turnkey offer! Millinear 10 gb hard disk recorder and mixer with a flip-up screen, 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 local points per song. The 16:2 digital mixer section has 3 band sweepable EQ with parametric mid and snapshot memories for the whole setup. The built in optional S/PDIF 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!

CD-RW700 COMPACT DISC RECORDER

The newest CD recorder is down at the mini-size! Tascam's CD-RW700 is a bargain priced professional unit machine with a 20 track peak level, jog wheel, separate record bypass button. Digital Direct button to bypass sample and hold, 44.1kHz, stereo record, filter adjustable between 1, 24 seconds, digital volume control for digital input, and a working copy of the LCD is standby mode! Writes pro and consumer discs, and has SCSI defeat, and digital I/O on S/PDIF optical and coaxial. Includes infrared remote control.

MACKIE 24/8

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

MACKIE 16:8 BUS

- 8 bus professional mixing console with external PSU
- Optional meterbridge
- 16 aux sends, 4 band semi-parametric EQ
- Talkback mic, direct outs on all main channels plus high quality mic preamps
- Also available in 12 or 24 channel frame sizes

MACKIE CFX12

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

MACKIE CFX16

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

MACKIE CFX20

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

MACKIE 1202VLZ PRO

- 42 mids with 3 band EQ, HPF, 2 auxes, auto PFL
- 5th Hi-Z input quality small mixer available today!
- New Improved XDR mic preamps with ultra low 3.0mV THD figure

MACKIE 1402VLZ PRO

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

MACKIE 1604VLZ PRO

- Reveries on of Mackie's most popular 16:4 mixer
- 3 band sweep mid EQ
- 8 auxes, HPF, 4 basses
- New XDR extended dynamic range preamps
- Physically adjustable I/O appendage suits racks

MACKIE 1642VLZ PRO

- Compact high quality 16 bus mixer in 16:4:2 size
- 8 mono channels with inserts and XDR preamps and 3 band sweep mid EQ
- 4 stereo line channels 9-18 with 4 band EQ
- 4 aux sends, 8 direct outs
- Each bus has 2 outputs

MACKIE D8B

- 88:2 digital console with integrated meterbridge
- 24 analogue + 24 digital ins via expansion cards
- Dynamics, 4 band EQ, 12 auxes, 4 band EQ, 12 auxes, 4 band EQ, 12 auxes
- Optional effects plug-ins Big Analogue Auto-Tune

SPIRIT STUDIO 24

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

SOUNDCRAFT GHOST 24LE

- 24:24 channel, 8 bus in-line recording mixer
- 8 auxes + 4 band EQ with two parametric mids
- Optional meterbridge
- LE version does not have MIDI mixing and MMC has a much less expensive!

SPIRIT STUDIO 16

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

YAMAHA 03D

- Fully automated digital mixer with motorized faders
- 20 ins/16 busses, 4 auxes
- 2 built-in stereo effects processors with 32 bit DSP
- 48 ins/16 busses, parametric EQ & dynamics on each ch
- 5:1 surround panning

YAMAHA	Channel I/O card (16/8)	Channel I/O card (16/8)
YAMAHA-C08AE	Ass 8 Channel I/O card (16/8)	£250
YAMAHA-C08AE	Ass 8 Channel I/O card (16/8)	£250
YAMAHA-C08AE	Ass 8 Channel I/O card (16/8)	£250
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YAMAHA-C08AE	Ass 8 Channel I/O card (16/8)	£250

APPLE IPOD

- Walkman sized MP3 player with FireWire Mac interface, will store over 1000 songs as MP3 files
- 5GB onboard drive also ideal for portable backup as external removable use
- 10 hour battery life

BOSS BR8

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

BOSS BR532

- 4-track digital recorder recording onto 32MB SmartMedia cards (expandable to 128MB)
- Nonlinear edit (copy, paste, move, insert)
- Drum machine track
- Mic and line inputs
- Multitracks including COSA amp modelling

FOSTEX VF08

- 11 track hard disk recorder
- 10GB drive for up to 4 hrs 44.1kHz 16 bit
- 16 ins/16 busses with two 8:1 ins & 8:1 outs
- 2 examples of effects, EQ and compression
- Backup to CD-RW via SCSI

PRICES GUARANTEE*

marantz

EZ CD!

CDR770 PRO CDRW RECORDER



The CDR770 is the most affordable CD Recorder ever from Marantz and features their new Advanced Power Calibration (APC) laser tracking and error correction technology for even higher quality recordings. It also has CD-TEXT compatibility, and a built in Sample Rate Converter. It offers SCMS free recording and can work with both consumer music CDRs and computer data / professional discs. Input, and uses both audio and data types of CDR disc. The coaxial S/PDIF input will happily recognise most professional AES/EBU signals too despite their higher voltage and different data subcodes. Includes infrared remote control.

OVER 30% OFF!

RRP £295
MARANTZ CDR770

CDR631 PRO CDRW RECORDER



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

RRP £699
MARANTZ CDR631

CDR830 REWRITABLE CD RECORDER

Streamlined in look, HMB's stylish purple 2U rack CD recorder with straightforward 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, headphone socket and features the CD-TEXT data read / write. Extra facilities include double speed finalising and a digital input gain and balance.

INCLUDES 50 FREE BLANK CD'S!!

RRP £349
HMB CDR830

VS2480 HDR WORKSTATION

This 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 mix buses offers 16 motorized 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 dithered editing via the LCD or a connected VGA monitor. Bu

FROM £2599
ROLAND VS2480P

202MKIII TAPE DECK

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

BUY WITH 10 x 90 MIN 90 MIN TAPES - ONLY £299.99 EXTRA!

RRP £312
TASCAM 202MK3

DA20MKII DAT MACHINE

The new Mk II version of the DA20 builds on what is already a quality machine: reliable transport mechanism, switchable SCMS, analog and digital recording at all 3 sample rates and clear S/PDIF I/O. New features include error counting and adjustable I/O encoding.

BUY WITH 10 x 90 MIN 90 MIN TAPES - ONLY £299.99 EXTRA!

RRP £429
TASCAM DA20MK2

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 built in noise reduction, tape crumpler, headphone and main outs, and comes in red blue or black finish!

BUY WITH 10 x 90 MIN 90 MIN TAPES - ONLY £299.99 EXTRA!

RRP £145
TASCAM PORTA02

CD4000P CD PLAYER

It's just a CD player, but it can play rewritable CDRW discs which most players give up on. It also has S/PDIF coaxial digital output, digital volume control on both analogue/headphone & digital outputs, and comes in a professional 2U rackmount case, with removable rack ears (in case you don't want them.) Includes infrared remote control.

SD4050P TWIN CASSETTE

Sturdy professional 3U rackmount twin cassette desk with auto reverse for continuous playback up to 7.5 hours from two C90 tapes. Deck A has a +/-10% pitch control, and can do synchro start recordings with Marantz CD players. The SD4050P features Dolby B/C Noise reduction and can have an infrared remote if you require it, although this is an optional extra, not included in order to keep the price as low as possible.

CDR500 TWIN DECK CD RECORDER

Based on the same recorder section as the CDR631, but including a player deck that can act as the digital source or as a separate CD Player. You can clone CDs at double speed, while keeping the text data, and assign the desired SCMS copy flag. The Automaster™ feature enables Disk At Once operations with any CDR disc, ideal for Red Book mastering.

RRP £799
MARANTZ CDR500

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, 150 virtual tracks per song, 99 levels of undo, SMPTE eye, and a huge range of on-board effects. There is a built in digital time stretcher which allows you to add tracks in slow motion playback at 50%, 55% or 55% 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.

OVER 30% OFF!
RRP £799
TASCAM 788

AW2816 HARD DISK 16 TRACK

The AW2816's baby brother brings you 16 track recording at uncompromised 24 bit, 44.1kHz, and 8 virtual tracks per track, plus a master stereo track. The 28 channel automated digital mixer is based on D2R / D3D 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!

AW2816CD ALSO AVAILABLE CPOA
FROM £1699
YAMAHA AW2816

AW4416 HARD DISC RECORDER

Integrated non-linear hard disc recorder and 26.82 digital mixer with dynamics, delay, effects, motorized faders, automation and S/PDIF I/O as standard. The recorder is up to 24 bit 44.1kHz linear, with 16 track mix simultaneous playback from 130 virtual tracks, and an optional internal hard drive up to 16GB may be fitted. Features include time stretch, pitch shift, 8 pad sampler, 16 track sequencer, SCSI backup, serial mouse input, and optional onboard CDRW.

AW4416CD ALSO AVAILABLE only £2099.99

CDR1000 PRO CDRW

As less someone I thought to include, Apogee UV22 encoding in a professional CD recorder! Yamaha's CDR1000 is a 2U rack CDRW machine with balanced XLRs and AES/EBU and S/PDIF coaxial with wordclock BNC input. Includes fader, peak hold metering down to -60dBFS, variable audio delay, sync record and an infrared remote control. The Apogee UV22 process copies the format bits on and off to create a 22.05kHz carrier frequency, whose duty cycle is modulated by the waveform of bits 17 to 24, preserving much of their essence in the 16 bit signal, and performing the necessary randomisation of the quantisation errors, whilst the carrier remains inaudible at 22.05kHz.

ALMOST 60% OFF!
RRP £1175
YAMAHA CDR1000

"The staff were professional, friendly, polite, approachable, humorous, knowledgeable and human"

D.H. (London)

FOSTEX VF-16

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

OVER 35% OFF!
RRP £1099
FOSTEX VF16
£699

KORG D12

Integrated mixer and 16 track hard disk recorder
Linear uncompressed 24bit x 6 tracks (4 in-cord) x 12 tracks (4 in-cord)
3 band EQ and 102 effects

RRP £999
KORG D12
£799

KORG D1600

Hard disk recorder with 20GB drive
16 tracks 16 bit 44.1kHz
8 tracks 24 bit 44.1kHz
24GB digital mixer with 3 band sweep mid EQ
98 effects algorithms
Mix snapshot recall
S/PDIF digital I/O
CDR backup + remastering
TouchView interface

FROM £1299
KORG D1600
£1299

FOSTEX D108

Replaces Foster's D-90
8 track hard disk recorder
ADAT optical digital I/O
99 local points
Reads WAV files via S-B

RRP £1600
FOSTEX D108
£799

HMB CDR 850

Use regular or rewritable disc (pro or consumer)
Balanced analogue I/O
AES/EBU digital input
CDR backup + remastering
TouchView interface

RRP £299
HMB CDR 850
£1299

MACKIE MDR24/96

A much cheaper version of Mackie's 24 track 24bit HDR
The original MDR24/96 has NOT been discontinued
The model isn't replaced!
24 bit analogue I/O convert
Lacks the built in exchange keyboard screen menu
Choose either 24 channels Digital or analogue I/O

RRP £299
MACKIE MDR24/96
£2199

ROLAND VS840GX

8 track non-linear HD recorder, 64 virtual tracks
Internal 50MB 2ip drive
8 channel digital mixer
S/PDIF digital I/O
Effects bus with 26 types
CDR burning / ripping
Optional SCSI interface

OVER 45% OFF!
RRP £999
ROLAND VS840GX
£529

ROLAND CDX1

Complete CD production in single load
8 track hard disk recorder
17 track simultaneous playback
Analogue and S/PDIF digital recording inputs
Sample rate converters
40 sec auto-chosen tempo
Built in CD burner

RRP £1199
ROLAND CDX1
£999

ROLAND VS1824CD

18 tracks of 24 bit hard disk recording and CDRW
10GB drive and built in VSP effects board
28 channel digital mixer
16 virtual tracks per track
CDR burning / ripping
COSM mix modelling

RRP £1699
ROLAND VS1824CD
£1599

SONY MZR-700

4 track cassette with 40 noise reduction
6 channel m/c line mixer
3 band sweep EQ
Two aux sends, variable
Backlit display & meters

RRP £345
SONY MZR-700
£285

TASCAM CD-RW5000

Pro 2U rack CD recorder
Records / Erases
Reversible files
Free from SCMS copy codes
AES/EBU digital and balanced analogue

RRP £1099
TASCAM CD-RW5000
£899

TASCAM 424 MkIII

Big box Portastudio
4 track cassette with 40 noise reduction
6 channel m/c line mixer
3 band sweep EQ
Two aux sends, variable
Backlit display & meters

RRP £345
TASCAM 424 MkIII
£285

TASCAM DAP1

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

RRP £1145
TASCAM DAP1
£899

TASCAM DA40

16 bit DAT recorder
Jog shuttle dial
Analog 16 level fader
S/PDIF coaxial + AES/EBU
Pro machine - not a toy

RRP £1099
TASCAM DA40
£749

TASCAM MD350

2U rack 16 track recorder
Balanced XLR and phono
S/PDIF optical digital I/O
Infrared remote control
Pitch control, auto cue and auto record ready
Headphone socket
ATRAC version 3 encoding

RRP £349
TASCAM MD350
£349

TASCAM 414 MkII

4 track tape Portastudio
2 band EQ & effects send
3 band 1/2 2 seconds
Double speed for higher audio bandwidth
4 trk simultaneous record

OVER 30% OFF!
RRP £379
TASCAM 414 MkII
£195

AW2816 & 20GIG HD

With 20 Gigabyte hard drive included
16 track recording at 24 bit 48kHz uncompressed
8 virtual tracks per track
28 channel automated digital mixer like CDR
4 band EQ, dynamics, FX
As above with CDRW drive built in £1999.99

RRP £1699
YAMAHA AW2816
£1699

YAMAHA MD4S

MiniDisc 4 track
8 channel 2 mic inputs
Noise reduction for disc
Cue from 32 to 1/2 speed
37 minutes of 4 tracks

RRP £629
YAMAHA MD4S
£449

YAMAHA MT400

Cassette 4-track
4 channel mixer
3 band EQ plus
2 auxes, 2 inserts, 2 m
Double time speed
16 track simultaneous r/c
80dB S/N ratio with d/c
This item is Yamaha IE
stock, but comes boxed with full guarantee

RRP £329
YAMAHA MT400
£199

ZOOM MRS1044

10 track audio hard disk recorder with sequenced synth bass and stereo drum tracks (10 tracks)
15GB drive a 14 hours
Built in drum machine beats with 400 patterns
Zoom multi effects, for 8 inserts simultaneously
2 mic inputs, S/PDIF, MIDI and optional I/O: USB

RRP £899
ZOOM MRS1044
£589

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
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
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
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 £159
£149
SAMS-SGATE4

PENTA COMPRESSOR/PREAMP

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

RRP £399
£295

TONE FACTORY CHANNEL STRIP

A Focusrite channel strip for under £200! We must be mad! But while stocks last, you should jump at the chance of this Platinum series Tone Factory. It's ideal for vocals, guitars, basses and any other source that needs premium quality signal processing. The Class A mic preamp includes 48V phantom power and there are also instrument and line level inputs. The opto-electric compressor section is highly versatile, ranging from subtle dynamics control to big beefy sounds with its hard-knee ratio switch and many other parameters. EQ comes in several forms including the two-band parametric section, adjustable HPF and LPF filters and a 3-band tonal EQ. There is also a built in expander/gate and even an overdrive section for anything from a rough edge to full-on distortion, and each processing block may be individually bypassed. Numbers are strictly limited - order early to make sure you get yours!

RRP £399
£199
FOCUS-PLATONE

COMPOUNDER COMPRESSOR

The Compunder looks like a major contender in the class of stereo compressor with its high-quality circuitry, 100% metal chassis, and 100% metal chassis. It's a compressor, attenuating very or high-level digital designs and superior build and sound. Unlike the other Platinum models, it uses a VCA for gain reduction, operating in Class A mode giving a faster response and more assertive limiting action than the Opto-electric designs of the VoiceMaster and ToneFactory (which are designed for effects). Like the 160A, the ratio setting can go past infinity to negative, and there is a "bass expander" which puts an inductor in circuit to filter the low frequencies. There is a useful expander / gate and limiter with metering via LEDs. The dual mono unit includes stereo linking, sidechain access and XLR and TRS sockets.

RRP £499
£379

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

M2000/24 DIGITAL MULTIEFFECTS UNIT

M2000 runs 2 simultaneous dual stereo FX channels with 24 different effects, including reverb, delay, pitch shift, chorus, phaser, compression, gating, expansion, limiting, EQ and saturation / stereo with enhancers. It has 500 presets, AES/EBU and coaxial I/O, 24 bit converters, and a 16-bit digital filter. Also features High Quality Wizard auto-tune, "Preset Glue" and "Dynamic Morphing". Strictly limited stocks only.

RRP £1199
£599
TC-M2000/24

MPX1 MULTI EFFECTS PROCESSOR

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

RRP £599
£525

MPX200 EFFECTS + COMPRESSOR

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 240 famous reverb and multi-effects presets. Like the MPX100 you get coaxial SPDIF, complete MIDI post processor control and 24 bit converters. And now you can pick one up for under £200 at Turnkey!!

RRP £299
£199

MPX500 MULTI EFFECTS PROCESSOR

Here, what have we here... It looks like a high quality effects unit - it has balanced XLR & jacks in and out, plus SPDIF 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 £499
£379

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 preset controls for the numerous popular digital effects, along with some interesting cabinet simulations, stereo width enhancers and a "Vocal Hot" effect to actually lift the vocal perceived volume from within a composite stereo mix. Similarly, the "Mic Simulator" is designed to imitate 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!!

RRP £109
£49
ZOOM-RFX300

RFX-2000 MULTIEFFECTS

The RFX-2000 is the tip of the range in Zoom's new multi-effects lineup, with SPDIF digital I/O as standard. Eight variations each of six different effects groups covering reverb, delay, pitch-based effects like flange and chorus, plus assorted special processes like a Vocodizer (with mix input), Ring Modulator, Time Trip, Dimension, Isolator, Comb, Sep Key, 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 active effects bundle.

RRP £229
£149
ZOOM-RFX2000

LEXICON MPX 100

20 bit stereo digital reverb and multi-effects
Supercedes the Reflex as a top entry level reverb
Full MIDI control
SPDIF digital output

RED SOUNDS XS-FX

Versatile DUEffects box with BPM detector to sync effects parameters to the beat of your song
2 pole lowpass filter with resonance and LFO
Delay, pan, cutter gate & flanger with BPM lock, and 2 plane in-out & sliders for live parameter control

ROLAND EF303

Tabletop groove effects processor built for DJs, and dance remcass
BPM or MIDI syncable FX
Includes delay, flange, sweep, reverb, slicer, isolator, resonant filter and voice transformer
18 step prog modulator
Even has DSP monosynth

SPL VITALIZER STEREO JACK

Combined controls for stereo operation
Multiband phase shifts based on programme dynamics & loudness EQ
SoftTight limit auto compression
Hass effect wide stereo expander

TC ELECTRONIC D-TWO

10 sec 24 bit digital delay
Tap tempo including rhythmic phrases
Five way ping-pong and polarity flip, reverse echo
Auto dynamic control
HPF for tape echo effect

TC ELECTRONIC FINALIZER 96k

Now supports 96kHz via double bus AES/EBU
3 band digital compression 5 band EQ
De-esser, Enhancer, limiter, E-pander
Learning, sample rate conversion

TC ELECTRONICS FINALIZER EXPRESS

Low cost easy to use Finalizer
24 bit conversion with balanced XLR
AES/EBU, SPDIF optical and coaxial
Finalizer also available - only £1699.00

TC ELECTRONIC FIREWORX

24 bit multi-FX & AES/EBU & ADAT I/O
8 simultaneous effects, real time control
Digital cruncher, ring modulator, vocoder, formant shifting & more

TC ELECTRONIC M-ONE

24 bit multi-effects with analog & SPDIF coax I/O
Dual engine DSP blocks for 2 simultaneous FX
128 presets & 128 user
20 algorithms including reverb, chorus, pitch, delay, mod, dynamics...

TC ELECTRONIC TRIPLE-C

3 band expander with adjustable X-over frequency
Lookahead delay, and broadband mode
Attack release gain for envelope shaping
Price for Stereo version - Mono also available for less

TLA FAT-1

Intelligent harmonizer with XLR mic input
24 bit DSP processor
Independent gender and tempo, formants and human mix parameters for each harmony part
Built in reverb and multi effects plus digital I/O
Voicepump plus version also available EPOA

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

TLA FAT-2

Mono valve compressor with additional mic preamp
High impedance DI input
VU meter for level and GR
15 preset settings or fully manual control
Hard / Soft knee switch

Quad mono pre-amp & stereo gain stage
Retro high pass filter & phase inverters
Saturate valves with controlled output
LED for valve drive level

TLA IVORY 5050

Mic, line & DI jack input with HPF
Manual compressor, GR meter & bypass
Output attenuator & jack connection

Channel strip with valve output stage
Mic, line or DI jack input
Compressor, expander & 4 band sweep EQ
Retro VU metering

TLA IVORY 5021 COMP.

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

Dual mono 4-band parametric EQ
Valve buffered output stage
High impedance guitar jack input
Input & Output trim & EQ bypass

UNIVERSAL AUDIO 2610

Two channel valve mic preamp based on classic 610 famed in the studios
Mic / line inputs with switchable impedance
Floating transformer balanced outputs

Low cost rackmount stereo effects processor
33 effects algorithms in three different banks
Two parameter edit knobs
High quality vocal amplifier effects and a mic input on the front panel

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 ± 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..?!

RRP £1399
£1095
 MACK-HR824

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 Ω or 75W into 4 Ω , and a brilliant 150W into mono 8 Ω (hence the name!). The RA150 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 Ω or 150W into 4 Ω (brilliant as 300W into 8 Ω !) Both amps feature balanced TRS inputs, and damping factors of 200, with a high 60V/ps slew rate and 20k Ω input impedance.

FROM £199

BM5 PASSIVE NEARFIELDS

At this end of the market the Dynaudio Acoustics BM5 is one of the 'foremost contenders you should consider when comparing nearfield monitors, especially if you are after a compact design - admirably model-like like the Altec Monitor 2 sound great for the money, but they're just too big for some people's very cramped conditions. This powerful 6.5" woofer with 3" voice coil keeps audible control down to 30Hz or so where most rivals have totally lost it. With Dynaudio, if it's there - you'll hear it.

RRP £349

1029A BI-AMPLIFIED MONITORS

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

RRP £479

ABSOLUTE TWO PASSIVE NEARFIELDS

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

RRP £269
£179

CONTROL 1 COMPACT MONITORS

These compact speakers have a protective front metal grille, and house a 5 inch woofer which is driven up to 6 kHz, while it's crossed over to the tweeter. The 411 nominal load handles 75W at 90dB SPL per watt, and bass extension is -3dB at 180Hz.

RRP £139
£89

REVEAL PASSIVE NEARFIELDS

A magnetically shielded two way nearfield monitor with a compensated front baffle. The 6 inch woofer is rear ported in a 12 liter cabinet and achieves a -3dB point around 80Hz. The port is tuned to approx 40Hz. The design uses a soft dome tweeter and offers 50 watts power handling at a sensitivity nominally 87dB SPL/V with pastelid ripple around 3dB above 80Hz. The drivers are crossed over at 3kHz with good timing coherence.

RRP £249
£175

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 Ω , 85 watts per channel into 4 Ω or 170 watts into a single 8 Ω load when both channels are bridged together.

RRP £289
£129

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 soloing a kick drum at high levels to listen for a squeaking pedal etc.) Output response -3dB drivers are 65Hz - 20kHz. The name LSR stands for Linear Spatial 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 £339
£349

SERVO 260 TWO CHANNEL POWER AMP

A higher power version of the servo 170 above, with the same functionality and 2u rack form. The 260 weighs just 6.5 kg, yet offers 85 watts per channel into 8 Ω , 130 watts per channel into 4 Ω or up to 260 watts into a single 8 Ω load with both channels bridged (hence the name.)

RRP £329
£179

VS2205 ACTIVE MONITOR

One of the most popular models in the Quested range the VS2205 is designed as a highly accurate reference monitor, and is low profile and shielding made it ideal for a wide variety of use. The built in amplifier 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 positioning.

FACTORY DIRECT
£1739

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 Ω , 275W per channel into 4 Ω or 550W bridged into 8 Ω .

RRP £399
£204

VS3208 ACTIVE MONITORS

A new made in the Quested line offering a range increasing 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 two 8 inch woofers (which are also by side of each other) has its own internal chamber, and the midrange is a softdome unit. The built in HF trim switches for each driver if you prefer non flat voicings, along with gain trim.

FACTORY DIRECT
£3699

BEYER BLUEPRINT

• 1U rack dual channel high quality power amp
 • XLR input, Speakon out
 • 100 watts per ch into 8 Ω
 • 150 watts per ch into 4 Ω
 • LF Damping factor > 300
 • VCA control link output

RRP £229

GENELEC 1031AM

• Very accurate portable biamped nearfield monitor
 • 8" woofer, 120W amp
 • 1" metal tweeter, 120W amp
 • 2200 @ 40 - 22,000Hz
 • Max 114dB SPL @ 1m each
 • Front ported, high low EQ trim, HF waveguide

RRP £299
£225

HNB CIRCLE 5

• Popular low cost nearfields, Pink cone
 • 8 inch woofer, silk dome tweeter
 • Front ported, 8 Ω nominal load
 • 50 Watts RMS, 87dB SPL per Watt
 • Active versions also available only £269.99

RRP £399
£325

QUESTED H108

• Compact passive 2 way design
 • Wide dispersion excellent stereo imaging
 • 8" excursion bass driver with cast chassis & double rear suspension
 • 1.125" softdome ferro fluid cooled tweeter
 • The H108M for pros

FACTORY DIRECT
£939

SPIRIT ABSOLUTE 4P

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

RRP £769
£499

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

F11 ACTIVE NEARFIELDS

Quested's most affordable fully 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 has a plywood composite internal more rigid and stiffer than conventional wood or MDF which helps to damp any nasty cabinet resonances. Amp noise is 100dB below 10Hz with 0.03% THD (-105dB) System response offers high roll off EQ tweels, and the 'flat' setting is -3dB at 60Hz.

FACTORY DIRECT
£1149

VS2205 ACTIVE MONITOR

One of the most popular models in the Quested range the VS2205 is designed as a highly accurate reference monitor, and is low profile and shielding made it ideal for a wide variety of use. The built in amplifier 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 positioning.

FACTORY DIRECT
£1739

VS3208 ACTIVE MONITORS

A new made in the Quested line offering a range increasing 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 two 8 inch woofers (which are also by side of each other) has its own internal chamber, and the midrange is a softdome unit. The built in HF trim switches for each driver if you prefer non flat voicings, along with gain trim.

FACTORY DIRECT
£3699

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. 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
£204

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
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-DT100EP

DT100 CABLE



- Replacement headlining 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

40% OFF!



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

RRP £120
£75
SHURE-SM58

C1000S CONDENSER MIC

OVER 40% OFF!



A lactic electret condenser mic with battery or phantom power operation. The polar response is cardioid but the included PCC1-00 adapter, if fitted over the mic capsule, will convert the response to hypercardioid. There is a steep bass roll-off (refer to the AKG's famous tuning) and the mic gives 6mV/Pa output sensitivity at 200Hz impedance. AKG's updated silver version also has a pressure boost adapter for a treble peak centred around 6-7kHz. Unparalleled value price.

RRP £115
£115
AKG-C1000S

C3000/B LARGE DIAPHRAGM MIC

INC FREE SHOCK MOUNT!

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

RRP £189
£189
AKG-C3000/B

C414B CONDENSER MIC

40% OFF!

For a long time this microphone, through several revisions, has been in constant sight in studios and live sound reinforcement where its clear consistency and multi-function versatility wins it many friends. A phantom powered multi-pattern large diaphragm condenser mic, with omnidirectional, cardioid, hypercardioid and figure-of-eight patterns, switchable -10dB or -20dB pad and also switchable 75Hz or 150Hz high pass filter. Characteristically bright with 15dB treble, only for pop vocals, but best suited to electric guitar or drum overheads.

RRP £479
£479
AKG-C414B

D112 BASS DRUM MICROPHONE

ALMOST 40% OFF!

The successor to the legendary D12 bass drum mic, AKG have updated the spec and performance to cement its heritage. It is a carefully designed moving coil design with bright presence lift to enhance bass drum and right angle body. Withstands punishingly high SPLs with minimal distortion.

RRP £134
£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 gain 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 filter, internal suspension shockmount, 1/4 inch PSU to mic cable, 1/4 inch audio cable, PSU main cable, and a thoroughly constructed aluminium flightcase.

RRP £700
£700
EPOA-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 dynamic
- 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
- 96dB SPL 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, 100dB SPL max
- Response -10dB, 10-30,000 Hz
- 250Ω version available

RRP £85
£85
BEYE-DT250

DT770 Pro



- Closed back circumaural design, 16dB isolation
- 600Ω nominal, 96dB SPL max
- Response -10dB, 5-25,000 Hz
- Single-sided cable

RRP £116
£116
BEYE-DT770

DT150



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

RRP £119
£119
BEYE-DT150

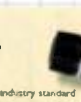
DT990 Pro



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

RRP £139
£139
BEYE-DT990

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 baskets, and is generally used on stand for vocals or instruments such as drums, and a favourite for guitar cabinets, but is great for punchy handclaps etc. It has a cardioid response and an fairly extended bass clip to 40Hz, and is supplied with a stand clip and case.

35% OFF!
RRP £110
£75
SHURE-SM57

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 15kHz boost that enhances most vocals giving extra presence and intelligibility. Balanced transformerless FET output. Requires standard 48V phantom power and has fixed cardioid polar pattern, includes carry case and full shock mount.

RRP £329
£329
EPOA-NT1

NT2 LARGE DIAPHRAGM MIC

45% OFF!

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

NT 3 CONDENSER

OVER 40% OFF!

A compact and fine small diaphragm condenser microphone with hypercardioid response and ideal for making up environments 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 windscreen.

RRP £239
£239
EPOA-NT3

NTK VALVE CONDENSER

OVER 40% OFF!

Large diaphragm condenser with 1/2 inch A valve preamp offering the warmth of 2nd and 3rd harmonic distortions and other non-linearities in the transient behaviour that 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 12dB pad A self noise with 12mV/Pa and 200Ω output impedance.

NT-V LARGE DIAPHRAGM MIC

OVER 40% OFF!

The NT-V is an affordable cardioid only version of the Valve Condenser, yet almost 10dB quieter in actual operation than the Classic and sporting an increasing edge connected diaphragm with no control bias, and this is gold-sputtered mylar only 1 micron thick. The aluminium flightcase, shockmount, valve power supply unit, cable and mains lead are included, and technically the mic offers 15mV/Pa sensitivity and a 200Ω source, with a 110dB dynamic range.

RRP £495
£495
EPOA-NTV

SAMSON Q5

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- Up to 500mW per channel

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RRP £159
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SENN-HD25

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50% OFF!

- Closed padded circumaural design
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- Response -10dB, 10-25,000 Hz
- 3 metre detachable OFC cable

RRP £149
£149
SENN-HD250II

SONY MDR-V500DJ

50% OFF!

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

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£59
SONY-MDRV500DJ

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50% OFF!

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AKG C2000B

50% OFF!

- Large diaphragm cardioid condenser mic with pad
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- 20dB inherent noise
- 200Ω nominal impedance
- Includes stand adapter and elastic suspension

RRP £229
£139
AKG-C2000B

NEUMANN TLM 103

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- Large diaphragm cardioid true condenser
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RRP £699
£485
NEUM-TLM103

SHURE BETA 58A

50% OFF!

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- Transient performance is improved, along with treble extension
- Bass handling noise due to capsule suspension

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£129
SHURE-BETA58A

SHURE ETV 58S

50% OFF!

- Shure's most affordable SM58 based system
- Dynamic cardioid capsule from SM58
- Up to 18 hours from 9V battery in 9V battery
- Single antenna receiver with squelch compander
- Twist antenna diversity also available

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SHURE-ETV58S

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THE FUTURE OF MUSIC TECHNOLOGY

Pocket PC PDAs have processor speeds that were the norm for top-line desktop computers only a couple of years ago, and can play back compressed video in real time. It's just one example of the increasing speed of technological advances that could also see wireless networking doing away with your studio cabling sooner than you might think.

Dave Shapton

There's a really strange thing about the way we perceive technological progress. Stuff I used to think about years ago as being almost the ultimate in science fiction is now commonplace. But what's surprising is that when there's a technical breakthrough, it doesn't necessarily make us stop in our tracks and say "wow, that's amazing". Perhaps that's because we are so completely surrounded by futuristic gadgetry these days that we're 'normalised' to innovation.

Thus it sometimes takes a conscious effort to put new developments into perspective. The way I usually do this is to try to figure out when I first thought about whether such a device might be possible. Here's an example: about 16 years ago I was involved in a project to design a digital mixing console, one based on low-cost DSP chips that had previously been used to power echo-cancelling modems. At the time, a top-end PC would have sported a 286 processor running at a scorching 8MHz: that's around two hundred times slower than the current crop of PCs — which are, of course, even more powerful than the clock speed would suggest, because of advances in processor design. Such a 286 computer would probably have a maximum of 1Mb RAM, with an upgrade from

the more usual 640Kb costing in the region of £300. If your computer had a hard disk at all, it would be too small to hold a single modern Windows application.

So my dream at the time seemed utterly impossible — or impossibly expensive: to store a whole track of audio in solid-state memory. Don't forget that most samplers at that time came with a paltry 128 kilobytes of memory — which is why the first preset samplers were drum machines, with their short sample times.

When the first solid-state MP3 players arrived, my reaction should have been "this is brilliant: science-fiction has turned into reality". But at the time I was caught up in the excitement over the copyright controversy triggered by the release of Diamond Multimedia's Rio MP3 player. Since then, RAM prices have gone into freefall, and new desktop computers are typically configured with a quarter, half, or even a whole Gigabyte of RAM. That's enough to store over an hour and a half of uncompressed, CD-quality audio. Compress it 10:1 using MPEG-1 layer three audio (MP3) and you've got 15 hours of CD-flavour playback from solid-state memory.

So, three years ago, I set myself a new target. I wouldn't be satisfied until you could play a feature film from a solid-state, hand-held device.

No problem. I've got one here,

on the table beside me, playing a trailer for the film *Spiderman*. It's a Compaq (or should I say Hewlett Packard, now that the HP giant has taken over what was the biggest independent PC manufacturer?). The device in question is called an iPaq, and is a Personal Digital Assistant with a similar form factor to the ubiquitous Palm PDA. It differs from Palm devices in that it has more RAM, and runs a strange mutation of Windows called Pocket PC. And it has much more processing power, with an ARM chip running at over 200MHz — puny compared to today's Gigahertz-plus desktop giants, but enough to decode video compressed as MPEG-1 or MPEG-4 in real time. (Don't forget that desktop PCs ran at 200MHz only

memory, you can cheat and work in an IBM Microdrive, an incredibly small hard drive, little bigger in outline than a postage stamp, with a capacity of 1Gb. The news that Toshiba have released a Pocket PC with a built-in Microdrive makes you realise that the Pocket PC PDA format is really going places.

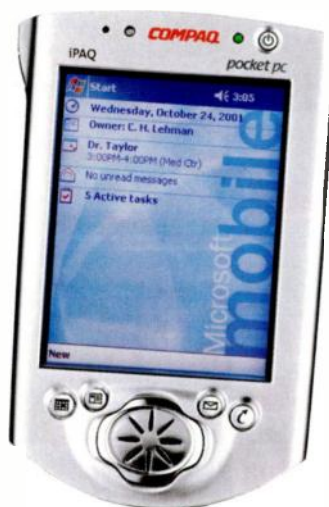
Wot, No Wires?

Ultimately, it's not the storage capacity or mobile processing power of PDAs that's going to have the biggest effect on the way we do things. It's wireless networking. Which is what got me onto this subject in the first place.

I'm doing a project for a client that involves streaming live audio and video to end users. The catch is that the people watching the streams are going to be mobile. Walking round a public exhibition space, in fact.

I've been talking about the possibility of wireless networking for some time now, and — suddenly — it's become an everyday possibility. Not a day too soon, because it should see off at least some of those million or so wires you have cluttering up your studio.

Most people have heard of Bluetooth. Named after a Nordic warrior god, not a chromatic orthodontal artifact, it's a low-power wireless network technology that is also low enough in cost to become a universal feature of mobile computing and communication devices. When I say low-power, I mean very low power. Emitting less radio energy than your microwave oven is legally allowed to leak, it works only up to about 10 metres. It's probably best thought of as a wireless parallel port: something you use to connect devices and peripherals together, simply, and without cables. Power consumption is so low that you can virtually forget about it. The bandwidth is theoretically 1.2 megabits per second, although



Being able to play back a three-minute song from solid-state memory seems almost trivial now that devices like the Pocket PC-format iPaq can play back movies...

three or four years ago.)

But how do you get a feature film plus stereo soundtrack into this diminutive hand-held cinema? Its 64Mb memory isn't anywhere near enough, so what you need to do is add non-volatile Flash RAM until you have sufficient playing time. It doesn't matter how much you add, because it will still be solid state. If you need still more

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► you'll probably never see that in actual use. A bandwidth of 500-600Kbits per second seems more likely.

What does this mean in practice?

It's not enough for stereo uncompressed audio, but it is enough for compressed audio and pretty fast Internet browsing. It's a lot faster than a serial port, and sufficiently speedy for multi-channel MIDI. I haven't come across any Bluetooth MIDI implementations yet, but it would certainly be good if this started appearing in new keyboard designs: imagine playing music from a keyboard into your sequencer by simply placing it nearby. I always have reservations about latency with networks, but I'd be surprised if there were problems with MIDI over Bluetooth.

Bluetooth devices can connect together in an ad-hoc network, called a Personal Area Network, or PAN, but I expect it will be some time before this all works seamlessly. As an example of a wireless technology, Bluetooth certainly has its role, but it's simply not fast enough or powerful enough to replace wired networks, which have the potential to move prodigious amounts of data.

The Need For Speed: Ethernet & WiFi

Wired networks come in three common varieties, these days mostly based on the network system called Ethernet. It's been around for decades but is now so cheap that probably the only reason why you wouldn't network your computers together is that it's still quite difficult to set up. There are 10Mbit/sec, 100Mbit/sec and 1000Mbit/sec versions, the fastest of which is more commonly called Gigabit Ethernet. Waiting in the wings is 10Gigabit Ethernet, which, very roughly, equates to moving nearly a Gigabyte of data per second. That's more than a CD's worth of data, and so fast that a typical DVD full of digital information could be transferred in only about five seconds.

Wireless networks, of course, come nowhere near this speed. But they are at least 10 times faster than Bluetooth and work over more than 10 times the distance. The most common version at the moment rejoices in the name of IEEE 802.11b, which is why the manufacturers are desperately trying to get us to use the expression 'WiFi' instead. Personally, I prefer IEEE 802.11b.

WiFi has a maximum possible data rate of 11Mbits per second, which is plenty fast enough for most things. At that rate you can move a floppy-disk's worth of data in roughly one and a half seconds. As with Bluetooth, you'll never get that rate in practice; but you will get a sustainable rate that is, for example, fast enough to stream a 1.3Mbit-per-second MPEG-1 video and audio stream (that's roughly VHS quality) over a surprising range. I have some practical experience of this because at the recent IBC (International Broadcasting Convention) in Amsterdam, I was demonstrating a wireless streaming application using an Elsa 802.11b access point and PCMCIA 802.11b wireless cards in a Compaq iPaq. A PCMCIA card has roughly the same dimensions as a credit card and is maybe four times thicker. These cards barely look big enough to do anything, never mind create a digital wireless network.

I was astonished to find that I was still receiving decent audio and video in the farthest corners of the exhibition hall (which was, I suppose, about the size of Olympia) and well into the next hall. Not only that, but I could see at least 10 other wireless networks in the vicinity — most of which had their security switched off, allowing me to tap into their data if I had been so inclined.

Security issues aside, wireless networking is going to transform the way we do things. For a start, it could replace Internet Service Providers, not to mention the cellular phone system. That's because it's quite legal (in this country but not others in Europe) to put a wireless access point on your roof and let others benefit



This tiny PCMCIA card can form the heart of a wireless network capable of sending audio and video data over considerable distances at high speeds.

from your wireless connection. If these rooftop installations are set up as routers, what you have is an *ad hoc*, high-bandwidth, totally free, wireless alternative to the Internet. It's not just going to happen, it's already happening. As I drove round Amsterdam I found that some of the city is already covered (but not necessarily for general Internet access yet). PDAs have microphones, and can put digitised speech onto a network, and if that network is wireless what you have is an alternative to the mobile phone system. Maybe this is why the telecomms industry is in such trouble?

Perhaps 11Mbits per second isn't fast enough for you. Well, next year we're going to see the first examples of (wait for it) IEEE 802.11a. Believe it or not, this is going to be five times faster than the 'b' variant, albeit with a

slightly lower range, because of its higher operating frequency. With a maximum possible bandwidth of 54Mbits per second, I would expect around 30Mbits per second to be usable with a good connection. That's fast enough for DV-quality video and very high-quality uncompressed audio. It's almost fast enough to access hard drives with, although I'd hesitate to use it for multitrack purposes. It's certainly enough, though, to connect a mixer control surface with a DSP rack.

Digital wireless networks are going to change the way we use computers. It's early days yet — but at the same time, the technology is mature and works now, out of the box. And because we use computers for creating and using music, that will change too. **SOS**

Technology On Trial

Soon after the — still — unbelievable events in New York on September 11, I heard a radio commentator saying that the disaster was an inevitable consequence of the spread of technology. I've heard this several times since, and it's an argument that I want to address here and now. (Note that these are my own opinions, and that the fact that you are reading them here does not suggest that they are necessarily shared by anyone else involved in this magazine.)

Technology does not make people bad. It doesn't make you want to kill people. However, it may give you the ability to do worse things than you could have done without it.

But it's the very absence of technology that helps oppressive regimes maintain their grip on populations that, through no fault of their own, have bypassed the very advances that have propelled us into what we think of as our world in the 21st century. With no access to the

outside world through television or the Internet, and with a constant diet of anti-western propaganda, how could anyone possibly take a balanced view of the world?

Yes, terrorists can use mobile phones to plan atrocities, but whole countries can liberate themselves from despotic governments who would prefer to keep their unwilling subjects in the dark ages if they realise — through free and open communication — that it doesn't have to be like this. (The ultimately unsuccessful, but highly influential, Tianenmen Square protests were part of a peoples' uprising that was organised using fax machines.)

And in a world where extremists in all the major religions distort their so-called faiths until they are mutually blasphemous, isn't it time we started looking for things that we can all share, independently of the things we were brought up — or made — to believe? It could be that sharing music is a good place to start.

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World Radio History

Q&A

Your technical questions and queries answered

Q Which synth should I buy?

I was recently reading Paul Nagle's review of the Waldorf XTK (see SOS March 2000) and found it very informative. It is for this reason that I thought I should contact him for advice.

I am looking for a really decent synth from which I can take the majority of my bass and lead sounds. The type of sounds I need are quite big, unique and organic, and would suit the ambient, driving, progressive trance style I'm into. I quite like the Novation Supernova at times but find the sounds a bit round and not sharp enough. It is for this reason that I am looking at maybe a Waldorf instrument, but I would really appreciate some advice on which you feel would be best for my needs.

Kristen Maunder

SOS contributor Paul Nagle replies:

Choosing a synth is always a difficult matter, and personal taste is more important than all other factors. Over the years I've found that some synths click with me and others do not (for example, I sold my Minimoog because I simply failed to find my own 'identity' when playing it). Some synths appeal at once, others only through time and patience. Auditioning in a shop doesn't always reveal everything, either. I fell in love with the Access Virus when I first played one and,

with daily use, I like it more than ever. In contrast, I didn't like the Supernova so much after a short shop audition but — after spending time with one — I now rate it very highly. And again, I disliked the user interface of the Waldorf Q keyboard when I first tried it — and I still do (although it does sound amazing).

There are so many facets to each instrument that advice from others should always be tempered by your own experience. Waldorf synths are certainly "big and unique" but when you say "organic", I think instead of an analogue synth — but I'm guessing your budget doesn't stretch to an Alesis Andromeda? The Waldorf Pulse is a superb lead and bass machine if you can find one.

I personally find the Waldorf Microwave 2/XT series ideal for spiky textures, dirty, aggressive leads and ambient soundscapes. I wouldn't describe its general character as "organic", and I have never succeeded in making the



We're often asked to tell readers what synth they should buy — but this decision is as personal as choosing a pair of shoes.

warm, analogue-style solo patches that I personally like. Perhaps it's something about the detune of the oscillators that always sounds a little harsh, but remember, this is a digital synth with its own strengths. It does

have an impressive modulation matrix so that subtle, varying timbres can be created, but it takes time to understand and fully exploit.

I also think that, with programming, the Supernova series can sound very sharp and hard, and if multitimbrality is important to you, they take some beating. Oddly, one of my own favourite 'Virtual Analogue' synths is the Yamaha AN1x, which has impressive synthesis power, and you could pick one up cheaply second-hand. Not the best user interface, perhaps, but it sounds awesome and is much underrated.

So I'm afraid there are no easy answers here. There are so many good choices out there, and you should be able to make almost any kind of music with almost any synthesizer.

Q How do you create a reverb algorithm?

Does anyone know how I go about creating a reverb from an algorithm and a microprocessor, or do you know where I could find out? I'm building a complex guitar effects pedalboard for university and I wanted to do away with the usual stamp-and-squint editing, so I am incorporating an embedded PC with TFT touchscreen. At the moment I am in the very early stages but I need to get a good grasp of the concepts involved. I would be grateful for any information.

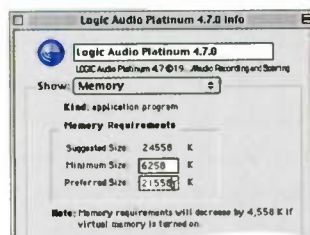
Dave Kernan

Editor Paul White replies: Klark Teknik (+44 (0)1562 741515) publish a book on digital reverb, called *Audio Systems Designer*, which explains the basis of the algorithms, so it would be worth calling them to get hold of a copy (it costs under £10). However, every company uses their own interpretation of this

quick fixes

Q How do you assign more RAM to Logic on an iMac? Luke Anthony

A To assign more RAM to *Logic* (or any Mac program): after booting, click once on the *Logic* program icon, to highlight it, and press Apple + I. A window giving program information should appear. This looks different depending on your version of Mac OS, but shouldn't have more than three or four pages. One of them will have settings for Recommended and Minimum memory usage. Type new values over these, then close the window. Next time you run the application these values will apply. Mac OS itself uses a lot of memory, so the amount available to programs will



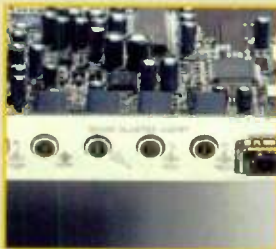
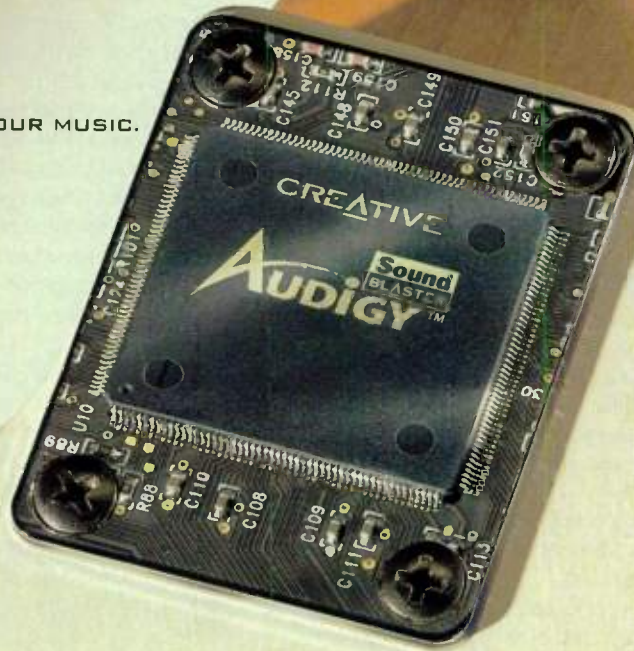
be less than you have installed. To ascertain how much memory Mac OS is using, select 'About This Computer' in the Apple menu when you're in the Finder. You should also have Virtual Memory turned off when running *Logic*. Do this in the Memory control panel, accessed from Control Panels in the Apple menu. Sam Inglis

Q What is a stereo signal? Is it necessary to record in stereo, when stereo reverbs, spatial panners, and so on, could just be applied on monitoring and mixdown to add a stereo spread? Steven Gravemarsch

A To reproduce true stereo, a signal must be recorded in stereo using two microphones in one of the recognised stereo configurations, such as coincident XY or as a spaced pair (SOS has covered stereo miking at various times over the years; you can check our web site for relevant articles). This stereo signal is recorded on to two tracks, which must be panned left and right in the final mix, using a stereo mixer channel or two

mono mixer channels. However, most of what you hear on records is artificial stereo, where a mono sound source is passed through a mono mixer channel and then positioned between the left and right speakers using the pan pot. The impression of space is usually added using reverb; it is common to feed the reverb from a mono signal, from which is derived a pseudo-stereo output. The reverb output is then fed into a stereo mixer channel or aux return, where the two sides are panned hard left and right. Other artificial processing, such as panning the original sound to one side and adding echoes panned to the other, or stereo chorus or flanging, can also be used to create stereo effects. Paul White

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World Radio History

Q&A

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

► **basic concept, as reverb algorithm design is as much art as science.**

A typical reverb algorithm starts with a tapped delay line or FIR (Finite Impulse Response) filter, to produce the early reflections, which can number anything from dozens to hundreds, depending on the hardware power available. These are randomly spaced to simulate a real room response and tend to decay in level at longer delay times. Some taps feed the right channel and some the left, to create the impression of stereo.

The outputs from these taps are then fed into networks of recirculating comb and all-pass filters, to build up the reverb density, and some EQ is included within these networks to produce the high-frequency roll-off associated with natural reverb. Duplicate networks are needed for the left and right channels. The outputs from these recirculating networks are then summed to produce an audio output. How these networks are arranged and how they are fed (from individual FIR taps or from summed groups of taps) is different for every reverb design, and once you have got a workable algorithm there's apparently much tweaking of the parameters needed, to get the decay time to be nominally even across the audio spectrum.

Q Am I better off with a soundcard designed specifically for musicians?

I have a SoundBlaster Live! card and read with anticipation your recent review of the new Audigy card [see November 2001 issue]. I was considering trading up when I first heard about it. I'm interested in

quick fixes

Q I am trying to decide which active monitors to buy. One of the strong contenders is the Mackie HR824s. I seem to remember seeing a pair of them in a picture of Paul White's studio in SOS. I've heard lots of good things about them, but also some general comments about metal-dome tweeters being fatiguing over long listening durations. What are your feelings? The only metal-tweetered monitors I've used are some small active Yamaha ones, which I found a bit 'splashy'.
Thom Cowland



A I'm currently using HR824s in my studio and find them extremely good. They have aluminium rather than titanium tweeters, which are certainly less splashy, and while a really good soft dome is slightly sweeter, soft domes don't like very high SPLs. A friend of mine who engineers for several name artists, and whose ears I trust better than most, has bought a pair and is well pleased. That

doesn't mean you shouldn't try other monitors, but if you check out the Mackies I think you'll be impressed.
Paul White

Q I read an old article (1994) on your web site about a short course on live engineering. It used to happen in April every year and was called Going Live. It was organised by Soundcraft Electronics. The contact number given does not work and I did not manage to find a web site for Soundcraft or Going Live. I am really interested in attending such a course.
Paul Maernoudt

A Soundcraft still offer the Going Live course once a year, over a Friday, Saturday and Sunday, with the Friday providing a beginner's introduction. You can attend all three days or skip Friday. The last Going Live took place in summer 2001, and there are plans to run the course again in 2002. Anyone interested can register in advance with Soundcraft's Elizabeth Gates (email her at elizabeth.gates@soundcraft.com, or call her on the Soundcraft main telephone number, +44 (0)1707 665000). The Soundcraft web site can be found at www.soundcraft.com.
Debbie Poyser

your comments about its sound quality — your comparison with the Mia card was very revealing. It was obvious that you perceived a definite difference in quality. I'm definitely looking for a noticeable step up from my current Live! card, both for recording and playing back samples, but having read your article I'm now not so sure that the new Audigy is what I should go for. I've amassed a good collection of Soundfonts, so I'm reluctant to abandon these for a new sample set, such as Gigasampler or Akai (although I perhaps would if it meant a significant step up in quality). I like having an onboard hardware sampler that gives me 64 voices, as the current Live! card does. I understand that the HALion software sampler can only send out over a maximum of 16 MIDI channels, and I have a possible 64. (I use Cubasis VST) I do think that the Audigy is huge value for money, as was my Live card when I bought it three years ago. My question is: do you think that the Audigy is a significant step up for me? Is it a genuine semi-pro solution? I've come to the place where perhaps quality is preferred over feature sets.

The other options I've looked at include the Marian cards, or perhaps a Creamware Powersampler (by the way, I find the Creamware options and software/hardware combinations completely baffling!). The Mia would be great except for the lack of MIDI, which would mean shelling out for a USB device.

Michael Potter

PC Specialist Martin Walker replies: *You've obviously already thought through your options carefully, but it can still be tough making the final decision when it comes to choosing a soundcard. It certainly makes sense to carry on using the SoundFonts you've amassed over the last few years, especially as having a hardware SoundFont player gives you guaranteed 64-voice polyphony.*

Since you're primarily interested in improving audio quality, you could retain your

SB Live! solely for SoundFont playback duties, and add a second soundcard (subject to a free expansion slot still being available) alongside this for recording and playing back audio tracks. I had no conflicts running the SB Live! and Audigy alongside my Echo and Yamaha soundcards when I reviewed them, so this is one way forward, and will give you noticeably better audio quality for recording and playing back audio tracks, although your SoundFont quality would be identical. If your new soundcard had a digital input, you could also send the fixed 48kHz digital out of the SB Live! into this to improve SoundFont audio quality, although this would force you to use a 48kHz sample rate throughout — not ideal for any musician whose final destination is a 44.1kHz CD-R.

The Audigy would give you noticeably better audio quality for your SoundFonts if you want to replace your SB Live! altogether, but according to my measurements most soundcards designed from the ground up for



The Soundblaster Audigy: in terms of facilities, great value for money, but if the lowest noise performance is your top priority, a 'musician's' soundcard could be a better bet.

musicians will give you lower background noise on your recordings, by between 5dB and 12dB, as well as providing true 24-bit performance for both recording and playback. Of course, you won't get all the Audigy's DSP effects or its SB1394 ports, but if you're primarily looking to improve audio quality this trade-off is something to bear in mind.

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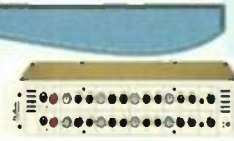
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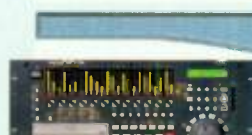
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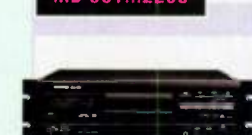
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Q&A

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► you decide on a different make and model of soundcard, there are now quite a few options for £200 or less, including models from Echo, Marian, M Audio, and Terratec. Don't be too worried at having to abandon your SoundFonts, since with Cubasis VST you could run a SoundFont player as a VST Instrument. There are various shareware models available at bargain prices, including the \$30 Bismark (<http://homepage.mac.com/bismark/english.html>), Vsampler from Speedsoft at about \$40 (www.virtualsampler.de/english), and SamplerChan at \$69 (www.samplerchan.com).

The only thing to bear in mind is that running 64 sampling voices in software will consume a significant amount of native processing power. I haven't tried any of these VST Instruments out personally, but you can download free demos to see how you get on, and this should give you a feel for how much of your CPU they will gobble up before you make a decision and part with any money.

If you decide to buy a mainstream commercial software sampler, like Creamware's Volksampler (\$99), splash out on the Creamware PowerSampler soundcard (bearing in mind its more limited 32-voice polyphony), or a professional stand-alone softsampler such as GigaStudio, you'll still be able to use your existing sample collection, since these all have SoundFont import facilities. HALion isn't currently an option for you, since it won't integrate with Cubasis VST, only with the more expensive Cubase VST 5.0 series, or Nuendo. However, it also imports SoundFonts, and you don't need to worry about a 16-channel multitimbral limitation — if you need any more, you just open another HALion and you get another 16, and so on.

Finally, even if you decide on a different software sampler that doesn't directly import SoundFonts, you could convert them using a utility such as Amazing Sounds' CDxtract (www.cdextract.com) or Chicken Systems' Translator (www.chickensys.com).

Q Is hit dance track's tempo variation deliberate?

I'm a London DJ (currently of the bedroom/house-party variety), and very much new to electronic music creation, although I've been writing music for years. Now I'm finally getting into it properly. I've been playing with

a demo of Acid Pro 3.0 and when Kylie's new track came out I felt it lacked oomph in the drum department and was also a little bit too pedestrian in tempo. So I grabbed an MP3 of it, and an MP3 of another house track (just the beats from the first eight or so bars), imported them both into Acid, and proceeded to muck around, overlaying the beat over the top. It worked well, except that I found that every one or two bars of drum sample I had to resync it to the Kylie track by altering the offset value, whilst auditioning the whole thing to see if the beats were in sync. I've tried another drum loop against it just to be sure, but it appears that the Kylie track's tempo alters slightly throughout the entire track. Is this common practice? If so, why — to stop people trying to do what I just did? Or to gradually increase tempo in order to provide a build-up which is subtle enough so the listener doesn't consciously notice, but subconsciously the buildup is there because the song is gradually getting faster?

Ashley Dando

Producer Steve Levine replies: I don't think it is generally the practice on 'dance music' to intentionally speed tracks up. (It's more common in other musical styles to program subtle shifts in tempo into a chorus, to try to add some emotion — bearing in mind that doing this means that 'flying in' vocals becomes very hard, as chorus one may not fit on chorus two.) What is more likely in this case is small timing-resolution shifts.

I am not aware of what gear was used to generate the drum track in this case, but it is well known that many dance and R&B

producers use the various models of Akai/Linn MPC drum/sampling workstations for their drum tracks, and all of these machines have an inherent 'feel' — small timing delays in the exact quantise position of the beats. In fact I have

made a set of MPC grooves (from recording these delays) which I use in Logic, and it perfectly recreates the MPC feel/effect. Looking at the MPC grooves in the edit window of Logic, you can see that they are moved by 6-18 ticks at Logic's high resolution when quantised, so aligning new beats to this groove would cause

a flam or drift unless exactly the same groove was used.

Also, in the case of the Kylie track I don't know whether the final mix master has been speeded up using a timestretch program. This would almost certainly mean that the overall tempo would not then be consistent (due to the way these programmes work, by snipping out small amounts of waveform). The tempo variation would not be noticeable to the ear, but if you tried aligning something to it, those small errors would suddenly show up.

Q Is all RAM the same?



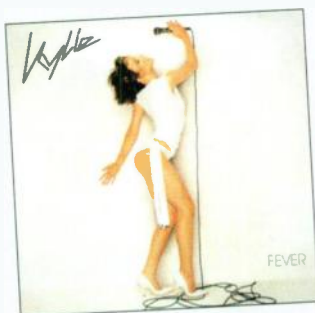
I have a graphite 466MHz Apple G4 for which I wanted some more RAM. I saw an ad in a magazine for a mail-order store offering 256Mb for £34 but when I asked them to email me a quote it was £49 plus VAT. I rang back to ask why, and they told me it was best to use the more expensive Kensington RAM if I was doing any serious audio or video work (I do both), as the cheaper RAM was prone to system crashes in such cases.

I then rang another outlet to get a quote from them: £22 for 256Mb. I told them what the first store had told me, but they seemed to think that it was not true and the type of RAM wouldn't matter. Do you know the answer?

I recently started reading your magazine and I am delighted to find a section on Digital Performer. None of the other mags I've read can seem to be bothered. I'd love to see more pages devoted to DP.

Arum Devereaux

Assistant Editor Sam Inglis replies: PC music experts, including our own Martin Walker, recommend that you buy good-quality branded RAM such as Kensington or Crucial, rather than cheap no-name stuff. As the RAM used in PCs is identical to that used in modern Macs, I think this advice would hold across both platforms. It's quite likely that you won't have any problems with cheap RAM, but for the sake of £20 it isn't really worth risking it. If you do happen to get a faulty piece of RAM, it can produce very annoying, non-repeatable crashes and glitches which can cost you a time and money in the studio, and be very difficult to track down. Having said that, £49 seems expensive even for branded RAM, and you should be able to find a better deal elsewhere. **SOS**



Kylie: fluctuates mildly.

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Sonic Foundry were the pioneers of loop-based PC sequencing with the initial release of *Acid*. More than three years on, it's more popular than ever, and the latest version includes MIDI and video support among other new features.

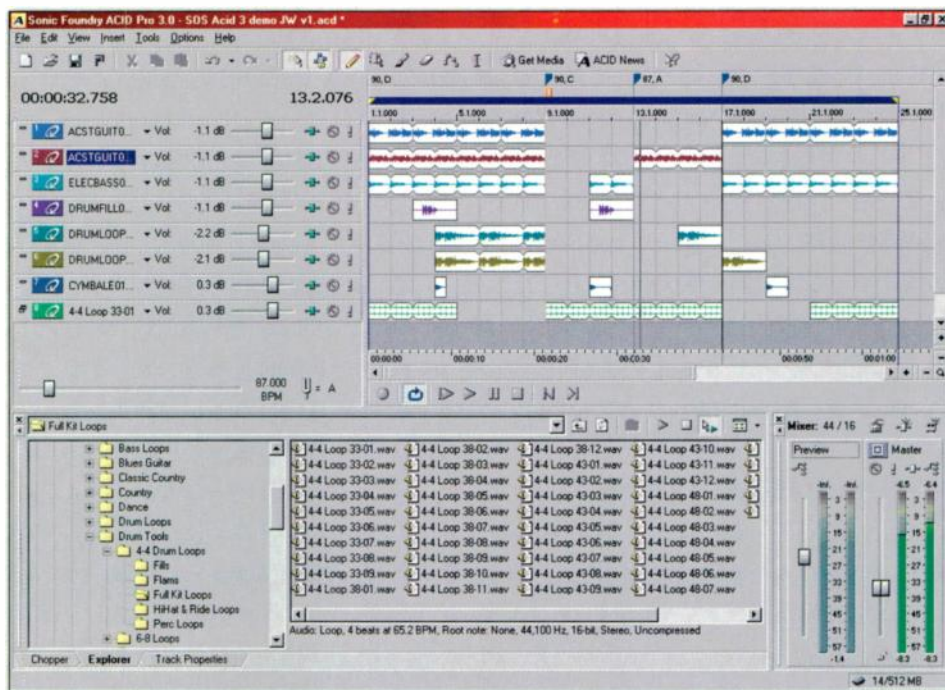
John Walden

Whatever your views on the 'paint by numbers' approach to music creation offered by loop-based audio sequencing, there is no doubting its popularity. Armed with the right software and a few suitable loops, even a musical novice can produce creditable results. Sonic Foundry's *Acid* has been at the forefront of this mini-revolution, and when Martin Walker reviewed the first version in November 1998, there was little in the way of competition. Three years down the line, a number of other products are now available. These include Cakewalk's *Club Tracks* and, more recently, *Sonar* (although this is also a fully featured MIDI and audio sequencer), *Making Waves* (reviewed by *SOS* in December 2000), eJay's *Dance* and *Techno* software, and Bitheadz's *Phrazer* for the Mac, which was reviewed in *SOS* April 2001. Sonic Foundry have also been busy during this time, and a number of cut-down versions of *Acid* have appeared, each bundled with a themed collection of loops and at a price that almost anyone could afford.

The flagship *Acid Pro* has now reached version 3 and, along with the usual collection of tweaks to the user interface, the new release also includes a number of major additions. The two most obvious new features are MIDI tracks and a Video window, but there are also two new tools: the Beatmapper and the Chopper. Are they enough to keep *Acid* ahead of the competition?

Bundled Joy

The boxed version of *Acid Pro* contains considerably more than just *Acid*. Also



Acid's default screen layout with the four main screen areas shown. Note the tempo and pitch changes inserted along the top of the Track View window.

Sonic Foundry Acid Pro v3

PC Audio Loop Sequencer

included are cut-down versions of other Sonic Foundry software in the shape of *Sound Forge XP Studio* and *Vegas Audio LE*. *Sound Forge XP* provides a competent audio editor, including tools to edit loops for use with *Acid*, while *Vegas Audio LE* is a basic eight-track audio sequencer. In addition, Sonic Foundry's *AFX1*, *AFX2* and *AFX3* effects packs are included, providing 18 DirectX audio plug-ins such as chorus, delay, distortion and reverb. Finally, a collection of some 600 loops is supplied covering styles including dance, techno, pop and rock.

Of course, the key element in the bundle is *Acid* itself and for those new to loop-based sequencing, a brief introduction might be useful. Essentially, *Acid* provides a means of sequencing short audio files along a timeline in a fashion no different from the 'arrange' window of most MIDI or audio sequencers.

However, the fun starts when *Acid* knows the tempo (the loop's length in beats) and pitch (the root note of the musical phrase) of the audio involved, as the software can then adjust both the pitch and tempo of the audio in real time. For example, a drum loop recorded at 120bpm can be automatically time-stretched to play back at 100bpm while maintaining the original pitch, or a bass line recorded with a root note of A can be pitch-shifted to play back with a root of G but without altering its tempo.

For loops you create yourself, *Acid* will do its best to estimate the tempo. If the user specifies the root note, then the software's pitch-shifting algorithm will also be able to go to work. Both this pitch and tempo information can also be fine-tuned using *Sound Forge XP* if required. As described more fully below, the end result is a system that

allows quite complex arrangements of audio loops to be constructed, all with the flexibility of instant pitch or tempo adjustment.

Getting Started

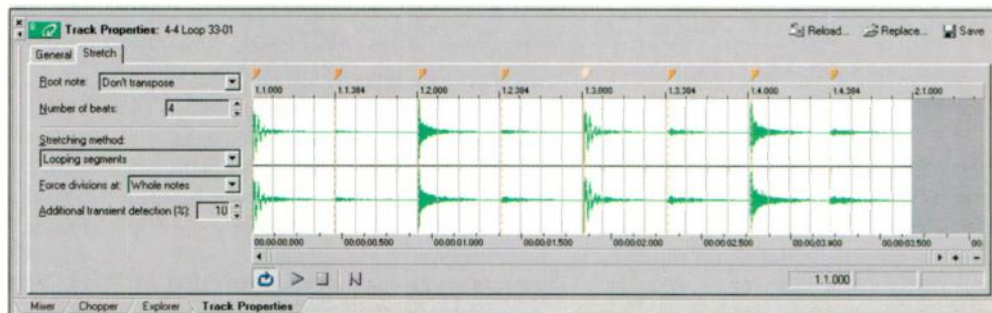
Obviously, you need a soundcard and CD-ROM drive to use and install *Acid*: as far as PC specifications go, Windows 98, Me and 2000 are all suitable, and Sonic Foundry suggest a modest 300MHz processor with at least 64Mb of RAM and 60Mb of free hard disk space. A 400MHz processor and Windows 98 SE, Me or 2000 are the minimum specification for those wishing to use the video playback options.

On the test system, installation took just a few minutes and proceeded without any problems. When first run, *Acid Pro* defaults to using the sound device currently selected by Windows and detects the presence of any other DirectX plug-ins present on the system. Sonic Foundry have recently improved their registration process and, with a suitable Internet connection, it took just a few seconds to fully register the software.

While *Acid* has undergone both some cosmetic and functional changes in its user interface, the main screen looks pretty much as it always has in its fundamental respects. The display is divided into four main areas. The Track View dominates the top right and provides the traditional timeline view through the project. Immediately to the left is the Track List which, as well as indicating the file name of the audio file associated with each track, also provides access to various mixer functions such as volume, pan, mute, effects send levels and output assignment. The left-hand side of the bottom half of the screen serves a number of functions, with a series of tabs allowing the user to toggle between

these views. Probably the most important of these are the Explorer, for finding and auditioning audio files, and the Track Properties view where, among other details, the root note and length of a file can be specified. To the right is a more traditional mixer view. The number of channels available here depends upon how many busses or effects channels the user has defined. All of

changes can be inserted at any point along the timeline. Any Loop tracks that have been set to follow such changes will then do so in real time. As with any tempo- or pitch-shifting process, audio artefacts will become apparent if it is pushed to extremes, but modest shifts of up to a few semitones in pitch or tempo changes of 10-15 bpm work remarkably well. Via the Explorer, new loops can be auditioned



The Track Properties window with a four-beat (one-bar) drum loop shown. The 'Don't transpose' setting means the loop will follow any tempo changes in the project but not key changes.

these four main screen areas can be resized and many of the windows can be docked into the bottom half of the screen if preferred.

Going Loopy

The basic process of song construction in *Acid* is simple. *Acid* automatically creates a new track for each media file added to the project, and 'Events' (instances along the timeline when the file is playing within the arrangement) can only be placed on that track. To insert such Events, a pencil tool can simply be pointed and dragged in the appropriate place on the Track View window. The Track View includes vertical and horizontal zoom buttons, situated in the lower right corner of the scroll bars for the window, and the zoom level affects the resolution of the grid displayed in the timeline to which Events will snap. Snapping can be switched off, enabled for just the grid lines or enabled for other location points such as the cursor position or markers, so getting an Event exactly where you want it is a breeze.

Three types of track are available: Loop, One-Shot and Beatmapped. Loop tracks are the most commonly used and are usually based on fairly short audio sections that are designed to contain a discrete musical phrase. These files are held in RAM once added to the project. Drum loops, bass riffs, short melody lines or chord sequences would be obvious examples. Loops can be set to follow the tempo and/or key changes as required via the Track Properties tab in the bottom half of the screen.

Both tempo changes and key

in real time with the current project playing — *Acid* will automatically pitch- and time-shift the loop being auditioned to fit the project. It is this core feature of *Acid* that makes it so easy to construct a complete song with just a few well-chosen loops, and if you don't wish to roll your own, Sonic Foundry have an extensive collection of loop library CDs available (see the Library Work box for more details).

One-Shot tracks are based on short sections of audio that are not designed to be looped. If longer than a few seconds, they are usually streamed from hard disk rather than held in RAM. One-Shot tracks will not change pitch or tempo with the rest of the project. Cymbal crashes or sound effects might fall into this category.

Beatmapped tracks replace the Disk-Based

SOUND ON SOUND

Sonic Foundry Acid Pro v3 £379

pros

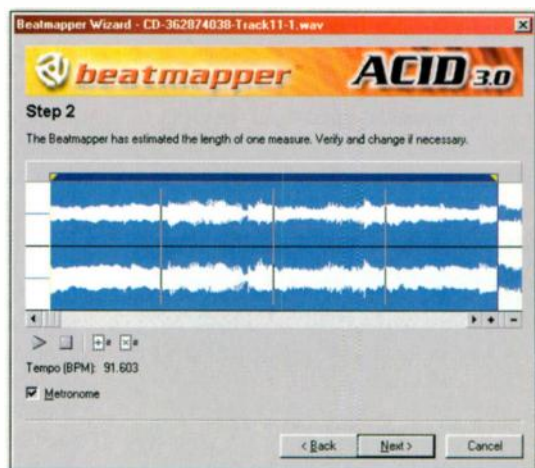
- Hugely creative in the right hands.
- Excellent user interface.
- Some very useful new features.

cons

- Pro version is not cheap.
- MIDI tracks offer limited functionality.

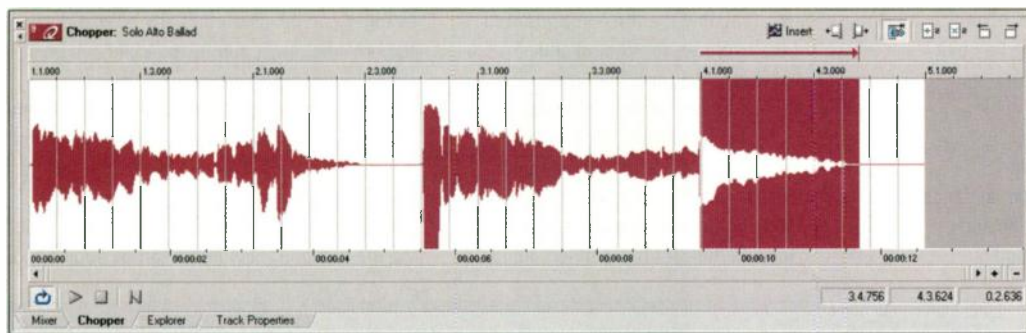
summary

About as much fun as it is possible to have with a piece of music software. *Acid Pro* is not cheap but it offers some excellent creative possibilities, particularly when sync'd up to a MIDI + Audio sequencer.



Step 2 of the Beatmapper Wizard allows the user to define the length of a single bar, so that *Acid* can tempo-match the whole file.

SONIC FOUNDRY ACID PRO V3.0



Using the Chopper tool to extract a single phrase from a sax solo.

► tracks of previous versions. These tracks are based on longer audio sections and, by default, when a file longer than 30 seconds is added to a project, the Beatmapper Wizard is automatically opened. This Wizard allows the down beats and tempo of the file to be identified. Both can be adjusted and auditioned by the user until they are spot-on. This tempo information can then be added to the file, allowing it to be time-stretched or compressed to match the project tempo. This tool does take a little getting used to but is an extremely useful addition to *Acid*.

The simple use of this tool would be for adding longer drum loops to a project, but two other obvious applications spring to mind. First, longer vocal sections such as a complete verse or chorus might be subjected to the Beatmapper treatment. The tempo of the vocal could then be automatically adjusted if you need to adjust the overall tempo of the project. Second, whole tracks could be imported (for example, using *Acid*'s new CD ripping facility), Beatmapped, and then have their tempo adjusted. If you wanted to compile an extended dance mix based upon a number of songs, get them all running at the same tempo and add some additional drum loops, the Beatmapper would make this very straightforward. The Beatmapper is not so effective if the file being mapped is not at a constant tempo, but otherwise works very well.

Allied to the Beatmapper is another new tool, the Chopper (no smirking at the back!). Selecting any event and then clicking the Chopper tab brings up an alternative

waveform view in the bottom portion of the *Acid* display. In this view, sections of the overall file can be selected and auditioned. Selected sections can then be added to the Track View as a new track, and Events based upon this selection drawn into the arrangement. This was possible in previous versions of *Acid*, but the Chopper certainly makes this task easier. Using this tool to isolate particular musical phrases from a lead guitar solo or to extract an individual bass-drum beat from longer audio files is very simple. While these functions could easily be achieved within a standard audio editor, it's useful to be able to do this quickly and efficiently from within *Acid*. It would also be possible to use this tool on completed tracks, so cutting up and rearranging a finished tune while making tweaks to its tempo and adding extra rhythm parts could all be attempted from within *Acid*.

On The Record

Acid can, of course, be used to record new audio tracks. However, unlike previous versions, recording now includes MIDI as well as audio. Clicking on the Record button in the Transport area brings up a dialogue: for audio tracks, the input source, sample rate, bit depth, recording folder and file name can all be specified. When the recording is stopped, the recorded audio is placed upon a new track within the Track View — all very fuss-free.

MIDI recording is also a straightforward process. MIDI in and out options can be specified via the Preferences settings from the Options menu. Once this is done, MIDI tracks can then be recorded and again, once the recording is stopped, the MIDI data appears as a new track in the Track View window. Copies of MIDI sequences can be drawn onto the Track View window in the same way as audio loops and, via the Track Properties tab, basic MIDI properties such as channel, voice, volume and pan can be set. However, in terms of MIDI functionality, that is more or less it: any editing would require an external MIDI editor. While it is an interesting development to see any MIDI sequencing functionality in *Acid*, it is a shame that it does not as yet provide something like a piano-roll editor to allow even some basic tweaking of MIDI data.

This said, *Acid*'s synchronisation capabilities via MIDI timecode or MIDI clock mean that it can easily be used in conjunction with a MIDI + Audio sequencer. As a regular user of *Acid Pro*, I've found that hooking it up with my sequencer of choice (Emagic's *Logic*) has usually been a pretty painless experience.

All Mixed Up

With each audio loop requiring a separate track in the Track View, it is very easy to end up with an awful lot of audio tracks that need mixing. *Acid* provides a good range of possibilities in this respect. Individual tracks can, of course, have their individual levels, pan and effects chains specified via the Track List. However, the Mixer tab provides access to a range of other possibilities. By default the Mixer window shows two faders, Master and Preview. The former controls the overall output while the latter controls the volume level at which new loops are auditioned via the Explorer. If the host PC has multiple audio output options available, the destination of each fader can be specified.

New fader objects can be added in the form of busses and assignable effects controls. Up to 26 busses can be added to a project and individual tracks from the Track List can then be assigned to a particular buss. For example, all the drum tracks in a song might be assigned to a stereo buss. The faders on the Track List can then be used to control the levels of individual drum parts whereas the buss fader can be used to control the overall level of the drums relative to other elements in the mix. As with the master fader, ►

Library Work

While creation of your own loops is a simple process using *Acid* and *Sound Forge XP*, Sonic Foundry have an extensive range of loop CDs available and it is well worthwhile budgeting for a few of these to get yourself started. The ground covered by the existing libraries is very diverse. As might be expected, there are plenty of drum loop libraries but the styles go from straight rock, through Latin, dance, hip-hop and into world beats. The music loop libraries cover the same territory but also include blues, country, various ambient collections, jazz and orchestral styles.

As well as regular new releases, Sonic Foundry now also offer some themed 'packs' such as the *Drum Pack*, *Producer Pack* or *Dance Pack*. Each *Pack* comprises a collection of four or five loop libraries fitting the named style but at a discounted price. More details on the loop libraries, plus some example loops from each, can be found on Sonic Foundry's web site.

Test Spec

- *Acid* v3.0 build 189.
- Pentium III 800MHz PC with 512Mb RAM running Windows 98 SE.
- Motherboard: Asus P3V4X with VIA Apollo Pro 133A chipset.
- Installed soundcards: Echo Mia with v5.58 drivers, Yamaha SW1000XG and DSP Factory/AX44 with v2.50 drivers.
- Tested with: Emagic *Logic Audio Platinum* v4.7.2.

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► busses can be routed to any of the PC's available audio outputs. Busses can also have effects added to them if required.

While effects (or chains of effects) can be added to both individual tracks and busses, in terms of processor overhead it is clearly sensible to have some global effects or effects chains to which signals from any track or buss can be passed. *Acid* calls these assignable effects, and up to 32 fader objects of this type can be used. The most obvious application of these would be a general reverb or delay treatment, but effects can be chained if required. Send levels can be set for individual tracks in the Track List or from busses.

The DirectX effects supplied with *Acid* cover all the main bases (see the Effects Box for a full list) and the quality of the processing is of a high standard with plenty of control on offer. The more routine processes such as delay, chorus, compression, flange, and so on offer exactly what you would expect, and the reverb quality is good. The plug-ins include a multi-band dynamics option, which offers four bands of compression. This could have a number of applications, and applied across the master output can add considerable punch to a final mix.

Like most modern audio or MIDI applications, *Acid* provides facilities for drawing envelopes upon tracks or events as a means of mix automation. The envelope tool can be used to draw levels for volume, pan and effects sends: these are followed in real time during playback.

In The Frame

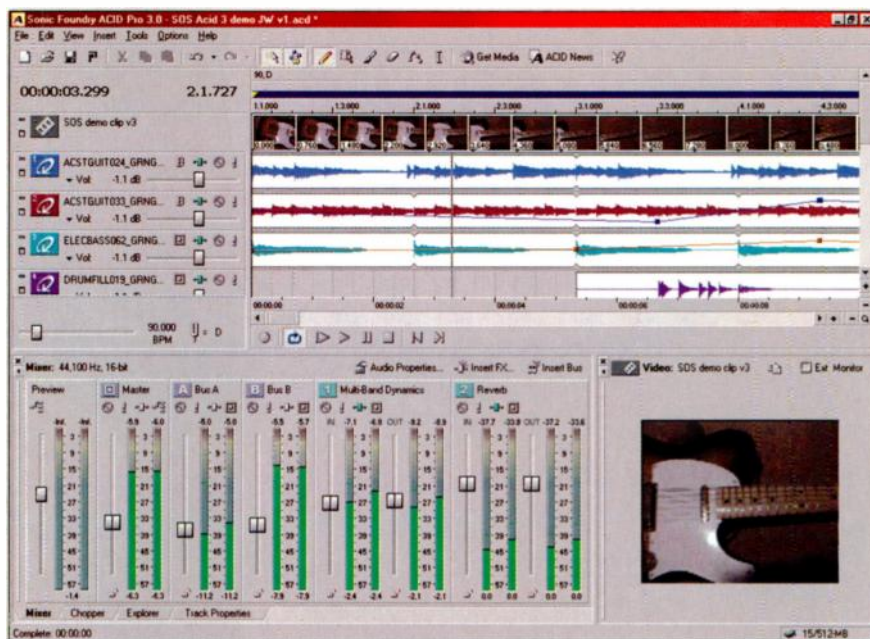
The Video window is a new feature in version 3. A single video file can be opened within a project, with both Quicktime (MOV) and Video for Windows (AVI) file formats supported. As well as playback in the Video window, a frame strip is inserted as the first track in the Track View window. Any audio included within the video clip is automatically inserted as a One-Shot track.

Using loops to build a musical bed for

Bundled Effects

The three XFX packs bundled with *Acid Pro* provide a good range of DirectX plug-ins. These include:

- Reverb.
- Compression.
- Pitch-shift.
- Chorus.
- Delay/echo.
- Noise gate.
- Multi-band dynamics.
- Graphic dynamics.
- Parametric EQ.
- Paragraphic EQ.
- Graphic EQ.
- Amplitude modulation.
- Flange/wah-wah.
- Smooth/enhance.
- Gapper/snippet.
- Vibrato.
- Distortion.



The Mixer window provides control over the Preview, Master, Bus and Assignable FX faders, while the Video window makes scoring for picture very convenient. Note the envelopes drawn on some tracks, which can be used to control volume, pan or effects send levels.

video footage is a sort of halfway house between using library music selections and composing something from scratch. With a suitable collection of loop CDs, the process can be very efficient, flexible and a whole lot of fun. Tempo changes can, of course, be inserted at key scene changes in the video so that the pace of the music can change to reflect the visual action. *Acid* also provides some tools for automatically calculating the required tempo for a section of the project so that the music will hit specific points in the video playback, thus offering more control over tempo and cue length than would be available when working with library music selections.

Finished Product

Once a project is completed, a range of output options are available. Stereo mixes can be created and, via the Render As option from the File menu, all the essential file formats are supported. These include MP3 audio with an excellent range of options in terms of data compression levels. If you're working with a video clip, *Acid* also offers options to render AVI, MOV or Windows Media Video (WMV) files that combine the original video footage with the *Acid*-generated audio. As with straight audio output, options are provided for compressing the video file, with options to reduce frame size and rate as well as settings designed for the creation of streaming media — all very useful for video to be delivered via the Internet.

Conclusions

Sonic Foundry have made some significant

additions to *Acid* in this release. While its core function remains the mixing and matching of loops via its excellent tempo- and pitch-matching capabilities, with the Beatmapper, Chopper and Video window, they have widened the software's appeal to those interested in remixing and producing music for picture. The addition of MIDI tracks is welcome even if the lack of MIDI editing is a restriction.

Of course, there is competition out there, most notably Cakewalk's *Sonar* which offers a sophisticated MIDI + Audio sequencer as well as *Acid*-like tempo/pitch-matching functionality. However, if you are not an existing Cakewalk user, syncing *Acid* to your sequencer of choice does provide a fabulous combination of creative tools.

At this price, *Acid Pro* will not be a casual purchase for most people. It is, however, a thoroughly professional product and capable of some wonderful results. If you just want to experiment with a few loops, then one of *Acid*'s cut-down siblings would make a good starting point. Be warned, though: *Acid* is an addictive substance and many people experimenting with the starter versions will soon find themselves craving a bigger fix. As serious software goes, *Acid Pro v3* is an awful lot of fun! **SOS**

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Practical Mixing

Hands-on advice to help you improve the fundamentals of your mixing technique.

Hugh Robjohns

Whether you own a simple eight-into-two mixer, or a giant in-line multitracking console, the basic facilities and principles of their operation are the same, and knowing how to use a mixer properly can make the difference between a well-recorded master track and something which is distinctly substandard.

Starting From Scratch

To start at the beginning, always make sure the mixer is 'zeroed' before starting a new project. By that, I mean make sure the input gains are at their minimum settings, the polarity reversals and high-pass filters are switched off, the EQ is set flat and bypassed, the auxiliaries are turned down, and any group routing is deselected. In the case of a digital mixer you could store this as a default memory from which to start

each new project.

With the mixer in this kind of 'safe' configuration you can start to build a mix coherently, without having to cope with unwanted signals turning up in all sorts of strange destinations. There is nothing so frustrating, unprofessional and time-consuming as having to hunt down the source of the strange noises coming from one of your effects units! At least with analogue mixers the offending knob can usually be spotted quite quickly, but with assignable digital consoles it can be a nightmare — hence the importance of always starting from a known safe condition where everything is turned off. I have never understood why the purveyors of digital mixers seem to have a default condition with all the faders open at unity gain...

Gain Structure

The most critical aspect of mixing is getting your gain structure right. This means optimising levels through each part of the signal path so that the signals are kept well away from the noise floor at the bottom, and below the overload point at the top — and it is especially important to allow sufficient headroom to allow peak transients through undistorted.

Something to bear in mind with budget analogue mixers is that headroom is often the limiting factor, especially when working with digital recorders. The relatively low voltage rails provided for the electronics mean that it is simply not possible to output signals with peaks in the +24dBu region often required to fully modulate a professional digital

recorder.

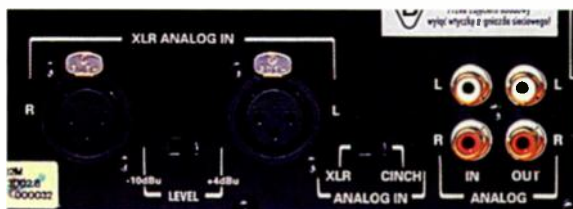
And, just because the mixer's meter is scaled to +10dB and above, it doesn't mean it is able to drive clean signals that loud. It is worth experimenting with your particular mixer to see what it is truly capable of, and aligning the input sensitivity of connected equipment accordingly.

By way of a personal example, I have a Mackie 1402 VLZpro — a very cost-effective little mixer which I use in a compact location recording rig — which drives an Apogee PSX100 A-D converter. Although the specifications suggest otherwise, this desk is not capable of driving the peak levels required to fully modulate a professional digital recorder to +20dBu. However, by re-aligning the Apogee to read +12dBu as the maximum digital signal (0dBFS), the Mackie is never stressed to deliver peak levels and,

Important Monitoring Facilities

In most budget desks the monitor section is the weakest link, often providing only a level control, a headphone outlet, and external monitoring of a master recorder return. A professional desk will have a plethora of external monitoring sources, the ability to drive multiple loudspeaker systems in stereo or mono, and the provision to dim or cut the monitors without changing the setting of the level control.

This last feature is particularly important because, when mixing, your ears develop a level reference based on the listening volume. If you change the monitoring level, that reference will be destroyed, and your mix will be inconsistent as a result. Professional monitoring systems therefore provide Dim and Cut buttons to reduce the monitoring level or to turn the speakers off without affecting the original level setting. It is also important to be able to check the mono balance of a stereo mix, so professional consoles provide facilities to listen in mono (ideally through only one of the speakers).



If your mixer has trouble outputting enough level to fully modulate master stereo digital recorders working at professional operating levels (nominally +4dBu), remember that there is often also the option to input at consumer level, which effectively gives you an extra 12dB of gain.

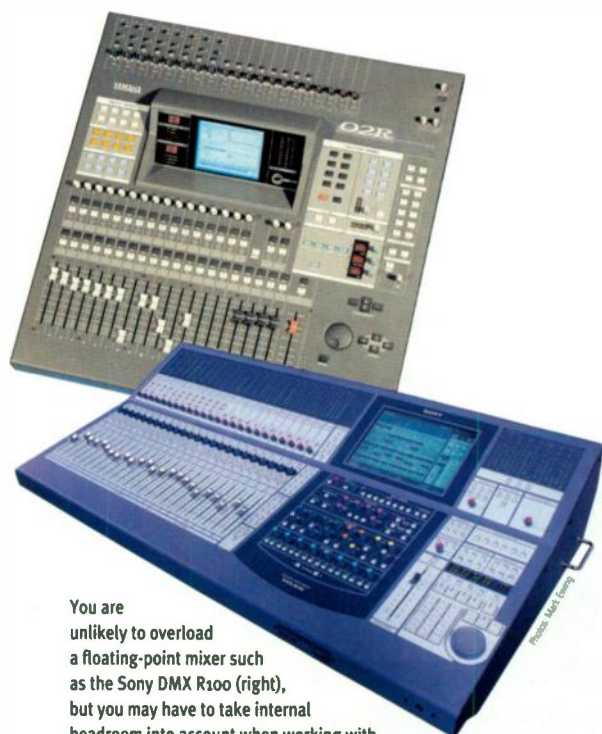
as I only record direct to DAT and CD-R, the noise floor remains sufficiently low for 16-bit performance.

Another workaround I have used on many occasions to avoid stressing a budget mixer is to connect the nominally +4dBu professional-level output to the -10dBV

input of semi-professional digital recorders. This effectively provides an additional 12dB of output gain without running out of steam in the mixer.

Mixing In The Digital Domain

The same fundamental gain structure considerations are also important in digital mixers, although the provision of sufficient headroom is usually far more important than worrying about the audibility of the noise floor. With an analogue system, as you run out of headroom, the amount of distortion builds relatively gradually — some engineers deliberately run their mixers fairly hot to take advantage of the distortion (although few mixers sound nice when driven hard). However, digital mixers don't have headroom of their own — you have to allow for it when you set levels — and the moment you run out of headroom everything sounds extremely horrid.



You are unlikely to overload a floating-point mixer such as the Sony DMX R300 (right), but you may have to take internal headroom into account when working with any desk that uses fixed-point processing.

Digital mixers come in two flavours: fixed point (most budget consoles) and floating point (usually the more expensive consoles). If you want to know more about these terms, check out the 'All About Digital' series which began in SOS May 1998. The important thing to realise is that floating-point designs have a massive internal dynamic range, which means that there is effectively infinite headroom and a totally inaudible noise floor within the mixer. Levels will still have to be managed to ensure the signal sits nicely within the output window of the digital or D-A interfaces, but you can't 'break' the signal while processing within the console.

On the other hand, a fixed-point console will have a finite dynamic range of about 6dB per bit of internal processing resolution. While this can look quite a lot on paper, it is surprisingly easy to run out of headroom if applying a lot of equalisation and mixing a lot of signals together. That is why these kinds of consoles tend to provide digital attenuation just prior to the EQ section. If you are planning to introduce

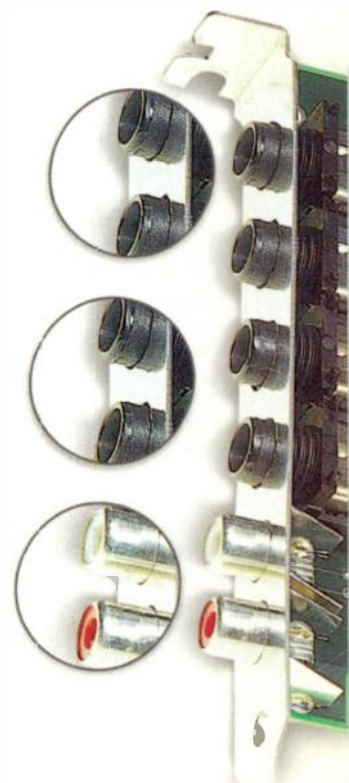
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Martin Walker **SOUND ON SOUND**



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If you mix with the fader levels substantially below the unity gain mark, you won't be making the most of the headroom available. You should always start with faders at unity and adjust the channel input gain controls.

- substantial amounts of equalisation, or if a lot of signals are being combined, think about winding in a few decibels of digital attenuation first.

Getting Your Fader Levels Sorted Out

Whether you're using an analogue or digital mixer, it's designed to operate most effectively with its faders at or near the 0dB or 'unity gain' position (sometimes simply marked with a 'U'). This provides the best compromise between a useful amount of headroom and adequately low mix-buss

noise. So, when setting up your mix, you should open each fader to the unity mark and then adjust that channel's input gain control so that the signal is at roughly the right level for the final mix. Clearly, you won't know what that is for sure, and EQ'ing the signal will affect its level too, but you can usually get it pretty close with a little thought and some experience.

If you have little experience with mixers, a handy tip is that when you have created something resembling the perfect mix with all the faders close to their unity marks, mute all the channels and then audition each

one in turn to see how loud particular sources are in isolation. That way, you will have a good idea where to set the input gains for those instruments the next time.

If, when you come to mixing, you find all the faders are barely off the backstop, or pressed up hard at the top of their travels, you need to re-optimize the channel gains, because you are in danger of either running out of headroom in the channels or suffering unnecessarily noisy signals.

Input Conditioning

Most home setups rely entirely on nearfield monitoring, and the weak or missing bottom octave(s) of such systems can make it very hard to know exactly what is going on in the deep bass region. Vibrations through mic stands, plosive popping and air conditioning or other machinery can all create huge amounts of LF energy which, at best, clutters up the mix, and at worst makes it impossible to create a decent mix at all.

So if in doubt, filter it out! Many desks include switchable high-pass filtering on the mic inputs and some even allow a tuneable filter. After setting the input gain, I routinely flip the high-pass filter in to see if it improves the sound quality or not. At this point it is often also a good idea to apply some corrective EQ cut if it helps clean up

Optimising A-D Conversion

The conversion of analogue signals to digital data is something with which almost all recording musicians will have to contend. If you're using a digital mixer, analogue signals will need to be converted at the mixer's inputs. However, even if you use an analogue mixer, you're still likely to have to convert to digital at the inputs of your master recorder. As a result, it's important to know how to get the best out of the analogue-to-digital (A-D) conversion process — a signal that is badly converted from the analogue domain to the digital domain will always sound bad, irrespective of what digital processing is available to you.

To get the best conversion, you should ideally set the input level to your A-D converters so that the peak analogue signal level is as close as possible to the maximum level accepted by the converter. However, there is often a degree of uncertainty about the maximum peak level of an analogue signal and so some headroom will have to be provided. This is particularly true in live situations where the signal sources



Voice channel processors, such as the Dbx 376 and PreSonus VXP shown here, have become extremely popular as a means to condition analogue input signals for digital recording.

are inherently unpredictable, but even in more controlled studio circumstances the most carefully optimised levels can fall foul of occasional mic popping, for example.

Creating this headroom solves the problem of transient distortion, but introduces two undesirable side effects. Firstly, for every 6dB of unused headroom you effectively lose one bit of digital resolution. With an unprocessed transient-rich percussion track you may well have to provide as much as 24dB of headroom to ensure those transients are captured intact, which means your 24-bit A-D converter is really only providing

20-bit resolution to the main body of the sound. With a decent delta-sigma converter there shouldn't be any problem with this, but with budget 16-bit converters the resulting quantisation noise and low resolution can prove a major headache! The second problem with leaving enough headroom is that noise levels can become a serious problem, particularly if digital gain and compression are applied to compensate for the low overall signal level.

However, there are ways of dealing with these problems. Perhaps the most useful way of circumventing

the need for excessive analogue headroom is to use an analogue 'voice-channel' processor to condition the signal — at least partially — prior to conversion. In this way the dynamic range can be brought under control and the peak-to-average level optimised more effectively before the signal reaches the A-D converter, providing a better sound overall and generally making life easier in the digital domain. The huge number of voice channels available on the market indicates just how popular this approach is at all levels of the music recording industry.

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World Radio History



If your mixer has dedicated stereo effects returns then it saves you having to use fully-featured input channels for this purpose.

► any acoustic spill. For example, if you have a number of microphones in close proximity — such as around a drum kit — there will be a lot of spill between them. Just make sure that any EQ you're applying to sort out spill problems doesn't detract from the wanted signal unduly.

Another thing that can help with spill is judicious use of the polarity reversal switches that are provided on most mid-price consoles. However, this facility is mostly used to find the most suitable sound where any instrument has been captured using several recording methods simultaneously.

Setting Up Your Effects Sends

Even the simplest mixer usually provides one or more auxiliary outputs as well as the main programme output. You can use these to send signals to external effects units — delay, reverb and modulation processors in particular — while mixing down. Auxiliaries are always equipped with a level control, often a pre/post switch and sometimes an on/off switch too. The pre/post switch determines where the auxiliary signal is derived from in the channel signal path — either before or after the channel fader. For mixing purposes, you'll probably want to switch these to post-fader, so that if you fade out the source it's effects processing disappears as well.

Obviously, if you're sending to an external effects processor, you'll also need to return the processed signal to your mix. Many desks have dedicated effects returns channels, but if yours doesn't have any (or not enough) you can always use any spare mixer channels instead.

Working In Stereo

A lot of sources are stereo these days, including drum machines, keyboards, turntables and so on. Ideally, you should bring these sources into the mixing console through a dedicated stereo channel — most desks provide at least a few these days. The advantage of a stereo channel is that there is only one gain control, one fader to push

and pull, and only one set of equaliser knobs to twiddle. If there are only mono channels in your desk, you will have to plug the left signal through channel one, say, and pan it hard to the left, while plugging the right signal through channel two, panning it hard right... and now you have two input gain controls, two faders and two sets of equalisation to worry about.

Why is this important? Well, the position of a sound in the stereo image is essentially governed by the relative loudness of the signal components in the two channels — a pan control takes a mono signal and allocates part of it to each channel, the relative proportions producing the required image location somewhere between fully left and fully right. In the case of a stereo signal, the stereo positioning of the instruments it contains is already defined — that is why it's stereo. If you are running this through two mono channels and they are not perfectly matched in terms of their gain and equalisation, the imaging will be offset to



It may not be the most elegant solution for linking two faders into a stereo pair, but it does work!

one side or the other. In the case of a mismatched equaliser, the image will pull in

Just because the mixer's meter is scaled to +10dB and above, it doesn't mean it is able to drive clean signals that loud. It is worth experimenting with your particular mixer to see what it is truly capable of, and aligning the input sensitivity of connected equipment accordingly.

different directions at different frequencies.

The only solution is to take great care in making sure the two channels are matched as closely as possible. Matching input gains is fairly straightforward, particularly if you can temporarily send a mono signal from the stereo source (use a mono record or CD, for example, or play a mono instrument sound without effects, rather than a stereo sound, from the keyboard).

When it comes to EQ, you just have to try to set the positions of both sets of EQ knobs to the same values and then hope for the best.

Listen carefully to the stereo image and make sure you are happy with it once you

Working With Effects

The most common problem for anyone new to mixing is deciding how much reverberation to add. *Sound On Sound* has carried many articles in the past on using reverb — particularly on selecting and fine-tuning the available programs of specific digital reverb machines. The idea of adding reverb is create the illusion of depth, adding a second dimension to the mix. In real life, the closer you are to the source, the stronger its direct sound will be in relation to the room reflections. The greater the room size, the longer it will take for those reflections to arrive, and the harder the surfaces, the denser the reverberation tail will be. Armed with these simple concepts, it is possible to modify the parameters of most reverb units to create believable acoustic spaces which will complement your music.

The thing always to bear in mind is that reverb will tend to clutter the mix by filling in the gaps between instruments, both in the time and frequency domains — particularly if long decay times are used. Try to create the room sound you want just through the levels, density and timing of the early reflections, adding a sufficient decay to sound natural, but without it becoming intrusive. If you have more than one reverb machine available, use different programs to create different acoustic dimensions and more interest in the mix.

In terms of balancing the reverb levels against the rest of the mix, the most useful advice I can give is to fade the reverb return up until it sounds about right, then back it off by about 4-5dB. This rule of thumb tends to cure the typical problem of having too much effect in the mix.

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- have everything lined up as best you can.

Of course, once the gains and EQ are set, you probably won't want to mess with them again during the mix, but you will still be riding the faders up and down. This is where most people come unstuck, because if one fader is moved a smidgen more or less than the other, the stereo image will wander.

To help reduce the likelihood of an unstable stereo image, you need to couple the faders mechanically. Companies like Canford Audio and Studiospares in the UK can supply clear plastic clips which fit over the two knobs, effectively locking them together. These are supplied to fit over different-shaped fader knobs from different manufacturers, and span different widths, so you will need to check out your specific requirements before ordering. A cheaper, though admittedly less attractive, option is to link the fader caps together using a short pencil and some ordinary sticky tape... Whichever solution you choose, make sure the link doesn't foul any routing buttons which may be positioned between adjacent faders.

Vibrations through mic stands, plosive popping and air conditioning or other machinery can all create huge amounts of LF energy which, at best, clutters up the mix, and at worst makes it impossible to create a decent mix at all. So if in doubt, filter it out!

Starting Work

There are several different approaches to mixing, but most people like to start with the rhythm section, building the song up from there. Just to be contrary, I often work from the opposite direction, starting with the most important element of a pop song — this will usually be the lead vocal track — and then filling in the countermelody instruments and supporting sections as necessary. It is often easier to make sure the peak levels stay under control by working this way. Starting from the bottom and

Referencing Your Mix

It is very easy to lose your way when starting out in mixing. Your attention is continually being drawn in different directions, concentrating on the different instruments and voices. This makes it very easy to become bogged down in the detail of the mix, rather than its overall balance. You also have to consider the general tonal balance of the mix and how it compares to commercial tracks of the same genre.

One way to create and maintain a reference on which to base your mixing decisions is to listen to examples of similar music released commercially. Playing suitable music CDs through the same monitors in the same listening environment will help establish the all-important sonic reference with which you can judge your own mix. Listen critically, and form opinions about both the spectral balance and the relative levels of different instruments. You may also be able to come up with some good ideas for reverb and effects settings, and maybe even a few production ideas!

Another trap to be wary of is that of ever-escalating listening levels. In general, the louder your monitoring level, the less accurate your perception of balance will be. This is because it is easier to hear detail in quiet elements of the mix when the whole thing is very loud. Turn the volume down to a more normal domestic listening level and the quiet bits will be completely lost! Far better to set a comfortable listening level with your reference music sources (which may be a little louder than a domestic level, but not too much), and then try to balance your mix at the same level. It is a little harder to do, but you will get better, more transportable results, with less ear fatigue and happier neighbours...



working upwards can often lead to a final mix which peaks significantly higher than intended.

Again, a popular approach is to start mixing with everything panned to the middle, and to start panning sounds to create a stereo stage only when the mix is roughly right. The drawback is that if you pan a sound close to either side, its level will fall by nearly 6dB relative to its level at the centre, which is enough to completely upset the balance. Consequently I find it quicker and easier to pan sounds to their appropriate positions in the stereo sound stage before attempting to build the balance.

It is important to keep checking the balance in mono as well as stereo (or surround) — particularly if your material may end up on the radio. Inevitably the mono mix will sound different to the stereo (and the stereo to the surround), so a degree of compromise will be required to achieve the most acceptable results in each format.

Pay particular attention to reverbs, which have a habit of drying up when you listen in mono.

At the mixdown stage, equalisation can be used to help instruments retain their individual clarity. I find that cutting unwanted frequencies generally sounds more natural and subtle than boosting wanted frequencies in this case. Whatever settings you choose, make regular use of the EQ bypass button to make sure you really are improving the situation and not just making everything sound loud and bright.

You Live, You Learn

The skills required to create a great mix don't come naturally to most musicians, and there are a lot of potential pitfalls for the beginner. However, if you take the time to practise the above mixing techniques, with a selection of reference CDs close at hand, you should be able to keep yourself heading in the right direction. **505**



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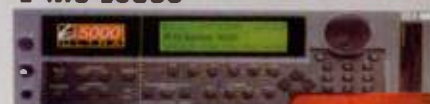
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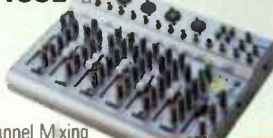
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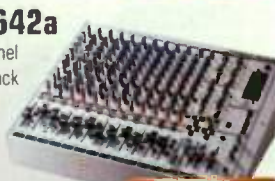
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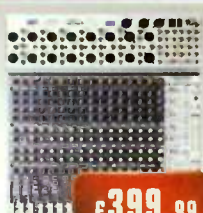


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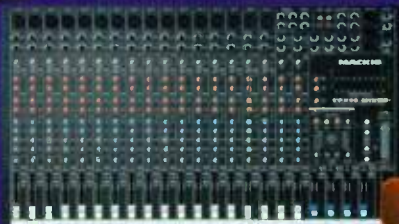
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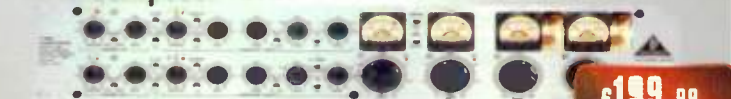


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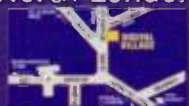
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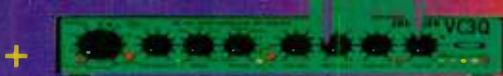
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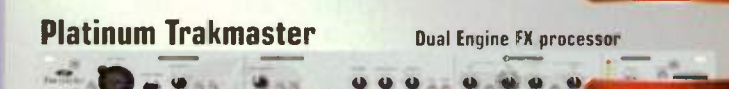
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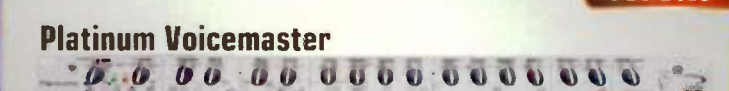


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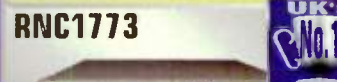
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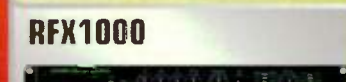
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STABILITY: Powered by Intel Pentium IV CPUs and Intel chipsets.

NOISE: If a computer is going to be used for music it must be quiet. DV PCs use only high quality parts like noise killer power supplies and Molex Silent CPU fans.

PRICE: Using our buying power as the largest recording studio retailer in the UK, we can keep the prices lower than anyone else and not by just tens of pounds but often by hundreds.

SYSTEM SPECIFICATIONS:

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56K V90 Modem

MP401 Midi Interface
512Mb 133MHz SDRAM
Intel Pentium IV 1.5GHz

40Gb ATA100 7200 RPM H/D
Sony 12/8/32 CD-RW
19" SVGA Monitor (beige)

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Windows ME License

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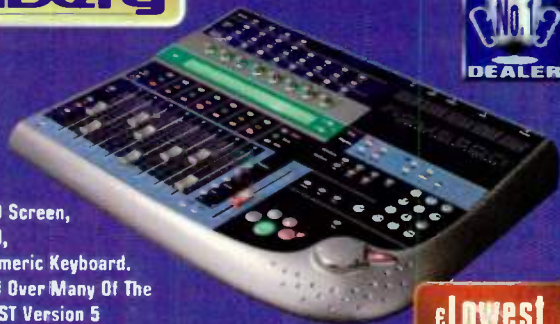
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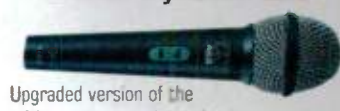
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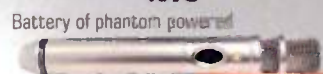
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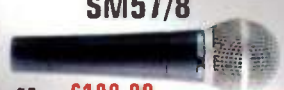
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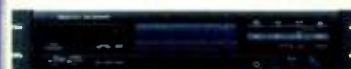
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Apogee Trak 2

Hugh Robjohns

Apogee are virtually synonymous with A-D and D-A converters. In fact the company's pedigree dates right back to the start of the digital age in the early '80s, with the manufacture of replacement and OEM anti-alias and reconstruction filter stages. However, although the new Trak 2 retains the large silver buttons and purple livery which have come to define the Apogee brand style, it is far more than just another converter package. And whereas countless companies have produced mic preamps of varying sophistication with integral digital outputs, Apogee have approached the market from the opposite direction, creating a flexible digital converter (with up to eight internal signal busses) incorporating a versatile mic preamp.

SOUND ON SOUND

Apogee Trak 2 £3108

pros

- Very clean mic preamp.
- Mic and high-impedance guitar inputs on front panel.
- Soft Limit and Soft Saturate useful and effective.
- Apogee converters.
- Useful modularity and configuration options.

cons

- No front-panel headphone volume control.
- Lots of button pushing when setting up.
- No stereo linking of conversion and signal-processing parameters.
- A price in accordance with a seriously professional piece of kit.

summary

A high-quality front-end for any professional DAW or other digital recording environment. Excellent flexibility in both set up and customisation through optional interface modules. Useful as independent or integrated analogue preamp, A-D and D-A stages.

Apogee have an enviable reputation for their state-of-the-art digital converters, but their new Trak 2 also includes sophisticated mic preamplification.

Mic Preamp & A-D Converter

Trak 2 Facilities

The front panel is wonderfully simple, because the unit is controlled entirely through a graphical user interface presented on a 240 x 66-pixel backlit LCD panel. The on-screen menus are navigated and adjusted through the familiar and intuitive paradigm of an encoder wheel and a quartet of cursor buttons. Two further buttons may be user-programmed to access directly the two most frequently required menu pages. The two remaining buttons switch the power on and off, and configure the metering. The latter, located under the bar-graph meter, resets the peak-hold LEDs and, if held depressed, switches the metering to provide a useful stereo phase correlation display.

Two rows of five LEDs to the left of the bar-graphs provide clear indication of the current status of each input channel, with lights for (analogue) input clipping, phantom power, polarity reversal, insert mode (see below), and auxiliary inputs. The level meters normally span a 50dB range, with separate Over lights, but there is also a ± 1 dB mode to enable precise level calibration. Various meter responses may be selected, including peak reading, or combined peak and average reading. Metered peaks can be held for two seconds or until reset.

It is hard to pigeonhole the Trak 2, because it can be used in so many different applications, with a wide range of optional interface cards — every owner will probably find a subtly different way of using it. For a start, it can serve just as a high-quality

dual-channel mic preamplifier with analogue outputs, or as a high-impedance DI box providing balanced line-level outputs from electric guitars, for example. The A-D stage can be used entirely independently too. Alternatively, it can be used as complete recording channel to feed a mic to a digital recorder.

Although there is a dedicated D-A converter built in for feeding a monitor headphone socket on the front panel, the standard Trak 2 does not contain a high-quality D-A stage. However, there is provision to install either a stereo or eight-channel D-A if required — and this can be used independently of the rest of the package too. The other user option is to install up to two AMBus cards (see the 'AMBus Options' box for details), which allow the Trak 2 to take on the role of a digital format converter or a complete I/O interface for a digital audio workstation. A sample-rate converter card is also planned for the future.

Onboard digital signal processing is available in the form of Soft Limit and Soft Saturate functions (although only one of these is available at a time). The Soft Limit can be used to protect against transient overloads and thus extend the effective headroom, while the Soft Saturate (reintroduced from the old AD500 system) emulates tape-saturation or valve 'warming', which may be useful during tracking.

The Trak 2 would also be useful in mastering applications, not only as a high-quality converter, but also by using the

APOGEE TRAK 2

- Soft Limit function to provide a few decibels of extra loudness. In addition, the UV22HR bit-reduction algorithm — highly regarded throughout the mastering industry — allows high-resolution 24-bit recordings to be reformatted for 16-bit media whilst retaining most of the low-level information.

Finally, the stability of Apogee's crystal-based word clock is such that the Trak 2 can also be used as a master clock source to improve the performance and resolution of connected budget digital equipment. It can even synchronise word clock to a video reference with the optional video-sync card installed, making the Trak 2 an ideal component in small video post-production areas or in studios involved with music for picture.

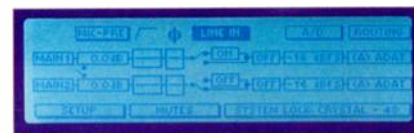
Incidentally, Apogee have also just released some bespoke software for Mac computers, which allows full remote control of the Trak 2 using MIDI via the OMS protocol. This software also allows storage and recall of Trak 2 parameters, and any operating system updates can be downloaded to the machine. However, at this point I have to admit to being entirely PC-based, so I wasn't able to try this out.

However, by selecting the Insert mode (indicated by the front-panel Ins LED), a separate pair of rear-panel Line Input XLRs are routed to the A-D converter instead. These line inputs can be configured in the relevant menu page for either +4dBu or -10dBV levels, and allow the mic preamp to be used independently of the converter, or some external compression or EQ to be applied to the mic signal prior to conversion, using the send outputs and line inputs as insert send and return.

The converter technology is derived from that used in the PSX100 and Rosetta, which I reviewed back in SOS November 1999. Both standard and doubled sample rates are supported, to 24-bit resolution. The A-D output is presented via one XLR connector, although the signal is software controlled for either professional (AES-EBU) or consumer (S/PDIF) data formats, and internal jumpers configure the electrical format (impedance and voltage levels). This digital output supports single-wire operation for doubled sample rates.

In addition to this main digital output, the two AMBus sockets can accommodate various

Tascam wiring standard. With the two-channel D-A installed, pairs of digital inputs (or the A-D signals) can be selected for D-A conversion. With the eight-channel version installed, eight digital inputs can be monitored simultaneously, although any pair can also be substituted for the A-D inputs, if required.



On The Menu Tonight...

When the system powers up, the LCD shows a status graphic, detailing the functional blocks of each channel of the mic preamp, A-D and output routing. Above the main block diagram you can access submenus to configure advanced preamp functions, line input, A-D and routing, while below the graphic are further panels to access the global setup menu, mute functions and clock reference (the current sample rate, reference and status also being shown). Using the cursor keys, any of these graphical boxes can be highlighted,

whereupon pressing or rotating the encoder wheel will either open a submenu or change its current value or status, as appropriate.

There are currently sixteen parameter pages

accessible from the global setup

menu. They are largely self-explanatory and easy to use, although there are some interesting points worth noting. In the clocking menu, for instance, internal sample rates can be selected from 44.1, 48, 88.2 or 96kHz, and the word-clock output can be set for normal, x2 or x256 (Digidesign Super Clock).

The mic preamp menu provides additional functions not available on the status display, including input pads, phantom power, and 'Gain Ride Mode'. The Trak 2 employs internal relays to set the gain in ranges, thereby optimising the noise and distortion performance for any given signal level. However, this means that there is sometimes a brief mute or click when switching across ranges. In situations where it may be desirable to continually adjust the gain, perhaps during vocal tracking for example, this is unacceptable, so Apogee have provided the GRM mode, which fixes the analogue gain structure at its current setting, and adjusts the gain in the digital domain instead.

The A-D menu allows the digital headroom to be established by setting the equivalence between +4dBu or -10dBV analogue input levels and a digital reference from -10 to -20dBFS. There is also an automatic calibration facility where the machine will



The rear panel of the Trak 2 with the optional two-channel D-A converter and ADAT8 AMBus card installed.

Connections & Control

The mic preamp section contains all the facilities you might reasonably expect. Phantom power is switched independently on each channel, and with a 'Mic Protect' mode that turns phantom power off automatically whenever a mic is disconnected from the unit. This is intended to afford protection to mics that don't require phantom, or which can be damaged by it. The remaining preamp features include polarity reversal, a 20dB pad, high-pass filtering (at 40Hz or 90Hz) and variable gain up to a massive 90dB! The step size for the gain control can be set between 0.5 and 4dB, the default being 1dB. A Channel Link facility synchronises setting changes between the two mic preamps and the mute ramps up and down to avoid clicks.

In addition to the rear-panel XLR mic inputs (which will also accept line levels if required), there is a pair of front-panel Aux combi jack/XLR inputs, the jack socket being optimised for high-impedance guitar pickups. Balanced line-level send outputs are provided via two more XLRs on the rear panel. Under normal circumstances the signals reaching these send outputs are routed internally through to the input of the A-D converter.

optional bi-directional eight-channel digital interface cards. The eight digital outputs from each AMBus card can be assigned from any of the two internal A-D signals and (potentially) sixteen digital inputs, through an internal router. These outputs can be bit reduced with UV22HR on a fully independent basis, although the resolution (16- or 20-bit) and either the 'normal' or 'low-level' mode are set globally. The low-level mode is intended for use when the signal may end up passing through the UV22HR process more than once.

Although the unit contains a very accurate internal crystal clock, word-clock I/O is provided on BNCs adjacent to the main digital output, and a video-sync board may be installed if required to enable synchronisation to an external video reference, (connected via the word-clock input socket). The unit can also be synchronised to one of the two AMBus interface cards. A 15-pin D-Sub connector forms a serial communications port, and a special lead supplied with the unit provides MIDI in, out and thru connections via this port.

The optional two-channel D-A converter uses XLRs for its output connections, but the eight-channel version employs a D-Sub connector conforming to the ubiquitous

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APOGEE TRAK 2

- align itself to a calibration tone at its input. The D-A submenu provides similar facilities for automatic output level alignment.

The ASP menu controls the 'analogue signal processing', meaning the Soft Limit and Soft Saturate functions. The Soft Limit facility is calibrated in terms of how much 'extra' headroom can be expected, from 2dB to 10dB, followed by the witty 'more' and 'oh man!' levels. Similarly, the Soft Saturate mode provides nine degrees of 'warmth', four of 'limit', the original AD500 characteristic, then five degrees of 'crush'. Four further saturation levels are called 'raiatone', 'van der fuzz', 'distortobob' and 'sqrwavdave'. The Soft Saturate system works by accentuating the even-order harmonics, and also by compressing the negative half of the signal waveform more than the positive half — a characteristic of many valve circuits.

The handbook talks about being able to adjust the threshold for the onset of saturation, but I was unable to locate this facility. Since the review model flash software was the current version 1.77, I presume this is an error of the handbook rather than a fault in the machine. However, I did discover a small software bug — rotating the shaft encoder quickly when cycling through the Soft Saturate options often resulted in a spurious number being displayed, rather than the appropriate Soft Saturate mode, although this didn't cause any practical problems. Having brought up the subject of things not being entirely perfect, I would like to mention the absence of a headphone volume control on the front panel. The level has to be set in one of the submenus and, although you can set up one of the user buttons to access the relevant page, a knob would have been a lot more practical.

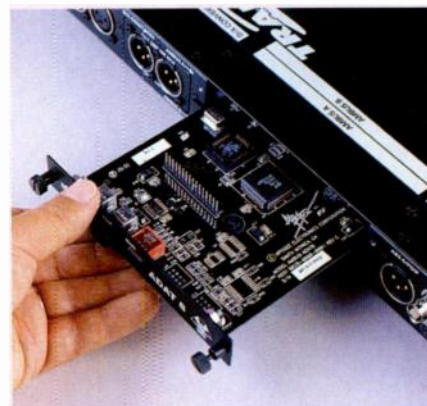
On The Job

Using the Trak 2 is a mix of joy and frustration. Overall, it is very easy to use and works well, with a very neutral, quiet mic preamp, and high-resolution converters. However, the menu-driven interface does require a great deal of button pressing when setting the unit up for the first time, and the stereo linking facility only applies to the mic preamp settings and doesn't extend to the signal processing or line-selection functions. I can see why Apogee have chosen to isolate the mic preamp facilities from the rest of the machine, but would have thought a second stereo link switch would have been useful. For example, trying to arrive at the optimum Soft

AMBus I/O Options

The three most obvious AMBus interfaces are probably the ADAT8, TDIF8 and AES I/O cards, all providing eight digital inputs and eight digital outputs — in Alesis ADAT, Tascam TDIF and AES-EBU formats respectively. The ADAT card is fitted with the familiar Toslink optical connectors, while the other two employ D-Sub connectors. I got to check out the ADAT8 AMBus card, and it performed entirely as expected, configuration switches being used to set up bit-splitting modes (to allow 24-bit data to be recorded on 16-bit machines) in much the same way as the equivalent facility in the PSX100.

There are currently also four other interface cards and more are planned for the future. Three of these cards are pretty specialist, but extend the appeal of the Trak 2 into areas not previously addressed in such a direct way. The first card of this group is an SDIF interface, designed to link with Sony digital multitracks or 1630 CD-mastering machines. A FiberDX card provides a high-quality optical interface which caters for



long-distance fibre-optical connections (up to 5km, apparently). Finally, the Digi8+ card provides a full eight-channel bi-directional interface which integrates fully with any Pro Tools system, removing the need for Digidesign's own interfaces.

Limit setting when mastering a stereo source is rather tedious, as each channel has to be adjusted separately.

Although there are no published specifications for the Trak 2 in terms of noise performance and so forth, it certainly sounds very quiet and clean, even with substantial amounts of gain. In fact, with 90dB of gain on offer, the Trak 2 can accommodate any

"...with 90dB of gain on offer, the Trak 2 can accommodate any microphone in virtually any situation."

microphone in virtually any situation. The high-impedance input works well with a range of acoustic and electric guitar pickups too, and there is plenty of sensitivity for any source. The Soft Limit function is remarkably effective at trapping transient signals, and the Soft Saturate can be used to enhance the signal with everything from a very subtle warming through to a fairly grungy edge — something for every taste and source.

One word of warning — if the automatic A-D calibration is activated without a suitable reference-level signal available at the line inputs, the machine will align itself incorrectly and, as a result, the A-Ds may well appear to be appallingly noisy and distorted. I made this mistake myself, but, after repeating the calibration with a proper test tone on the line input and then recalibrating the converters, I was able to obtain results which were indistinguishable from my own reference Apogee PSX100 system.

The Trak 2 is a big and fairly heavy unit

despite being only 1U high. It extends a considerable 360mm or so behind the rack ears and I would suggest some rear support in the rack would be a good idea! The handbook recommends leaving a half-rack gap above and below the machine for cooling, which makes sense as I found that it can get pretty warm after a full day's work. This is despite a large area of (purple) heat sink on the left-hand side and an internal forced-air cooling fan which is, thankfully, extremely quiet.

Overall, I am very impressed with the Trak 2 and I can overlook the occasional software bug and the menu-driven operating system.

By allowing the owner to specify much of the machine's functionality with the optional stereo or eight-channel D-A cards, eight AMBus interface cards, and the video-sync option, the relatively high UK price can be justified by spending money precisely where it is needed. This is a unit which really can claim to be all things to all people, and if you are seeking a very high quality front-end for a high-spec digital system, this is where you should start looking. **SOS**

Test Spec

Apogee Trak 2 OS v1.77

information

£ Trak 2, £3107.88. Optional D-A conversion cards: two-channel, £411.25; eight-channel, £934.13. Optional AMBus cards: ADAT8, £411.25; TDIF8, £411.25; AES I/O, £581.63; FiberDX, £411.25; SDIF, £581.63; Digi8+, £464.13. Prices include VAT.

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Industry Pros Pass Judgement On Your Demos

Tom Flint

Breaking into any part of the music industry is notoriously difficult, so it pays to be armed with a demo that presents your music to its very best advantage. The demo is likely to be the first exposure an A&R representative or manager will have to your music, so it's important not to blow your chances by offering one that is an instant turn-off. Of course, producing the perfect demo is far from easy...

The best way to find out what industry insiders look for (and want from) a demo is to ask them directly, so *Sound On Sound*, with the assistance of the Music Producers Guild (MPG) and The British Academy of Composers & Songwriters (BACS) gathered together a panel of industry professionals (see 'Meet The

What would a panel of successful producers, songwriters, musicians and management think of your demos? Some SOS readers are about to find out...

Judges' box) who were prepared to spend an evening listening to a few of the demos sent in for appraisal in our Demo Doctor column. The senders of the demos were not aware that the panel would be listening to them.

We asked the panel to provide us with their honest reaction to every aspect of the demo package, including the artistic content, production values and presentation. We made sure that our professionals included songwriters, musicians, producers and a manager, so that a range of opinions would be represented. The MPG and BACS judges were assembled at Hear No Evil studio in

London (thanks to Steve Parr), where we emptied the bag-load onto the table and let them pick out the demos that caught their eye. All the recordings were fed through the same sound system and several tracks from each submission were given a hearing. This is what they had to say about six of them...

Adrian Blau

Recording Venue: Rehearsal space.

Recording Equipment: TEAC half-inch 8-track, Yamaha PM1000 16-channel mixer, Shure SM58,

Meet The Judges: The SOS Demo Panel



Producer Steve Parr at his Hear No Evil Studio, the venue for the SOS demo panel session.

STEVE PARR

Steve Parr is a producer, engineer, composer and expert in 5.1 surround, having mixed over a thousand surround tracks in the course of the last four years. Together with partner Sharon Rose, he owns recording studio Hear No Evil, (www.hearnoevil.net), which specialises in film and television soundtracks. Steve is a Director of The Music Producers Guild.

TONY PLATT

Over the last 30 years, Tony Platt has engineered and produced albums by some of the biggest names in music, from rock to reggae. Tony cut his teeth engineering Bob Marley and The Wailers' *Catch A Fire* and *Burnin'* albums, before going on to engineer for Robert John 'Mutt' Lange on AC/DC's 16-million-selling album *Back In Black*. Tony is now involved with a multimedia company, DAT Productions, alongside his work as a producer and engineer.



JONA LEWIE

Award-winning songwriter, musician and producer Jona Lewie began his career back in the late '60s, when he played with Arthur Crudup during the British blues boom. He has had numerous solo

worldwide hits, most notably with 'You'll Always Find Me In The Kitchen At Parties', 'Seaside

Shuffle' and the perennial Christmas favourite, 'Stop The Cavalry', for which he won an Ivor Novello Award. Jona operates his own studio facility and is a member of The Music Producers Guild.

ANDY EAST

Andy East, a former engineer/session player, is Managing Director of a London-based Artist Management/Consultancy company called Hip-Hop Cow. He regularly attends and chairs industry panels and seminars for a number of clients, including The British Academy of Songwriters & Composers (BACS). He is also a consultant for several record labels in Europe and the UK. Andy is a Director of The Music Producers Guild.



JASON YARDE

Jason Yarde is a freelance composer, arranger and saxophonist, active in both music and contemporary dance. Most recently he has worked with Jonzi-D, The Mighty Diamonds, Eardrum and the big bands of McCoy Tyner, Roy Ayers and Manu Dibango. He has produced a number of albums for Dune Records, performs with many London-based bands and has toured extensively with his own group, J-life.



SM57, Tandy PZM, Sennheiser, Shure Beta 87 and AKG 414 microphones, ART Tube compressor and Tube MP preamp, Alesis ADAT XT digital 8-track, Creamware Pulsar soundcard, Sonic Foundry *Sound Forge* software, Steinberg *Wavelab* software, Steinberg *Cubase VST24* sequencer, JBL active monitors, Antares Mic Modeller, Boss DD5 and EQ pedals.

Andy East (AE): "This is a classic — he's put a label on the CD itself but there's no details on the label. Somebody might pick up the CD, not the jewel case, and the info's not on the

Adrian supplied a CD demo of diverse, mainly rock-orientated compositions featuring some breakbeat-style rhythms, as well as live drums, electric guitar work and samples. The CD kicks off with an instrumental but also includes songs, and is not accompanied by detailed band information but has attractive artwork.



CD, and the CD can easily get separated from the case."

Steve Parr (SP):

"It's not particularly to my taste. Sadly a bit irritating, but interestingly it was at least twice as loud as the previous CD we heard, so it

has been finalised or they've just been a bit more careful. And the recording quality was actually quite good."

Jason Yarde (JY): "I think I was led astray by the first track. I was quite into the first track but the rest was different — possibly too different. I guess that the point of the demo is to roll people in with the first track. But if the other tracks were more of the artist's vibe, it would make sense for them to come clean.

The first track was that broken-beat drum and bass thing. It was quite grungy and instrumental, whereas the other tracks were more like a guitar band. I'm not saying that's a bad thing, but the styles are like chalk and cheese."

AE: "The recording was much better than the first CD we heard tonight, so they do seem to have given some thought to the recording process, but at the end of the day the songs need to be there. I think they need to do some work on their song construction and arrangements. Also, I didn't think the songs were great lyrically. There's no consistency between the first track and the other tracks, and I don't think it's that original. It reminded me of things like the Velvet Underground."

Jona Lewie (JL): "I quite like the loop and the drums in the first track, and the song had the right length to it and started to fade before it became boring. The second one had the surprise element of vocals which didn't come in the first one. It reminded me of Elton John's *Funeral For A Friend*, where the first track is all instrumental and on the next track you've got vocals, so I thought, 'oh, nice.' But then it became too reminiscent of Bowie and

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► the Velvet Underground. The third track suggests to me that the style is just a little bit too personalised and inward."

SP: "The artwork is very attractive. I don't know how they've created the writing on the box."

Tony Platt (TP): "One of the things that seems important to me is having a little bit of an understanding of what you are doing it for. If you're making a demo you're trying to get somebody interested in investing in your music, and what they're going to need is a load of information. That cover artwork is absolutely stunning, but it is for a fan, or people you're going to sell to and are hip to your musical style. You're not going to get people to invest in that concept until further down the line. We needed more information at this point."

SP: "Is there a letter with it?"

TP: "No, I don't think there is. I thought the first track showed promise for about 20 seconds and then it lost me. The sound was really refreshing and crisp, and there was a great intro, but it didn't really go anywhere structurally. If you throw away the concept of song construction, you've got to put something else in its place. If you don't do that, all you've got is a bunch of sounds that anybody can make. The difference nowadays is that because there's so much gear available for anybody to go out and buy, it means you've got to up the game."

"There's something in there, a little spark, but once it had my attention, I wanted it to entertain me, and it didn't."

Slate Pipe Banjo Dragers

Recording Venue: Unknown.

Recording Equipment: Roland VS840 digital 8-track, Lorenzo & Bontempi 5 keyboards, toy accordion, Watkins Copicat echo, Roland TR505 drum machine, Evans EP100 echopet, Coloursound Theremin, Burmese Mandolin, Kenyan drum, baby-minder intercom, Voice Changer toy megaphone, Yamaha compressor, Boss distortion pedal, Sony ECM717 and FV7 mics, castanets.

JY: "I'm quite impressed that someone recorded this on a VS840. The songs were almost making me feel it was an album rather than just a demo. But if I was listening to it as an album I wouldn't quite be content. A bit of editing might be necessary."

TP: "They're a lo-fi experimental outfit but they want a deal, and there's a contradiction: 'lo-fi experimental outfit' means that you've got a minority audience which you can distribute to around the Internet and by



mail-order. The moment you move out of that genre you are no longer lo-fi and experimental — you're a commercial mainstream artist, and the two things don't work together."

AE: "Don't you think there's a common confusion between what is lo-fi — something to distribute to your fan base via the Internet or through your gigs — and what is commercialism? There are some great ideas going on and great uses of weird and wonderful instruments like theremins and vicious old tape echos, but if they're looking for a deal the question is 'who is going to sign that?' You might as well release it yourself, and maybe pick up a deal with a small distribution company who'll get it out to the people who are looking for that sort of material."

JL: "I like the name, suggesting all sorts of interesting things — it's terrific. At the moment the music sounds like it's underground, but I can imagine them coming up with some really good dance tracks if they develop. They've come up with good ideas, but each track seems to contain one, so the end of the track is the same as the beginning. The third track, however, did seem to have more than one idea and was very interesting. I don't know if they realise where they're going yet themselves, but in time they might. I think they're just doing their thing and are really into it."

JY: "There is a big underground scene in Stoke Newington [where the band are based] for improvised electronic jazz. That seems to be their bag, but if they want a deal they are going to have to make some sort of move."

TP: "If you want someone to give you a deal, it comes back to this investment factor. If you want investment, you cross the line from being just in a nice creative flux to a entering into a business transaction of some description. If somebody is going to invest, they are going to want some return, so you've got to give them some potential for doing that."

AE: "They could be one of those bands that somebody in advertising — say, Saatchi

This well-presented CD has a lo-fi, experimental feel based around what seem to be heavily processed samples and noise loops. The artwork looks professional but there is little personal information about the band.



— picks up on and decides that a track is great for the next Levi's advert, but it's that pure hit and miss thing... I don't know if they could sustain it in a commercial situation."

SP: "The bottom line is that we all actually quite liked it, but is it down to marketing? If it was marketed as a contemporary minimal classical album it might fill the halls!"

TP: "It wasn't pretentious, and for it to get a deal in that direction it would probably have to be a bit more pretentious, which might mean we didn't like it so much but they'd make a load of money out of it. They've got to decide."

The Mild Mannered Janitors

www.mildmanneredjanitors.com

Recording Venue: Unknown.

Recording Equipment: Akai DPS16 digital 16-track, Korg D8 digital 8-track, Roland JV35 keyboard, Tannoy Reveal monitors, Lexicon Alex digital effects, Steinberg Cubase VST MIDI + Audio sequencer; Sonic Foundry Sound Forge software, Steinberg Wavelab software, Sony DAT recorder, Sony MDS JES10 Minidisc recorder, Phillips CDR870 CD recorder, Fender Stratocaster electric guitar, Ovation acoustic guitar, Yamaha acoustic guitar, Marshall Valvestate V80 amp, AKG mics and ART tube mic preamp.

AE: "I thought the songs were quite weak. There were some interesting ideas, more so in the first track than the others, but they weren't complete songs for me. I don't think they've thought very hard about their song construction. They weren't good songs that made me want to go back and listen to them again. It strikes me



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PHOTO: STEVE SESKIS
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Please find enclosed a copy of the latest offering from Serotonin.

Previously reviewed in the December 1999 issue of Sound on Sound. All come a long way since then.

The current incarnation of the Serotonin line up is Colin McKee and Adrian Bristol and are currently looking for a break. The ideas and preparation live audio and visual extravaganza often far out-way our bank balance. A readers find

Recording location: Home

Recording equipment:

Roland 2 x MC202's
MC303
SH101
SH09
Juno 60
Boss SE70
Akai DPS12
Mackie 1202
Lexicon Vortex
Behringer Composer
Behringer Ultraflex 2
Yamaha RM1X
Alesis SR16

We'd appreciate it if
sarcasm! Anything re

Serotonin go for simplicity with their package, which is clearly intended as a demo/taster rather than an independent release, being presented in a clear plastic sleeve with no artwork. This rhythm-based, electronica-style, three-track CD was accompanied by a simple, straightforward letter giving just sufficient band background.

Steve Parr: "Everything I've heard so far tonight could have benefited from an experienced producer."

Kraftwerk, apart from the choice of snare drum, which I felt was very out of place. They need to mix better. The second track was going into the trance area, but it needs to go further and be more developed. Then I could see it being a really good club tune. I felt they weren't quite sure where they were going. They'd written some nice tunes but they hadn't finished them off properly and hadn't spent enough time really thinking about the construction critically. Great potential, but maybe they need to get someone to help them."

AE: "Maybe what they

need is a producer?"

SP: "I think that's probably what it is."

JY: "I preferred the last track, but I also thought the vocal got lost here and there. They should have constructed the track more dynamically around the vocal. In general, there was too much reverb. There's a lot of stuff in there I would like to hear with a little more clarification."

TP: "It's a pity, because I think the vocal performance is really, really good. Whoever it is has taken those words and really made them work. It's quite sexy and seductive, and then there's the little pay-off line, 'Fucking Weirdo'. But they have not incorporated that into the music very well at all. They're not recognising what they've got there in that performance."

AE: "I'm a big fan of bands like this. There's one I really like, called Fluke. They haven't taken on board what Fluke are good at and that's dynamics — the little payoffs with the drum rolls, and just getting the dynamics right so it keeps your attention. Maybe what they need is someone with a more experienced ear as a producer, to say to them 'you've got these great ideas, you just need to assemble them in the right order.'"

TP: "They need to have some good arguments!"

JL: "In rehearsal or on stage?"

SP: "Both."

TP: "I always say to bands, the last people you should play your music to is all your

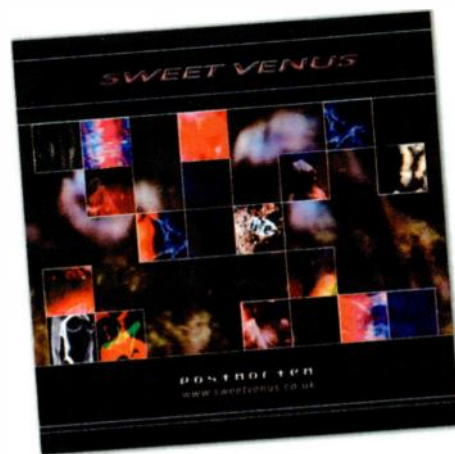
mates, because they are either going to want to be controversial or they are not going to want to say anything that upsets you. They are not good critics at all. That's why I say you need a few good arguments. Play it to somebody who you think won't like it and see whether they do, because those are the people who make the difference."

Sweet Venus

www.sundial.dircon.co.uk

Recording venue: Home.

Recording Equipment: Steinberg Cubase sequencer, Propellerhead ReBirth Techno Microcomposer software, Steinberg Recycle loop software, Yamaha SW1000XG soundcard.



A very complete package from Sweet Venus includes good CD artwork and an organised, factual letter. The music is song-based with vocals provided by their female singer, featuring heavy use of synths and effects, and a programmed feel. They describe their influences as "punk/goth... independent". Sweet Venus were the only band of the selection to provide a conventional band photo (see overleaf).

SP: "There's quite a lot of maturity in what they're doing; some of the song constructions are quite interesting and they have an interesting use of harmony, either by design or accident. It says on their packaging that they've been together four years and I think it shows. You've got three people who are talking things through and criticising each other. Generally very inventive. The mixes are not bad and they've used some good vocal treatments."

JY: I really like the production of the music, but I wanted the vocals to leap out at me more in places. Interestingly enough, one

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Gavin Miller. Pro Audio Sales.

- Started at Thatched Cottage Audio and soon moved into Pro Division. Ex Sales Manager for Blue Systems. 12 years experience in Pro Audio sales has elevated him to guru like status. Published film score composer.



Mark Russell. Specialist Sales & Support.

- Former UK Sales Manager for Glyph Technologies, so has the inside track on storage solutions. Digi trained in all aspects of ProTools and associated products. Signed to LTJ Bukem's Good Lookin' Records.



Steve Trim. Pro Audio Sales.

- Ex resident ProTools specialist of 4 years standing at Stirling Syco. Previous incarnations include 2 years at Yamaha within their R&D department and a 2 year stint with M1 giants Turnkey.



Jamie Gibbons. Pro Audio Sales.

- Started at Thatched Cottage Audio, then moved on to Sound Technology, Sound Control, Digital Village and managed Music Connections' Head Office in Chelsea, before joining Creative, specialising in acoustics.



Andrew Wise. Support Technician.

- Ex Data Recovery Technician for Control Group, whose clients include Abbey National & Deutsche Bank. Digidesign trained ProTools Technician with encyclopaedic knowledge of computers.



Justin Spier. Technical Support.

- Technical Manager for Stanley House Studios, maintaining SSL studio complex. Ex Dreamhire ProTools Supervisor, former high end Pro Audio sales specialist at Digital Village.



Alex Morris. Support Technician.

- Ex Blue Systems. Progressed from building ProTools systems to supporting them in the field. Mac specialist whose second home is the studio. Teaches in the Creative Recording School.



Rob Ferguson. M.D.

- Over 15 years music industry experience. Director at Thatched Cottage Audio. Ran Artist and Tour Management Company. Manager at Digital Village, consultant to Blue Systems. Founded Creative in 1997.

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World Radio History

- member of the band is a designer and he does the graphics, so it's a shame he didn't do the CD itself. It's just a disc with scribble on it."



AE: "I think that's the best thing I've heard so far this evening but it doesn't make me go 'wow'. I would like to have heard her voice much more; it was getting lost in the mix somewhere. I heard some interesting song construction going on. The harmonies have been carefully thought out and they haven't always gone for the easy option. But the first track on the CD didn't sell it for me, so I think they could have ordered it differently."

JL: "It was very pleasant, but it could have drawn me in more if another level of interest had come in. Improving the vocal level might solve that problem, because it was too low. Although I like the dreaminess of the music, it lacks definition, so there needs to be some kind of hard counterpoint to put that against, which might just be a well-defined vocal."

SP: "Do they need a producer?"

AE: "Or a more experienced engineer?"

SP: "Everything I've heard so far tonight could have benefited from an experienced producer."

TP: "The cover says this is their first exploration into using computers, so it would have been useful if we'd heard what they've done before, then we could compare the two. Like everybody, I thought the first track was quite interesting, but it seemed to have some missing elements. The next two I thought were far too derivative, with almost a Duran Duran influence. I didn't think they went anywhere, and there seemed to be an element of searching going on. They would benefit most from an engineer who is aspiring to be a

Tony Platt: "I always say to bands, the last people you should play your music to is all your mates, because they are either going to want to be controversial or they are not going to want to say anything that upsets you."

producer, or a producer who is prepared to get involved, because then you'd have an objective pair of ears. But there is a maturity there, they're on the right track, and there's certainly a musicality and constructive sensibility."

Babelfish

www.quantumstring.com

Recording Venue: Unknown.

Recording Equipment: Apple Mac G3 and G4s running Digidesign Pro Tools software.

TP: "Totally brilliant! Round of applause? If somebody doesn't sign that..."

AE: "Best one of the lot."

JL: "Great sense of drama, timing and arrangements."

TP: "The 'Girl From Ipanema' bit is inspired."

JL: "A good or arresting cover can work sometimes."

AE: "If that had landed on my desk, I'd want to go back to it."

SP: "Great editing, great production, great mixing."

AE: "They know exactly what they're doing there with Pro Tools. They should be approaching labels for remixes. That's a good

enough calling card to give to labels."

TP: "They've got to be as determined in getting somebody to listen to it as they have been innovative in making it. We know, because we are trying to open the same doors as these people are, on a regular basis, so what we can say is that they should go and sit in peoples' reception areas until they get noticed. If the people they are seeing are not taking notice, then they are not the right person to be hearing it. I suggest this band go round to all the appropriate A&R people until one does exactly what all the people in this room have done. Then they will have found the right person to release it."

"I think they are totally original. They also have a theme that goes between the tracks and they're bringing it in; the third track has got a kind of Latin groove which reflects what's happening on the second. This band wouldn't benefit from a producer because they've got the whole package."

SP: "A producer would benefit from *them*."

TP: "They should resist that, and resist any record company trying to change that situation, because they've got something that works. You could put this out. Somebody could change it, but they wouldn't necessarily improve it." **SOS**



This is another professionally-produced CD, with clever and attractive artwork, including on-CD labelling. The music is heavily sample- and loop-based, including spoken-word samples and snips (credited on sleeve). The simple accompanying letter describes Babel Fish as "a collection of musicians and DJs making alternative hybrid dance music."

SOS would like to thank the Music Producers' Guild (telephone +44 (0)20 7371 8888, www.mpg.org.uk) for their help in producing this feature.



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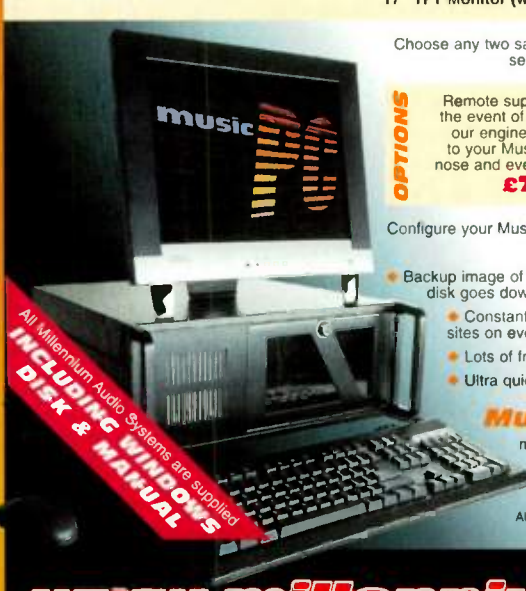
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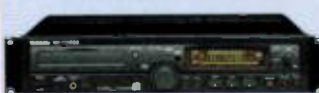
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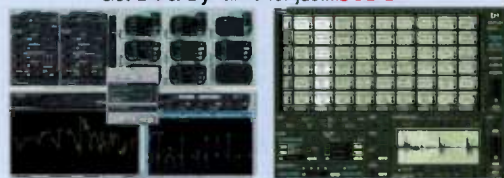
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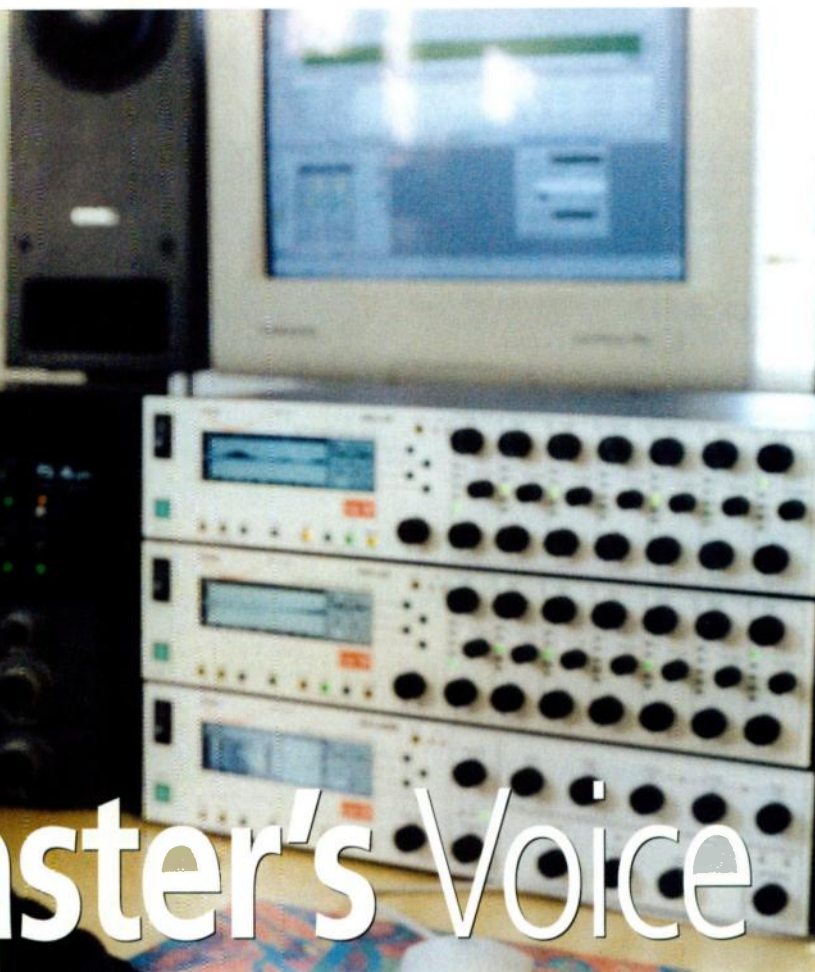
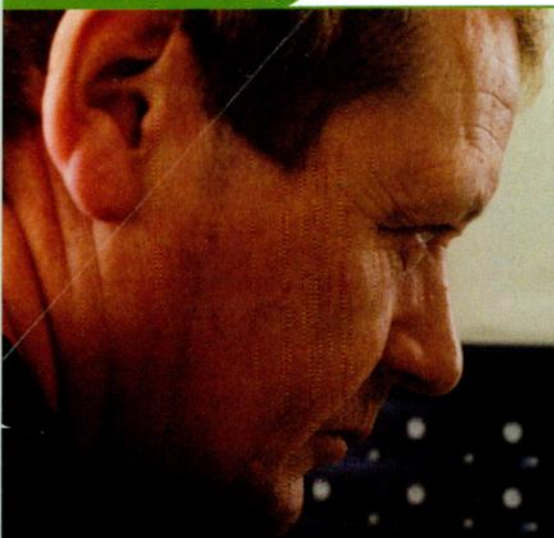
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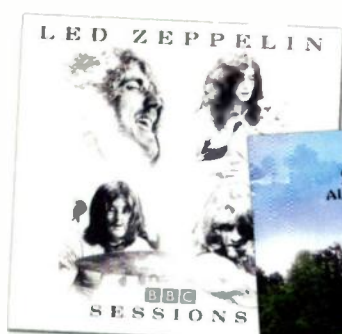
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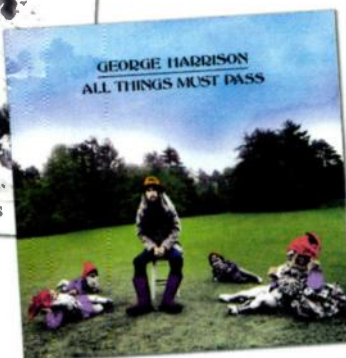
"Since I've been doing this, a lot of people have said to me 'It's great working with you because there are no secrets. You explain everything you're doing.' And I realise now why I hated taking my stuff to mastering engineers when I was a producer. I do try to make sure that my clients know exactly what processing is being applied, and I always A/B things at the same level so they can really hear how it's being affected." Mastering is no black art to Jon Astley, merely a logical step in a process with which he is intimately familiar in its entirety, having made the classic career progression from teaboy to engineer, then engineer to producer and finally mastering engineer (with a spell as a Fairlight programmer and artist in his own right thrown in for good measure).

From the elegantly appointed mastering room in his Georgian town house overlooking the Thames, Astley, feted in recent years for his award-winning remastering and restoration work with The Who, Led Zeppelin, Abba, Level 42, George Harrison and many more, recalls starting out in the audio industry in 1972. "I really

Among his many credits as an engineer, producer, programmer and artist, Jon Astley is perhaps best known for his award-winning work remastering classic albums from the likes of The Who, Abba and George Harrison.



wanted to get into the film industry, but there wasn't a film industry in the UK then, so the next best thing was recording music for films. I went to Olympic, because they did a lot of that. I actually met the owner in the pub and said 'Please can I work in your studio?' and he said 'Can you start on Monday?' Of course, I was making tea for two years before I was allowed to really do anything, but I was lucky enough to start working



with Glyn Johns and became Glyn's right-hand man for the latter part of his stint with The Eagles and for Joan Armatrading and two Eric Clapton records. It was a fantastic time because Glyn was the man that everyone wanted to work with and a great engineer — he'd often just go and reposition a mic and the sound would change quite dramatically. I was mostly running around for him, wiring, miking up, but then later, he wouldn't even show up sometimes.

Eric Clapton's 'Tulsa Time' we did from start to finish without him and played it to him the next day, backing vocals, the lot! I started to work with Glyn out of the studio as well — we did some live recording in America — and then he asked me if I wanted to do The Who with him. That was potentially a little difficult for me because

Pete Townshend is my brother-in-law and up to then he and I had pretty much kept apart, professionally, but I said 'As long as I'm working for you, Glyn, I don't see that there's a problem.' Then, three months into the project, Glyn ran out of patience with the band and left! They came to me and asked if I would I finish the record and that was how *Who Are You* became my first production job."

Astley was not entirely comfortable with all the responsibilities of the producer's seat, however. "You always have to be watching the budget — I remember often thinking 'Christ, we didn't achieve anything today and we've spent a thousand pounds.' I felt very guilty about the wastage and I didn't enjoy that side of producing. That was one reason why I bought a Fairlight 1 when they first came out and got into programming stuff, because I could see the way that a lot of pre-production work could be done, and tracks could be assembled before going into the studio. I realised that as sampling time got longer, I could actually sample whole bits of backing vocals and guitar parts and that's when it started to get exciting to me.

"I suppose I was looking at it as a way of cutting corners — 'If we get a backing vocal in the first chorus that's perfect and the track's been done to a click, we can just use it again on the second chorus and that'll save us half a day of singing.' It made budgeting so much easier. You could schedule four days to do a single and you knew as you walked in with your backing track that you'd be singing by day two, doing the guitar solos by day three and mixing it on day four. But I took it to extremes, though, and started to make records that were practically all Fairlight. After a while I found myself thinking, 'I actually don't like this any more — I really don't like these bands.' And that's one of the reasons I stopped producing at that point, because I just didn't like the music any more. All those great 'playing' rock & roll bands that I used to work with had disappeared. So now I'm in heaven because I am remastering them all!"

Re: Mastering

Jon Astley's career move into the more specialised role of mastering engineer was no more planned than his sudden elevation to producer on *Who Are You*. "In 1996, The Who asked me to oversee their reissue/remastering program, so I started to reassemble the album masters, which was actually quite difficult as a lot of them were missing. In a lot of cases I was looking at copy masters and safety copies. But as I was listening to this stuff I started to think that



Clive Osborne of CEDAR Audio presenting Jon Astley with an award for his remastering work on George Harrison's *All Things Must Pass*.

perhaps it would be more interesting to actually remix a lot of it, so I went back to the record company and asked if they would entertain the idea of me faithfully remixing the eight- and 16-track masters. I had already done this on some tracks for the boxed set we had done just previously, and everybody liked the results there so they agreed.

"I went to Andy McPherson's Revolution Studio in Manchester. He's a great friend, a great engineer but most importantly a great Who fan and he knew exactly what was right for it — in fact, as we got further into the project, he went out and bought an old plate echo to help us faithfully recreate exactly what it would have sounded like in the '60s and '70s. For mastering, I took those remixes to Tim Young at Metropolis and I went to see Bob Ludwig, who used to

master my productions from the '70s and '80s and I spent a lot of time with him, going 'What does that do?' and 'Do you prefer that to that?' and dragging him out to dinner so I could pepper him with questions. I must have bored him rigid. But he was wonderful and gradually I became aware of what mastering was all about and what was really going on."

A Lot Of Little Things

Astley cites the ability to maintain perspective as one of the most important aspects of the mastering engineer's job. "You mustn't get so locked in to the details that you lose sight of the overall picture. And you have to know when to stop — you have to know when you've done as much for the track as can be done and when applying any more of a process will actually start making it worse.

"I tend not to do alternate versions — I stop when I like it and let the client decide. I don't vacillate as a mastering engineer. But I do like feedback from clients though. I really don't mind, and expect to go back and revisit things. I am always willing to try something else.

"Suddenly mastering seems to have become all-important — louder, brighter, faster... People are using their Finalizers and their Pro Tools mastering plug-ins and so much stuff is just too crunched. People aren't letting dynamics happen. Volume seems to be everything, even for record

The Who Live At Leeds

The Who's *Live At Leeds* album is regarded as one of the band's finest, but the original live tapes presented a major technical challenge. "As everyone knows, there was a mains plug hanging out of the wall somewhere in the system, producing this constant crackling on every other track on the eight track. Bass drum, bass guitar, vocal... and guitar — nothing too important! Sometimes it was just intermittent, and other times there were whole rows of them. It was so bad that Pete hadn't even mixed some of the tracks.

"The CEDAR processors really came to the forefront on this one. They worked brilliantly on the bass and bass drum: the only thing you could hear them working on was the guitar, where they just took the plectrum off the front. I had to treat that slightly differently. I use the *De-hiss*, *De-click* and *De-thump* plug-ins within SADIE, and I've got a hardware *De-crackler* in case I have to work with vinyl. The off-line processes just work beautifully: even the Auto ones will usually be right first time. Just occasionally I'll have to tweak the start and end point because the total area you are applying it to can sometimes affect whether it works or not. People often find it hard to believe that you can take something out without affecting the music, but you can. The first



time I used the CEDAR *De-hiss*, I was just amazed. Suddenly I could hear all this echo that I hadn't been aware of because it had been covered up by tape hiss. There are some very clever guys there at CEDAR.

"On the original vinyl of *Live At Leeds* they put a little note on the label saying 'The crackles are intentional'. So when I remixed it in '96 and used the CEDAR *De-crackler* to clean it up, I wrote on it 'The crackles are gone!' It's a nice record now. But some of the Who fans still come up to me at gigs and say 'You completely ruined that track because you took the hiss away.' I say, 'What are you comparing it to?' They say 'The one I've got,' so I just say, 'Well, play that then!'"

► companies. But as soon as volume becomes the primary issue, you're into crunchiness and less dynamics and it's such a shame because CDs could be so much nicer.

"Sorting out a whole lot of apparently little things is actually a large part of what I do. A lot of people have not got a running order sorted when I get the tracks, so as soon as you put them in running order you become aware that some of the transitions don't work or that there are level differences. Sometimes they'll have tried a running order and just thought 'Oh, that'll be OK when it's mastered: track two slightly brighter, track three slightly louder.' A band whose album I had already mastered called me yesterday and they had decided that they wanted to use a different version of the single, which was track two on the album. So I dug out the one I mastered six months previously and pasted it in, and the album just died when track two came in because it sounded 2 or 3dB quieter than the rest — actually it was just as loud, but it sounded quieter. That's one of the mistakes that people often make: just because it peaks at the same level doesn't mean it's going to sound as loud. That's typical of the sort of work I often do.

"Some records are quick — Catatonia's *Paper Scissors Stone* was done in a day with Clive Langer here with me, and I revisited two spots, which took maybe an hour, two days later. That would be a quick one, whereas something like Tori Amos' *Strange*

Surround

Whilst he is keenly aware of the potential pitfalls arising out of many domestic surround systems' origins in the home-cinema market, Astley remains a fan of mixing in 5.1. "The most horrifying thing is that people are selling these systems where the TV speaker is the centre speaker in a 5.1 setup. That does very peculiar things because it's not the same as the others. You know that not everyone is going to have their surround speakers in the right place, but you can only get it sounding right on the system you mix it on. Bob Pridden and I have just remixed *Who Are You* in surround and it's great fun. We used to spend days in mixing trying to get all those beautifully recorded, big sounds to come out of two speakers, but you just don't have to bother in 5.1. As soon as you start to place things around in different areas, you no longer need to thin them out or place them further back. You can hear all the sounds as they were recorded without them fighting against each other. A lot of the *Who* stuff that I did was sequencer-based, and if you just pull that stuff forward in a surround mix, the band have suddenly got their own space. It's beautiful. You don't have to fight for space for everything."



The ancient Decca EQ on top of the rack has been 'sampled' into Jon Astley's Sintefex Replicator allowing him to get the same sounds but with full digital recall. Also visible beneath the Replicator are Astley's DCS converters.

Little Girls album took two weeks to master. It's not unusual with me for an album to get mastered three times. One thing I like to do is to master it and give people a copy and say, 'There's your record. This isn't finished. Go away and listen to it. Call me Monday.' Most people think of mastering as something where you walk out of the door and that's the end of the process. I like it to be much more creative than that. Decisions have to be made with the perspective of a couple of days. Sometimes I'll listen really quietly to an album that I've done and I'll think, 'I wish that intro was a bit louder.' So I might take that section, which may have peaks that are already 0.1dB off zero, and just push it up against a limiter to gain another 1, perhaps 1.5dB. The beauty of doing that inside something like the SADiE system that I use is that you can just tail it off after the intro and get rid of it for the rest of the track. Little tricks like that can make all the difference. Everything is recallable now and that makes it so much easier to just make these little tweaks. Although I do still write everything down as well. Sometimes you just can't get back to something that you had before — it's inexplicable but probably to do with where the moon was!"

Remarkably, there are no tape machines at all in Jon Astley's room. "If I get anything contemporary on analogue, these days it's on half-inch and I will go out to wherever they mixed it and lift it from the machine it was recorded on — there are just too many

vagaries in half-inch line-up, especially at the bottom end. If the studio is getting back off their machine what they want to hear, I know that if I take my Genex and maybe some DCS converters out to their studio, I can come away with what they are listening to at 96kHz. Working from the Genex is great, as I can zoom around sections quickly, unlike working with tape."

With the Genex as the primary replay

"All those great 'playing' rock & roll bands that I used to work with had disappeared. So now I'm in heaven because I am remastering them all!"

source, the next unit in the mastering chain is usually Jon's Sintefex Replicator. "I use that mostly for valve-sounding EQ, as that enables me to keep it all digital — SADiE have just put this old Decca EQ in it for me. Then it goes into my Weiss EQ1, the new linear phase model. It has a smoother sound, but it puts a 250mS delay through the system, which isn't great when you are working on a DVD. The next thing I'll go through is the Weiss DS1, if I just want to

catch vocals that I think haven't been looked at properly in the mix, and very often I will go into my TL Audio PP10, which is the warmest digital compressor I've ever heard in my life — it's got the most horrible front end to it, especially if you are working in surround, but the sound makes it worthwhile. I use the soft-knee compressor in there. Finally I'll throw it into my TC Electronic System 6000, which I mostly just use as a brick-wall limiter, although sometimes I'll use the three-band compressor if I want to get it sounding like a Finalizer! Obviously, every job differs in little unique ways, but that would be a typical processing chain. I knock stuff in and out all the time to see what it's doing.

"My compression settings won't actually change that much from track to track. I'll tweak the threshold to suit the material; ratio will be between 2 and 3 to 1, as I'm only affecting the top few dB. There's a parameter



called Softness on the PP10 — I've no idea what it does, but it goes between 7 and 8 and it sounds great! Finally, there's my SADiE system [see box].

"On modern stuff I'd very rarely need to EQ anything beyond

one or two dB in maybe a couple of bands, but I can get fairly radical with EQ for remastering. It's funny, but top and bottom seems to always sort out what's missing

from any track from the '70s, but during the '60s the top end was horrible, so you actually don't want to bring that out. The original tapes from the '60s will often be OK, but the masters are horrible at the top end. With George Harrison's *All Things Must Pass*, I felt there were complete bands of frequencies totally missing because it had been bounced on eight-track three or four times, with slightly faulty line-ups. Everything around 5k was just not there, even though Phil Spector had probably been adding tons of it every time he bounced because he loved that area so much. So sometimes you just have to get radical with it, but in that instance I could dial in a great big peak and it made no difference at all,

Jon Astley: Solo Artist

"Very soon after I started working with the Fairlight I delivered a Marilyn Martin record to Atlantic in New York and I got a phone call at my hotel from the head of Atlantic and he said 'I need to see you in my office tomorrow.' I thought 'Oh shit.' When I went in he said 'I want you to make a record for me.' I said 'OK, who is it?' And he said 'No, I want you to make a record for me as an artist. I really like your production work and I understand that you do all the programming yourself. Can you sing?' I said 'I think so.' And he said 'Go and make a record.' He didn't even want demos. So I made a fairly rough and ready record for Atlantic called 'Everyone Loves The Pilot', based on Fairlight 1, and then the following year I got an all-singing, all-dancing Fairlight 3 and I took it to extremes. I made this record that was practically all Fairlight and delivered that. Pete Townshend told me that he used it as his benchmark in the studio for quite a long time, because it was just so 'perfect'."

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'Doctor Fixit': Editing And Mastering With SADiE

"I bought my first SADiE in 1992 when I was a producer, as a studio tool just to edit albums together. I became known as 'Doctor Fixit' — I used to work with Chris Kimsey a lot. There was a live album that we did for Johnny Halliday from four nights at Parc des Princes. Chris was in Metropolis — four studios with four engineers — and I'd be running around, taking a guitar solo and flying it in to night three and taking a vocal line from night two and putting it into night four, and that's how the whole album was pieced together. I thought, 'this is the way to do things'. We assembled the album on the SADiE too.

"When I went mastering I just used to take the SADiE with me. I even went to Bob Ludwig with two Who albums, *Quadrophenia* and *Tommy* remixed, and he mastered from the hard drive. My current SADiE system is an eight-in, eight-out Artemis and it's great. It does everything that I want it to do and it sounds good too so long as you clock it externally."

The screen for Jon Astley's SADiE Artemis mastering system sits above a Prism Sound MEA2 stereo EQ, with his Weiss EQ 1 digital EQ and DS1 dynamics and TLA PP10 digital dynamics unit to the right.



- ▶ because there was just nothing there for it to work on. I had to make it wider and work with what was there on either side of the hole! *All Things Must Pass* was possibly the most challenging thing I've done — just the amount of hiss on it was overwhelming."

A New Challenge

Although such painstaking restoration work often requires all his expertise, Astley also cites the recently released Tori Amos album *Strange Little Girls* as one of his more demanding mastering jobs. "For the first

time I mastered the tracks in running order. We'd start each day by playing what we'd done the day before. Tori is not a volume freak at all, she just wants to hear certain things in the music that she knows can be got out of it in mastering. Sometimes she'll try to bring out a vocal and then she'll say 'OK, go back to the earlier setting for that chorus.' Then the mastering practically becomes part of the mixing process. Tori will want to use a specific EQ just for a part of a song, if that's what works. I do that myself sometimes too, if I'm working on my

own. I will listen to something that I've had a couple of goes at, and think, 'Well, I really like it up to there, so why don't I just use that bit and then set up something else for the next bit and edit it together?' Obviously, I can hear the edit, because I know where it is, but if you don't take it to extremes, people never know.

"On *Strange Little Girls* I had seven bands of EQ that would vary from point to point in the track. I tend to get an overall EQ that I like for most of the track and then revisit parts and edit those in on the SADiE. Sometimes Tori would say 'Let's use that verse that we did from the other day.' Sometimes even 'Let's use that word that we did the other day.' But she's got extraordinary ears. You can play her a CD made in one machine alongside a CD made in another and she'll be able to tell you which was which every time. I couldn't tell you, so I don't know what she's listening to! But she's consistently right. She has hearing from another planet. There was one occasion when I had forgotten to switch on my external clock so the SADiE had used its internal clock and Tori came to me and said 'This CD you've made doesn't sound right.' I thought about it and looked at the system, and there it was — I hadn't switched on the clock. And then I could hear it too. The top end just wasn't as clean, so there must have been a bit of jitter or something."

Recording Eric Clapton's *Just One Night*

Among Jon Astley's many production credits is Eric Clapton's live album *Just One Night*, which threw up an unusual technical difficulty: "The main challenge on *Just One Night* was that Eric wasn't supposed to know that I was doing it. I put up all these mics and the manager came running in saying, 'No, no, no! If Eric sees that he's going to know it's being recorded!' So I had to hide the audience mics and I had to take splits off the PA mics and I had to duck and dive backstage at the Budokan and keep out of everybody's way. I built a studio in one of the dressing rooms and just had all the cables coming in. And I sat there all afternoon and didn't venture out in case any of the band saw me. I got no soundcheck — I just had a roadie go round the drums and I just guessed levels. I thought I'd lose two or three songs sorting it out, but we'd got two nights recording. As the band

started I was poised over the mic gain controls on the board and as they went into 'Tulsa Time' all the needles were peaking at zero and it was just perfect. I thought, this sounds quite good just as it is — don't touch anything! And that's how it went down. It was all the first night, which is why we called it *Just One Night*. That first night was just brilliant.

"I got slated in the press for it sounding like a studio record, but the only thing we did to it was to overdub one bass note where there was a key change in the middle of a blues and the bass player went 'booonng', on the wrong note! He came into Olympic when I was mixing it and we matched it up in 10 seconds and replaced that one note. There was no spill problem. These days we'd just copy a note from somewhere else in the track and paste it in."

(sound
modules)

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Bizarre move cures *Cubasis* VST glitching problem

I was recently trying to find out why my new copy of *Cubasis VST* was spluttering so badly when used with my Toshiba laptop and Roland UA100 USB audio interface device (the pair worked fine with my other music software, and *Cubasis* worked fine with the Toshiba's built-in soundcard). During testing, I discovered that if I moved the transport out of the Arrange window, the glitching stopped. I don't know why, but this has cured my problem. Might be worth a try for anyone who has a similar setup exhibiting the same problem!

Derek Preston

Reader passes on details of tried-and-tested Apple G3 system

I've just read Aaron Symonds letter in Q&A in the October issue of *SOS* (replied to by Sam Inglis), concerning a hard drive for his G3.

I have the same setup — a beige G3/233 and a MOTU 2408. I bought a LaCie 9GB Ultra2 SCSI hard drive (external) and a Grappler SCSI 940UW PCI card and they live in harmony with my G3 and MOTU hardware and software. Both the card and hard drive were a dream to install, and after rebooting and firing up *Digital Performer* I was soon recording music effortlessly to the drive. Both the drive and card were purchased from MacLine, although they will most likely be available elsewhere.

One further bit of info: I would suggest buying a smallish drive, as opposed to buying a large one and then partitioning it, because recording and retrieving data from more than one partition slows down the playback. The 9Gb drive works for me. As we know, size isn't everything!

Dave Keegan

Shielded monitors

In your article entitled 'FAQs: Computers In The Studio' (SOS December 2001), you state that "...shielded monitors often cost more and the sound can be compromised, because the designers tend to avoid using powerful magnets which are more expensive to shield."

Genelec's bi-amplified active monitors are all shielded as standard, therefore they do not cost more. Also the sound quality is not



Cubasis VST: moving the transport out of the Arrange window solved a PC glitching problem for one reader.

I have found that an inspired arrangement of rhythmic, melodic, harmonic, lyric, dynamic and sonic elements (not necessarily in that order), no matter what the recording medium or performance method

adversely affected, as the shielding cup is additionally used as a resonator to damp magnet/basket resonances. This is a patented invention that actually enhances the sound quality. Finally, we do not use smaller magnets when we shield our monitors.

Also, I noticed that the diagrams you have for the studio setups do not exhibit any left-right symmetry. This severely compromises the stereo imaging that can be achieved from any monitoring system and is very often overlooked by studio owners. In addition, nearby reflecting surfaces should be minimised to reduce comb-filtering effects.

Other than that, keep up the good work of educating our customers!

Andrew Goldberg, Genelec

Can't beat a good tune?

I enjoyed Paul White's recent editorial. He made many great points. One additional point I think worth mentioning about many old recordings is that they contain live playing and masterful performances of the artists and studio musicians of the time.

These musicians diligently studied and practiced their instruments, integrating the musical stylings of others with their own creative innovations.

This emphasis on the musical aspects, as well as the 'physical mastery' of their instruments, contributes to the seemingly different experience that some of these 'analogue recordings' provide.

(sequenced or live), will often transcend the actual manner in which music is recorded. Whatever the style or era of the music recorded, there is no substitute for musicianship itself.

David Frank

Cheaper source for unbalanced-to-balanced converters

I was reading the Q&A Quick Fixes section of your excellent magazine in the October edition and noticed a question from Graham Wright regarding unbalanced-to-balanced converters.

I thought that you might like to know that we make a range of matching amplifiers, including a single unbalanced-to-balanced converter, the RBUL1 (£114.95 plus VAT) as part of our Redbox range of products. If you could redirect Graham to our web site (www.sonifex.co.uk), there's more information available there.

Marcus Brooke, Sonifex

[illegible]

The Red Book range of matching amplifiers from Sonifex, as highlighted on their web site.

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audio cards.

If you go to the movies, you've heard his work. He's the man behind the scores for "Blade", "Kiss the Girls", "Quiz Show", "Nell", "A River Runs Through It", "The Moderns" and dozens of other films. Not one to be limited by genres, Mark's compositional palette includes orchestra, electronic, acoustic jazz, and everything in between.

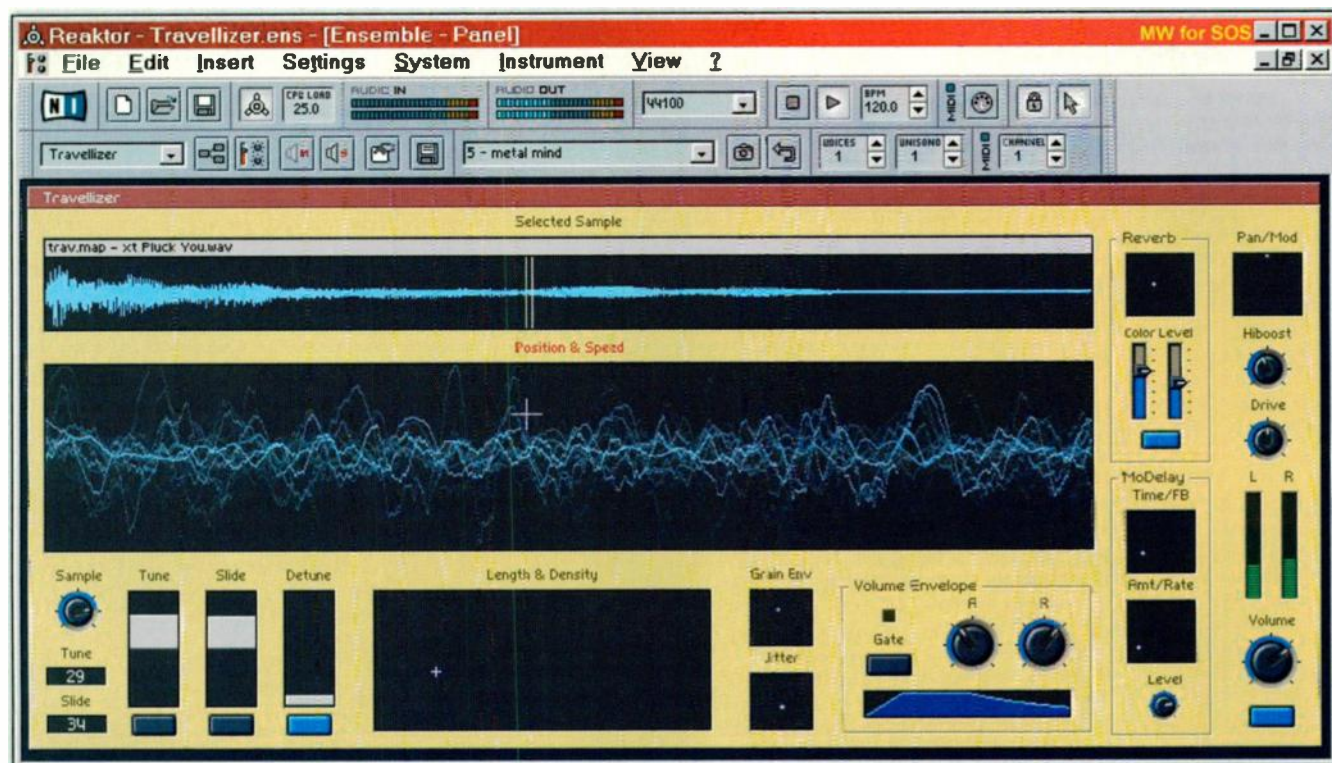
Mark needs a digital audio card as flexible and diverse as his music. He uses Delta 1010's. The Delta 1010 has become a staple item in pro studios because of its ability to work well in so many environments. Mac or PC, from Gigastudio to Logic, from tracking to soft synth playback, the Delta 1010 is the card behind the scenes. To learn more about the Delta 1010 go to www.m-audio.com

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Reaktor 3.0

The Travellizer demonstrates the new Grain Cloud granular synthesis module, as well as the many uses for the X-Y module. This screen shows the latter module being used not only to display the current audio, and control the position of the cloud within the main waveform, but also to create the various quad panpots, and even the bar sliders of the Tune, Slide and Detune controls.

Native's ambitious DIY software synth creator, *Reaktor*, has had a major update which improves its look and feel, adds some juicy new features, and — perhaps most importantly — claims to greatly reduce computer CPU load.

Martin Walker

Native Instruments have possibly done more to encourage musicians to embrace the software synth concept than any other company. They started their product line with the ambitious *Generator*, a completely open-ended synth designer. *Generator* was followed up by *Reaktor 2.0* (reviewed SOS October 1999), which added audio sampling, plus wavetable and granular synthesis options. Two years on, *Reaktor* is

Native Instruments Software Synthesizer Designer for Mac and PC

up to version 3.0, benefitting from a graphic make-over, new modules, and a completely new and more CPU-friendly audio engine.

Installation

Previously, NI protected *Reaktor* with a combination of a specially modified CD and a 100Mb file that discouraged cracked copies from being distributed. For this latest version, they've moved to a USB dongle that is accessed when reading and writing files. This is good news for those with small hard drives, but a mixed blessing for the rest of us, who may not have a suitable USB port, who may want to disable USB to avoid audio clicks and pops, or who are worried that someone will pinch their dongle from the USB port. NI will swap the USB dongle for one that plugs into the serial, parallel, ADB, or even PCMCIA port, although there may be a small charge.

I received the PC version of *Reaktor* for this review, but the Mac one has now been released as well. If you want to swap from PC to Mac, NI offer a free crossgrade if you register on their web site. Registered users are also eligible to purchase a secondary license and another dongle, to let them use *Reaktor* on two computers simultaneously. It's well worth visiting the NI web site anyway, as updates are periodically posted. I downloaded and installed the latest version 3.0.4-002 patch from the site before starting my review.

New Goodies

The most obvious change to *Reaktor* is its crisp new graphic design, featuring completely redesigned front-panel controls, user-selectable colour schemes, and even bitmap-import facilities that allow you to add front-panel logos to synths created in *Reaktor*.

SOUND ON SOUND

NI Reaktor £250

pros

- New audio engine is far more CPU efficient.
- Versatile new modules.
- More upmarket graphic design.
- User-definable colours and bitmap import.

cons

- USB dongle may not suit some existing users, although other dongle options are available direct from NI.

summary

Reaktor 3.0 takes an already impressive software synth design one stage further, and should win NI plenty more customers.

The toolbars have also had a make-over: now they have far more understandable and stylish icons, as well as larger and more accurate horizontal Audio In and Out meters. Instruments and Ensembles now have a greater choice of sizes of knobs, sliders, and buttons, as well as variable-length faders in both horizontal and vertical orientations. NI have added drag-and-drop functionality, too, so you can place multiple audio files into Sampler or Beat Loop modules quickly and easily.

There's a lot going on under the surface as well, notably a completely new audio engine optimised for both the SSE instruction set of Intel's Pentium III and 4 ranges, and the AltiVec set of Apple's G4 series. NI claim enormously improved performance for this new engine, as measured against the previous 2.3 version, and even with my Pentium II PC I noticed a significant lowering of the CPU Load indicator. With my new Pentium III, of course, the difference was still more marked. The new engine will enable users to run more simultaneous voices, add more effects to them, or improve audio quality by increasing the internal sampling rate. The transitions between snapshots (patches) have also been greatly improved, which is handy if you want to change sounds mid-song.

Bearing in mind the undoubted popularity of Cakewalk's Sonar digital recording package, NI have also included a DXi and DX plug-in version of Reaktor, while the VST plug-in version has been upgraded from playback-only status to full editing capability when running within a host VST application.

Draw Your Own Waveforms

While it's extremely useful that the various sampler modules can now display their audio data in a window, and that an Akai CD-ROM import facility has been added that lets you transfer Akai programs and samples into Reaktor Map files, it's the ability to draw in new data that's exciting. You can use this to create new waveforms, envelopes, and even MIDI note or

System Requirements

Mac users will require a minimum of a 250MHz PowerPC with 32Mb of RAM, running MacOS 8.6 or higher, and an OMS- or FreeMIDI-compatible MIDI interface. PC owners will need at least a 233MHz processor from the Intel Pentium/Celeron or AMD Athlon/Duron ranges, running

Windows 95, 98, ME, or 2000, along with 32Mb of RAM. However, you'll be lucky to be able to run the most interesting Ensembles without at least double this processing power, and to run a MIDI + Audio sequencer at the same time I would recommend an extremely powerful machine.

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one box with a **wide range of mono compressor settings** for recording and a **preset stereo compressor** for mix down. I want to **plug my mic straight in** and get a **smooth, clean vocal** that's dynamic and up-front. I need a **clean and crisp acoustic guitar** treatment and **tighter loops**. **Killer bass lines**, **warmer pads** and the ability to **tail that long piano sustain** are all 'must haves'. Then give me **stereo width control** over the mix and some **tube-style colour** that I can **control**. Oh, and don't forget the **digital output option** and I want...
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Test Spec

- Native Instruments *Reaktor* 3.0.4-002.
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- Soundcards: Echo Mia, Yamaha SW1000XG.

► controller sequences — in real time!

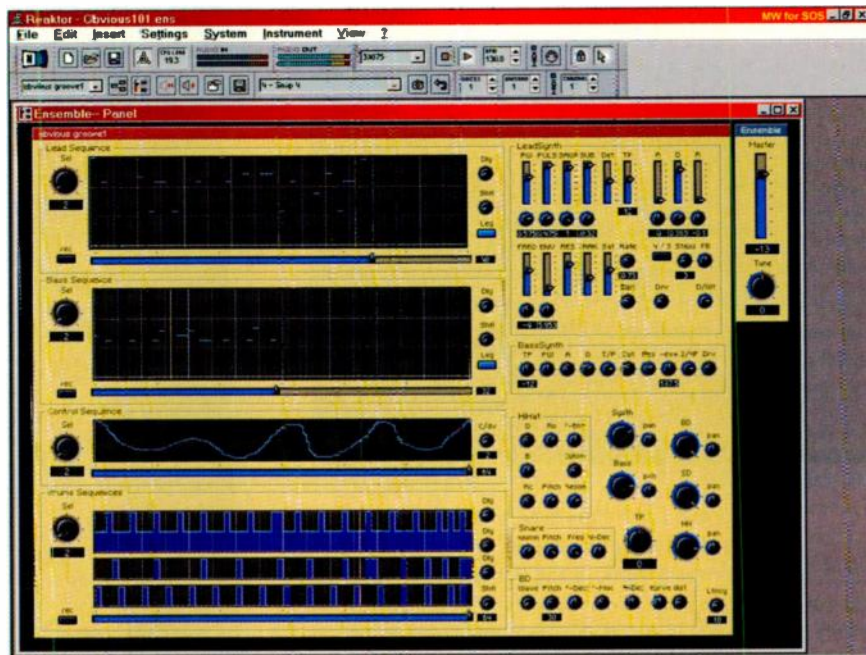
To do this you use either the Audio Table or Event Table modules. Their graphic windows can be any size and shape you choose, and horizontal units can be integers, milliseconds, or tempo ticks. Values are entered either by drawing them with the mouse, or loading them in from an audio or text file. Any section of the display can be selected and edited, using a variety of commands, such as Mirror and Rotate. Any gaps between table entries can either be ignored, producing a staircase waveform, or interpolated. The latter option smooths the result into a ramp. Interpolation is useful when drawing waveforms; note sequences are better entered with this function switched off. You can display the graph in pixel, line, bar, or 2D forms (see right).

The Big Event

The new X-Y module can display a visual object such as an audio waveform, and be simultaneously used as a real-time, two-dimensional controller — just hold down the left-hand mouse button and drag the cursor with your mouse. The visual object can be displayed in scope format, or in a wide variety of other styles, including pixel, rectangle, bar, and crosshair, and some of the bundled Ensembles show how you can use these options to create quad panpots, moving abstract filter responses, and graphic slider controls. The cursor is also resizable.

A Grain Of Synthesis

Reaktor 2.0 merely offered basic granular synthesis, but the new Grain Cloud module changes all that, by providing a stereo-multisample granular synth capable of much more versatile musical results. As NI



The Obvious101 Groovebox Ensemble shows the new Event Table modules in action, with lead and bass synth using the pixel display, control sequence using the line display, and bass, snare and hi-hats using the bar format.

themselves put it, "built-in, randomised jitter lets you create delicate clouds of sound or complete sample shredding" — and I wouldn't argue with that. The new GrainState Ensemble shows what's possible under suitable control, using the new Scanner module, which scans and crossfades between eight audio inputs.

However, another use of the Scanner, in conjunction with the new Multi-tap delay, is producing surround delays and reverb early reflections. This is how the scanner vibrato implemented in NI's acclaimed *B4* organ instrument was produced. And speaking of VST instruments, the analogue-modelled filter from NI's *Pro 52* synth has also been included as a new *Reaktor* module. This filter certainly provides a warmer sound than its predecessors, as does a new Ladder Filter modelled on Bob Moog's classic design.

Final Thoughts

Reaktor was already a powerful modular synth designer in its initial version 2.0, and NI

built on this power for the version 2.3 update. However, version 3.0 shows that it has matured even further, offering more refined and varied sounds, as well as some which defy description. To help demonstrate some of the possibilities offered by this program, NI's entire Premium Library is still included, along with a small selection of fresh Ensembles that showcase the capabilities of the new modules.

However, despite its easy-to-use interface, *Reaktor* is extremely complex under the surface, and has had its share of stability problems in the past. With version 3.0 I did initially have some repeatable crashes, traced to dodgy contacts on the first batch of USB dongles, but this problem has now been solved. I subsequently found version 3.0 extremely stable.

Reaktor 3.0's new audio engine is particularly impressive, as it should provide significant performance boosts for most users, whatever their CPU. The other new features are powerful and varied, and further expand on an already huge number of design possibilities. Overall, I think Native Instruments deserve congratulations for an extremely worthwhile upgrade. **5/5**

Tiny Touches

As well as its graphic make-over, new audio engine and new modules, *Reaktor* 3.0 offers lots of smaller improvements to make the musician's life easier:

- The program now supports the Open Sound Control (OSC) protocol, to allow you to send MIDI data over any Local Area Network (LAN) or the Internet, between multiple *Reaktor* computers. Since this data is time-tagged, it overcomes latency and jitter.
- The MIDI Settings dialogue has a Thru option, selectable input channels, and a selection of

input and output filters.

- The floating Inspector window lets you modify the properties of any number of modules — just click on any front-panel control and its display is updated, which is a real time-saver!
- New Auxiliary modules display or modify instrument parameters such as note range, MIDI channel, and tuning.
- A progress bar appears when loading and saving files.
- The level meters have been redesigned.
- Tape deck modules can now record and play back to hard disk as well as RAM.

information

£ Native Instruments *Reaktor* 3.0 £250 including VAT; upgrade from version 2, 101.75 Euros (only direct from NI web site).

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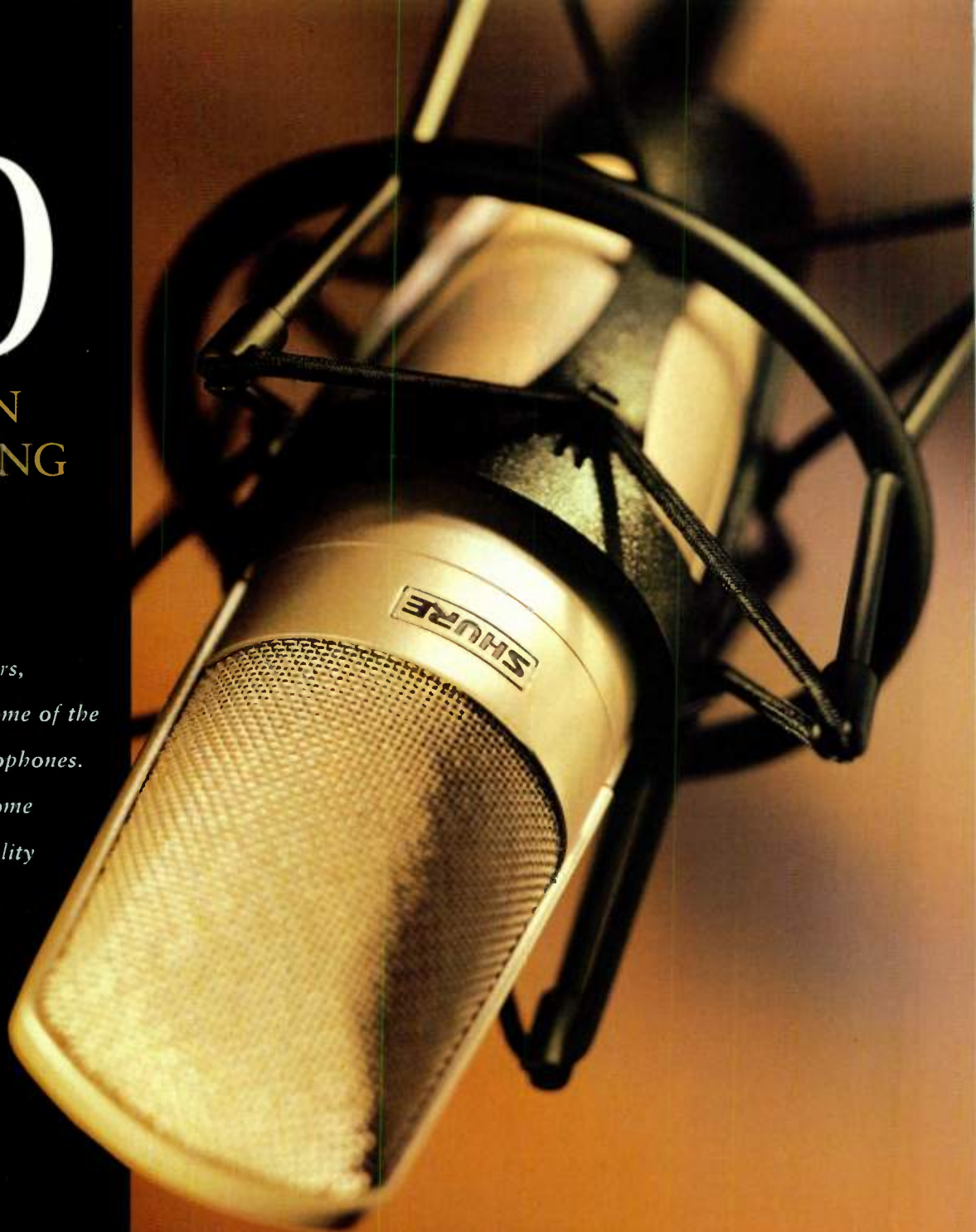
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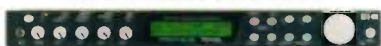
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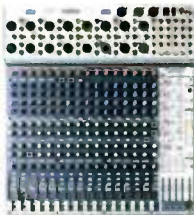


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World Radio History

PC Soundcards

A Practical Guide

Newcomers to PC recording face a steep learning curve. How do you get sound in and out of a computer, what makes a soundcard suitable for music, and what pitfalls do you face if you buy the wrong one?

Martin Walker

With all the hi-tech PC Musician features I write, it can be easy to forget that some of our readers, while perhaps seasoned musicians, may still be new to the PC. For instance, there are plenty of guitarists and keyboard players who have been recording on hardware multitrackers for years, without ever getting involved in computer-assisted recording, editing, or mastering.

To these musicians, buying a PC may seem like the ideal step forward, and let's face it, powerful PCs have never been so inexpensive. However, once you've opened the boxes, fathomed out what plugs in where, and had your first couple of sessions using the new machine, it's easy to get totally lost knowing what to do next. Is the consumer soundcard that came ready-installed with the PC up to making good-quality audio recordings of your music? Will you need to buy any more hardware to plumb in your MIDI keyboards, and if so what options are available?

Although some of the topics I'm about to cover have been presented in more depth on previous occasions (see 'Further Reading' box), the last thing a newcomer wants is to have to wade through page after page of



highly detailed information. So, this month I'll be gathering together in one place all the relevant information the PC musician needs to get started.

Sound Chips Or Soundcards

'Which soundcard should I buy?' is probably the most popular question on the SOS web forums, and one of the most confusing topics for the newcomer, since there are now so many models competing for attention. The forum includes all my on-line FAQs on the subject, but for the newcomer even some of the terms used may be unfamiliar, so here I'm going to go right back to basics.

Nearly all modern PCs include some sort of sound-making apparatus, which will either be a sound chip built into the motherboard, or a separate soundcard that plugs into one of its expansion slots. The cheapest solution for the manufacturer is to use a motherboard with an integrated sound chip, and although in the past these have often produced pretty poor results, customer expectations have now risen to the

Like most other modern MIDI + Audio applications, *Cubase VST* can theoretically record with 24-bit resolution at a sample rate of 96kHz, and with a latency of 2 milliseconds, as shown here. But is this a practical proposition for your soundcard, hard drive and PC processor, and is it even necessary for your music?

point where you should get audio performance good enough for some quick demos. However, one limitation is that many onboard sound chips are playback-only: you may not get an audio input to enable you to record your own performances, or a MIDI port for attaching external keyboards and synths. Happily, it's easy to check whether your PC's built-in sound source is a motherboard soundchip. Just look on your PC's back panel and see where the audio sockets are. If they are mounted on the main case, next to the parallel port and twin serial ports (where you can plug in a printer, external modem, or old-style mouse) then you have a sound chip, and you can check by the labels on the sockets what facilities you have.

If instead the sockets are mounted on a separate panel in one of the typically four to

six expansion slots placed in a row, alongside other panels which feature sockets that you plug in to your telephone socket (an internal modem card) and your computer monitor (a graphics card), then you have a proper soundcard, with more features on offer. By the way, don't despair if you discover you have a limited integral soundchip, since you can nearly always disable these by altering an on-screen setting such that they become invisible to the PC system, and add a proper soundcard.

Unless you've bought a PC specifically for music purposes from a specialist music retailer, any supplied soundcard will almost certainly be a low-cost consumer model, such as one of Creative Labs' extremely popular Soundblaster series. These provide a lot of features, and are capable of some good results, but it's important for the musician to realise that the feature set is primarily intended for applications such as gaming and DVD viewing, although they do include multiple MIDI ports and a built-in synthesizer or sampler.

This sort of soundcard provides incredible value for money, and creditable performance when recording and playing back audio tracks: their audio quality exceeds that of many cassette multitrackers, and matches that of some DAT recorders. However, even the most up-to-date models won't have audio performance on a par with entry-level soundcards designed specifically for use by musicians. Soundblaster cards also have a fixed internal sampling rate of 48kHz: this is a pain if you want to create audio CDs, since these have to be recorded at 44.1kHz.

Another major limitation of most consumer soundcards concerns drivers — the low-level software components that allow computer programs to 'talk to' the card. Most music applications work much better with



Creative Labs' Soundblaster series of consumer soundcards are hugely popular and excellent value, but for music recording, any consumer soundcard represents a compromise in terms of ease of use and sound quality.

specialist drivers that are different from the driver types used by consumer applications (the different formats available are explained in the Soundcard Driver Types box), and as we'll see, this is an important factor in favour of buying a more professional soundcard. Apart from Creative Labs' new Audigy card, few consumer soundcards support specialist driver formats such as ASIO.

It should also be pointed out that although having a huge array of features can be incredibly useful, it does make using a consumer soundcard considerably more confusing. Moreover, the huge number of software drivers, utilities, and demos that come with consumer soundcards can often cause more problems than the simple, clean, conflict-free approach of most music soundcards, which typically install under a dozen small files.

Onboard Synths & Samplers

Although they can be complicated to use, the additional features on consumer soundcards usually include such welcome goodies as onboard synths and samplers. Again, though,

if this is what you want from a soundcard, specialist music soundcards can offer more powerful facilities, albeit at a higher price. These days, software instruments also provide a real alternative.

Up until a couple of years ago, if you wanted quality synthesizer sounds in your songs, you had to use external MIDI synths. Consumer soundcards have included onboard synths for a long time, but the first ones used two-operator FM sound chips and sounded pretty tacky. Creative Labs' Soundblaster cards provided a big improvement at the budget end of the market, with their collection of 16-bit SoundFont-format samples. Although the default 1Mb, 2Mb, and 8Mb General MIDI collections in SoundFont format were still mostly uninspiring, the user could add up to 32Mb of proprietary RAM to the Soundblaster AWE64 Gold to hold a smaller number of higher-quality instruments. The subsequent Soundblaster Live! card made this technology even cheaper by using up to 32Mb of your PC system RAM to store its SoundFont data, while Creative's latest Audigy series are claimed to be able to use up to 1Gb of system RAM!

Libraries in SoundFont format are now a well established standard supported by various developers. Even where they use exactly the same samples as collections in other formats, however, these libraries have never been taken very seriously by 'real' musicians, and two things have conspired to make having an onboard SoundFont synthesizer less desirable today: Yamaha's SW1000XG soundcard, and software synths.

The SW1000XG was a turning point in soundcard design, as it was essentially a Yamaha professional hardware synth — the MU100R module — transplanted onto a card. Capable of 64 voices and 32-part

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► multitimbral, the SW1000XG provided a built-in 20Mb ROM set whose voices were in a different league to the majority of SoundFonts. It also included a daughterboard socket that could hold any one of six PLG (PLUG-in) cards, each one a synth on a small circuit board that added a different synthesis type and more polyphony. Its five-buss 24-bit digital effects engine, plus the ability to add these effects to the six additional stereo audio playback channels, set new standards for soundcard sound quality, and it's still selling well three years later.

Other designs have since followed this trend of providing professional sounds on a soundcard. Terratec's EWS64/Microwave PC combination, for instance, is a Waldorf Microwave XT synth on a circuit board, while the various models in Creamware's versatile range, including the Luna, Powersampler and Pulsar, are essentially a clutch of DSP (Digital Signal Processing) chips on a card to which you download software code that runs synths, samplers, and effects, all without using up the native processing power of your PC.

Software Synths

However, with processor clock speeds doubling every year, the PC is now powerful enough to run several software synth engines in real time without the need of assistance from a soundcard DSP chip, and still have enough power left over to run a sequencer application and some real-time audio effects. Software synths take a MIDI input signal and generate an audio output signal, just like any hardware synth, but while many new PC users take to them like ducks to water, some musicians are still sceptical of their sound quality and practicality.

Early software synths did cause more than their fair share of problems because they were stand-alone applications: you launched them directly from Windows, had to provide them with their own dedicated MIDI input to play them from an external MIDI keyboard and a dedicated soundcard audio output to hear them, and then either had to rerecord their audio output into a sequencer application as you would a hardware synth, or 'capture' it during playback as an audio file on your hard drive, and then import this into your MIDI + Audio sequencer. The biggest cause of premature hair loss was attempting to use them alongside a MIDI + Audio sequencer package using just one soundcard, as two or more applications can share a soundcard only if that card has so-called 'multi-client' drivers.

Thankfully, quite a few soundcards now have these, but many soft instruments are now being developed in formats that don't require direct access to a soundcard independent of a sequencer. Plug-in instruments were first introduced by



Consumer soundcards have had synths on board for a long time, but Yamaha's SW1000XG was the first soundcard to feature a professional-quality sound module built in.

Steinberg in *Cubase VST*, and are now supported in slightly different forms by all of the major sequencing packages, including Emagic's *Logic Audio* and Cakewalk's *Sonar*. Plug-in VST, *Logic* and DX Instruments are soft

synths that can be launched from within the sequencer package, whereupon their audio output appears within the sequencer in just the same way as recorded audio streamed from hard disk. It is mixed within the sequencer and sent, along with the recorded audio, to whatever soundcard output is being used by the sequencer.

Today's twin availability of multi-client soundcard drivers and integral software synths means that getting started is no longer a problem, and personally I don't think sound quality is an issue either. Recreations of vintage instruments should fool most people unless they have the original alongside for an A/B comparison, and there are loads of new sounds now available that have never existed in the world of hardware synths.

One remaining problem may be not having enough processing power available to run all the soft synths you desire. While some

Soundcard Driver Types

Most musicians' soundcards now support between two and six possible driver formats, while consumer ones may offer two or three, and working out the best ones to use with your particular music software can often result in a lot of wasted time and frustration. Here are some basic guidelines and explanations:

- **MME** (MultiMedia Extensions) are the lowest common denominator. First introduced in Windows 3.1, these drivers have in the past given high latency figures (see main text), and in general they are to be avoided with sequencer software like *Cubase VST* and *Logic Audio* unless you have no alternative. However, Cakewalk seem to have used them to provide excellent performance in their *Sonar* package, and they can also give good performance with some stand-alone soft synths.
- **DirectSound** drivers generally provide much lower latency than MME, and are a good choice for many soft synths in the absence of other dedicated drivers, especially as they can be accessed from multiple applications simultaneously. To do this they hook into Windows at a lower level, and utilise various onboard acceleration features on the soundcard, but must have properly written drivers. If your soundcard doesn't have properly written DirectSound drivers then Windows will still let you choose them as an option, but will use an emulation mode, which degrades performance often to a point worse than MME drivers. The main limitation is that they can only be used for playback — if you want to record you need to choose a different driver format.
- **ASIO** (Audio Stream Input Output) drivers were introduced by Steinberg in their popular *Cubase VST* MIDI + Audio sequencer, and were the first driver type to offer truly low latencies of 10 milliseconds or less. ASIO 2.0 also supports sample-accurate positioning across multiple ports (handy for ADAT transfers), as well as the provision of 'zero'-latency monitoring (see main text). Always use them if your sequencer and soundcard both support them.
- **EASi** (Enhanced Audio Streaming Interface) drivers are only available for a few soundcards, and



The secret of success when running MIDI + Audio applications is to choose the most suitable drivers from those available.

essentially offer an improvement over ASIO drivers when running in Emagic's *Logic Audio* range since version 4.0. CPU overhead is generally lower than when running ASIO drivers, so *Logic Audio* users should always use this format if available, though *Logic* will also happily run using ASIO drivers.

• **GSIF** (GigaSampler InterFace) drivers only work with the Tascam/Nemesys *Gigasampler* and *GigaStudio* range of soft samplers. These are highly regarded due to their excellent sound libraries and fixed low-latency performance (6 to 9ms). If you want to run these applications then having GSIF support is almost obligatory: although DirectSound drivers do work in a more limited fashion, they give higher latency, and don't offer multi-output support. Always use GSIF drivers with *Giga* products if they're available for your soundcard.

• **WDM** (Win32 Driver Model) is the latest driver type from Microsoft, first introduced in Windows 98 SE as an option (although there are some problems with this combination, and few soundcard manufacturers have released suitable drivers). They can run successfully under Windows ME, but are far more important to Windows 2000 and XP users. They offer much lower latency than either MME or DirectSound drivers (in some cases down to an amazing 1.5ms), but have been slow to be released, although this looks likely to change with the recent launch of Windows XP. Use when running Windows 2000 or XP, and especially if running *Sonar*.

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Choosing a soundcard with on-board DSP, such as Creamware's Pulsar, will allow you to run soft synths, samplers and effects without taxing your PC's own processor. (Note, however, that these cards can only run applications that are specially written for them — normal soft synths can only be run on the PC's own CPU.)

- musicians manage to create complete songs using software synthesis, this still demands a cutting-edge PC with the fastest processor available. If you're writing dance music that uses lots of drums and percussion, but monophonic lead synths and bass lines, and limited chord work, your total polyphony will still probably leave you with some spare CPU power to add software plug-in effects. However, judging by my own recent tests, a Pentium III 1GHz PC will be pretty well fully occupied if you attempt both to run effects and achieve the 64-voice polyphony provided by many of today's hardware synths, so you still can't expect to create the equivalent of a full commercial track inside a PC quite yet.

The Problem Of Latency

Latency is by now a pretty well-known problem, but it's often not until you experience it for yourself that you realise the nuisance it can be. Owing to interruptions such as opening new windows, responding to user key presses and incoming MIDI data, soundcards cannot simply output data as soon as it is received, because they cannot guarantee that the stream of data will not be broken. Instead, they need to 'buffer' the sound that is being both recorded and played back, effectively introducing a delay. As long as its buffers are large enough to survive these interruptions, the soundcard can carry on delivering audio smoothly, without any clicks and pops. However, if any interruption

is long enough to result in the buffer outputting all its data before there's enough time to feed some more in at the input end, you'll hear a gap in the audio.

So, depending on the size of the soundcard audio buffers, there will always be some sort of delay between initiating a sound and hearing it. This isn't a problem during playback of existing recordings, since the music software can prepare the sounds in advance, but there's no way to do this with sounds being recorded, since they occur in real time. The result is that if, like most vocalists and electric guitarists for instance, you want to listen to your performance with a little reverb or other effects, what you hear from the output of your soundcard will lag behind what you play, exactly as it does when monitoring off-head from a tape deck.

There are several possible solutions. For recording with effects, you could monitor using an external rackmount effect unit, but still record a dry signal so you can add software effects later on. If the soundcard has built-in DSP effects, you could use these in exactly the same way. A third way, with suitable ASIO drivers (see Soundcard Driver Types box) is to use a soundcard with 'zero'-latency monitoring. Effectively, this bypasses all the software, by passing the soundcard input signal direct to the soundcard output socket so that you can hear it immediately. You can then use this signal as a headphone feed, or patch it into a

rackmount effect unit as before.

The other area where latency can cause problems is when playing a soft synth in real time. Here, only the audio playback buffers are involved, so the time delay is usually less than that involved in recording, and most modern music soundcards with ASIO, EASI, WDM, and in particular GSIF drivers will provide soft-synth latencies of 12ms or less, which are unnoticeable for most musicians. In the longer term, bold claims are being made for WDM soundcard drivers that should offer latencies of under 6ms with suitable soundcards, effectively making even audio monitoring latency problems disappear, although we'll have to wait and see whether or not this is achieved in practice.

Attaching MIDI Hardware

If your PC already contains some sort of soundcard, you'll probably already have a MIDI interface. Most consumer soundcards, as well as some motherboard soundchips, have a 15-pin socket that doubles as a joystick port (for playing games), and a MIDI In and Out. All you need to complete the picture is a suitable adaptor lead. These are often called Gameport adaptors, only cost about £10, are available from most mail-order suppliers, as well as from both high-street PC and music shops, and provide a standard five-pin DIN MIDI In and Out lead. There are also plenty of entry-level musician's soundcards that provide a single MIDI In and Out, including the M Audio Audiophile 2496 and Terratec EWX 24/96 (both reviewed in SOS April 2001).

If you've got two or three external MIDI synths and keyboards, you'll probably scrape by with a single MIDI In and Out, but buying a dedicated MIDI interface and allocating a separate MIDI port to each synth will make your life a lot easier, and this is where many people get totally lost in the huge number of available options. MIDI interfaces are available in a huge variety of forms, ranging from

Further Reading

Over the last few years I have written many PC Musician features that go into particular topics in much greater depth. Here are some of the most appropriate for the newcomer:

- April 1999: Latency explained.
- July 2000: Getting started with Windows 95/98 music applications.
- Nov 2000: The practicability of software-only studios.
- Jan 2001: Making music with laptop PCs.
- Feb 2001: Windows 2000 and the PC musician.
- July 2001: Basic principles of PC audio recording.
- August 2001: Choosing and installing today's PC soundcards.

These and other useful articles are available on the SOS web site; go to: www.sound-on-sound.com/search/search.asp

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- one-in/one-out devices that plug into serial, parallel, or USB ports, to eight-in/eight-out rackmount units with built-in SMPTE, patchbays, and cable testing.

If you're thinking of buying a more comprehensive soundcard, there are a few that come with integral multiple MIDI ports. Models to look at include the Marian Marc 4 MIDI (reviewed in *SOS* March 2001), which provides two MIDI Ins and Outs along with four-channel analogue audio I/O for the very reasonable price of £225, and the SEKD Siena, which has eight analogue ins and outs as well as two MIDI Ins and Outs for around £399.

If you're convinced that you only need to record single mono or stereo instruments to build up your songs one track at a time, the Lynx One from Lynx Studio Technology has a hefty £499 street price, but is probably the best-sounding soundcard I've reviewed to date, as well as having two MIDI Ins and Outs. Finally, if you want even more MIDI ports on your soundcard, one of the few options is the EgoSys WaMi Rack24, which has four analogue audio inputs and eight analogue outputs, along with four MIDI Ins and Outs — quite a combination, and very reasonably priced once again at about £500.

If you're already happy with the audio facilities of your soundcard, but want to add one or more MIDI ports, there are far more possibilities. For between one and four extra Ins and Outs, USB is probably the easiest

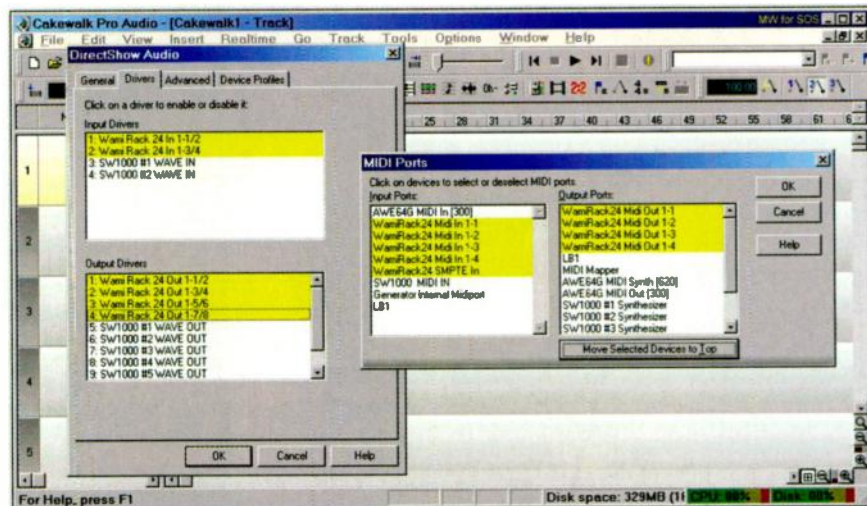
solution, and despite reports of MIDI timing problems with older PCs, the majority of teething troubles now seem to have been resolved. Ranges to consider include those from Edirol, Emagic, Midiman, and Steinberg among others, while if you are particularly concerned about tight timing and use *Cubase* or *Logic*, then it makes sense to buy one of the 'intelligent' interfaces made by Steinberg and Emagic respectively. These send MIDI data early and then clock it out exactly on time regardless of any USB delays.

Up And Running

There's a steep learning curve involved in

If you want to buy a soundcard with multiple MIDI ports built-in, the WaMi Rack from EgoSys provides more than any other model reviewed in *SOS*.

recording with PCs. This is partly because there are so many possibilities open to you, and partly because of the sheer number of ways in which you can achieve them. When you've chosen a soundcard that works well with your software of choice and a MIDI interface that is sufficiently well-endowed to connect all your MIDI instruments, however, you'll be in a good position to explore these possibilities and find a way of working that suits you. Good luck... *SOS*



Glossary Of Terms

- **24-bit:** Now offered by most entry-level soundcards designed for musicians, 24-bit recording typically offers between 6dB and 16dB more dynamic range than 16-bit recording on the same soundcard. This makes it useful for capturing subtle details, as well as letting you leave more headroom for unexpected peaks (particularly handy if recording live).
- **96kHz:** As well as recording at higher bit depths, some sequencers and soundcards give you the option of recording audio at a higher sample rate than the 44.1kHz used by CD audio. This can make high frequencies sound slightly more natural, but plug-ins will take double the amount of processing power, and 24-bit/96kHz audio files are three times the size of those recorded at 16-bit/44.1kHz.
- **DSP (Digital Signal Processing) chips:** additional computer components dedicated to audio functions such as synthesis or audio effects, which take some of the load from your PC's own processor.
- **Gameport adaptor:** a cheap way to add MIDI sockets to an existing consumer soundcard. Bear in mind,

though, that some older and cheaper cards may not cope with heavy MIDI traffic such as large SysEx dumps, leading to hanging notes.

- **Latency:** the delay between generating a sound and hearing it from your soundcard's audio output, which is largely dependant on the soundcard and PC setup. Most modern soundcards designed for musicians are capable of being adjusted to run at 20ms latency or less with suitable drivers (see Soundcard Driver Types box), which is sufficient to prevent playing a soft synth in real time from a keyboard feeling like wading through treacle. However, latency needs to drop to under 10ms to make monitoring incoming audio with plug-in effects very practical.

- **Plug-ins:** real-time software audio effects that can be added to a suitable MIDI + Audio sequencer such as *Cubase VST*, *Logic Audio*, and *Sonar*. Many freeware ones are available for download, while shareware and commercial ones continue to amaze with their audio quality and possibilities.

- **Soft synth:** a synthesizer

created entirely in software, and running on the native processing power provided by your computer. These have come on in leaps and bounds over the last couple of years, and now offer believable recreations of various old analogue synths, as well as totally new designs. Many are now available as plug-ins (see above) in either the VST Instrument format compatible with *Cubase VST*, *Logic Audio*, and others, or the DX Instrument format compatible with *Sonar*. Latency can be a problem with some consumer soundcards, but partnered with a decent musician's soundcard they are only held back by how much processing power your PC has.


- **SoundFont:** a format used originally by Creative Labs soundcards to store a set of samples to use as a playback-only sampler, but now capable of being loaded into many soft synths as well.
- **Sound chip:** essentially a computer chip that reproduces some of the functions of a soundcard, but which is built in to the PC's motherboard. Can be useful on a laptop, but seriously outranked by

any soundcard as far as audio quality is concerned, and can sometimes cause conflicts with consumer soundcards if not disabled.

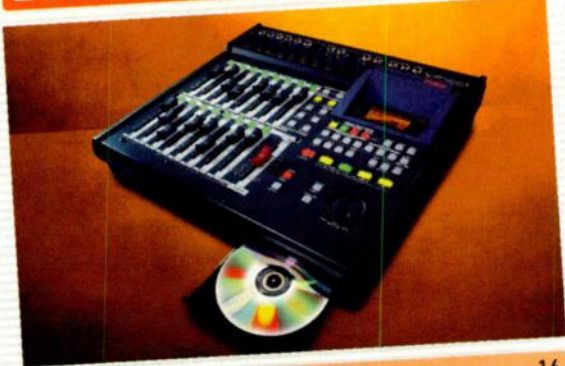
- **Soundcard:** an expansion card installed in a PC providing inputs and outputs that can be used to record and play back audio data, and often a single MIDI port as well. Some also include onboard hardware synths, samplers, or effects.

- **USB (Universal Serial Bus):** quite possibly the easiest way to add audio or MIDI peripherals to your computer, USB ports are to be found on all PCs sold during the last couple of years. Beware of attempting to run both MIDI and audio on USB at the same time unless using a specially designed product designed for the task, or you may run into timing problems.

- **WAV:** the majority of Windows audio files will have this suffix automatically appended to their filenames, although you may also find some AIFF (Audio Interchange File Format) files that have escaped from a Mac. Although other audio formats exist, these are two you are most likely to come across.



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Yamaha AW2816

Digital Audio Workstation

Hugh Robjohns

Following the success of the AW4416 workstation last year, Yamaha have now released a more cost-effective version in their new 16-track AW2816. This is derived directly from its predecessor, but with a slightly smaller feature set. Clearly, Yamaha

aim to attract musicians who wanted the AW4416, but who couldn't quite afford it. While all of the core functionality has been retained, some of the icing has obviously been removed from the original machine's cake. The hard disk recording is identical, but the AW2816's digital mixer is a cut-down version, although still based on the O2R technology. All analogue inputs and outputs

employ 24-bit converters, and the internal signal processing is to 32-bit resolution, with 54 bits employed in the equalisation algorithms.

Up Front

The centrepiece of the machine's control surface is a familiar-looking 320 x 240-pixel monochrome LCD panel. The graphical user



interface continues the usual Yamaha theme, and anyone with previous experience of the O-series mixers will have little difficulty. Newcomers will also find the operating system intuitive and easy to learn, helped along by the excellent Owner's Manual and Tutorial guide, supported by a demo CD-ROM.

The AW2816 has a smaller footprint than its elder sibling, with less space available for hardware controls. The more obvious omissions include the AW4416's fluorescent metering and timer display, the eight sampling pads, half the motorised faders, and the assignable EQ knobs.

The nine 60mm motorised faders which remain (eight channel faders plus a main stereo output fader) are the same as those on the AW4416 — quiet and fast under the motor drive, yet still pleasant to use manually. Fader paging is used to access the eight input channels, disk replay 1-8 or 9-16, and six auxiliary sends (there are eight in the AW4416). Rotary encoders set the levels of the two stereo effects returns and the usual On and Sel buttons are provided, the former performing PFL duties when in Solo mode.

The back of the machine sports only one mini YGDAI slot instead of two — effectively discarding eight inputs and outputs. There is no insert point on either of the first two analogue inputs, no word clock I/O, and no mouse port... but other than that, the facilities are much the same as the bigger machine. That said, the rear-panel fan actually seems quieter, as does the hard drive.

The Ins & Outs

For many people, one of the most important aspects of this new machine will be whether it has sufficient I/O. The physical analogue inputs comprise eight balanced TRS quarter-inch sockets, all able to accommodate sources with nominal levels between +4dBu (line) and -46dBu (mic). The first two inputs also have XLRs connected in parallel with the TRS sockets, complete with switchable (but shared) phantom power. Input eight is equipped with a high-impedance unbalanced socket in addition to the normal balanced input. Additionally, there are S/PDIF phono sockets for digital stereo I/O, and the mini YGDAI slot allows eight further inputs and outputs to be added.

Overall, then, up to 18 external sources can feed into the mixer. Combining these with the two stereo internal effects returns, the metronome click and the 16 hard disk replay outputs, there are therefore 39 possible sources. The digital mixer has permanent inputs from the 16 disk tracks, plus eight further mono and two stereo inputs, which means that the other 23 sources have to be patched to the remaining 12 mixer inputs as required.

The mixer also features 18 mix busses (eight groups, six auxiliaries, a stereo main output, and a stereo solo bus), eight channel direct outputs, 16 recorder direct outputs, and up to eight channel insert sends and 16 disk replay insert sends. This vast array of notional outputs must be allocated to the available physical outputs, which include a stereo monitor feed operating at a nominal level of +4dBu; four unbalanced Omni outputs (at 0dBu); and an unbalanced stereo output on phono sockets at -10dBV. There is also the S/PDIF digital output, and potentially eight mini YGDAI card outputs. A single headphone outlet is located on the rear panel.

44.1kHz and 48kHz sampling rates are supported internally, with ± 6 percent varispeed. The system can also be synchronised externally from the S/PDIF or mini YGDAI digital inputs. Both sampling rate and bit-resolution are fixed per Song.

A SCSI 2 port on the rear panel allows additional storage devices to be attached. As on the AW4416, this is only for backup purposes — it cannot be used for real-time audio recording or playback.

A trio of MIDI sockets is provided (In, Out/Thru and MTC Out), as well as a To Host serial data port for direct connection with a computer sequencer. The AW2816 can act as either master or slave for synchronisation via MTC or MIDI Clock, and it supports MIDI Machine Control (MMC). MIDI control change messages are also supported and a footswitch socket permits remote drop-ins.

Automation Stations

The automation system remains the same as on the AW4416, with up to 96 Scene memories, and 16 Automix passes stored with each song. Full dynamic mix automation, with motorised faders, records and replays all the channel parameters as well as information about which Scene memories, libraries, and even remote MIDI control functions are required. Subsets of automation data (mutes, faders, EQ and pan) can be disabled or overwritten individually and there are facilities to determine how the faders react at the end of each automation pass.

Operating System Tweaks

Having sorted out the suitability of the AW2816's interfacing, the next most important consideration with a product like this is the operating software. This benefits from a very mature graphical interface with a well-established user base, and has been derived directly from the AW4416's recently released version 2 software.


Amongst the new features available in the new software is the long-promised MIDI remote control functionality. This enables the AW2816's faders and channel On buttons to respond to assigned MIDI messages, allowing them to be controlled from an external MIDI controller or sequencer. External MIDI control data can even be recorded as automix data.

The shortcut-key facility has also been extended with the addition of a 'Control Key Assign' function. This allows the user to assign operations to the soft keys below the LCD screen. There is also a Quick Record system which provides a fast way to set the machine's input routing for recording.

The control surface of the AW2816 is immediately familiar and intuitive — especially to anyone with previous experience of Yamaha's O-series digital mixers. The gain controls for the eight analogue inputs are arranged across the top of the control panel, marked simply with Mic and Line at opposite extremes, and each is accompanied by an overload LED. The level controls for the headphone outlet and stereo monitoring feed are also here. Some of the early AW4416s suffered from strange high-pitched whistles on the monitoring output under certain conditions, but I could find no trace of any such problems with the new machine.

Given the absence of the AW4416's assignable EQ knobs, the channel and output equalisers must be adjusted by accessing the EQ menu page and using the cursor keys to select the required control, which is then adjusted with the dial wheel. While this approach feels clumsy in comparison to the hardware controls, I doubt it is much slower, and I had no problems in that regard.

To the left of the display a large array of ▶



Yamaha AW2816 £1799/£1999

pros

- 16 tracks of uncompressed 24-bit digital audio.
- Most important functions of the AW4416 in a more streamlined form.
- Fast and intuitive to operate.
- Optional internal CD-RW drive.
- SCSI archive facilities.
- I/O expandability using optional mini YGDAI cards.
- Smooth and quiet motorised faders.
- Reduced drive and fan noise.

cons

- Absence of AW4416's hardware metering and EQ knobs.
- Relatively noisy analogue inputs.
- No real-time audio to or from external SCSI drives.

summary

The junior sibling to the acclaimed AW4416 cuts few corners, providing top-quality 16-track hard disk recording integrated with a powerful digital mixer featuring typical O-series facilities. The operation is fast, intuitive and entirely familiar, with extensive automation facilities and MIDI functionality. A lean, mean package of essential pro-studio tools at a home-studio price.



► buttons accesses most of the machine's parameters and functions. The Song parameters are set here, disk files can be managed, the internal CD-RW (if fitted) can be accessed, and the Quick Record mode initiated. There are also buttons to set up the input and output patching, establish user preferences, configure the MIDI operations and so forth.

The next row of buttons in the group offers the familiar mixer functions, accessing pan, EQ and dynamics screens, as well as the channel overview screen. Further buttons call up the different fader layers, with six dedicated pages for the aux sends, plus a MIDI remote page and a Home page which can be further selected from inputs 1-8, recorder 1-8, and recorder 9-16.

To the right of the screen are the usual track arming buttons, an All Safe key, and a Track Cue button which routes any track selected on the arming buttons straight to the monitor outputs (bypassing the mixer's monitor channels). There is also a button here to access the Meter page on the LCD — a very important facility given the lack of hardware metering. Below this top array, more buttons access the track-display screen (showing recorded audio tracks as strips against a time line), enter the various edit modes, and undo or redo edits. The Automix screen is also accessed from here and the Scene memories can be managed.

The operation of the shuttle/jog dial wheel

will be familiar, as will that of the four cursor keys, Enter button, and the standard transport functions at the bottom of the panel. A group of 16 buttons provide the locator facilities and Autopunch operation, as well as doubling up as a numeric keypad.

Mixing Muscle

Each of the eight input channels, 16 hard disk track monitoring channels and stereo output are provided with comprehensive signal processing identical to that of the AW4416. A digital attenuator (essential for maintaining headroom) precedes four-band parametric EQ and flexible dynamics — both with libraries of 128 factory and user presets. Polarity inversion is provided along with up to 59ms of delay, and routing to the eight mix busses and main stereo output. The panning is only for stereo, not for surround as on the O-series mixers. There is also channel muting, an insert point and the usual stereo channel linking facilities, along with four fader groups and four mute groups. Channel settings can be stored in 64 channel libraries to save time reconfiguring the console.

The AW2816 retains the two independent and powerful effects processors from the bigger machine, with all the usual multi-effects including reverb, ambience, delay, and time-modulation effects (chorus, flanging, symphonic, phasing, auto-pan, tremolo, pitch-shift, rotary speaker simulation, and so on). There is also a selection of very

usable distortion and amp-simulation effects intended for the recording guitarist or bassist.

The effects processors can be configured to operate in the normal send/return arrangement, or they can be inserted directly into the signal path of selected channels or into the stereo output bus. As a default, the effects processors are fed from auxiliaries five and six and returned through the two dedicated effects returns channels, controlled by rotary faders, although everything can be reconfigured should you wish. These return channels have access to the full EQ, routing, panning, delay and aux sends of normal channels — only the dynamics functions are absent. A dedicated library caters for up to 128 factory and user effects programmes, but the usual comprehensive parameter controls are also available to allow fine-tuning of programmed effects.

One small point worth mentioning — although the individual aux sends from each input and disk replay channel can be controlled from dedicated fader pages, there is no provision to set the aux send master output levels via the faders. Nor is it possible to set the levels of the eight group masters on faders — unlike the O-series mixers where there are separate fader pages for these functions. Instead, the levels of the group mix busses and auxiliary outputs have to be controlled through simple on-screen attenuators on the Home menu page, using the cursor buttons and data dial.

Recording To Hard Disk

The selected recording resolution (16-bit or 24-bit) affects how many channels can be recorded and replayed from the disk simultaneously. For example, working with 16-bit resolution the machine will allow eight tracks to be recorded and 16 to be played back simultaneously. Recording 16 tracks at the same time mutes all replay tracks. In 24-bit mode, the total number of record and replay tracks will always equal 16. So, if you're recording four tracks at once, only twelve can be replayed at the same time.

Each of the 16 nominal tracks can be

Preamp Pecadillos

The performance of Yamaha's mic preamps has been one of the perennial weaknesses of Yamaha's O-series digital mixers, and the AW2816 is, I'm sorry to say, no exception. For a start, the preamps are disappointingly noisy in comparison with even very modest analogue mixers, particularly at high gain settings. I'm not suggesting that they're unusable, but my Mackie 1402 VLZpro's inputs are around 10dB quieter. Admittedly, the Mackie preamps perform exceptionally well, but Yamaha should nevertheless resolve this issue, as it is a significant weakness of their otherwise excellent digital mixers and associated products.

There is also the problem that the maximum 46dB of gain (56dB if the input fader is pushed to the end stop) is barely sufficient for moving-coil mics, even when used in close proximity to acoustic sources. The situation with high-output condenser mics is better, obviously, but not really adequate for more distant, ambient mic placements. OK, you could argue that the majority of home studios rely entirely on close-miking techniques, probably with back-electret and condenser mics, so there is no need for more gain. This may be true, but the fact remains that the input stages are rather inflexible.

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YAMAHA AW2816

► selected from one of eight virtual tracks, giving 128 tracks per song. It is not possible to switch between virtual tracks during playback, but a comp track can be constructed from the different takes using a specially designed edit mode. In addition to the 16 main tracks, there is also a dedicated stereo track, intended to receive the final mixdown. When recording on the stereo track, the 16 main tracks can only replay, and when replaying the stereo track the 16 main tracks are muted automatically.

The AW2816 provides basic but functional non-destructive editing facilities, with 15 levels of undo should an editing sequence not work out as expected. In addition to the usual editing operations, there are also time-stretch (50-200 percent) and pitch-shift (up to one octave either way) functions. In addition, selections of audio can be exported as WAV files, and saved to any of the connected drives.

There are two fundamental editing modes. In one mode operations can be carried out on any of the 16 playback tracks, whereas the other mode confines edit operations to the virtual tracks of a single playback track. The latter mode allows excerpts from multiple takes recorded on different virtual tracks to be compiled into a composite performance on another virtual track, for example.

Selection of edit points can be made on the fly or with the transport parked, and specific time or measure values can be typed into the numeric keypad. A selected track can be viewed as a waveform if you wish, and scrolled back and forth to locate an edit point, but there is no audio scrubbing in this mode. Being used to working with more sophisticated audio editing platforms, I found the waveform editing function very frustrating. Only one track can be viewed at a time, so you can't see how tracks relate to each other, and only at the higher zoom resolutions is there any correlation between the rotation of the dial wheel and the movement of the waveform. Lower zoom settings reveal a longer window of audio, and the very slow reaction time of the system makes overshooting the point you're aiming for inevitable. The result is that you can end up chasing the wanted section of audio all around the screen — and without the ability to hear it as you scroll, it is easy to become hopelessly confused!

As long as the waveform is viewed at relatively high zoom settings the waveform editing mode is useful and usable for performing fine editing. It is no substitute for

Drive Details

The AW2816 is supplied with one 2.5-inch, 20Gb IDE hard drive fitted, as standard. This is sufficient to store about 230 minutes of continuous 16-track material at 16-bit/44.1kHz resolution (the most space-efficient format with the lowest available quality). At the highest possible resolution (24-bit/48kHz) the standard drive will store about 138 minutes of continuous 16-track recording.

Only one drive can be installed within the machine, but additional drive caddies are available to enable drives to be quickly swapped in and out of the machine, either to allow different projects to be stored separately or to transport work between different machines. The Yamaha web site lists approved alternative drives of six, 12 and 20Gb capacity, although the maximum size supported by the current operating system is 64Gb. Furthermore, the hard disk's filing structure limits the maximum storage capacity allocated to any one song to 6.4Gb. That translates to about an hour and ten minutes of 16-tracks at 16-bit, so no problem with the Pink Floyd-style concept albums then...

Like the AW4416 before it, the new machine can be fitted with an optional (in the UK) internal ATAPI CD-RW drive to create red-book CD-Rs of finished stereo mixes, and to store data backups of songs and associated mix data. It can also be used to input audio samples to the hard drive and to load software updates. The CD-RW adds such important functionality to the basic machine that it

really is an 'essential' option.

However, if you want to install the drive later, Yamaha's web site currently only recommends their own CRW2100E and CRW2200E series CD-RW recorders. The site also lists various drives for connection to the SCSI 2 interface, and a selection of suitable CD-RW drives from Yamaha, Plextor and I/O Data have been approved so far. Similarly, various 640Mb and 1.3Gb MO drives; 20, 40 and 60Gb hard disks; 250Mb Iomega Zip and Jaz drives have also been tested and approved for expanding the machine's data storage via the SCSI 2 buss.



The internal CD-RW drive provides so much extra functionality that it should be considered pretty much an essential addition.

a ProTools or SADiE system... but then Yamaha don't intend it to be — this is a cost-effective multitrack recorder with some basic editing facilities, not a high-end post-production system.

Effective management of Songs on the hard disk is important and Yamaha have provided some useful facilities including storing comments with the file to help distinguish between various versions of a Song, and a built-in calendar function time-stamps every recording. There is also a couple of utility routines to maximise disk space, such as a hard-disk optimisation program which removes unnecessary data (the undo history, for example) and a defragmentation routine which maximises the usable storage space.

The Right Choice?

Deciding which features to retain and which to remove to meet the target UK price point can't have been easy. Some might argue that the demise of the fluorescent metering is a step too far (and I would support that view), while others may initially miss the hardware EQ controls. However, the reduced number of faders presents negligible operational problems and the same applies to the loss of two aux sends. And as for the inserts on the first two inputs, I don't know anyone who ever used them anyway! Having only a single mini YGDAI slot is far more influential on the

machine's interfacing, but only a few users at this budget level would probably require more I/O anyway. That said, users should probably budget for an external preamp and A-D converter, as the quality of the mic inputs isn't great (see 'Preamp Pecalillos' box).

Overall, the AW2816 impresses with its competence and usability. Following in the footsteps of its elder sibling, the new machine enters the market as a fully developed and finely honed product with pretty much all the features and facilities you could wish for. It is also worth stating that this new machine has benefited from Yamaha's continuing development of the AW4416 and, as a result, is a mature and completely stable product.

If you have been hankering after an AW4416 since its launch, but couldn't quite justify it, the new AW2816 will be your salvation. I dare say it will also cause a certain amount of consternation at the headquarters of Yamaha's competitors... **SOS**

Test Spec

Yamaha AW2816 OS v1.02

information

E AW2816, £1799; AW2816 with CD-RW drive, £1999; extra hard drive caddies, £49. Prices include VAT.

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Studio Ergonomics

Elizabeth Hallows

If you've ever experienced neck pain from spending hours peering sideways at a monitor, shoulder pain from reaching repetitively for an effects rack or back-ache from sitting on a broken-down chair, you'll know the toll that poor ergonomic design can take. These aches and pains, and more specific problems such as tendonitis, tenosynovitis and frozen shoulder are known as musculoskeletal disorders (MSDs) and account for more working days lost than any other cause.

The principles of ergonomics, which looks at the way we work within our environment, can be used to design the layout of your studio, in such a way as to minimise the risks of these problems occurring.

The Bad News: Causes Of MSDs

There are many ways in which working in a home studio can increase your risk of developing serious musculoskeletal disorders.

Poor Posture: Poor posture, such as sitting in a slumped position with your head twisted to one side to look at a monitor, results in straining of joints, overstretching of some muscles and shortening of others. Unfortunately, you can often feel entirely comfortable, but still be in a slumped position. Similarly, correcting to an upright

Most SOS readers spend a lot of time considering what equipment to buy, and learning how it works. But it's also important to consider the ergonomics of your studio if you're to avoid the possibility of painful, and surprisingly common, strain injuries.

posture can feel quite unnatural at first.

As well as your spinal posture, it is important to consider the position of your arms and hands. Sitting at a keyboard or work-surface that is too high for you (or on a chair that is too low) results in the wrist being 'cocked' or extended and the hands deviated towards the little fingers; both postures that strain the muscles of the forearm.

Overstretching: Working with an outstretched arm, perhaps reaching for a mouse or effects rack, is likely to cause problems to the muscles and tendons in the shoulder. Using this posture whilst slumping in your chair can result in the shoulder blade sliding round the rib cage and 'winging' away from the body. In addition, this position stretches the nerves running from the spinal cord in the neck region to the fingers.

Long Hours: It's common for musicians to work for long hours in a studio, often in a sitting position in front of a computer monitor, using a mouse and keyboard. The longer you spend in one position, the more

important it is that you are using a good posture. However, even with good posture, staying still for too long results in sluggish circulation and a build-up of toxins around muscles and nerves. Muscles working statically, such as the shoulder muscles



Adjusting the height of your chair to suit different studio tasks is one of the best ways to avoid aches and pains in the studio, so it's worth spending a little extra money on a chair which allows its height to be easily adjusted while you're seated.

when reaching out to the side for a keyboard or mouse, become tired more quickly than those working to create movement. Sitting for a prolonged duration means that the back muscles relax, and they are then easily pulled if reaching for something or standing up quickly.

Repeated Movements: Working with a computer keyboard or mouse often involves frequently repeated movements, which can present a real risk of Repetitive Strain Injury (RSI) in the hands and arms. However, the problems often arise not just from repeating one particular action, but from combining this with having the arm in an unsupported position for too long, which requires muscles to work statically, and may stretch the nerves.

Stress: In workplaces, high levels of stress and MSDs often go together. Feeling stressed leads to a physical tightening of muscles and this may again result in reduced circulation, a build up of toxins, and damage to nerves. Our posture often worsens when we feel stressed; in particular we tend to lean forward, hunch our shoulders and bring our chins down. All these changes result in strain on muscles, especially those of the neck and shoulders. Also, it is important to recognise that even amateur studio musicians can be stressed by battling with unfamiliar equipment or the pressure of juggling their leisure time.

The Good News

You might now be thinking that your studio is a veritable assault course, with every piece of equipment a potential hazard. The good news is that you will certainly be able to make it a safer place with little or no outlay, and you can bask in the knowledge that every little thing you do reduces the risk of MSDs.

The Right Chair: To start with, you need to think about how you use the studio, which pieces of equipment you use most often, and which pieces you use in conjunction with others. If you need to access a mixing desk, an effects rack, a computer monitor and keyboard, and a musical keyboard, then you are going to need a chair on castors.

Office-type chairs, with five castors, are designed to comfortably support people who sit all

day long at their computer workstations, and as such will also be suitable for your studio. Most of us tend to sit in a slumped posture, with our lower backs rounded, but if you stand up you'll feel the arch that we have in our lower backs, and this should be preserved when you sit.

A good office chair will have a lumbar support to do this for you, and all you have to do is make sure you sit to the back of the chair rather than perching on the front. The variable height will also be necessary when getting the right wrist position for using the keyboards or mixing desk. You are much more likely to use the height adjustment facility if it can be operated while you sitting on the chair, rather than having to get up to do it. Consider the height of any chair arms, which may prevent you from getting close enough to the work-surface, and the depth of the seat, which should support your thighs but not dig into the back of your knees. Most office chairs have back rests which can be adjusted to different heights and angles, and expensive chairs have the option of tilting mechanisms which allow movement as you lean forward and back.

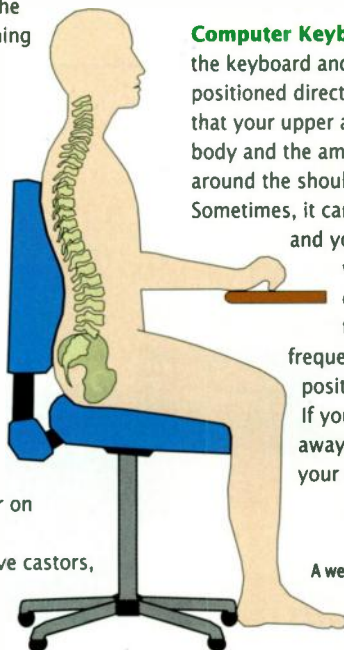
Good office chairs are not cheap, but it is sometimes possible to get them second-hand or from offices having a refit. Check that all the adjustment levers work, and that it feels comfortable for you.

If even a second-hand office chair is beyond your means, use an older style dining chair and tie a rolled-up towel to the back of the chair, to support your lower back. Make sure that instead of over-reaching from your static chair, you stand up to get to equipment further away — you can congratulate yourself for regularly altering your posture at the same time!

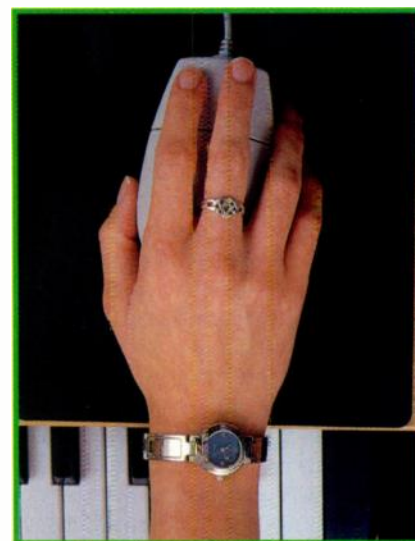
Computer Keyboard & Mouse: Ideally, the keyboard and mouse should both be positioned directly in front of you, to ensure that your upper arms remain close to the body and the amount of static muscle work around the shoulders is minimised. Sometimes, it can be difficult to achieve this,

and you should then consider whether you use the mouse or keyboard most. Usually, the mouse is used more frequently and therefore its positioning has to take priority. If you try putting the mouse far away from you, you'll see that your shoulder muscles have to

A well-designed office chair should help preserve the natural curvature of your spine while you're sitting.



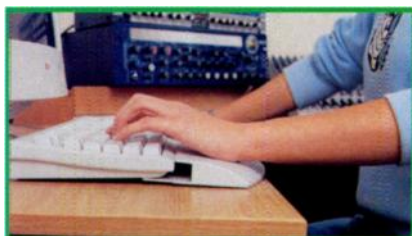
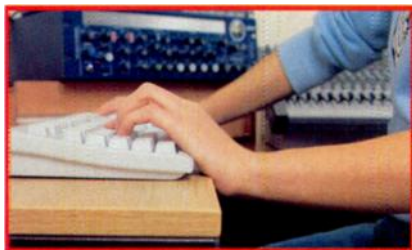
It's easy to get into the habit of stretching to reach your computer's mouse, which can cause your wrist to assume unnatural positions such as those shown in the top two pictures here. However, this dramatically increases your risk of RSI and other musculoskeletal disorders, so you should look to ensure that your wrist and forearm are always in line when using the mouse, as in the picture below.



work statically to hold your arm out, and that the mouse is moved purely from your wrist. As well as risking damage to the shoulder, arm and wrist, it's common to see people slumping to that side too, so side-flexing the spine. Bring the mouse closer, and you'll be able to relax your shoulder, as well as using small movements of the whole arm to move the mouse.

The chair height should be adjusted so that when your hands are on the mouse or keys, your forearms are horizontal, so that the wrists are in a neutral position. If this chair height means that your feet are unsupported, use a footrest (again, a deep book or solid box may do). If you are very tall, adjusting your chair height for optimum wrist posture might result in your knees pressing against the underneath of the work-surface; if this is the case, raise the work-surface.

Watch your keying technique: if you tend to rest your wrists in front of the keyboard, use a wrist rest to avoid a 'cocked' wrist



A wrist rest in front of your computer keyboard can help to avoid 'cocked' wrist positions which are known to contribute to the risk of painful RSI.

- ▶ posture. It is a good idea to have space between the keyboard and the edge of the work surface to allow you to rest your arms when possible. Most keyboards have a mechanism that allows you to tilt them; consider using this to bring the keys to a more comfortable angle.

Your Monitor Screen: It is important that the monitor is directly ahead of you when you need to look at it, and not off to one side. Once you've adjusted your chair height to ensure your forearms and wrists are horizontal when your fingers are on the keyboard, check the height of the monitor. The top of the monitor casing should be about level with your eyes. Too low and you'll be looking down, which strains the muscles in the neck, too high and your chin will be poking out. However, if you're having to look down at the keyboard a lot, the monitor can be a little lower to reduce

the amount of head movement required. The level of the monitor can be adjusted by mounting it on a stand or simply by using a selection of books...

To avoid visual strain, the monitor needs to be about an arm's length away from you, and you'll need to check that there's no reflection from windows or lights. As the icing on the cake, you should try to provide some opportunity to look up from your work and gaze off into the distance, to allow your eyes to focus at a different focal length.

The Mixing Desk: The main hazards from using a mixing desk are from it being too high or low, and from reaching to the controls furthest away. When adjusting the height of your chair, again ensure your forearms are horizontal with your hands on the faders, as working with your wrists 'cocked' upwards (if your chair is too low) or with your wrists unsupported (if your chair is too high) are both risky.

Make sure there is enough space underneath the desk for your legs, so that you can get as close as possible. When using the control furthest away, don't keep your hand there, but bring it back down quickly, to avoid a prolonged reaching position.

Check that other units you'll be using in conjunction, such as the effects rack, are as close as possible, and remind yourself to move to them with the chair rather than twisting and stretching. Consider standing at the mixing desk in order to reduce the amount of time spent sitting, but beware of stooping forward for a prolonged time to reach the furthest controls.

Synths & Master Keyboards: In order to avoid twisting, try to position musical keyboards so that you can sit directly facing them. Usually, it is comfortable to have the

chair a little higher than you would have it to use the computer keyboard. Make sure that there is space underneath for your legs, again to avoid over-reaching.

Remember that you may well need to see your computer monitor while using the music keyboard. This can be difficult if you're moving between a musical and computer keyboard positioned side by side, so you need to think about which you use most with the monitor. Consider putting the monitor on a swing arm so that it can move with you, or position one keyboard above



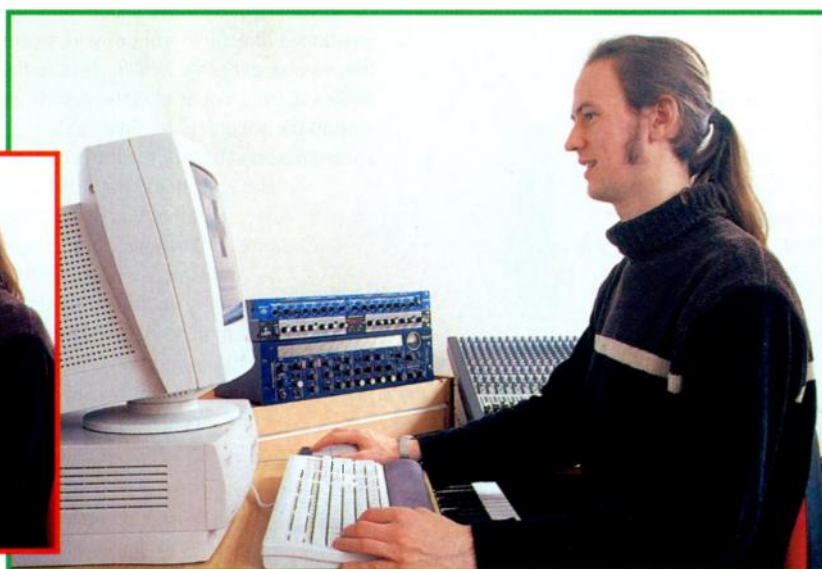
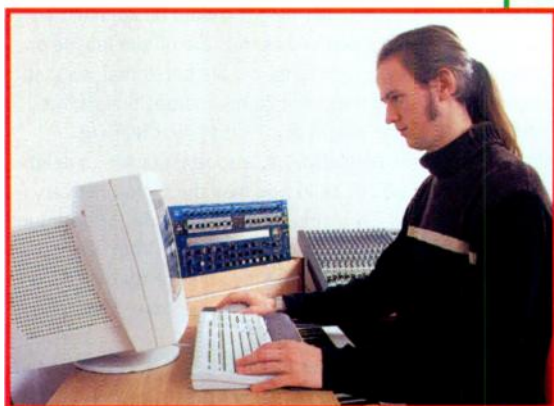
If you're working mostly within your computer, why not consider getting yourself a desk with a sliding shelf, such as that shown above? This can allow you to position both computer and music keyboards in line with your computer monitor, so you can control all the sequencing operations without reaching or stretching.

the other, with the monitor in line.

Update Your Working Methods

A poor studio setup is unlikely to cause problems to a musician who uses it infrequently, for short periods of time. However, the likelihood of poor design resulting in physical problems will significantly increase if the musician uses the studio more often, and for longer periods. In addition to rearranging the physical layout, there are methods of working that help to reduce the risk of

Placing your computer's monitor too low, as in the left-hand picture, can lead to neck and eye strain, as well as encouraging poor posture overall. To raise the screen to a more suitable level, you can sometimes rest the monitor atop the computer, as in the right-hand picture.





Some simple extender arms for your keyboard can make playing and editing rackmount synth modules a much more comfortable experience.



developing musculoskeletal disorders.

It is important to take regular breaks from specific activities, not necessarily to rest, but to vary your posture and the way you are using your body. In particular, it is important that the time spent in sitting is broken up, to include periods of standing, as even sitting in a good posture becomes stressful for the spine after a time. Positioning the mixing desk at a height to enable it to be used standing would be helpful, and having a high 'perching'-type stool available would offer more postural variety.

Spending a lot of time sitting encourages a round-shouldered, poking-chin posture; eventually, as muscles and joints adapt, it can become difficult to correct. Ensure this doesn't happen to you, by stretching regularly.

The following stretches are a good starting point, though you shouldn't do any of them without medical advice if you have any relevant health problems or if they cause pain:

- Sit against the back of your chair, looking straight ahead. Draw your chin back (not up or down), so that your neck lengthens and the neck muscles relax. Repeat slowly.
- Sit against the back of your chair, allow your arms to hang by your sides. Think about the muscles between your shoulder blades and your spine, and tighten them, drawing the shoulder blades back and down, while your collar-bones widen. Your shoulders should not move much.
- Sit against the back of your chair, clasp your hands together at chest height. Turn your hands so your palms are facing away from you, and slowly stretch your arms above your head.

Remember that our bodies are designed

to move, so make sure that you counteract hours spent sitting by exercising regularly. If you already have problems it is advisable to try slow, controlled exercises such as Pilates, the Alexander technique or Yoga, all of which aim to improve posture, muscle balance and suppleness.

Gain Without Pain

It's worth taking the time to improve ergonomics in your studio. If you already have aches and pains, you have even more reason to ensure your studio isn't making your problems worse. Try it and see! **ES**

Elizabeth Hallows is a chartered physiotherapist with an additional qualification in ergonomics. She works with companies, organisations and individuals to prevent the musculoskeletal problems that are associated with poor working environments.

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Samson S•Com & S•Com Plus

Despite their highly affordable pricing these processors offer sophisticated additional functions, including de-essing and an enhancer.

Dual-channel Dynamics Processors

Paul White

The cut-throat market in analogue signal processing has resulted in some astounding bargains for the home studio owner wanting better-than-average signal processing quality at a significantly less-than-average price, but now Samson have joined the fray and seem determined to push prices even lower. Their two S•Com compressors are elegantly constructed in 1U rack cases with blue anodized front-panel extrusions and illuminated buttons. Servo balancing is used on the quarter-inch input and output jacks, doubled up on regular XLRs, enabling both balanced and unbalanced connections to be used with switchable -10dBV or +4dBu operating levels. Power is via an IEC mains connector rather than the customary budget wall-wart, and there's side-chain access plus stereo link switching, just as on more expensive units.

Both units feature comprehensive metering, plus an in-built expander/gate, but, in addition to that, the S•Com has a single-knob enhancer circuit while the S•Com

Plus features both de-essing and an independent peak limiter.

The compression circuitry in both models is based on the latest generation of low-cost, high-performance VCAs, and incorporates Smart Knee Detection (SKD), which automatically changes the compression curve from soft knee to hard knee depending on

the level of the input signal. A switchable automatic attack and release adjustment is provided in the form of the Automatic Envelope Generator (AEG), and the S•Com model includes a Spectra circuit that can be switched in to help attenuate sibilant high/mid-range frequencies when compressing vocals.

Ergonomically, although the panels are quite busy, the compact, 41-detent knobs are reasonably spaced, and the integral status LEDs in the buttons economise on panel space. Separate LED meters show the amount of gain reduction plus the input/output level (switchable) while the S•Com Plus also has a meter to show the amount of de-essing taking place.

Spectra Switch

The S•Com is the simpler of the two models, and its signal path starts with a switchable gate/expander which can have a fast or slow release time. A pair of LEDs indicate whether the gate is open or closed.

Immediately following the gate is the compressor section, which is almost identical to that of the S•Com Plus except that the

SOUND ON SOUND

Samson S•Com/S•Com Plus
£129 / £169

pros

- Very affordable.
- Simple and predictable in operation.
- Very respectable sound quality and performance.
- Lots of features.

cons

- None at this price.

summary

Both units represent a good performance-to-cost ratio and include competent metering plus useful extra features.



S-Com also has a Key Listen button as well as the Key switch that feeds the external key input into the side-chain circuitry. The usual Threshold, Ratio, Attack, Release and Output (make-up gain) controls are in evidence, and each channel has its own In/Out switch. When the Spectra switch is engaged, a dynamic high-frequency anti-sibilance/harshness contour circuit becomes active when compression is taking place. Heavily compressed vocals can sound harsh and aggressive, and the dynamic filter, which switches in only when compression is happening, can help to take the edge off the sound.

The Auto button automates both the attack and release time constants according to the input signal dynamics while the I/O button switches the level metering between input and output. A Stereo Link button gangs both side-chain circuits for stereo use — in linked mode, the left-hand channel controls govern both channels, though the Output controls remain independent.

The Enhance knob brings in a 'high-frequency recovery' circuit to help compensate for the loss of high end that can occur during compression. This behaves much like a conventional high-frequency enhancer, though the manual is rather vague on the details of exactly how it works. When the enhancer's control is turned fully anticlockwise, the enhance effect is disabled.

De-esser And Limiter

The S-Com Plus dispenses with the variable Enhance control and instead provides a switchable, preset Enhancer function in place of the S-Com's Spectra switch. Spectra isn't needed in this model, because there is a one-knob de-esser plus a one-knob peak limiter. A single LED shows when the limiter is operating, while de-essing is monitored by a five-LED meter that shows up to 12dB of gain reduction.

De-essers vary in their means of operation, the simplest being based around a compressor with a frequency sensitive side-chain system that causes it to react more to sibilant sounds in the 2-6kHz range than to the rest of the spectrum. This results in the de-esser pulling down the gain of the whole signal whenever a sibilant sound triggers the compressor, so non-sibilant sounds occurring at the same time will also be affected. This can give rise to an unnatural lisping effect, which is why more elaborate methods have been developed.

Perhaps the best form of de-esser is the one that only causes gain reduction to occur in the band of frequencies where sibilance is a problem, without affecting the rest of the spectrum, but a good compromise is the system that seems to be employed here. Again, a compressor is used to reduce the

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► gain when triggered by sibilant sounds, but the circuitry is arranged so that only high-frequency cut is applied, leaving low frequencies unaffected. The result isn't quite as transparent as produced by 'sibilance band only' compressors, but it is a lot better than the basic 'squash everything' system. Using the de-esser is simply a case of increasing the Level setting until the desired amount of de-essing occurs, while monitoring the high frequency gain reduction via the meter. In practice, the best setting is generally a compromise between the most effective sibilance removal and the introduction of distracting side-effects. The de-esser comes after the compressor, but before the Output control, so adjusting the compressor output level doesn't mess up the de-esser operation.

While compressors can often be set up as limiters by choosing a high ratio setting and a fast attack time, it's often useful to be able to apply limiting after more moderate compression, to take care of the occasional signal peak that sneaks past the compressor. This is particularly important when you're feeding digital systems where clipping is unacceptable. Here the limiter threshold can be set anywhere between 0dB and +18dB, and any signal trying to exceed that threshold is subjected to gain reduction to prevent it from doing so. A single limit LED shows when the limiter is doing its thing and, as a rule, it's best to adjust your levels so that the limiter LED only blinks briefly on signal peaks — unless of course you want to use heavy limiting as a deliberate effect.

Performance

Clearly the operation of the compressor section is the most important thing here, as that's the main processing function of both these units. Despite the low cost, I found it to work very well. The compression is tight and positive sounding without significant side-effects and, although you can make it pump by getting very heavy handed with the settings, I'd say the units would be best employed looking after levels rather than

creating heavy compression effects. The Auto circuitry adapts effortlessly to complex mixes and, even without the Enhance function, the high frequencies remain pretty much intact at all sensible settings.

The expander/gate section is identical for both units and works quite effectively to clean up pauses. The fast release time works well with percussion, while the longer release setting seems fine for pretty much everything else. You do need to be careful to set the threshold so that it's only just above the noise you're trying to mute out, otherwise

"...although you can make it pump by getting very heavy handed with the settings, I'd say these units would be best employed looking after levels rather than creating heavy compression effects."



you can find yourself gating chunks out of the wanted sound. As expected, the expander setting is a little more forgiving than gate mode, due to its more progressive action, but I experienced no problems in either mode.

The variable enhancement function of the S•Com produces the classic high-end sizzle to help spice up mixes as well as to compensate for any compression treble loss. As with all enhancers, over-use can result in a somewhat aggressive, artificially fizzy sound, but, used with care, it can help add life to a recording that is suffering from a loss of high-end detail. Having a fixed on/off enhance option on the S•Com Plus is a little more limiting, but the setting has been sensibly optimised so that only a hint of extra high end is evident.

The Spectra button of the basic S•Com is quite limited compared with the fully adjustable, dedicated de-esser of the S•Com Plus, though it is a useful bonus and can help smooth out moderate sibilance and harshness without making its presence too obvious. Subjectively, it just seems to attenuate the upper mid-range when the compressor is applying gain reduction, but it

Both S•Com models offer balanced audio I/O on XLRs and jacks, as well as full sidechain access via external key inputs and outputs.

is reasonably subtle.

The S•Com Plus de-esser is simple to set up and it does make a worthwhile difference to sibilant material, though it won't provide a complete cure where the sibilance level is excessive. If too much is applied, the material being processed can lose some of its high end, so you need to find a good compromise setting. Having a meter helps, as you can see exactly when the de-essing is being applied, which means you know when to listen out for audible side effects.

Another benefit of the S•Com Plus is its limiter, which is again simple to set up and surprisingly transparent in use, providing you only use it to catch peaks. If you push it harder, so that the LED stays on for longer periods, you can hear the action of the limiter quite clearly, but, as touched upon earlier, this can be a useful effect when working on rock vocals or drums.

Conclusion

It seems that in launching this range of aggressively-priced rack products capable of delivering good sound quality and simply bristling with extra features, Samson are trying to out-Behringer Behringer! Certainly they offer a lot of functionality and quality, and any minor criticisms relating to their performance or flexibility are swept away in the light of their unbelievably low UK price. What's more, if you fill in the warranty registration card, Samson extend the warranty to three years. If you spend more, you can buy compressors with more character (or more transparency come to that), but what you get for your money is solid, predictable performance that gets the job done without fuss. What can I say — workhorses for the price of ponies? **SOS**

Information

E S•Com, £129; S•Com Plus, £169.

Prices include VAT.

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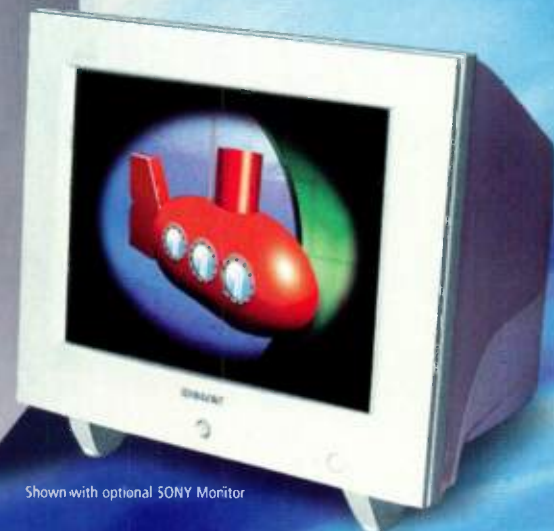
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You Are Surrounded

Surround Sound Explained • Part 6

Our series turns to the practicalities of setting up your own surround-capable recording system, and we talk to two radically different surround studios to see how they've coped — one at project and one at pro-studio level.

Paul White, Hugh Robjohns, Matt Bell

Here at *SOS*, we're currently in the process of planning a small surround system to use as the basis for a series of practical surround articles, but before that gets fully under way, I'd like to build on Hugh Robjohns' excellent theoretical series on the subject by considering some of the practical ramifications of putting together and using such a system. Inevitably, a lot of questions arise along the way, but I'm a firm believer in explaining the questions before I attempt to provide answers! We've also been interviewing a number of studio engineers who have been working in surround sound, ranging from project-studio owners to top-notch mix engineers at big London studios, to see how they have overcome some of the problems that arise

when trying to create surround mixes with equipment designed for a stereo end product. This month sees the first excerpts from those interviews.

The increasing popularity of DVD means that many people already have surround theatre systems at home, and in addition to films and other visual material, these can now be used to play back surround audio-only recordings or music videos with surround-sound tracks. The idea is that as the domestic penetration of DVD increases, the home music system will move away from standard CD player and onto the DVD platform. Whether this will happen or not is unclear, but if it does, it will have many consequences for project- or home studio-based musicians, who until now have bought equipment designed to produce finished tracks in stereo, most commonly on CD-R or stereo DAT. If you now wish to switch

to producing music in 5.1 surround on DVD, say, you suddenly have a host of new points to consider at all stages of your music-making chain, particularly if you are hoping to make the switch with as little alteration to your studio setup as possible. As we shall see, such an attitude probably isn't practical, as there is much more involved than simply adding a few channels to your finished mix! I'll start by considering how the various stages of the recording, mixing and mastering process can differ when the end result is not a stereo Red Book CD, but a 5.1 mix on a DVD-Audio disc.

Mics In Surround

The whole purpose of surround sound is to escape the boundaries of stereo and to create music that can literally surround the listener. As with making stereo records, where source sounds may be mono signals panned into the final mix or true stereo recordings, surround productions can incorporate mono, stereo and full surround elements. The last of these are generally produced by means of microphones capable of producing a 5.1-compatible output (such as the Soundfield mic mentioned in part four of this series — see www.sound-on-sound.com/sos/oct01/articles/surroundsound3.asp) or mic arrays which are designed to capture the individual directional components of the soundfield (as detailed in

part five — see www.sound-on-sound.com/sos/nov01/articles/surround4.asp).

Fortunately, this doesn't necessarily mean that you have to go out and buy a Soundfield microphone or a ton of extra mics so that you can use five-mic arrays on all of your sound sources if you want to work in surround, any more than you *have* to own stereo microphones or record everything with stereo mic arrays in your current setup. Surround microphones are used extensively in classical recording and some areas of film work, but I think it's fair to say that most of us beginning work in surround will be using predominantly mono and stereo sources, at least to start with.

Surround Mixing & Effects

Trickier to solve is the issue of surround panning on mixers designed for stereo output. Just as an engineer mixing a stereo record can use simple level panning to create a phantom image location between two loudspeakers, surround mixing can achieve the same effect in two dimensions rather than one (front-back as well as left-right) by using the multi-channel equivalent of volume panning. The main mixer control requirements for this are not just left-right panning, but also front-back panning and some means of controlling the width of signals that started their life as stereo sources.

How well project-studio equipment supports the ability to create surround recordings varies, with hardware currently tending to be less flexible than software unless you spend a lot on it (see the box on the right for more on the pros and cons of the software-based approach). However, much existing stereo equipment can be used within a surround mixing system, albeit with some limitations, and many of the engineers already practising surround mixing are working with equipment originally designed for stereo, as we shall see later on in this article.

The main difference between a stereo mixer and a surround mixer is that a surround mixer must have at least six busses that can be used to carry the mixed surround signals as well as a means of surround panning between them. There must also be some way of monitoring the surround busses. A number of stereo mixers have at least the required number of busses, but devising a way to change the balance of the signal feeding the five main surround busses isn't easy. It is possible to gang channels together or to use aux sends to get the required number of feeds



Audient's ASP510 surround controller provides one-knob level control for an active array of surround monitors (as well as one-touch speaker muting functions), and is therefore the box of choice at top-flight facilities such as London's Abbey Road. However, at a recommended UK price of just under £2000 including VAT, the ASP510 is harder to justify in the project-studio surround context!

onto the right busses at the right levels, but positioning a sound within the surround mix in this way is cumbersome. Moreover, any form of dynamic panning is virtually impossible, because of the number of controls that have to be manipulated together to create the smooth level changes needed for the appearance of a convincing sweep between surround speakers.

Some of the cheaper multi-buss digital mixers, such as Yamaha's 03D or 02R, get around the dynamic panning problem by offering a surround mode in which *automatic* panning is possible. You simply pick a pattern, a pan speed and decide when the effect should occur. This may be OK for some musical effects, but it doesn't offer the same freedom as something like joystick control that can be used to position sounds intuitively (interestingly enough, as I write this, Yamaha are announcing a new digital desk with a joystick panner built in for exactly this reason— see this month's News pages for more details). When positioning a sound

manually on an older type of console, you generally need to operate at least two separate controls.

So, I'm not saying you can't create an effective surround mix using a hardware console designed for stereo; you just need to be aware that you will have to work within a number of limitations. The same goes for effects and processors; just as with mics, you don't need to rush out and buy specially designed surround effects processors to achieve spectacular results within a surround mix, because although

such units are available (for example TC Electronic's System 6000 or Lexicon's 960L), it's possible to create dramatic surround effects by simply using two stereo units, though some lateral thinking may be necessary.

There's much more to be said on the subject of adapting existing stereo mixers and routing setups for surround applications, but the finer points will have to wait until later in this series.

Surround Monitoring

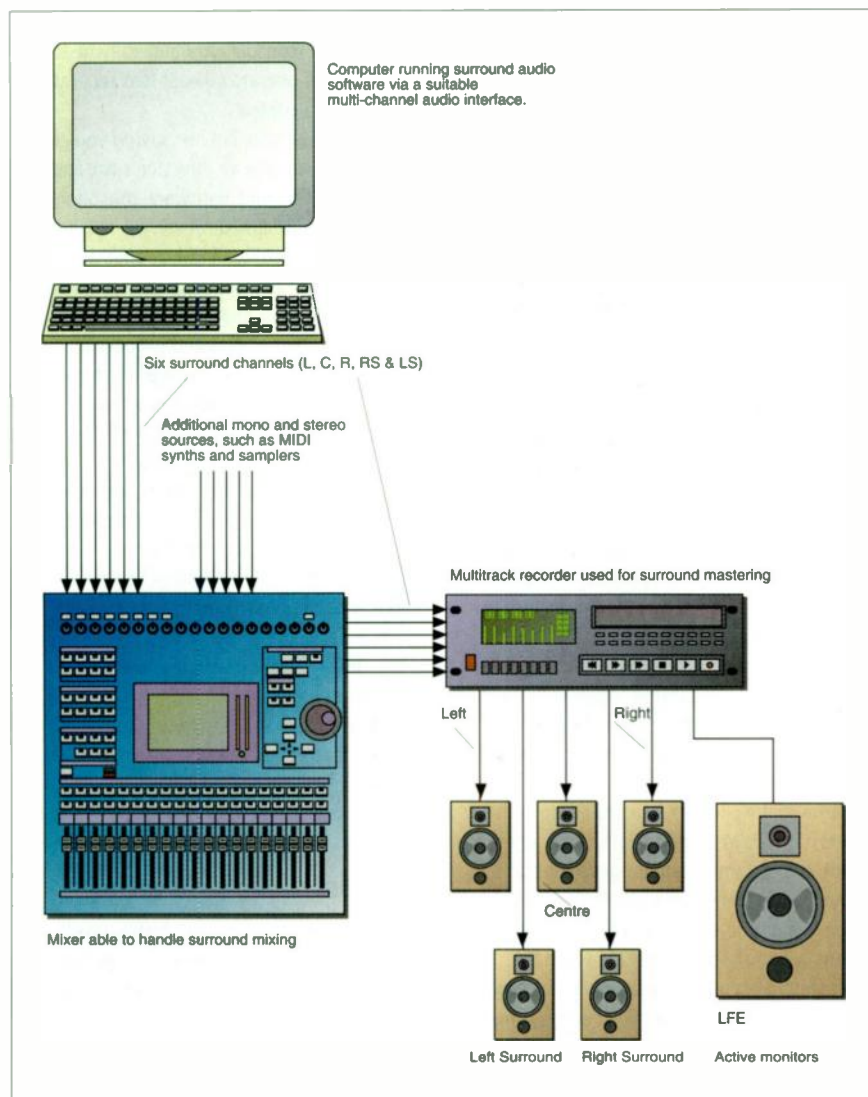
If you've been following this series, you'll know that a surround monitoring system comprises six speakers, one of which is a sub-bass or LFE unit handling low-frequency effects below 120Hz (for more details on the speakers and how they are arranged spatially, see part four of this series). Of course, the first difference between this and the monitoring system you probably have at the moment is that you're going to need more speakers, and space to put them in! In the

The Pros & Cons Of Software-based Surround Systems

Although it's not the case that hardware mixers *cannot* be used for surround mixing (digital desks in particular are strong candidates), it's fair to say that it's a great deal easier with software-based recording and mixing systems, as they are inherently more flexible than hardware, and the major serious audio sequencers now support surround. Adding new master busses and swathes of extra routing configurations is not a problem in software, of course, and options for burning DTS or AC3 surround audio files to DVD-Audio discs are likely to appear in software before affordable hardware options become available. Furthermore, writing automation for level changes to create surround panning effects is much easier in software. There are even surround panning plug-ins for Digidesign's Pro Tools, such as Kind Of Loud's *Smart Pan Pro*. With these, you simply move a panning 'puck' around in a window representing the surround soundfield, and the

plug-in works out all the necessary complex level changes to create your panning effects automatically. Surround panners for other audio sequencing systems are currently in the works or already released.

Despite these plus points, there are a few things you have to remember when adapting a software-based recording system for surround use. You need an audio output card or interface with enough outputs to handle the master busses simultaneously (ie. a minimum of six), and if you want to use external MIDI synths as well as virtual ones, you either need to add a hardware mixer capable of surround mixing back into the signal path, so that your synths can be recombined with the output coming from the computer, or you'll have to record the external synth parts into the computer as audio tracks, so that they can be part of the computer-based mix from the beginning.



Surround monitoring with active speakers via a multitrack recorder.

► smaller studio, finding space for surround monitoring can be a real problem, but if you don't have room for five full-range speakers and a sub-bass unit, you can opt for a system that uses five smaller speakers, such as the popular Genelec 1029A (another advantage is that Genelec also make a dedicated, separate sub-bass speaker for these). However, simply increasing your number of speakers, finding a suitable sub-bass unit and arranging them all appropriately isn't the end of the story; how do you drive them from your mixer? Unfortunately, there are few project-studio mixers currently available that offer surround buss outputs plus surround monitoring — most still only provide for the connection of stereo monitoring, even if they have some kind of multi-buss surround mode. Even assuming you have the necessary number of spare hardware outputs from your mixer, when you want to turn the overall monitor level up or down, how do you control the channels together so that their relative levels remain constant? Adjusting several controls

in tandem is not really practical.

If you use passive monitors, the solution is relatively affordable and straightforward — there are reasonably powerful domestic surround amplifier/decoders available with separate analogue inputs in addition to the more usual optical input, and you can connect your master surround output busses to these, and drive the speaker from the amp's speaker connections. Not only is this the most cost-effective option, it also provides you with a one-knob means of setting your monitor output level via the amp.

If you use active speakers, however, the optimum setup is less obvious. There are commercial surround decoder/amplifiers that have individual *line-level* ins and outs, and you can use amps like these in the signal chain as described above, to drive your active monitors and control the level, but these are more expensive.

One practical, though not entirely satisfactory solution is to use the multiple buss outs (either as discrete analogue feeds or

as a composite digital feed if a suitable interface card is available) from a mixer configured for surround mixing to feed a multitrack recorder such as an ADAT or DA88, which you'll be using for six-channel surround mastering anyway (more on mastering in a moment). The outputs from the recorder (which must be left in input monitor mode) are then routed directly to a set of active monitors as shown in the diagram on the left. Note that you could also record onto 18 tracks of a 24-track hardware recorder and then mix your six surround channels to the remaining six tracks to avoid the expense of a separate mastering machine.

However, the problem when monitoring directly from the multitrack outs is that when the optimum level is being fed into the recorder, the monitors will play back at a fixed level determined by how you set the trim pots on their back panels. It's quite possible to set this up for a sensible monitoring level, but there's no simple way to control that level. When you're at the tracking stage, you can turn down the mixer buss outs to feed a less-than-optimum level to the multitrack recorder, and that will bring down your monitoring level accordingly, but when you're doing your final mix to the multitrack master recorder, the level is effectively fixed as you need to record at an optimum level. Of course, if you use passive speakers powered by a surround amp (again fed from the multitrack outs), you can still control the level via the amp. Professional six-way level control boxes are available, such as the Audient ASP10 shown on the previous page, but these are still a bit expensive for project-studio use (the ASP10 retails for just under £2000). As expressed in my Leader column in August last year (see www.sound-on-sound.com/sos/aug01/articles/leader0801.htm), I'm still waiting for the affordable box that functions as a surround monitoring volume control.

Surround 'Mastering'

When we complete tracks by mixing them into stereo, most of us consider them finished. These days, we can even burn those stereo files to a CD-R which can then be played back on any domestic CD player. A surround equivalent to these procedures is harder to come by. Firstly, you have to have a surround mix recorder — something capable of recording six tracks simultaneously. This isn't too difficult — six spare sequencer tracks in a software-based setup, or a stand-alone multitrack recorder capable of recording six or more channels simultaneously, like an Alesis ADAT, or Tascam DTRS machine, will suffice, provided you note carefully which track relates to which channel of the final surround mix! But playback of this 'master' is then only going to be possible from that computer, or

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► from that type of multitrack recorder. To arrange it such that your mix can be played back on domestic systems, you need to get it onto DVD, and this requires more hardware and/or software. First you need to create files that DVD players will recognise, and for the greatest chance of player compatibility this currently means AC3 files (for Dolby Surround) or DTS files. Not only do these have to be encoded by software, there are also many settings which have no counterpart in stereo mastering — the metadata — which have to be determined at this stage, as explained in part four of this series. Dolby Digital AC3- and DTS-encoding software is available for use with Digidesign's Pro Tools, but it's still fair to say that affordable, project-studio oriented software to create these files is scarce at the time of writing, although I think it can only be a matter of time before suitable solutions become widespread.

The second part of the process involves a DVD burner to get the encoded files on to the actual disc, and again, the hardware, although falling in price, is still expensive compared to that of stereo CD-R burners.

Of course, mastering houses and the top studios have access to expensive top-end DVD encoding and production software, as well as the necessary hardware writers. If you're prepared to pay to use such facilities, you can produce DVDs from six-channel computer sequencer files or ADAT/DTRS tapes that you've prepared. However, this method is expensive, and takes the last stage out of your hands, which can be irritating if you're used to producing a finished product in your home studio yourself.

If all of this sounds impossibly daunting, it's important to remember that there *are* nevertheless people mixing in surround — and not just at the top end of the industry, either. We spoke to two engineers at very different ends of the business to see how they are coping with some of these issues.

Surround Study 1: Rik Ede's Project Studio

Project-studio owner Rik Ede is in the fortunate position of working for Dolby as their 5.1 surround evangelist. At the same time, Dolby let him run his own company, Gamesound, in which capacity he creates surround soundtracks for computer games. This allows Rik to practise what he preaches, so that when Dolby clients ask him technical or practical questions, he can reply from a position of practical knowledge rather than theory only. In fact, Rik has been experimenting with 5.1 sound ever since it became available. His work for Dolby means that he has easier access to some surround-production tools than many project-studio owners, such as Dolby

Surround-encoding hardware and DVD-burning software, as well as a hardware DVD-R burner, but in some respects, the Gamesound studio is not so different from a typical project studio setup. Rik uses ordinary mics to capture his sound sources, usually in mono, and mixes using two Yamaha 02Rs cascaded together, with a Tascam MX2424 as his multitrack recorder, as he explains. "At the time I started writing music for 5.1, I needed a console that would have enough inputs, and the 02R was the only affordable choice that had surround panning on the version 2.0 software. Previously, I'd been using analogue consoles and routing surround via the aux sends, but the 02R seemed the best way to go."

Although most of his sound sources are in mono, Rik finds ways to make them work in surround, and hasn't yet felt the need to resort to surround effects to do it. "Dedicated surround boxes like the TC System 6000 look



Rik Ede in his project studio, Gamesound.

can be interesting to delay the left or right signal slightly and then send it to the rear speakers via a slight pitch detune.

"To fatten a mono signal, you can use the 02R's autopan, or add something like stereo chorus at the front and stereo reverb at the rear. However, most of the time I'll keep sounds where they are and reserve movement tricks for game soundtracks. I'm stumbling

across new mixing tricks all the time, and the only rule is that there are no rules, providing what you do provides somebody with a satisfying listening experience."

Rik's monitoring setup comprises five full-range Genelec 1031 nearfields, with a B&W A800 subwoofer which he uses in preference to Genelec's own sub. To get around the problem of driving his monitors, he has been using the dodge explained earlier, whereby he feeds his speakers from the individual outs of his Tascam DA38



The control room at Gamesound, with its two 02Rs for surround mixing, and active 5.1 Genelec 1031 monitoring system.

interesting and I've tried them out, but I've found that you can use a more affordable box like the TC D2 tapped delay, and then ping-pong the delays between the centre speaker and the rears and get very nice percussive effects. That for me is what makes surround interesting.

"When I need surround reverb, I use my PCM80 on the front and a TC M2000 or similar on the back, perhaps delayed slightly. Even some of the 02R's built-in effects work nicely, and if you have a stereo drum loop, it

eight-track DTRS recorder. "The 02R comes out on TDIF to the DA38, and I've taken the analogue outs of the Tascam directly to my Genelecs, which have been calibrated to a particular level that I'm comfortable with. When I'm writing material, I have control over the levels of the buss outs from the 02R, but when I'm transferring a mix to the DA38, I have to set the mixer outputs to give an optimum record level, which means the monitor level can't be adjusted. That means I end up monitoring quite loud, which is the

downside of the system! However, I've recently bought a Kenwood domestic surround decoder/amplifier that I can use to feed my monitors, and with that, I can control the monitor mix level with a single knob."

Completed six-channel mixes may be recorded from the 02R either via TDIF to six tracks of the DA38 or, via an ADAT optical feed on an optional TC Unit+Y card in one 02R, into Rik's PC, where he does 5.1 mastering if he's not using a Dolby hardware encoder. "I can save my six-channel mixes as a Microsoft multi-channel WAV, which is like a single file with all six components, but I prefer to save them as separate WAV files, so that I can go in and process them separately, for example, rolling off the sub at 66Hz rather than the stock 120Hz."

For AC3 encoding on the PC, Rik uses Sonic Foundry's *Soft Encode*: "It's been withdrawn from sale for some reason, but it's very stable and I still use it. It has a front end that is exactly the same as a Dolby hardware encoder. You just feed in the six WAV files, set the various parameters, and hit Encode. Depending on how fast your machine is, it will encode to a AC3 file in real time, or a little slower. If I want to listen to my AC3 files and

check they're OK, the new Soundblaster Live cards support AC3 as a surround format, so I can play back via one of those, via the digital out into a surround receiver like my Kenwood. That means I don't have to burn a DVD-R to check the file works."

Rik is doubly fortunate when it comes to mastering; most of his gaming clients will accept AC3 surround files as they are, so he usually has no need to take production any further and author his own DVDs. However, when this is asked of him, he does have access to DVD burners through Dolby, as well as hard-to-come by, expensive DVD-authoring software like MTC's *Streamweaver*. "If I'm giving the file to somebody else to incorporate into a project, such as a game, I simply burn an ordinary CD-R with the AC3 files on it. If I have to burn DVD-Rs, I'll use software like *Streamweaver* and burn them as a video DVD with audio only — the video stream remains blank". In this way, Rik can produce 5.1 surround-compatible audio from initial idea to finished DVD.

Surround Case Study 2: Abbey Road Studios

Our second interviewee this month is also intimately involved with the production of 5.1 audio from the recording stage through to DVD-compatible mixes, but at a very different level. Peter Cobbin is Senior Recording Engineer at Abbey Road Studios, London, and

has been responsible for the production of many 5.1 mixes, originally to accompany music videos and films (such as The Beatles' 5.1 soundtrack for the re-released *Yellow Submarine* film, and surround soundtracks for DVDs of live concerts by the likes of Freddie Mercury and Eurythmics. More recently, he has been doing audio-only mixes to accompany DVD-Audio

releases. As he explains, "One of the reasons I love working at Abbey Road is that we have had a firm commitment to surround on the pop side since 1996, when I did *Yellow Submarine*. Every control room we have here is now capable of surround work, even the



5.1 mixing expert Peter Cobbin in Studio 3 at Abbey Road.

Photo: Andy Auld

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Abbey Road's Studio 3, with the modified SSL J-series desk and B&W 801N monitors.

► small control room in Studio 2."

We spoke to Peter in the famous Studio 3 at Abbey Road. As befits a world-class facility, the control room offers various ways of creating surround mixes; following a recent refit, it's now kitted out with a SSL J-series console, custom-modified to make surround mixing in the analogue domain easier. There are also numerous Pro Tools systems for tracking and mixing in the digital domain, complete with various multi-channel A-D/D-A units, an impressive B&W 801N surround monitor array, and a choice of possible mastering recorders, including eight-track Tascam DA98HRs and Genex magneto-optical recorders. There are even options at the very beginning of the recording chain, Peter having experimented extensively with Surround mics and mic arrays when making classical recordings destined for 5.1 presentation.

"We have a Soundfield mic, and that has worked well on some occasions. I have also done some recordings in Studio 1 with the Royal Philharmonic Orchestra, using a variation on the Decca Tree concept with Neumann M50s in an arrangement I call a five-way tree, which provides a 5.0 output with each mic effectively feeding its own speaker. For the best results, I reconfigured the orchestra from a traditional layout, so that it was ranged much further around the mic array than around a stereo mic array. It worked very well on this particular project, although it wouldn't suit everything. It wasn't a case of adding some rear-channel mics for ambience — I was trying to push things, to see what it sounded like with the orchestra enveloping the listener to a much greater degree than would normally be the case. I did have to spend ages setting up the mics relative to one another to minimise phase problems, though; I usually rig speakers out

on the studio floor as a point sources to try out that kind of thing — that's a good test."

Peter started mixing for surround in the early days of the 5.1 format, in the mid-'90s, when there was very little custom-designed gear around. As such, he knows a lot about having to 'kludge' surround mixes with stereo equipment. Decent multi-channel converters, for example, are crucial to surround mixing, both at the tracking stage, where Peter is often bringing old material from analogue multitrack master tapes into the digital domain for 5.1 remixing, and also at the monitoring stage, where a digital six-channel mix has to be converted back to analogue to drive the monitors. "We use Prism eight-channel converters now, but when I started, there weren't any multi-channel

converters, and I had to go around the building scrounging spare stereo converters to provide enough channels. I can remember once I had a Prism doing the Left and Right channels and a Genesis converter doing the Centre. I folded the front three channels down and it sounded horrible! It was the minuscule differences between the two converters — delays of just a few samples — that were causing the problem. You really have to have identical, phase-accurate converters for all the channels."

Mixing is taken care of in the analogue domain by the advanced routing of Studio 3's modified SSL J-series, or by Digidesign Pro Tools systems for digital projects. "We use Pro Tools a lot — I can't remember the last time I did a job without it in some capacity or other, either as a multitrack recorder, or in sync with my master recorders to do some fine tweaking, or as a machine to mix on to. Digidesign's own 888 interfaces have their limitations, but we generally bypass those with Prism converters. We record a lot of film scores straight onto Pro Tools, now that we can use the Prisms to provide the high-end quality. These kinds of software solutions often handle surround more comprehensively than hardware as well, even in relatively low-cost facilities."

With all these options on offer, you'd expect Peter to use only the finest true-surround effects units in his mixes, but perhaps in a hangover from his 'kludging' days, he has stuck mainly with pairs of stereo processors. "I am yet to commit myself to any multi-channel boxes, like the TC System 6000. My appraisal of the System 6000 was that I generally liked it, but it didn't give me the kind of flexibility and options in six-channel



The Audio Restoration Suite at Abbey Road, with SADiE system for AC3, DTS and metadata authoring, and the slightly smaller B&W 802N surround monitor array.

mode that I wanted. Since I was coping with two-channel boxes, I stuck with them. I love Prism EQs, and valve compression is still a favourite — particularly Chiswick Reach and Manley gear. We also have a number of TC M5000s which I have used for digital dynamics occasionally.

"Using two-channel dynamics processors for a surround mix can be tricky. It depends on how you are using the front three channels; you don't always *want* a six-channel compressor. If I have a vocal on the Centre channel and a drums and bass thing going on Left and Right, I will use separate compressors, because I want separate control. I don't find multi-channel dynamic processing essential. I can do what I need to with stereo boxes and more routing spaghetti in the patchbay here!


"When it comes to reverb, it's the same. We do have the Sony DRE 777, which is surround-capable, and I've used the Lexicon 960L. But at the moment, I prefer to have lots of discrete stereo reverbs, both digital ones and plates. I also like to mike up Studio 2's echo chamber and Studio 1. I'll often have as many as 12 reverbs running at once, which is why I need such a big desk. Sometimes I'll use a stereo reverb, but pan it off in a direction to create depth for an instrument."

Unsurprisingly, Abbey Road does not skimp when it comes to monitoring. Not only are the Audient ASP10 surround monitor controllers in evidence in all the surround-capable mixing studios, thus circumnavigating the level control problem, there are impressive arrays of surround monitors too, as Peter explains. "I scouted around for decent full-range speakers for Studio 3 that could handle pop and classical work when I was about to start *Yellow Submarine*, and that's when B&W made the first prototypes of these 801Ns. They've gone on to be a tremendous commercial success. Some of the mastering rooms have B&W 802Ns and others have the 801Ns. The small control room in Studio 2 has active KRKs, and there are domestic surround systems in the lounges — there must be at least a dozen surround monitoring systems in the building. Having a variety of different surround monitoring systems, both professional and consumer, is important, just as it is with stereo mixing — I have five different stereo monitoring systems in this control room to check mixes."

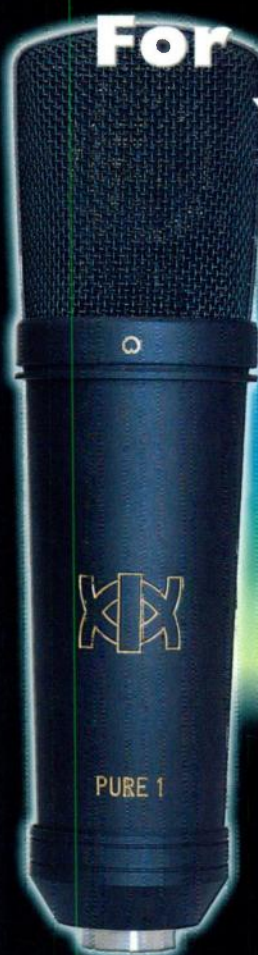
Surround master recording hardware has also come a long way since Peter began surround mixing. "When I started, the only real multi-channel master recording option was the DA88 with Prism converters, bit-splitting to give six channels at 20-bit resolution. We now have the Genex magneto-opticals and Tascam DA98HRs, which both give 24-bit resolution over eight tracks. Some of our classical guys reckon the Tascam converters are fantastic and have stopped using the traditional external A-D interfaces!"

Once Peter has completed his six-channel mixes, they are sent elsewhere in Abbey Road for mastering and DVD authoring (all of which is handled in house). There'll be more from Peter's colleagues who handle that side of things in next month's instalment of this series; suffice it to say for now that DVD metatag creation and disc authoring takes place on high-end SADiE and Sonic Solutions systems well beyond the budget of most home studios (see picture, left).

Next Month

In the next part of this series, I'll be looking at some of things that can be done with surround at the mixing stage, as well as pointing out potential pitfalls, and we'll hear from Rik and Peter again about how they deal with the various difficulties in their very different recording setups. 

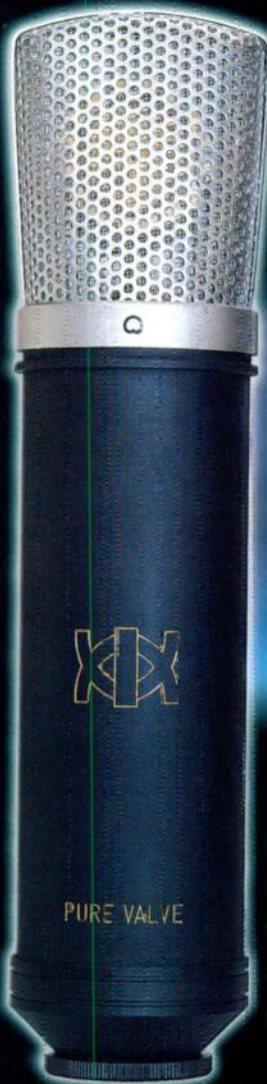
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Superlux CMH8 Series

Capacitor Microphones

The price war in the budget condenser mic market gets even more fierce with the launch of this new range of large-diaphragm models.

Paul White

With so many high-quality, low-cost capacitor microphones now on the market, many of which originate from the same factory in China, it begs the question why the factory don't simply sell their mics under their own name rather than making them for third parties. According to SCV London, who distribute the Superlux range of microphones in the UK, this is exactly what they are now doing, which means one less price markup between the manufacturer and the end user.

Build Quality & Specifications

The range of mics reviewed here are the CMH8 series, comprising A, B, C and D models. My guess is that the CMH8A will draw the biggest crowds simply because of its cost/performance ratio. This is a fixed-cardioid large-diaphragm (one inch) model with an evaporated-gold diaphragm only three microns thick. The onboard electronics comprise a transformer-balanced FET preamp and a low-cut slide switch on the circuit board, although there are no switches accessible from outside the mic. A swivel standmount comes with the mic as standard, though there's also a sensibly priced shockmount available as an optional extra, and the mic itself comes in a

rigid, foam-lined plastic case.

The frequency response of the mic shows a gentle drop-off below 80Hz, though with the low-cut switch active the roll-off starts above 200Hz to compensate for the proximity effect when using the mic up close. Other than a very gentle peak at around 3kHz and a mild boost at 15kHz, the response is flat up to 15 or 16kHz and is still only 3dB down at 20kHz. Sensitivity is 20mV/Pa, which is pretty typical for this



The baby of the CMH8 range: the CMH8A.

type of mic, and the equivalent noise is a healthy 16dBA with a maximum SPL handling of 132dB. The mic requires standard 48V phantom powering.

This product is rather nicely engineered both inside and out, with moulded plastic circuit board supports used to cut down on metalwork costs without compromising performance. The body itself has a rather attractive bulbous shape and conductive springs keep this in electrical contact with the grounded parts of the PCB. A dual mesh basket structure protects and screens the capsule, while the aluminium mic body has an attractive satin silver finish with the printed model number denoting the live side.

The slightly more expensive CMH8C model features a dual-diaphragm capsule and is cosmetically similar to the CMH8A. It also has quite a similar frequency response, but can be switched for cardioid, omni or figure-of-eight responses and has on-body switching for the low-cut filter and a 10dB pad. Between these two models comes the fixed cardioid CMH8B, which is essentially

SOUND ON SOUND

Superlux CMH8 Series

pros

- Eminently affordable
- Nicely engineered and styled
- Good sound quality

cons

- None at these prices.

summary

An attractive range of affordable capacitor mics which are able to deliver good vocal sound quality and which can double up for recording acoustic instruments.

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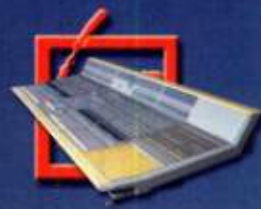
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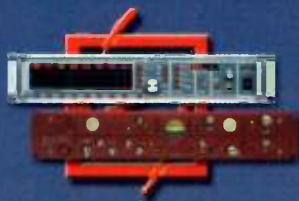
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SUPERLUX CMH8 SERIES

- a CMH8A with external pad and roll-off switches. All three solid-state models are optionally available as boxed matched pairs suitable for stereo recording — the model numbers are SKMH8A, SKMH8B and SKMH8C respectively.

Again visually very similar to the previous models in the range, and with the same general frequency-response characteristics, the CMH8D features switchable cardioid or omnidirectional patterns (like the CMH8B), but has the added benefits of a tube preamp. A second three-position switch selects between low-cut, flat and -10dB pad. A single military Nuovistor-type tube is hard-wired to the circuit board inside the mic body and, as with the previous models, the preamp has a transformer output stage. Nuovistors are very tough, have a long life and run on lower voltages than conventional valves. A seven-pin XLR cable connects the mic to the included power supply, which in turn provides a conventional balanced three-pin XLR output for you to send to the input of your mixer or voice channel. An aluminium camera case houses the mic, cables and PSU as well as a swivel standmount, a cradle shockmount and a foam wind shield. The electrical spec is extremely close to that of the CMH8B and I'm pretty sure the same capsule is used in both models.

Performance Test

In my tests, the CMH8A turned out to be a nicely neutral vocal mic, similar in sensitivity and overall tonal characteristics to my reference Rode NT1, though with perhaps marginally less 'weight' at chest frequencies. The high end is less splashy than some of the transformerless models I've tested in the past and, because the presence colorations are quite subtle, the mic should suit a wide range of voice types, making it ideal as a project studio all-rounder. It's also quite at home recording



The three solid-state CMH8-series mics are available in matched pairs for stereo recording.

acoustic instruments and would work adequately well as a drum overhead, especially in a matched pair. Noise was

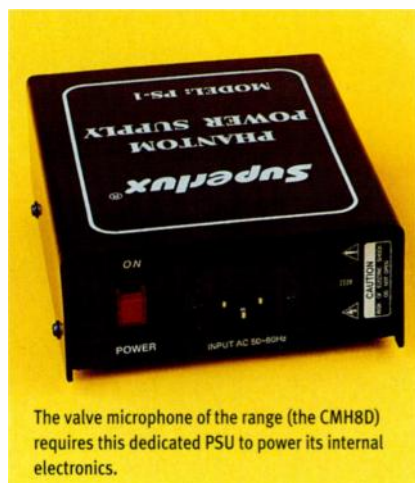
“The CMH8D sounds as warm and exciting as you’d hope a valve model would, with a slightly throaty and very much ‘in-your-face’ character.”

never a problem during testing, and even though having a low cut switch accessible only from inside the mic may seem like a limitation, most mixers and mic preamps have low-cut filtering so you may never need to access this.

As expected, the CMH8C switchable-pattern model sounded similar in cardioid mode, though the presence characteristics weren't exactly the same because of the dual-diaphragm capsule. In omni mode, the pickup pattern was nicely even, though possibly less transparent and natural sounding than some of the high-end, small-diaphragm models available. Used in figure-of-eight mode, the mic delivered more or less the same punch and clarity as in cardioid mode. As with all properly designed figure-of-eight mics, it was almost totally 'deaf' to sounds coming in from 90 degrees off-axis. For example, if you were to set it up to record an acoustic guitar with

the side of the mic pointing towards the player's mouth, it would reject the majority of breath noises, headphone spill and even vocals (other than reflected sound). Of course, you need to be aware of exactly where the back of the mic is pointing as it's just as sensitive as the front! Similarly, a second figure-of-eight mic can be set up to capture vocals while rejecting most of the guitar, making it possible to record simultaneous guitar and vocal parts with a respectable degree of separation. To my mind, this is as good a reason as any for buying a boxed pair of these mics.

Finally I checked out the CMH8D valve mic, which, although less overtly coloured than many of the valve mics I've used, does seem to open out the high end without adding harshness or splashiness. There's also a subjective increase in low-end warmth, but my impression is that the high end is the most noticeably enhanced part of the spectrum, lending the sound more 'airiness' than the other models in the range. Unfortunately, this model only has the



The valve microphone of the range (the CMH8D) requires this dedicated PSU to power its internal electronics.

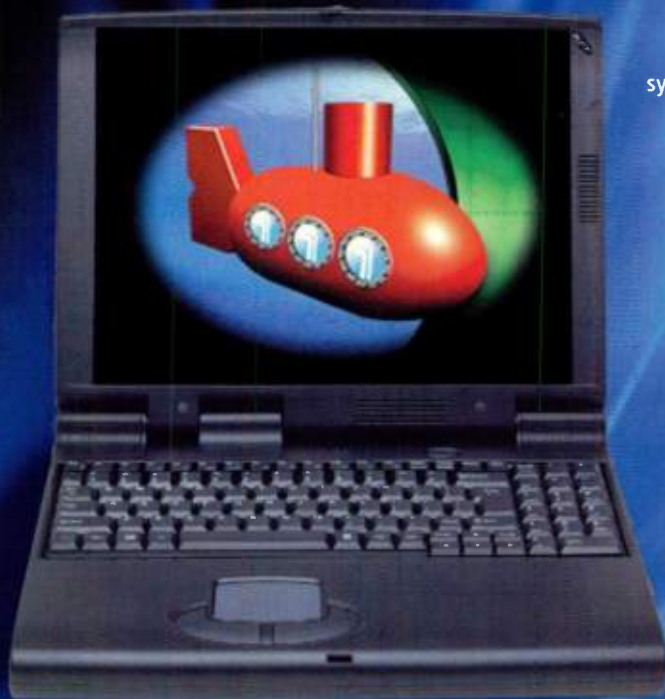
About The Manufacturer

The Superlux CMH8 mics are only a few of the products manufactured by Tenlux Electronics, based in Taiwan. The company was founded in 1987 initially to supply microphone components for large electronics companies such as Sony, Kenwood and Sharp. In 1993 Tenlux began producing its own microphones, and now has a range including more than 20 different models. It also continues to manufacture microphone products for many companies including Sony, Sharp, Electrovoice and Behringer.



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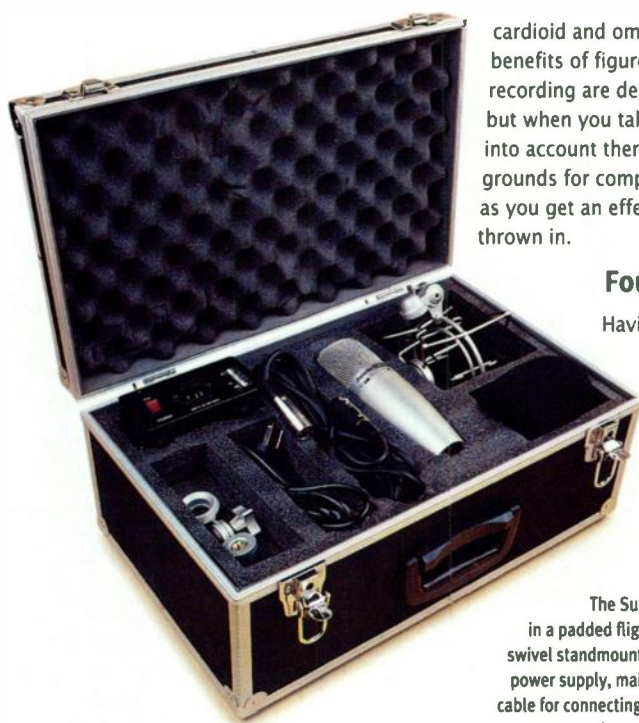
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Which Microphone? CMH8 Series Spec Comparison

	CMH8A	CMH8B	CMH8C	CMH8D
Circuitry	Solid state	Solid state	Solid state	Valve
Available polar patterns	Cardioid	Cardioid	Cardioid, omni, figure of eight	Cardioid, omni
Sensitivity	20mV/Pa	20mV/Pa	28mV/Pa, 17mV/Pa, 17mV/Pa	40mV/Pa, 25mV/Pa
Equivalent noise	18dBA	18dBA	14dBA, 18dBA, 18dBA	14dBA, 18dBA
Maximum SPL	132dB	142dB	138dB, 142dB, 142dB	142dB, 146dB
Low-cut filter switch	Internal	External	External	External
Pad	No	Yes	Yes	Yes (only when low-cut filter not in use)



cardioid and omni options, so the benefits of figure-of-eight recording are denied to the owner, but when you take the low cost into account there are really no grounds for complaint, especially as you get an effective shockmount thrown in.

Four Tops?

Having so many inexpensive mics on the market is a mixed blessing in that it detracts from the perceived value of truly

The Superlux CMH8D comes in a padded flightcase complete with swivel standmount, cradle shockmount, power supply, mains cable, a seven-pin cable for connecting the mic to the power supply, and a foam wind shield.

professional mics that are probably built to more stringent standards and which possess subtleties of tone that these cheaper mics can't match. On the other hand, the subjective performance offered by these mics comes dangerously close to that of some high-end models, and the clear advantage is that while my early recordings were limited by the fact that I had to use cheap, dynamic, live performance mics for everything, today's musician can experience capacitor-mic quality for less than I paid for some of those dynamic stage mics.

Judging the Superlux mics against other Far East budget capacitor models is no easy task. Even though most of them sound slightly different to each other (which can be due to something as simple as basket design), the general quality tends to be much the same, which is not surprising when you consider that pretty much all the capsules, and often the electronics too, are made in the same factory. Transformer models in general sound less splashy (some people would say 'warmer' while others might say 'less transparent') than transformerless models as their high end roll-off tends to start at a lower frequency, but, other than that, they all offer incredible performance given their UK price.

In addition to sounding good, these Superlux models have the advantage of very low cost, pleasing cosmetic design and generally good build quality, coupled with the fact that the range offers a number of options to suit different needs. They may not be anything radically new, other than even better value, but that's probably enough to guarantee them a successful future. **EOS**

Second Opinion

I tried three of the mics from the Superlux range. The CMH8A, which is the base model with a cardioid polar pattern, was tested first on vocals. I thought it had a clean, natural, airy sound, and I felt it was capturing my voice quite faithfully. I slightly preferred it on vocals to my AKG C3000, finding the Superlux smoother and silkier next to the rather woolly 'chestiness' of the C3000. The C3000 sounded 'bigger', fatter and more forward, but at the expense of a clarity and naturalness that the Superlux was notable for. On guitar it was a different story; I like the C3000 for miking acoustic guitar, and it came out best. Where the C3000 gave a lively sound with a lot of body, the Superlux sounded more mellow, but also somehow more muffled. The C3000's success on acoustic guitar (for me, anyway!) may be at least partly due to a pronounced peak at around 7-8kHz in its frequency-response plot — which can be a good place for boosting 'sparkle' if you're EQ'ing acoustic guitar.

Considering that I paid £300 for my C3000 a few years ago, and it was then pretty much the main affordable large-diaphragm condenser, the price of this Superlux mic is impressive. It's not a 'character' mic, in my opinion, but it produces good, professional-sounding results that no-one would be ashamed of. It also has a look and finish

that wouldn't disgrace a microphone of several times the price, and would make a good starter vocal mic that could continue to be useful even as your collection expanded.

I also evaluated the CMH8C switchable polar pattern model. Subjectively, its sound in the cardioid position was very similar to that of the CMH8A, while switching to omni produced the thinner, more ambient (and arguably more natural) sound of an omnidirectional response. Until quite recently, this would probably have been the cheapest multi-pattern mic on the market; however, it's a testament to the pace of change in the world of quality mics that it already has serious competition from other manufacturers!

I tested the CMH8D valve mic alongside my Rode NTK (also a valve mic), and thought it came out very well from the comparison. The CMH8D sounds as warm and exciting as you'd hope a valve model would, with a slightly throaty and very much 'in-your-face' character. My Rode is smoother and less 'pumped' sounding, with a slightly more sophisticated quality, to these ears, but I really did like the Superlux for its more aggressive edge. If I ever sang a proper rock song, I feel the Superlux would be just the ticket. I wouldn't trade in my Rode for it, but I would like the Superlux too! **Debbie Poyser**

information

£ CMH8A, £116.33; CMH8B, £175.08; CMH8C, £327.83; CMH8D, £586.33; SKMH8A pair, £327.83, SKMH8B pair, £398.33; SKMH8C pair, £703.83. Prices include VAT.

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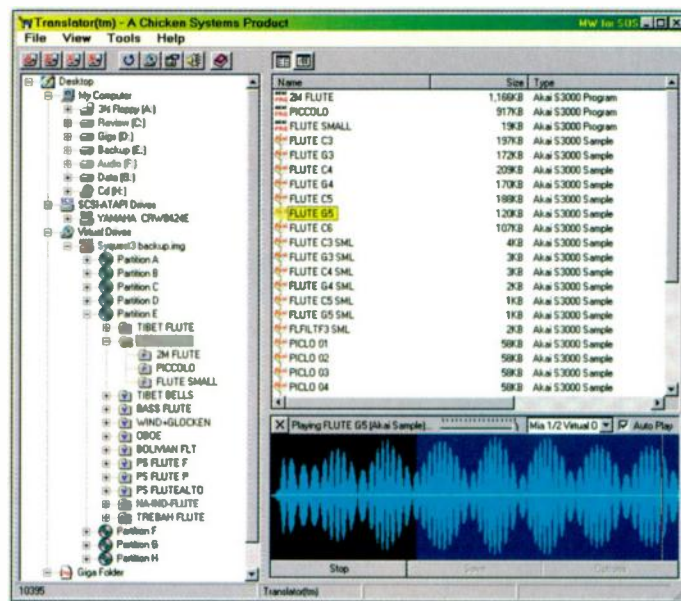
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Chicken Systems Translator

Sample Conversion Software

Ever found yourself really needing a particular sample CD-ROM, only to find that it's not available for your sampler? Or perhaps you want to back up your sample programs in proprietary CD formats? Chicken Systems' PC package *Translator* may be able to help.



Here you can see the three-pane *Translator* display, with an Emu sample CD recognised in my CD-ROM drive, an Akai one created as a Virtual Drive with some of its contents in the right-hand pane, and the Wave View beneath.

Martin Walker

Given the number of excellent hardware and software samplers that are now available, you might be forgiven for thinking that the modern samplist would have an easy life. Sadly, however, there's still one large fly in the ointment — each and every product has its own data format for loading and saving samples, programs, and multis. This doesn't present any problems if you buy one sampler and stay with it for life, but few of us do that: we buy one, build up a library of sounds, and then get tempted by a different product with bigger polyphony, built-in effects, or computer-based editing. Even the way data is stored tends to be proprietary: Akai CD-ROMs are totally different from Emu and Roland CD-ROMs, for instance, and when you format a dedicated hard drive for use with your hardware sampler it may well do this in a proprietary format too.

Manufacturers have long recognised that musicians may want to import sounds from other libraries, and many samplers now provide facilities to read a few 'non-native' CD-ROM formats, and then convert the sounds. However, these conversion processes tend to quite basic, and may not include the format you're interested in. Enter *Translator*,

from US developers Chicken Systems, a PC (and shortly Mac) utility that can read dozens of different sample formats, including non-standard disc formats such as Akai, Emu, Ensoniq, Kurzweil, and Roland, convert them

to any other, and all in a comprehensive way that retains as many parameters of the original format as possible. It can even create image files in various formats, allowing you to burn your own proprietary-format CD-Rs.

Installation

I first mentioned *Translator* in SOS November 2000, in the context of software studios, but since then Chicken Systems have added a great deal to the original release, which at the time of this review has just jumped to version 2.5. It currently runs on Windows 95, 98, ME, NT 4.0, 2000 and XP, while the forthcoming Mac version (no release date given) should run on Mac OS 7.0 or higher.

When you first run it, a registration page requires that you enter Keycode and Unlock codes supplied on the 'Certificate of Authenticity'. However, my version was only supplied with an Unlock code, and in this situation you need to register at the Chicken Systems web site to get a suitable Keycode. This was emailed back to me in under a minute, allowing me to download the latest update while still on-line. As Chicken Systems intend to add support for more sample formats on a regular basis, it pays to return periodically to see whether a new patch file has appeared. To make this as easy as possible there's even an Auto-Update menu

SOUND ON SOUND

Chicken Systems Translator £99

pros

- Reads the biggest range of DOS and proprietary sample formats of any utility.
- Performs detailed and thorough conversions in a reliable and efficient manner.
- Writes Akai, Emu, Ensoniq, and Roland-format image files.
- Supplied with DOS-based utilities to read Akai, Emu, Ensoniq, and Roland floppy discs.
- Pro-active user support.

cons

- There are still a few cosmetic rough edges left to tidy up.
- Packaging provides misleading information on supported formats.
- Mac version not yet available.

summary

Translator is an ambitious utility which provides the most comprehensive sample conversion facilities available to date, and despite a few teething troubles should prove invaluable to many samplists.

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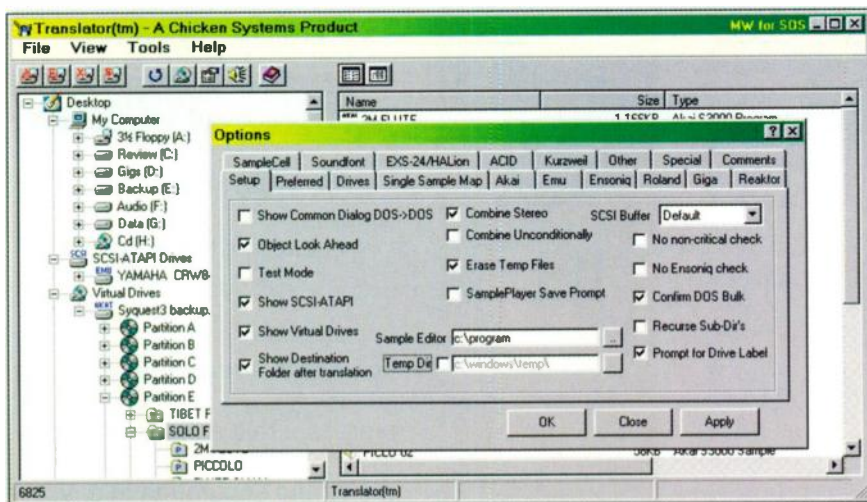
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CHICKEN SYSTEMS TRANSLATOR



Chicken Systems say that their default settings will work 99 percent of the time, but if they don't, *Translator* provides a huge range of alternative options.

- option in *Translator* which can automatically check whether or not a suitable update has become available.

Interface & Drive Options

Chicken Systems have decided to make their user interface as familiar as possible, by basing it on Windows Explorer. It has two main panes, the left-hand one displaying drives, folders, and files while the right-hand pane displays the contents of the currently highlighted drive, folder, or file. Your normal computer drives are always DOS-formatted, and appear at the top of the drive list, while any SCSI, CD-ROM, CD-RW, USB, or parallel-port drives are automatically detected when *Translator* starts up. Any found with proprietary formats are then grouped under the heading 'SCSI-ATAPI Drives', and appear in the drive list beneath the DOS ones.

Translator also offers an intriguing third option, Virtual Drives. These are effectively large image files saved on your computer's hard drive, but appear within *Translator* as additional proprietary-format SCSI-ATAPI drives. You can either make a fresh one of a user-specified size in Akai, Emu, Ensoniq, or Roland format (and in the special case of Akai specify a partition size as well), or create one

from an existing SCSI-ATAPI drive. The virtual drives then appear at the bottom of your drive list: you can drag additional files to them to compile a new CD-ROM, delete or rename existing ones, and then use your favourite CD-burning application to create a disc in this format from the image file.

The icons for drives, folders and files appear just as in Windows Explorer, but *Translator* also uses its own set of icons to display other known items. For instance, if you open an Emu drive you'll be able to see the contents of its Banks, Presets, and Samples, while an Akai drive will display its Partitions, Volumes, Programs, and Samples.

An optional Wave View splits the right-hand pane horizontally into two to make room for a waveform display of the currently selected sample, complete with loop area if available, and lets you audition it through the DirectSound drivers of your soundcard.

Sample Conversion

Two methods are available to convert files, depending on their type. If your file is already in DOS format, and you want to convert it to another DOS-based format, you right-click it and choose the Convert option. You then get a list of available DOS formats to choose from, and selecting one of these starts the conversion process. Single Sound Mapping also lets you take a bunch of samples in a single Windows folder and combine them into a single instrument in your chosen format.

The second method applies to non-DOS formats and allows you either to convert DOS files and send them to a proprietary SCSI-ATAPI drive, or *vice versa*. You just locate the source file and make it appear in the right-hand pane, and then locate the destination folder in the left-hand pane. Then you drag the source file to the destination folder, and choose the destination format. The source can be a single sample, a program containing multiple samples, a folder

containing multiple programs, or the entire contents of a drive. You can also double-click on the source file, which launches a Browse for Folder window for you to choose your destination, and I often found this easier.

There are absolutely loads of setup and conversion options, the majority of which apply to specific formats and include such destination options as whether to write files in S1000 or S3000 format for Akai files, 1.0 or 2.0 format for *GigaStudio*, Intel (PC) or Motorola (Mac) format for *Reaktor*, translate SoundFont Presets or Instruments, and so on.

In Use

Getting started is easy: you just attach the desired drive or insert the appropriate CD-ROM into your drive and start *Translator* for it to be detected, or click the Refresh option or use the F5 shortcut to examine a new one. There is a printed manual, but

Supported Sample Formats

- Akai S1000, S3000, S5000, and MPC series.
- Bitheadz *Unity DS1*.
- Creamware Pulsar/Powersampler.
- Emagic *EXS24*.
- Emu 3-series (E3, E3X, ESI32, ESI2x, ESI4x)
- Emu 4-series (E4, E4x, E64, E64000, Esynth and Ultra).
- Ensoniq EPS/ASR, ASRX.
- Korg Trinity/Triton.
- Kurzweil K2000, K2500/2600.
- Native Instruments *Battery*, *Reaktor*.
- Nemesys *Gigasampler*, *GigaStudio*.
- Propellerheads *Recycle*.
- Digidesign *Samplecell*.
- Seer Systems *Reality*.
- Sonic Foundry *Acid*.
- SoundFont.
- Steinberg *Halion*.
- Roland S700-series.
- WAV and AIFF.
- Yamaha A3000, A4000, A5000.

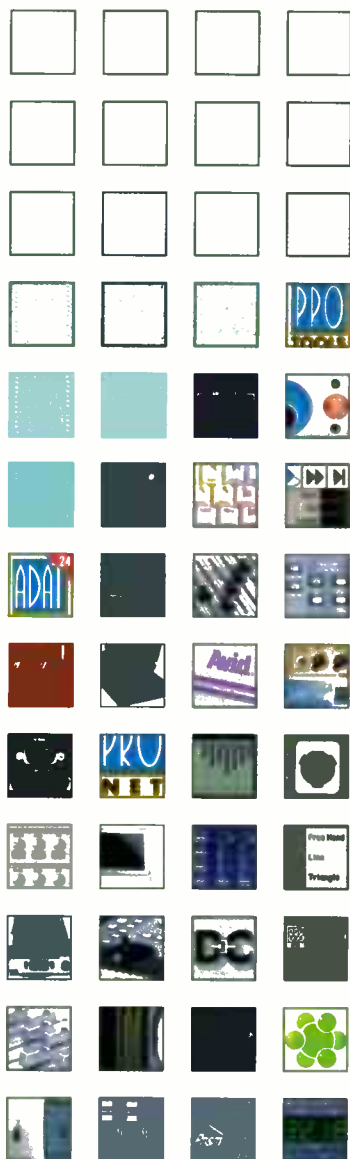
Don't be misled by the huge list of possible translations on the Chicken Systems web site: not all of them have been implemented, and some of the older ones mentioned like the 20-year old Ensoniq *Mirage* are never likely to be. If the translation has already been coded, its current status is helpfully given as either Level One (loops, tuning, and basic mapping in place), Level Two (envelopes, LFOs, and other modification parameters supported), or Level Three (everything possible has been converted).

I don't normally approve of developers advertising features that have not yet been implemented, but in the case of a sample file converter it is worth knowing what future formats are being considered before you buy it. In addition, not all of the above formats are available as both source and destination in every case. After all, with about 30 formats this would mean around 900 possible translations. By the way, if you only require conversion to *Gigasampler* format, a considerably cheaper *Giga-only* version is available.

Test Spec

- Chicken Systems *Translator* v2.5.
- Pentium III 1GHz PC with 256Mb RAM running Windows 98 SE.
- Motherboard: Asus TUSL2-C with Intel 815EP chipset.
- Other software used: Tascam/Nemesys *GigaStudio* 160 v2.20.42, Native Instruments *Reaktor* 3.04, Steinberg *Wavelab* 3.04c build 67, Akai and Emu-format CD-ROMs, various SoundFonts.

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The Competition

If you want mainly PC-based conversions, FMJ Software's *Awake Audio* is now at version 7.2, and provides an impressively long list of supported individual sample formats, as well as some higher instrument-level support including *Gigasampler*, *Reaktor*, and *SoundFonts*. It also features some built-in sample editing and looping functions, as well as supporting MIDI SDS and SMDI transfers and batch processing. It doesn't read custom format drives at all, but at its shareware price of \$59.95 (from www.fmjsoft.com) it's still an extremely useful utility.

Although it's sold as a stand-alone

utility, Bitheadz' *Osmosis* is primarily marketed for *Unity DS1* owners, since it can read Akai S1000/S3000 and Roland 760/770-format CD-ROMs, Zip disks, and sampler-formatted hard drives, and can then convert their instruments into *Unity DS1* or Samplecell formats, and the samples into *Unity DS1*, AIFF, or WAV formats (see www.bitheadz.com).

For a wider range of more general-purpose conversions, the only real competition is the shareware *CDxtract* (www.cdextract.com), now at version 3.6 revision 2, which can read SoundFonts, Samplecell/PC, and Kurzweil K2000/2500 bank files on

DOS-formatted drives, as well as a comprehensive selection of proprietary non-DOS formats on CD-ROM, Zip, Jaz, and hard disk including Akai S1000 to S5000 and MPC2000, Emu 3 and now 4-series, and Roland S7xx. Samples can then be saved in WAV, AIFF, or MP3 formats, and programs can be saved along with their respective samples in Emagic *EXS24*, *Gigasampler*, *Mesa*, *Pulsar*, *Reaktor*, Akai S5000/S6000, *Halion* and *SoundFont* formats.

It's an attractive and well-written utility, and also has a useful database facility to catalogue your sounds. On the other hand, *Translator*

offers a more comprehensive list of formats, as well as disc image writing. In some of my tests *Translator* also converted more parameters than *CDxtract*, although on others perhaps the opposite would occur. In a perfect world we'd all buy both applications and use them side-by-side, but if not your decision should be based on which formats you need converting, and whether or not you need image-writing capability. If you don't, at \$79 *CDxtract* is almost half the price of *Translator*, and I've always found it very easy to use and extremely stable.

► software is updated so quickly nowadays that the electronic help file is far more up to date, particularly in the area of supported formats.

I was impressed by the number of available options, and the thoroughness of the conversion, which is something that converters built into hardware samplers often fall down on. Whereas getting a group of samples correctly key-mapped in the destination format is obviously the most important consideration, sample programs offer plenty of other parameters such as velocity layering, filtering, envelopes, and LFOs. If the destination format supports similar functions then it's important to try to translate them.

With about 30 input and output formats, there's no way I could reasonably test out every one to see how close each translation

was, so I decided to examine various examples at random with both *Translator* 2.5 and *CDxtract* 3.6 revision 2 to see how the results compared with the original format.

The majority of multisampled instruments, as well as most beats and grooves, don't employ the special features of most hardware samplers. In these cases both *Translator* and *CDxtract* performed very well, and I was pleased with the results using both utilities on a variety of import formats including Akai and Emu CD-ROMs and SoundFonts. However, there were still subtle differences. With Akai S3000 to *Gigasampler* conversion, for instance, *Translator* consistently produced a less dynamic velocity response than the original compared with *CDxtract*, although this is a simple tweak to correct manually.

With more complex source material, on the other hand, *Translator* preserved the filter settings, whereas *CDxtract* ignored them. However, neither of them got very close to original vibrato and tremolo settings, which benefited in both cases from a little manual LFO tweaking. *Translator* also scored where multiple Akai programs used the same samples: converting the entire folder with *Translator* created a single GIG file containing the various instrument options, whereas *CDxtract* created a separate GIG file for each one, taking up far more space on the destination drive. Overall, I gained the impression that Chicken Systems' claim of the most thorough conversions is borne out in practice.

I did discover various small bugs while using *Translator*, although the main translation formats worked extremely well. Thankfully Chicken Systems are amazingly responsive to user feedback, and users are invited to email to them any files that don't translate properly, so that the problem can be quickly resolved, often within a day or two. A Test Mode option is available, which strips out the audio data and compresses the rest of

the file to typically under 100K so that you don't have to send large email attachments. The previous version 2.1 went through 129 builds in its lifetime: although this wouldn't be good news with a sequencer, it makes a lot more sense with *Translator*, especially since each update file is only about 3.5Mb in size.

Final Thoughts

Translator provides extremely good conversions of a huge range of sample formats, and its ability to create image files in Akai, Emu, Ensoniq, and Roland formats will make it invaluable to musicians wanting to back up or create libraries. It's not surprising that many sound developers are already *Translator* users, including such luminaries as Eric Persing of Spectrasonics, who apparently used it to convert his latest *Metamorphosis* release from Roland to Akai format.

It does still have some rough edges, and I initially had a few doubts about its stability, but the more I worked with it, the more I appreciated its powerful and comprehensive translation options, as well as being reassured by the rapid response of the developers to bug reports and specific conversion issues. Whatever native format your sampler uses, you will always get best results if you buy libraries in that same format, but whenever you use non-native formats *Translator* should give far better results than the utilities built in to hardware and software samplers. **SSS**

Other Useful Features

- *Translator* can deal intelligently with dual-mono samples, including those with names ending in -L and -R, converting them to a single stereo file during translation if the destination format allows it.
- If you have a Peavey, Ensoniq ASRX, Kurzweil, or Emu sampler from the ESI onwards, it can use the SMDI protocol to take samples from any drive and send them direct to the sampler or vice versa — if it's detected on the end of a SCSI chain the sampler will simply appear as another drive in your list.
- Four stand-alone DOS-based utilities are also included with the package to read, write, and format Akai, Emax, Ensoniq, and Roland-formatted floppy disks, and you can also launch these from within *Translator* using toolbar buttons.
- Samples from the Roland S700 series can be compensated in both directions using the coding from Roland's own Emphasis-Deemphasis filter.
- Drives can be Logged, wherein a text file is created with a full contents readout, complete with file types and sizes.

Information

£ £99; *Gigasampler*-only version £39.95.
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Zoom MRS1044

Digital Multitracker



Photos: Mark Ewing

The MRS1044 is Zoom's first serious 'studio in a box', offering 10-track hard disk recording and editing with integrated drum machine and bass sounds. Does it have what it takes to succeed in this increasingly competitive area of the market?

John Walden

The digital multitracker market is certainly hotting up, with a range of products at various price points from companies such as Korg, Boss, Roland, Fostex, Akai and Yamaha. Not to be outdone, Zoom have now followed up their diminutive PS02 pocket studio (reviewed in SOS February 2001) with their first attempt at a more fully featured digital multitracker; the MRS1044.

While the Zoom is priced towards the

lower end of the market, the feature list is very attractive. This includes 10 tracks of uncompressed 44.1 kHz, 16-bit audio recorded to the internal 15Gb EIDE hard disk, a rhythm section (comprising a MIDI-based stereo drum track and mono bass track), 24-bit effects processing using Zoom's VAMS (Variable Architecture Modelling System) technology and stereo recording via unbalanced or balanced inputs, the latter with switchable phantom power. As well as analogue outs, the MRS1044 features an S/PDIF optical output for mixing to DAT or Minidisc.

SOUND ON SOUND

Zoom MRS1044 £649

pros

- Well-designed user interface makes operation a breeze.
- Very good audio quality.
- Phantom power as standard.
- Very useable rhythm section and guitar amp/cab simulations.

cons

- Can only record two tracks at once.
- No data backup connectivity as standard.
- Optional USB board compatible only with PCs.
- MIDI implementation not very sophisticated.

summary

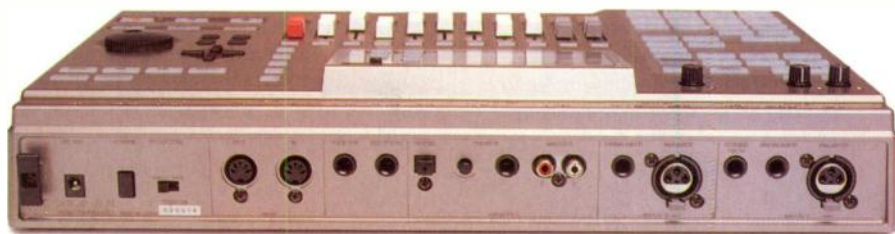
A very competent digital multitracker with a feature list aimed at the guitarist/songwriter looking for a complete recording setup in a single box.

Many of those making their first tentative steps into the world of digital multitrack recording either cannot afford or do not wish to go down the computer route. The recent crop of digital multitrack recorders can offer much of the simplicity of a cassette-based multitracker, but also many of the recording and mixing advantages of a PC or Mac. On top of this, Zoom seem to have decided to build on their strong background in guitar effects processing, designing the MRS1044 with pluckers and strummers firmly in mind. Time to plug in, tune up and rock out...

Main Features

The MRS1044 is housed in a smart silver-coloured plastic case about the size of an open copy of *SOS* — very portable. The 10 audio tracks are configured as six mono and two stereo. As only two tracks can be recorded simultaneously, recording a full band performance with multiple microphones is not an option; the MRS1044 is therefore going to be more appealing to those happy to build up their recordings track by track. In common with many other digital multitrackers, each audio track has ten virtual tracks available to it, one of which is selected for playback. These certainly increase the flexibility of the system, and can be used to store alternative takes or as destination tracks for track bouncing and mixdown.

In terms of layout, the left-hand portion of the control surface contains (from top to bottom) input selection and level controls, an effects selection panel and the rhythm section buttons. The latter section includes eight velocity-sensitive pads for real-time playing of the MRS1044's internal drum or bass sounds (more on this below). The



middle section is dominated by the LCD display and faders. There are faders for the stereo drum track, the mono bass track, the mono audio channels one to six, the stereo audio channels 7/8 and 9/10, and the master output. The LCD does the usual job of providing level meters (switchable between pre- and post-fader) and feedback for other operations such as project management or effects editing. Directly above the master fader is a vertical strip of five buttons that access the two bands of available channel EQ, the two effects send levels (the first dedicated to chorus and delay treatments and the second to reverb), and the panning for a selected track. The right-hand side of the unit is dominated by a combination of editing buttons and cursor keys, a data wheel and the transport controls.

All the connectivity is provided on the rear panel. This is listed in full in the 'MRS1044 Specifications' box, but two features are worth highlighting. Commendable is the inclusion of switchable phantom power on the two XLR inputs. Phantom powering is a feature which is unusual on a machine at this end of the market — given some of the very respectable, and extremely affordable, condenser microphones now available, this ought to make high-quality acoustic recordings possible.

On the other hand, a serious downside for many potential purchasers will be the lack of any connection for data backup as standard. However, there is an expansion slot on the side of the unit, into which an optional USB or SCSI card can be inserted for this purpose — see the 'Backup Options' box for further details.

The MRS1044's operating system allows up to 1000 Songs to be created on the internal hard disk. The general mode of operation would be to create a new Song, enter a rhythm part using the internal MIDI drum and bass patterns and then record the various audio parts, adding effects and EQ as required. The finished mix would be created either by bouncing to a pair of virtual tracks or by transferring to another recorder via the analogue or digital outputs.

The Rhythm Method

When a new project is created, copies of the 255 preset rhythm patterns and 220 effects programs become available within that project. Any edits made to the patterns or programs are stored within the project and restored when the project is reopened.

The various drum kits and bass patches are all quite serviceable, if a little unadventurous. Kits suitable for rock, funk, jazz, dance, hip hop and techno are present as well as lo-fi and distorted options. The bass sounds cover a variety of electric

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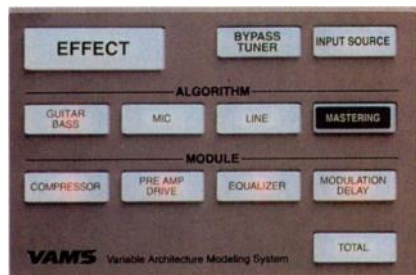
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ZOOM MRS1044

► types, an acoustic, a fretless and a few synth styles. All the sounds respond to velocity, but there are no multisamples to give an associated change in timbre with volume.

Each of the preset patterns contains both drum and bass parts and a sequence of patterns can be chained together to create a complete rhythm accompaniment for a song. The basic patterns cover all the expected styles — rock, dance, hip hop, latin, blues, etc. — again, perhaps not overly exciting, but they're still very usable. However, three of the pre-installed projects contain alternative pattern sets covering rock, hip hop, techno, jazz and latin, and things do get a bit more interesting here. Chord changes can be entered into the rhythm sequence at any position within a bar (up to 16th-note intervals). The bass parts will then be adjusted to fit the chosen root note and chord type. The 15 chord



types available should suffice for all but the most ardent jazzers.

Entering a sequence of patterns and chord changes is, of course, a little time consuming, but sequences can be copied to different parts of a song, so a verse/chorus sequence could easily be copied an appropriate number of times. Users can, of course, create their own drum and bass patterns using the eight, velocity-sensitive

pads. For drums, the Bank button can be used to assign groups of eight drum sounds within the chosen kit to the pads. For bass, each pad plays back a different note. While recording, patterns can be looped and built up gradually.

The rhythm section can transmit and receive note data via MIDI. I had no problems getting *Logic Audio* on my PC to communicate over MIDI with the MRS1044. However, the MIDI support is fairly limited; MIDI Note messages are pretty much all that are recognised — for example, MIDI Pitch-bend messages are not supported. The MRS1044 will transmit (but not receive) MIDI Time Code and Song Position Pointer messages. Getting *Logic* to follow the MRS1044 and respond to the recorder's transport controls was no problem.

Recording Your Audio Tracks

For recording audio, either or both inputs can be activated, and the input levels are set at top left-hand corner of the control surface. The Rec Level knob allows further adjustment of the signal level being recorded. Tracks can be armed for recording by pressing the appropriate status button (above the track fader) until it turns red. Once this is done, it's simply a case of putting those transport keys to use. I found the quality of the audio recording to be extremely good.

Both manual and automatic drop-ins are possible, should you wish to rerecord the occasional suspect note in an otherwise good take, and the in and out points can be set easily. A basic, but useful, audio scrub function is available for finding exact time locations. Up to 100 Markers can be created in a project for song navigation, and Markers



are also key to the mix automation process, of which more later.

The MRS1044 includes a range of audio editing functions, so whole tracks or track sections can be copied or erased. Multiple copies can be specified, allowing audio passages to be looped. Audio editing is, of course, one area where computer-based systems excel, but the facilities available here are fine for basic work. Track bouncing is very straightforward, either to submix and free up tracks for further recording, or to create a final mix. The virtual tracks allow all the original audio to be retained when bouncing (disk space allowing) so remixing at a later stage is possible.

The Effects

The effects processing is divided into two types: insert and send/return. Two send/return effects are provided; one offering a range of chorus and delay programs, the other a selection of different reverb treatments. Send levels can be set for both effects from the drum, bass and audio tracks. Usefully, send levels can also be set for the input channels, so a little reverb or delay can be added to help a vocalist with their performance without committing the effect to the recording.

The single insert effect is more flexible than you might expect. At any one time, it can be placed in one of three locations: immediately after the input jack (the default), in an individual audio track, or immediately before the Master fader. When it is positioned after the input jack, a range of editable multi-effect programs suitable for direct recording are available. These are split into three algorithms: Guitar/Bass, Mic and Line. A further Master algorithm contains 20 programs based upon a combination of three-band compression and EQ, but it is only available when the insert effect block is placed in one of the other two positions.

Pressing the Effect button and one of the

MRS1044 Specifications

- Recording: two tracks of uncompressed audio at 44.1kHz, 16-bit.
- Playback: 10 audio tracks, one stereo drum track, one mono bass track.
- Data storage: 15Gb EIDE hard disk, giving approximately 44 hours of mono audio track time.
- A-D converter: 24-bit 64x oversampling.
- D-A converter: 24-bit 128x oversampling.
- Internal signal processing: 24-bit.
- Effects: one insert processor and two send/return processors.
- Frequency response: 20Hz-20kHz ± 1 dB.
- Signal-to-noise ratio: 93dB.
- Faders: 11 non-motorised 45mm faders.
- Display: 60 x 42mm backlit LCD.
- Drum sounds: 30 different kits, each with 24 sounds.
- Bass sounds: 15 different bass sounds.
- Guitar/Bass input: high-impedance quarter-inch mono jack.
- Unbalanced inputs: two quarter-inch mono jacks.
- Balanced inputs: two XLRs with switchable 48V phantom power.
- Input level: variable between -50dBm and +4dBm.
- Master output: RCA phono operating at -10dBm nominal level.
- Headphone output: quarter-inch stereo jack with level control.
- Digital output: S/PDIF optical.
- MIDI: In and Out sockets.
- Footswitch input: for use with optional FS01 footswitch. Allows hands-free transport control or drop-ins.
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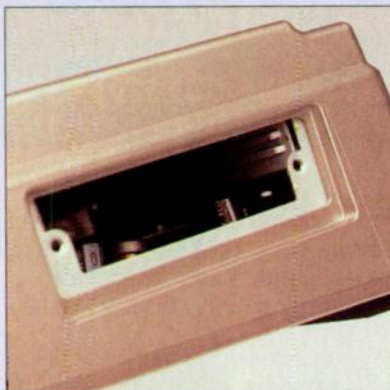
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Backup Options

Zoom have announced that two optional boards for the MRS1044 will be available by the time you read this. One provides USB connectivity (for PC only) and the other a SCSI port. Either (but not both) can be fitted to an expansion slot on the right-hand side of the unit. At the time of going to press, few details were available, but either board could provide a solution to the data backup issues I have raised in the main review.

The USB board is designed to allow a suitably-equipped PC to retrieve data from the MRS1044's internal hard disk. Information on Zoom's web site suggests that the internal audio files are in a WAV format, so further editing or data backup should be able to be carried out on the PC. In contrast, the SCSI board is for direct connection of a suitable SCSI hard disk, CD-RW drive or Iomega ZIP drive, again allowing data backup. Information on compatible drives is available within the FAQs on the Zoom web site.



An expansion slot, normally hidden behind a blank panel, allows an optional USB or SCSI board to be fitted into the right-hand side of the MRS1044.

- ▶ four Algorithm buttons allows an insert effect to be selected via the data wheel. Each program is, in fact, a chain of effects. For example, under the Guitar/Bass algorithm there are some 70 preset patches (plus 30 empty user patches) built from a chain of Modules including Compressor, Preamp/Drive (including noise reduction), EQ, and Modulation/Delay. The Mic presets are built from a similar chain, but with the Preamp/Drive Module containing mic tonal contouring and a de-esser. Insert effects can be recorded or just used for monitoring while a dry signal is recorded.

The sheer number of guitar and bass presets suggest Zoom are catering mainly for guitarists with the MRS1044. The amp and speaker modelling covers familiar territory, with a range of clean, crunch and distortion options. There is perhaps not the versatility of Zoom's dedicated amp-modelling and multi-effects units, but within the context of a full mix the overall impression is very convincing. The bass programs are equally useful, and the Mic algorithm presets provide plenty of scope when shaping the tone of vocal or acoustic instrument recordings.

As you would expect, the more routine delay, chorus, tremolo and flanger-type effects are of a high standard. The Modulation/Delay Module also includes auto-wah, enhancer and stereo width-manipulation options. The effects editing is not, of course, as comprehensive as on a dedicated multi-effects processor, but there is reasonable control over the key parameters. The editing process itself does

involve a certain amount of finger dexterity, but it is no worse than with most other digital multitrackers that contain internal effects units. In fact, the user interface in general has been well put together, and operation of the unit is very intuitive overall.

Mixing In The MRS1044

For all tracks you can adjust volume (via the faders), pan, effect send levels and EQ settings. The EQ provides two bands, each with ± 12 dB gain. The HF band can sweep between 500Hz and 18kHz, while the LF band can sweep between 40Hz and 1.6kHz, though neither has any bandwidth control.

Pressing the Scene button allows a mix Scene to be saved for later recall. The stored Scene contains the input levels, all the track settings (level, pan, EQ and send levels), the state of all the track status keys and the patch numbers for all the effects. Up to 100 Scenes can be saved for each project, and a Scene can be assigned to a Marker so that the scene

is recalled on playback, automating all key elements of the mix.

The Master effect algorithm provides a useful set of options for processing a completed mix. The names of the presets (such as All-Pops, StWide, Power, WarmMst) give an idea of what is intended, and there is reasonable control over frequency crossover points and compression levels for those wishing to tweak the presets. Both the analogue and digital outputs produced excellent results when

transferring finished mixes to a master recorder.

Of course, some form of data backup is an essential facility for any digital recording setup. Even with the fairly generous 15Gb hard disk, space and data security will eventually become an issue. The optional USB interface is likely to be the most obvious choice for many users; data can be copied to a USB-equipped PC (your own or that of a cooperative friend) and then archived to CD-R. Given that the MRS1044 would seem to be aimed at the first-time digital multitrack user, I do wonder whether USB connectivity should not be supplied as standard, perhaps making the optical S/PDIF an option to avoid raising the overall price.

Conclusions

With its SCSI or USB output card installed, the Zoom MRS1044's most comparable UK competitor is the Korg D12. In favour of the Zoom are its provision of phantom power, the quality of its internal drum and bass sounds, and the slightly better quality of its guitar modelling sounds. On the other hand, the D12 allows four-track simultaneous recording, offers a 24-bit recording mode, has somewhat more flexible effects configurations, and has a more comprehensive MIDI implementation enabling real-time mix automation when used with a sequencer.

Choosing between the two units would have to be a case of 'horses for courses' — the feature sets are quite different, and therefore each will suit the needs of different potential purchasers. Where the Korg is more an audio recording workstation, the Zoom MRS1044's slightly broader range of features will be more likely to appeal to guitarists who are first time buyers in the digital recording world, especially if they do not already own a MIDI rhythm box or sequencer.

The MRS1044 is an effective, no-fuss digital studio in a single box that won't leave your spare room looking like the inside of a spaghetti factory. It is certainly capable of some excellent results and well worth a demo — just make sure to budget for a data backup strategy when considering your options. **SSS**



Test Spec

Zoom MRS1044 OS v1 r9043.

Information

E MRS1044, £649.95; UIB01 USB interface board, £99; UIS01 SCSI interface board, £99; FS01 footswitch, £24.95; FP02 expression pedal, £49.95. Prices include VAT.

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Great performances and multitracks of a wide range of instruments including Fiddle, Uilleann Pipes, Mandolin, Accordion, Galician Bag, Bagpipes, Whistles, Flutes, Bodhran, Boston Bannarda, Oveidon Banjo, 12 string, 6 string, Marching Snare, Pipe & Snare, Scottish Snare, Celtic Snare, etc.

4 CD Set (2 Audio + 2 Wav) - £59.05



8.BIT STYLEZ (BEST SERVICE/UEBERSCHALL)

Sampling Library with Sounds from the C64 SID-Chip. 40 Power Construction Kits, wicked drumbeats, sharp hits, game music & fx shots, machine vox... plus over 1000 single drum and instrument sounds. All from the legendary SID-chip "MOS 6581". It's a killer, get infected! low tech sounds for high level music!

Audio + Akai \$1000 - £59.95



XX-LARGE CLUB EDITION 4 (BEST SERVICE)

These latest additions to the XX-Large series take you on a journey through dance. XX-Large Club Edition 4 contains 1300 drumloops (115 140bpm and 1400 sounds (chords, synths, hits, basses, guitars and guitar riffs, FX, organs and pianos) for 2-Step and Garage productions.

Audio CD - £59.95



2 STEP GARAGE (BEST SERVICE/UEBERSCHALL)

This audio CD contains 30 dance construction kits for 2Step Garage productions. Much of this collection is on the Loopy-style commercial side of UK garage. However, there's plenty of musical depth here, which should suit fans of MJ Cole and Wookie. Fans of UK garage should check it out quick style. Future Music

2 Audio CDs - £59.95



TECHNO IDENTITY (BEST SERVICE/UEBERSCHALL)

2 CDs containing over 115 minutes of CJ tested techno material for your next production. Drum arrangements of up to one minute long. FX, causes breaks, noise, tribal beats, hook lines, alien vox and vinyl FX. For the techno terrorist this sample CD is an awesome stash of dancefloor weaponry. FM Platinum Award

Audio+Akai CD-Rom - £59.95



ELECTRIC GHETTO (BIG FISH AUDIO)

Electric Ghetto is the toughest Rock/Rap/Industrial collection ever produced and followers of Limp Bizkit, and NIN will be pleased by the madness of these sounds. Construction kits and crazed mayhem. "Some of the most authentic construction kits I've heard in a long time." Sound on Sound 5 Star Review

Audio CD + Wav CD-Rom - £59.95



NOIZE LOOPS (BIG FISH AUDIO)

Drumloops which have been manipulated and tweaked to the extreme. If you like bands like NIN, Coil or Aphex Twin, you will love this CD. Crazy futuristic sounds, Mad loops, ambient, drones. "The perfect accessory for the dark and distorted imagination." Future Music Platinum Award

Audio CD + Wav CD-Rom - £59.95



MEGATON TRANCE BOMB (BIG FISH AUDIO)

From the soaring melodies of Goa, to the pounding machine rhythms of Berlin. Megaton Trance Bomb delivers everything you need to create psy-trance and goa. This 2 disc set gives you mostly construction kits with extra drumloops and synth arps for that custom sound everything you need to bliss out!

2 Audio CDs - £69.95



NU SKOOL BREAKZ (TEKNIKS)

Tekniks, producers of 'Underground Garage' and 'Rising Drum'n Bass' invites you into the new world of Nu Skool Breakz. Bringing the old with the new you'll find everything you'll need. Inspired by the likes of Stanton Warriors, DJ Zinc and the Plimp DJ's you'll find 30 construction kits fully loaded with slamin' breakz, phat drums,

pulsating basses, special FX and much more.

Audio CD - £59.95



XTREME HOUSE (TEKNIKS)

Xtreme House is a massive 2-CD collection of filtered house loops and samples. You'll find absolutely no construction kits here, just pure loops. Everything from drums, filtered loops, bass, guitars, keys, hits plus you get all the sounds in WAV format. If you after a mixture of Mousse T, Dalt Punk, Masters at Work and Bob Sinclar Xtreme

House has it all for you.

Audio CD + Wav CD-Rom - £59.95



ABSTRACT HIPHOP (E-LAB)

Abstract HipHop is simply jam-packed with insuring deep, smooth, jazzy grooves and will make any producer of experimental HipHop fall in love with this disc. "Abstract HipHop deserves to be a firm favourite with those who like their beats laid back, funky and lovingly constructed." Sound on Sound

"Abstract Hip Hop provides plenty of scope. High quality all round!" Future Music

Audio CD + Wav CD-Rom - £59.95



CLUB TRACKBUILDERS (POWER FX)

Club Trackbuilders uses 6 producers from 4 countries to create an unparalleled double CD of the latest breaks sounds and samples of kicking club music. Construction kits in 2-step, hard house, techno and drum'n bass styles with extra loops and sounds. "all of the sections have a few gems in there

somewhere." Future Music

2 Audio CDs - £59.95

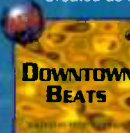


DOWNTOWN BEATS (POWER FX)

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, this is for you. The wide range of tempos could make this a valuable tool for the

R&B producer." Future Music

Audio CD - £59.95



NU GROOVE R'n'B (E-LAB)

Here comes the follow up to the highly rated Strictly R'n'B which finds its inspiration from Timbaland. "This library stands out above the exhaustive pack of hip-top-oriented libraries. In fact, we were nothing short of floored by the quality and freshness of Nu Groove, which is why it gets a Key Buy. Keyboard

Magazine (US) Key Buy Award

Audio CD + Wav CD-Rom - £59.95



TRANSLATOR (CHICKEN SYSTEMS)

Universal sampler file converter and sampler tool. Translates Akai, Emu, Roland, Kurzweil, Erschnq, Giga, SoundFont and many other pro formats. For example, take any Akai S5/6000 CD-ROM, and Translator can convert a Sample, a Preset, a Bank, or even the entire CD-ROM, into Akai S1000, S2/3000, Creamware Pulsar, EmuEGS, ESI, Emax, EPS, ASR, Giga, Triton, Kurzweil, Reactor, Reality, Roland, Samplecell, SoundFont, Wav or Aiff format! Program parameter information is translated as well as the samples and structure - keymaps, tuning, looping, envelopes, velocity cross-switching/fading, wavedata, everything! Translator pays attention to the small details, faithfully replicating your sounds, unlike other programs on the market. New file formats are being added to Translator on a daily basis and updates are available FREE for download, using the easy-to-use updating method from the program itself. Translator is presently available for Windows; the Mac version is under development. Now available for Windows (Mac version coming soon) - £99.00

BT - BREAKZ FROM THE NU SKOOL (EAST WEST)

This is the first of two sample CD's in BT's signature collection and features cutting edge break beats hand mangled through hundreds of plug-ins! It streams through on all frequencies of subconscious awareness. Once you've tasted some Breakz From the Nu Skool, you won't look back!!

2CD Audio+Wav - £79.95

Akai+Audio or Giga+Audio CD-Roms - £199.00

BT - TWISTED TEXTURES (EAST WEST)

Twisted Textures, produced by BT (the founding father of trance), is a massive collection of sounds, pads, and waveforms that will lead you into all realms of the human condition and beyond the doorways of reality! No matter what you're working on, this CD has a sound for you.

2CD Audio - £79.95

Akai or Giga+Hation CD-Roms - £199.00

Q.L. RARE INSTRUMENTS (EAST WEST)

Featuring 16 groundbreaking, ethnic multi-sampled instruments, including Taiko Drums, 23 Thai Gong, Middle Eastern Fiddle, Highland Pipes, Uilleann Pipes, Irish Low Whistle and much more. "Overall, this is an excellent library. The most expressive collection of ethnic instruments I've heard to date." SOS 5 Star Review

Akai S1000 or Giga 3-CD-Rom Set - £329.00

VOCAL PLANET (SPECTRASONICS)

Vocal Planet features both multi samples and phrases, over 1200 samples. This is no ordinary set of samples. The sheer amount of material is breathtaking... the price for so much material is surprisingly modest... this has to be the Encyclopedia Britannica of vocal samples!

Sound on Sound 5 Star Review

Akai/Emu, Roland or Kurzweil Set - £299.00

METAMORPHOSIS (SPECTRASONICS)

An extraordinary library of 21st Century Grooves. If you're a fan of Spectrasonics' creative groove processing on Distorted Reality, Liquid Grooves and Ethno Techno, prepare yourself to be knocked out! "The loops groove nicely... Hard to find from any other source." SOS 5 Stars

Audio CD - £59.95

Akai/Emu, Roland or Giga CD-Rom - £119.00

BACKBEAT (SPECTRASONICS)

Backbeat lays down the perfect foundation for a wide variety of contemporary styles. Tempo locked intros, fills, bridges, sidestick patterns, Endings and Breakdowns are provided along with separate Cymbals to create your own song structures. "Exceptionally well recorded standard drum grooves." SOS 5 Star Review

Audio CD - £59.95

Akai/Emu or Roland CD-Rom - £119.00

INTERACTIVE STRING SECTION (ILIO)

This unique new string library features beautifully recorded Violin, Viola, Cello and Double Bass in a variety of playing styles including legato, marcato, staccato, pizzicato and tremolo for solo, medium and large ensembles. Deluxe features more samples than Universal. Call for further details.

Akai Universal CD-Rom - £179.00

Akai Deluxe CD-Rom - £249.00

ANALOG MELTDOWN (ILIO)

This CD has the brains of one synth and the body of another. Stunning leads, power pads, plucky sounds, sweeps, resonators, and more. "Some of the sounds could be described as pads, but most are out and out leads, solid, edgy sounds that can be guaranteed to elbow their way to the front of any mix." SOS

Audio CD - £59.95

Akai/Emu or Kurzweil CD-Rom - £119.00

SKIPPY'S NOIZEBOX (ILIO)

A new drum loop library from John "Skippy" Lehnkuhl, the creator of the hugely successful Skippy's Big Bad Beats. Now he balances the Hip Hop R&B message of Big Bad Beats with something more "amped up." More than half of Noizebox is over 120bpm and 100% Groove Control activated!

Audio CD - £59.95

Akai/Emu or Roland CD-Rom - £119.00

MODERN SONGWRITER (ILIO)

A complete sonic toolkit of acoustic and electric pianos, pads, strings, basses, synths, brass, guitar, drums, backbeats, percussion, organs and even some stannin' beats to inspire your next big hit! A great starting point for new sampler owners and a terrific addition to the professional's arsenal of sounds.

Akai Universal CD-Rom - £99.00

IFX VOLUME 2 - MATINEE (ZERO-G)

Created by top UK design consultancy Matinee Sound & Vision. Possibly the ultimate collection of sounds and music for your web design needs. Ambient FX, Atmos Loops, Button Pushes, Clicks, Events, Mechanical, Music Loops, Reverse Events, Rollovers, Sweeps and Whooshes.

Wav / Aiff CD-Rom - £59.95

SKUNKWORKS (EAST WEST)

Skunkworks features rhythm guitar grooves and solos from legendary Steely Dan guitarist Jeff "SKUNK" Barker. Guitar licks for all styles from acoustic to heavy metal, and everything in between. For the small price of this disc you can have Jeff "Skunk" Barker on your next track!

Audio + Wav CD-Rom - £59.95

Akai S1000 CD-Rom - £149.00

DAN DEAN SOLO STRINGS (DAN DEAN)

Solo Violin, Solo Viola and Solo Cello, recorded in stereo in various articulations (arpeggiato, pizzicato, half-step and whole-step trills, spiccato and tremolo). There is no pitch-shifting or unnatural transposition artifacts commonly found in other libraries. Whether you need chamber music or a hip backing for a pop band, the Dan Dean Solo Strings collection

should be on your shortlist! Sound on Sound

Giga CD-Rom - £129.00

DAN DEAN SOLO WOODWINDS (DAN DEAN)

This trend-setting 10-CD-Rom library features multi-sampled Bassoon, Contrabassoon, Clarinet, Bass Clarinet, Flute, Piccolo, Alto Flute, Bass Flute, Oboe and English Horn. "...better in quality than most similar samples... very playable... these instruments would fool the majority of listeners that they were hearing a real performance."

Sound on Sound 5 Star Review

Giga 10 CD-Rom Set - £379.00

DAN DEAN SOLO BRASS (DAN DEAN)

Dan Dean Solo Brass is a 10 disc library comprised of Bass Trombone, Cimbalino, Euphonium, French Horn, Piccolo trumpet, Piccolo Trumpet V, Trombone, Trumpet IV, Trumpet V and Tuba which sets a new standard of excellence in playability and sound quality. Each and every note of all of the instruments has been chromatically sampled in up to 8

layers of dynamics (ppp through ff).

Giga 10 CD-Rom Set - £429.00

ETHNO TECHNO (ILIO)

Ethno Techno is an explosion of metallic impact and stratospheric playing. "Ethno Techno manages to surprise, delight and inspire from the first bar and doesn't let up. As a resource for cutting edge yet richly authentic percussive material this one comes rated very highly indeed." Sound on Sound 5 Star Review

2 Audio CDs - £79.95

Akai/Emu, Roland or Kurzweil Set - £179.00

HOT STEEL BLUES (ILIO)

Blues Guitar, Served Hot and Cool. Hot Steel Blues contains over 800 phrases, both plugged and unplugged, divided into patterns, melodies and endings and arranged into construction kits. "Anyone needing anything from a few blues licks to a full blues arrangement will find this collection hard to beat." SOS 5 Star Review

Audio CD - £59.95

Akai/Emu, Roland, Kurzweil CD-Rom - £119.00

DEEP FRIED HAMMOND (BEATRICK SAMPLES)

On this disc you will find Hammond samples taken from performance complete with all of the incidental colour and character that make the instrument come alive. Whatever kind of music you make, these samples will always cut through the mix and add the unique colour and energy of the Hammond organ. All samples have

been recorded dry.

Audio + Wav - £39.95

PFX SERIES (POWER FX)
PFX sound effects series is a new generation in sound effects. All sounds are digitally recorded, processed and mastered entirely in the digital domain. Many of the sounds on the PowerFX series come with different versions that may vary in length, processing and layering techniques. PFX 1.1 - CROSS SECTION: firearms, sports, aeroplanes, machines, weather, household, cartoon and much more. PFX 2.1 - INDUSTRY/OFFICE: Factory machines, hydraulic machines, motors, printers, saws, phones, computers, etc. PFX 3.1 - SPORT/LEISURE: Sound effects from various sports and activities including drag racing, tennis, ice skating, swimming, golf, football, skiing plus you get atmospheres including football crowds. PFX 4.1 - HUMAN/RURAL: Walking, stairs, eating, drinking, snoring, coughing, etc and town atmospheres. PFX 5.1 - TRANSPORT/CITY: Sirens, motorcycles, cars, lorries, trucks, aeroplanes, jets, helicopters, cars, car crashes, bus, main road, city traffic, motorway, subway trains, car washes.

Audio CD - £29.95 each volume or 5 CD Audio Set - £116.00



Swedish manufacturer Elektron claim that their SPS1 rhythm synth is the most sophisticated drum machine ever built, with a stunning specification that includes no less than four different types of percussion synthesis.



Elektron Synthetic Percussion Sequencer Machinedrum SPS1

Chris Carter

Elektron are the Swedish manufacturer of the under-rated SidStation synth based on the sound chip used in the Commodore 64 home computer (see *SOS* November '99 or www.sound-on-sound.com/sos/nov99/articles/sidstation.htm). If you thought that bringing out a synth like the SidStation seemed an anachronistic move, you'll probably find the company's new product, the Machinedrum SPS1 drum machine/percussion synth, even more out of step with the times. A drum machine, in the 21st century? But Elektron aren't an ordinary company, and the SPS1 is no ordinary drum machine...

Out Of Time

According to Elektron's Daniel Hansson, the idea behind the Machinedrum was to incorporate the sounds and features of the most highly regarded drum machines and electronic percussion of the past, such as the Roland TR-series, Simmons kits, the LinnDrum and the Emu SP1200, and to include the popular TR-style rhythm grid/programming

interface, whilst bringing the overall feature-set up to 2001 standard — so there's a comprehensive MIDI spec, and plenty of modulation and real-time control potential.

Of course, Elektron aren't the first company to produce a 'sound-alike' drum machine, and samples of classics are available everywhere. But a sample, no matter how good, is a poor substitute for many rhythm aficionados. As a result, although the Machinedrum does feature sampled drums, it also has three other main means of sound generation: FM synthesis, modelled analogue percussion synthesis on classic TR-series Roland lines, and physical models of real drums and percussion. Now that's what I call a percussion synth...

Before you head for your local music shop, credit card at the ready, I should point out two things: firstly, the Elektron Machinedrum is a professional piece of kit from a small manufacturer, and consequently has a decidedly pro price tag (about 850 pounds at the current exchange rate); and secondly, it's currently only available directly from Elektron themselves, via their excellent web site. If you're still interested, read on.

User Interface

Elektron are boldly touting the Machinedrum as "the most sophisticated drum machine ever", and looking down the SPS1 spec, I have a feeling they may be right. This machine has an outstanding feature-set, as you can see in the box on the next page. In brief, the SPS1 consists of three main programmable elements — a percussion synth, a percussion sequencer and built-in effects.

The SPS1 is superbly constructed, with a Swedish steel casing and a heavy-duty brushed aluminium front panel. At 340 x 176 x 68mm (including knob depth), it's compact, but still weighs in at a fairly hefty 3kg, not including its power supply.

On power-up, the Machinedrum's most striking feature is its large bright red backlit LCD. The display is essential for almost all operational functions, from selecting Songs and Patterns and adjusting tempo to sound editing, Pattern programming and MIDI settings. The control panel layout closely follows standard 16-step drum machine conventions, and the large continuous data wheel, knobs, buttons and LED indicators are

logically laid out. Good use is made of LEDs, including one above each of the 16 pads to show rhythm pattern activity, mirrored in another group of 16 (the Sound Selection indicators) directly above the data wheel. This second bank of LEDs also indicates which of the 16 percussion voices is being edited in the main LCD window. Apart from selecting percussion sounds for editing, the data wheel is only used for adjusting global parameters such as Tempo (30-300 bpm), Accent, Swing and Machine selection in Kit Edit mode.

The Master Volume and Track Level controls are self-explanatory, and other parameter adjustments are carried out using a bank of eight so-called Data Entry knobs, which take on different functions depending on the mode and current LCD screen. Most of the front-panel knobs and buttons can also be used to control external MIDI equipment, and conversely the majority of internal parameters (384 of them) are adjustable via MIDI.

Not only are the Data Entry knobs on the Machinedrum infinite rotary types, they also incorporate a useful, and I think a fairly unique, push-switch function; if you push down on a knob while rotating it, the data values change at a much faster rate.

Navigation when editing via the LCD is by four dedicated arrow buttons directly under the display. There is also a pair of Enter/Yes and Exit/No keys to round off this much-used section. The Transport controls consist of Record, Play and Stop buttons, which also double as Copy, Clear and Paste functions

when used with Patterns and Songs (in fact, most of the front-panel keys operate as dual-function buttons). There are, however, no dedicated fast-forward or backward transport controls, so if you wish to jump to a new song position, you need to enter Edit mode while the song is playing, and use the arrow keys to move up and down the song Pattern list — a slightly messy solution.

The five-button section marked Pattern Selection is used for moving between the eight Pattern Banks (a total of 128 Patterns) and also for activating track Mutes, Accents, Swing and Slide settings; more on these later.

The back panel of the Machinedrum is just as well kitted out as the top panel, with audio jack sockets for headphone connection, main stereo audio outs, four further individual assignable outputs, stereo audio inputs (of which more later), and MIDI In, Out and Thru sockets. Also here are the power switch and a 6V AC socket for the external PSU. Like most people, I'm not really keen on external power supplies, but I can accept that the SPS1 has one; what I *really* wish was that it had been one of the more common 9V DC types. Believe me, if you are in the middle of a tour and break or lose an AC-to-AC wall wart, you have about as much chance of finding a replacement at the local electrical store as you have of finding a nun at a Marilyn Manson gig.

Machinedrum Synths

The basic percussion building blocks used in the SPS1 are called MD-Synths, of which there are four types: TRX, EFM, E12 and PI. The MD-Synths are available to the user as various percussion Kits, each containing 16 sounds called Machines. All Kits offer a range of Machines so that all the usual drum machine sounds and percussion instruments are present, such as bass drums, snares, toms, claps, cymbals and so on, and many metallic and synth-like sounds are also included.

The TRX Kit takes Roland TR-series synthesis as its starting point, and indeed the TRX Machines are quite capable of sounding just like an original TR drum machine. However, the recreations have extended controls not found on the original machines. The bass drum, for instance, has parameters for Pitch, Decay, Noise, Harmonics and Clip (distortion) amongst others, while the snare offers Snap, Tone, Tune (which detunes the oscillators) and Clip (distortion). Of the 12 TRX Machines available, all have various extended parameters, with up to eight variables on offer in some cases.

The EFM Kit is based on FM algorithms, and once again the percussion voices cover the usual fare of bass drum, snare, toms, and hi-hats, although in this case only eight different Machines are available. The (numerous) adjustable parameters for the EFM

Features At A Glance

SOUND GENERATION

- Four MD-Synths (TRX, EFM, E12, PI).
- 39 individual Machines.
- 64 user-programmable kits.
- Five effects per Track.
- Four stereo master effects.

PERCUSSION CONTROL SEQUENCER

- 16 Tracks.
- 128 user Patterns.
- 32 user Songs.
- Swing, Slide, and Accent options.
- 16 x 24 Parameter Locks per step.
- Real-time control.
- 384 MIDI-controllable parameters.

EFFECTS

- Amplitude modulation.
- One-band EQ.
- Resonant 24dB low-, band-, or high-pass filter.
- Sample-rate reduction.
- Distortion.
- Rhythm echo delay.
- Gatebox reverb.
- High/low shelving and parametric EQ.
- Dynamics processor.


HARDWARE

- 24-bit D-A converters.
- Left and Right stereo outputs.
- Six individual audio outputs.
- Two individual audio inputs.
- Stereo headphone output.
- 128 x 64-pixel backlit LCD.
- MIDI In, Out, and Thru.
- Flash-upgradable OS.

Machines are subtly different too, with more emphasis on filtering and pitch modulation. The preset Kits are relatively laid back considering what the Machines are capable of with a little tweaking; you can treat each individual EFM Machine as a programmable FM synth and conjure up the most outrageous rhythm patterns. Think Kraftwerk on LSD...

The E12 Kit is the sample-based one, and the 16 Machines encompass everything from bass drum, snare and tambourine to shaker, triangle and something called 'BongoCongo'. Unlike on the other Kits, most of the E12 adjustable parameters are much the same from Machine to Machine, but each contains a different sample. All have Pitch, Decay, Retrigger, and Bend parameters, and most have a high-pass filter with resonance.

Retrigger is an interesting function that doesn't appear in the other MD-Synths. It retriggers the sample at an adjustable rate, from just one trigger for each step event to continuously retriggering. But usefully, it also allows you to vary the time between each trigger using the 'Rtim' parameter; decreasing this setting closes up the gaps between triggers, until at the minimum settings the effect becomes so fast that it acts as a kind of ▶



Elektron Machinedrum SPS1

1350 Euros

pros

- Outstanding percussion (and synth) sounds.
- Vast array of programmable features.
- Real-time editing controls.
- Good MIDI spec.
- Individual outputs.
- Beautifully constructed.
- Nothing else quite like it.

cons

- A few inscrutable operating procedures.
- Song composing mode needs tidying up.
- It's a premium-quality instrument... but it comes with a premium-quality price tag.
- Pads not velocity sensitive.
- Red LCD can be hard on the eyes.

summary

The Machinedrum is an outstanding drum machine. Its percussion sounds outshine anything currently available, and range from spookily authentic-sounding classics to off-the-wall, hardcore beatbox and synth mayhem. Some operational quirks still need ironing out, but if you can live with its idiosyncrasies you won't be disappointed. Professional and pricey, but very, very tasty.

ELEKTRON MACHINEDRUM SPS1

► modulation LFO. This allows the creation of unusual discordant cross-modulation and ring modulator-like percussion sounds, and if used with the high-pass filter and bend options, the samples take on a completely new life.

The PI Kit is comprised of physical models of acoustic drums. There are six PI Machines, including bass drum, snare, toms and (peculiarly) maracas, and each has between four and seven parameters, including model parameters such as: Tension, Dampening, Ringing, Grain, Rattle, Tune and Size. Playing the Machinedrum with a Roland Octapad, I was quickly able to get a custom PI kit I'd put together sounding highly expressive, and I imagine a 'real' percussionist would get even more impressive results.

Although the PI Kit doesn't include the same wide range of Machines as the others, or as many variable parameters per Machine, it is nevertheless a very versatile 'building block' and is capable of some outstanding percussion sounds, real and invented, which come across as more realistic than the sample-based E12 Machines in many ways.

Last amongst the kits is GND, which isn't really a MD-Synth. All it contains are a few miscellaneous Machines that don't come under any of the above types, such as a sine-wave oscillator, a white noise source, an impulse generator for pulses and clicks and the Input Machine, which allows external audio signals connected to the rear A and B inputs to be inserted into Patterns and/or passed through the SPS1's many effects options as if they were from an MD-Synth Machine on individual Pattern tracks. The inputs can also be set for triggering using standard piezo drum pad transducers.

The Machinedrum includes 30 factory default Kits which can be overwritten or



The SPS1's red LCD is packed with information, but this can make it a bit hard on the eyes if used for too long. Navigation around the multitude of options is via the cursors and Yes/No buttons.

recalled at any time, and space for 64 user kits. Also included is an uneven demo song with far too many weak spots amongst some real 'show off' sections. The supplied Kits are fine, if a little unadventurous, but they'll get you started, and you'll be building your own kits in no time. Most importantly, the user kits are not restricted to just one type of MD-Synth, as many of the presets are; you can mix and match different Machines within kits as you wish. Putting a TRX bass drum and snare in the same kit as a few E12 toms and some EFM claps and hi-hats is no problem.

Pattern Sequencing

Pattern sequencing comes in two flavours: Classic and Extended. In Classic mode, the

Patterns operate as on a traditional drum machine, with the Patterns and Kits as separate entities. In Extended mode, a Kit (including its Machines, effects and routing parameters) and a Pattern are bonded together. Extended is probably the most useful mode, as you can guarantee your rhythms will always sound as you intended, whereas Classic is useful for trying out different Kit and rhythm combinations while you're trying to get your sounds right.

Patterns are put together in the time-honoured fashion established by Roland's TR808 drum machine, called Grid Composing on the Machinedrum. With a new Pattern, you first need to decide the maximum number of steps (2-16 or 17-32) and the scale. The default setting is 16 steps and a 4/4 scale, but various other scales are also available. In the extended 32-step mode (2 x 16 steps), there are two LEDs at the right of the front panel to indicate which of the two 16-step patterns you are editing.

The 16 numbered drum keys along the front of the unit are labelled with the same percussion names as the Sound Selection LEDs above the data wheel. In normal Play mode, the LEDs above the drum keys flash to indicate which Machines are playing on any given Pattern step. Pressing Record, however, changes the LED arrangement to show a single running LED and non-flashing, lit LEDs at points where trigger steps have been programmed for the currently selected sound. Although the SPS1 allows you to enter Pattern step triggers in either Play or Stop modes, you cannot hear any real-time Machine editing unless the pattern is playing.

Other pattern/track options include Swing (50 to 80 percent), Accent (which works across the whole pattern, not on individual

Track Effects, LFOs & Master Effects

Each of the 16 Machines (as each individual SPS1 drum sound is called) has its own dedicated Track Effects: an amplitude modulator (with LFO Depth and Speed parameters ranging from tempo-locked tremolo to full amplitude modulation), a one-band parametric EQ (with fully variable boost, cut and frequency), a resonant 24dB-per-octave low-, high-, or band-pass filter, a sample-rate reducer (which does exactly what it says, and is capable of reducing your sparkling audio to lo-fi grunge with exaggerated aliasing artefacts), and distortion.

Further sonic mangling is possible with the detailed LFO sub-section, which has a dedicated display page for each of the 16 Machines in a Kit. At power-up, each LFO is mapped to its own Machine/Track, for example

bass drum LFO to bass drum, snare drum LFO to snare drum, and so on. However, the Track parameter will let you re-route the LFO output to another track for multiple LFO modulation of a single Machine.

The Parameter control selects the Machine parameter you wish to modulate from a lengthy list covering every editable Machine variable. You can even modulate other LFOs. The Update function synchronises the LFO to the main tempo, lets it run free or resets the waveform when a trigger is received.

If there is one feature the SPS1 isn't short of it is LFOs; there are around 44 by my count, and I probably missed a couple somewhere! I can't think of many synths with that many LFOs, let alone a drum machine. But

I'm far from complaining, as it's this sort of attention to detail which begs users to experiment with bizarre sound manipulation, and that's right up my street.

As if that weren't enough sound-shaping potential, the Machinedrum also has four stereo Master Effects: the Rhythm delay, the Gatebox reverb, the Dynamix dynamics processor and a parametric and high/low shelving EQ section. The Rhythm echo and Gatebox reverb are accessed via dedicated sends in the 16 Machines/Tracks, while the Dynamix processor and EQ sections process the final stereo output signal.

The Rhythm echo is a tempo-synchronised (but variable) mono-in/stereo-out affair, with the added bonus of integrated high- and

low-pass filters and an LFO for modulation effects. The Gatebox reverb covers workaday reverb, gated reverb and ambience effects, and although it has a decidedly 'budget' sound it isn't without low-tech charm.

The Dynamix processor is optimised for compressing percussive sounds, and includes all the parameters you'd expect to find on a well-specified compressor, including Attack, Release, Threshold, Ratio, Knee (hard/soft), 'HP' (a side-chain filter), and Gain. The compressor is used to good effect on some of the factory presets and can have a dramatic effect on a rhythm, particularly when used in conjunction with the EQ section. All settings for the Stereo Master Effects section are saved as part of a Kit.

Plug-ins with their *OWN* muscle

We've all been there. The mix is almost finished and all you need is a few more effects and a bit of high end EQ on the lead vocal plus some warm, fat compression on the kick. Your computer CPU is already working at full steam and just can't handle any more. Game over!

It's time you got serious and it's also time you got **UAD-1** from Universal Audio. Not only does the **UAD-1** DSP Card ship with world class plug-ins, far surpassing anything possible with native DAW's, but it also ships with its own muscle, which means that your CPU won't even know they are there. This is what Universal Audio call 'Powered Plug-Ins'.

All Plug-Ins appear in the Plug-In folder of your favourite VST compatible host application and you assign and use them just like any regular native Plug-In. This is where the similarities end! True studio quality reverbs, such as a RealVerb Pro from Kind of Loud Technologies just cannot be run as a native Plug-In, nor can the painstakingly recreated 1176LN or Teltronix LA2A. These types of Plug-In require enormous amounts of DSP power to carry out their calculations and that's exactly what the **UAD-1** has. Power and lots of it.

How about running eight instances of RealVerb Pro? No problem. 32 EQ's and 16 compressors simultaneously? Bring it on. Eight 1176LN vintage compressors all pumping away simultaneously? Permission to pump granted.

There are many more reasons to buy a **UAD-1** Card, such as UltraDither in hardware, smoothing of all parameters to avoid 'zipper' noise, high resolution floating point processing, automation and totally uncompromised audio quality. Perhaps the biggest reason to muscle-in on the new **UAD-1** is because it is the most cost-effective way to enter the world of true studio-quality audio processing.

The UAD-1 Powered Plug-Ins Bundle ships with:

- UAD-1 DSP Card
- 1176LN and Teltronix LA2A Vintage Compressors
- RealVerb Pro reverb
- CS-1 Channel Strip with 5-band EQ, compression, chorus, flange, echo and a reflection engine

System Requirements:

To run Powered Plug-Ins, you must have the following minimal system components.

VST-compatible host application
128MB RAM, 30 MB disk space
1 open PCI slot
Windows 95/98/ME

Support for Windows 2000 and Mac OS to follow.

SRP £799.99 inc. VAT

ELEKTRON MACHINEDRUM SPS1

Mostly MIDI

The Machinedrum is well specified in the MIDI department, and I encountered no problems sync'ing it to, and controlling it from, other drum machines, keyboards and MIDI interfaces. At the moment, it doesn't respond to Song Position Pointers, but Elektron claim that this will be implemented in the next software update. At power-up, the SPS1 is arranged to allow you to trigger Patterns mapped across an external MIDI keyboard. This is a useful way of trying out combinations of rhythms and for jamming, although unfortunately this feature didn't seem to work in real-time Song recording mode.

Full support is given to external control of the SPS1 over MIDI; in fact there are 384 MIDI-controllable parameters. You can also use the Machinedrum's buttons and data knobs as a MIDI controller for external gear, and Patterns, Songs, or the entire contents of the SPS1 and its settings may be saved via SysEx.

► drums), Mute (to silence individual drums) and Slide. Slide is interesting as it works in conjunction with the Parameter Lock. This last feature is only available in Extended mode and is in my opinion one of the Machinedrum's most indispensable features; I used it extensively in this review. It allows any Machine, effects and routing parameters within a kit to be locked to a fixed value at any step in a pattern. Using it on the pitch control of a suitable Machine, you can compose basic monophonic melodies alongside the rhythm pattern, creating (say) bass lines, analogue sequencer-style synth patterns, or arpeggios. You could also use it on effect send parameters to add delay and/or reverb to specific steps in a Pattern, or on Level parameters as an accent for individual percussion sounds.

The default state for Parameter Lock is to move from one step to the next exactly as programmed; however, the Slide feature lets you apply an element of glide between steps for a smoother transition. There is an upper limit of 24 Parameter Locks for each Pattern step on each Kit, but this equates to 384 parameters for each Kit, per Pattern, which is likely to be sufficient!

The Live Recording option lets you record drum triggers and Parameter Lock adjustments in real time. You simply hold down the Record button and press Play, and can then enter rhythms by hand using the drum keys or via MIDI, although MIDI velocity information isn't recorded. In Live Recording mode, the Parameter Lock functions similarly to the Motion Control feature on some Korg, Roland and Yamaha gear, and records any tweaks or adjustments you make to the data knobs while looping. This allows you to add movement and expression to Patterns, with changes to level, decay time, filter frequency, and modulation over time.

Patterns are selected in Play mode by using a combination of the drum keys (1-16) and Pattern Selection buttons, plus the 'Bank Group' button to select banks A to D or E to H. Patterns can also be copied and pasted to other locations or erased, as can individual note triggers and Parameter Locks.

Song Construction

Song construction is basically arranging a list of Patterns to be played in sequence. At each step in a Song you can determine the Pattern to be played, the number of times it repeats before moving to the next, whether a Pattern starts playback from its beginning, or override the pattern tempo with an alternative value. A Song can contain up to 256 steps and 32 Songs can be stored in memory.

Songs can be constructed to play to their end and stop, or play to a predetermined point and stop. Using the 'Loop & Jump' feature, Songs can loop indefinitely, loop at a certain point or play to a point and then jump to a different point in the Song. Thankfully, Songs (and their associated Kits) can be saved with meaningful names, unlike on a lot of drum machines. There is also a real-time Song recording mode, though there is little mention of it in the instruction manual. I found creating Song Patterns in this mode a lot easier.

Final Thoughts

It would be easy to dismiss the Machinedrum

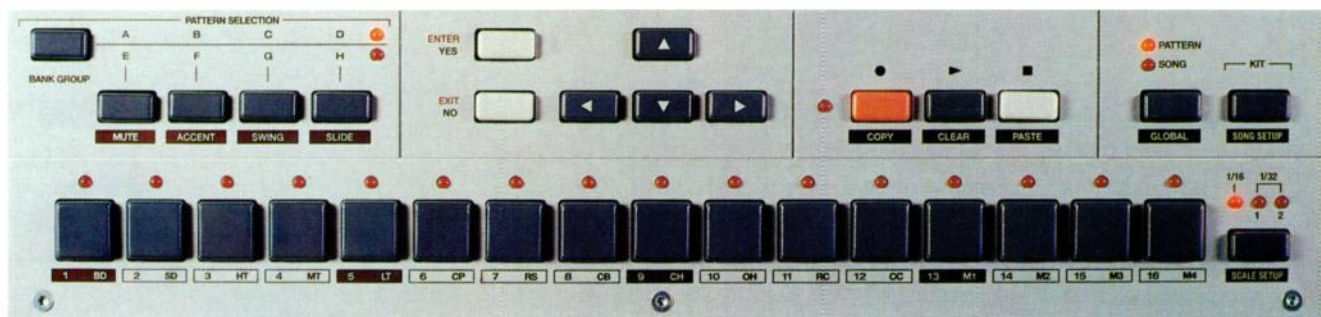


The Level control (which sets the volume of the currently selected Machine/drum sound relative to the others) and multi-purpose, MIDI-transmitting Data Entry knobs. Access to the bewildering variety of Machinedrum LFOs is also via the seemingly innocuous white button here.

as a repackaged bunch of 'has-been' drum machines, but I think this would be most unfair. Although my first few hours with it were indeed spent faithfully recreating and reminiscing over those golden oldies, I soon moved into the realms of custom Kit construction, modulation, manipulation, extreme percussion-warping and fancy rhythm-pattern programming. And from then on, I never looked back.

Having been using it for a while, it seems to me that the Machinedrum's appeal is twofold. Firstly, by incorporating high-quality software-based sound generation with real-time controllers in a hardware box, Elektron are hoping to attract the not-insubstantial following of dance musicians, DJs and producers who prefer to do their rhythm programming and playing with a 'hands on' instrument, as opposed to via a computer. Secondly, this machine will appeal to budding electronic percussionists who aspire to rhythm-making the 'old-school' way, but whose budget won't stretch to an arsenal of old TRs, Linns and Emus.

The programming grid interface. This is where step-and-real-time input is performed, where the grid scale is altered between 16 and 32 steps, where per-step parameters like Mute and Slide are set up, and where Patterns are chained into Songs. The main transport controls are also here, although the lack of simple forward and backward controls makes moving through sequences a little harder than it needs to be.



Having said that, at around £850, the SPS1 is hardly a snap purchase either — it may be a top-quality instrument, but it has a price to match, and despite the wealth of features it offers, a price this high will inevitably limit its appeal. Furthermore, although I can't fault the Machinedrum's construction, logical layout, external interfacing and its awesome sonic capabilities, it is let down a little by a few operational quirks, plus a couple of none-too-clear editing screens. Song construction and playback could be easier. I would also have liked a dedicated pattern fill-in feature and a few more master effects. Finally, I did find the red LCD a little hard on my eyes after prolonged use, but that was after an exceptionally long session.

According to Elektron, the next major SPS1 software revision (version 1.1) should be available from their web site by the time you read this. The company claim that this will rectify some of the shortcomings I've noted here, while also adding some useful extras,

Test Spec

• SPS1 version reviewed: v1.00c.



Even the rear panel is impressive; there's the full trio of MIDI I/O (no 'soft Thrus' here), and no less than four individual outputs in addition to the main left-right stereo output pair. There's even a stereo input to allow you to pass external audio through the SPS1's not-insignificant processing engine. Full marks to Elektron.

like MIDI Song Position Pointer recognition, MIDI sequencing Machines for control of external MIDI gear, new sound-generating Machines, a redesigned song interface, and many other general improvements.

I feel confident in guaranteeing that you'd be hard-pressed to find another drum machine, or even many synths, that can generate quite the extreme range of sounds this one is capable of; the nearest hardware equivalent would probably be a combination of a Korg ER1, a Yamaha AN200 and Jomox XBase09. Of course, you could get sounds similar to those in the Machinedrum using a couple of grand's worth of Mac or PC and some software, but I still doubt that this

would sound quite as good, and it definitely wouldn't be as portable or half as much fun. In short, despite my (few) reservations, I think the Machinedrum is a truly awesome piece of kit. **SOS**

information

E The SPS1 is available only at the Elektron web site, for 1350 Euros (about £840) including express shipping and Swedish sales tax. The optional rack kit is 40 Euros (about £25).

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Millennium Music Pentium 4 Music PC

Millennium Music Software are one of the UK's biggest names in custom-built PCs for music, and their latest systems are exploiting the power of the newest Pentium 4 processors.

Martin Walker

Millennium Music Software are about to celebrate their 10th year in business, and their ninth supplying PCs specially built for musicians. However, no branch of technology moves faster than computing, and PC specs seem to change faster than anything else. Since I last reviewed a PC from Millennium in SOS September 2000, its Pentium III 700MHz processor and Intel 440BX chipset have dropped below entry level, and the AMD Athlon has become the processor of choice for many musicians looking for faster performance. However, there are still compatibility issues with soundcards and some Athlon-based chipsets (see SOS August 2001 for more details), and most specialist music retailers still stick to Intel for both processor and motherboard chipset. With this in mind, and given the current confusion surrounding Intel's new Pentium 4, I was most interested to receive another Millennium PC system for review, at about the same price as last time (£1300 without soundcard or music software), but this time featuring a 1.7GHz Pentium 4 processor.

Cool Case

The PC was housed in a stylish Coolermaster ATC200 'thermal chassis' with a 5mm-thick brushed aluminium front panel, coupled with an additional 3mm-thick grey bezel surrounding the drive bays, and grey top and side plates. There were three 5.25-inch bays, the topmost of which was already occupied by a Sony CRX160E CD-R/W drive capable of 32x read speeds as well as a top write speed of 12x and rewrite speed of 8x. Beneath these were two 3.5-inch drive bays, the top one occupied by a floppy drive, and the bottom by a small removable panel hiding two USB

sockets (there are four in all, the other two being on the rear panel).

The bottom half of the front panel had Power and Reset switches, again in aluminium, and was completed by a grey perforated grille. Behind this were two system cooling fans, and once I'd removed the two easy-access screws and the side panel, I could see the rest of the cooling arrangements — a fan mounted on the top panel, and of course the fan inside the Q Technology Ultra Quiet 300 Watt power supply.

There was also a generous complement of six 5.25-inch internal drive bays, just one of which was taken up by a 60Gb Seagate Barracuda ATA IV hard drive, model ST360021A. This range is not only fast, but extremely quiet, featuring a 'SoftSonic' motor. The motherboard was an Asus P4T, claimed (by Asus of course) to be the best selling P4 motherboard in the world, and widely regarded for its rock-solid stability and excellent performance as well as for its

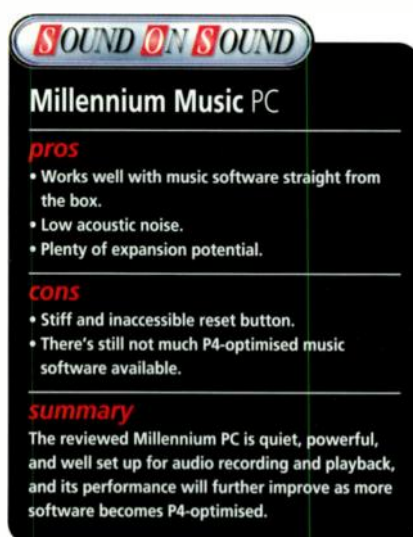
overclocking capabilities, although Millennium had wisely steered clear of implementing this last feature in a commercial product. It features the Intel 850 chipset, and the Socket 423 1.7GHz Pentium 4 processor had been fitted with a Molex Radial Fin Cooler, one of the quietest and most efficient Pentium 4 designs available.

Perhaps because of the single drive and the efficient CPU cooler, Millennium had relied on the PSU fan to extract hot air from the case, leaving all three chassis fans unconnected. The system certainly ran fairly cool during the review period, but if you do subsequently fit multiple hard drives then it would only take a few seconds to plumb in the extra fans if required. The remainder of the interior was neatly wired up, with the various spare ribbon cables and PSU connectors clipped tidily out of harm's way.

Card Slots

The Asus P4T motherboard has five PCI slots and one AGP slot, and in Millennium's review system quite a few of them were filled. The supplied graphics card was a Matrox Millennium G550 dual head model with 32Mb of RAM: these are proving very popular with musicians, who never seem to have enough room on one screen when running the latest MIDI + Audio sequencers. Slot three was filled with a Zoom V92 voice fax modem, and slots four and five were occupied by the two supplied soundcards, leaving slots one and two free for expansion.

All of the four RIMM (Rambus Inline Memory Modules) slots were occupied, providing 256Mb of RDRAM, although the memory itself consisted only of two 128Mb modules. However, sockets not populated by RDRAM modules must be filled with Continuity RIMM modules to avoid breaking the serial connection signal lines, and most motherboards, including the Asus P4T, supply a couple as standard. Millennium had installed them in the configuration recommended in the motherboard manual: C-RIMM, 128Mb RDRAM, C-RIMM, and 128Mb RDRAM. If you later want to add more memory, the C-RIMM modules can be replaced by 128Mb RDRAM



SOUND ON SOUND

Millennium Music PC

pros

- Works well with music software straight from the box.
- Low acoustic noise.
- Plenty of expansion potential.

cons

- Stiff and inaccessible reset button.
- There's still not much P4-optimised music software available.

summary

The reviewed Millennium PC is quiet, powerful, and well set up for audio recording and playback, and its performance will further improve as more software becomes P4-optimised.

MILLENNIUM MUSIC PC

► modules, bringing the total RAM to 512Mb. This should be enough for most musicians, although the P4T motherboard supports up to 2Gb.

Like all *SOS* specialist music retailers, Millennium offer a wide range of hardware and software options, so it's inevitable that each PC I review for *SOS* is only a snapshot of what's available. I wanted to concentrate on reporting the performance of the basic system without getting bogged down in any very specialised setups, and with this in mind I asked Millennium to install *Cubase VST 5.0*, since this would allow me to more easily compare performance with my own PC setup, and in particular to see how the Pentium 4 processor performed in comparison with my Pentium III 1GHz processor.

The soundcard Millennium supplied was an RME DIGI96/8 PST. This is a versatile choice, since it not only has high-quality 24-bit/96kHz-capable stereo analogue input and output, but also both S/PDIF and ADAT optical I/O. RME drivers are also renowned for their reliability and good performance. As it happens, I'd just finished testing RME's DIGI96/8 PAD, the next one up in the range, and can confirm its excellent audio quality.

However, some musicians will need more than the single stereo analogue input this card provides, so Millennium also included one of RME's own expander boards, the AEB4-I, which adds four more analogue inputs. These connect to the DIGI96/8 PST card using its internal ADAT interface. If you require MIDI I/O, Millennium would recommend something like the Midiman MIDIspport 2x2 USB shown in the photos, although this wasn't part of the review system.

Look And Feel

To interface the Millennium PC to the outside world, the review system was supplied with a black 102-key keyboard with a pleasing tactile response, and a black Keytronic 2-button mouse with the same shape and feel as Microsoft's popular Intellimouse. I also asked for a flat-screen TFT (Thin Film Transistor) monitor with the review system: although flat-screen technology is still considerably more expensive than traditional CRT (Cathode Ray Tube) designs, prices have been dropping, and there's no denying the multiple advantages for the musician, as outlined in last month's Computers In The Studio FAQ.

Millennium initially supplied me with a beige Hansol 520F monitor with a 15-inch viewable screen area, which is exactly the same size as that provided by a conventional 17-inch monitor. The 520F is a straightforward budget design with simple tilt-only adjustment and analogue-only input, but during the time I spent with this TFT

screen, I was so impressed by its crisp picture quality and small footprint that I bought the review monitor from Millennium. For those who prefer the mean and moody 'all black' look, Millennium can instead supply the slightly more expensive 'midnight grey' (black to the rest of us) Viewsonic VE150MB 15-inch TFT monitor, as shown in the photographs accompanying this review. This provides an additional digital port for even crisper picture quality using the Matrox G550's DVI socket, as well as height, swivel, and tilt adjustment. Its display can even be rotated through 90 degrees to edit documents in portrait mode.

Powering Up

As I fully expected given Millennium's careful choice of components, the PC proved to be wonderfully quiet when I first booted it up. Given the amount of time I've spent silencing two PCs of my own, I know all the problem areas, and this machine had none. In fact, I was quite envious of the Seagate Barracuda IV hard drive, which was quieter than either of my own drives, even though mine have the additional benefit of SilentDrive sleeves.

After a couple of hours I also removed the side panel to check temperatures, and sure enough, even without the extra chassis fans connected, there were no hot spots or excessive heat build-up. Checking the Hardware Monitor section inside the BIOS showed that in idle mode the motherboard and CPU reached 33 and 45 degrees Centigrade respectively, and even after a prolonged CPU workout using the *BurnInTest* utility the maximum temperature reached was only 57 degrees Centigrade.

The single 60Gb Hard drive had been split



into two partitions: a 20Gb C drive for Windows 98SE and applications, formatted with FAT32 and 16K clusters, and a 37Gb D drive intended primarily for audio purposes, again formatted with FAT32, but this time with 32K clusters. All this makes good sense. If this were my PC, I'd only have allocated 5Gb or less for Windows and applications, and split the remaining 52Gb into audio and data partitions, but Millennium have made a sensible general-purpose split that will suit the majority of their users.

Installed Software

I was pleased to see quite a comprehensive bundle of software included, most important of which was the full OEM version of the Windows 98 SE CD-ROM and Manual — some suppliers cut costs by simply copying an image of the CD-ROM onto your hard drive, which won't help you if you ever get problems with the drive and need to reinstall Windows from scratch. Windows 2000 is a user option, as will Windows XP be once it's been tested by Millennium engineers for performance and stability.

Other software installed of particular interest to musicians included the excellent *Nero 5.5* CD-burning application from Ahead Software, the *AudioGrabber* CD audio ripping utility, demo versions of *Cool Edit 2000*, *Fruity Loops 3* and *Reason*, and RME's useful

Specifications Of Review PC

- **Case:** Coolermaster ATC200 aluminium case with front USB connectors.
- **PSU:** Q Technology Ultra Quiet 300 Watt.
- **Motherboard:** Asus P4T.
- **Processor:** Intel Pentium 4 1.7GHz (Socket 423).
- **CPU fan:** Molex P4 (423).
- **System RAM:** 2 x 128Mb Rambus modules.
- **Hard drive:** 60Gb Seagate Barracuda ATA IV, model ST360021A 4, 7200rpm, Ultra ATA/100.
- **Floppy drive:** 1.4Mb 3.5-inch, black.
- **CD-R/W drive:** Sony CRX160E, black, EIDE, 4Mb buffer, 32x read, 12x write, 8x rewrite speed.
- **Graphics card:** Matrox Millennium G550 dual head with 32Mb RAM.
- **Monitor:** Viewsonic VE150MB 15-inch viewable XGA, 1024 by 768 resolution TFT colour (black).
- **Modem:** Zoom 56K internal voice fax modem.
- **Keyboard:** Ceratech Accuratus 260 (black).
- **Mouse:** Keytronic 2-button (black).
- **Installed soundcards:** RME DIGI 96/8 PST and RME AEB4-I analogue input expander.
- **Installed audio software:** *Cubase VST 5.0* revision 6.

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MILLENNIUM MUSIC PC



The ATI Coolermaster case is an excellent choice for the musician: its thickness provides some sound insulation, while its thermal properties mean that this PC can be run with all three chassis fans disconnected, thus generating less noise in the first place.

► **DIGIcheck** utility. A handy collection of freeware plug-ins and VST Instruments had also been installed in *Cubase's* vstplugins folder. Also on the hard drive were the excellent *ZoneAlarm* personal firewall utility (as discussed in PC Notes August 2001), and a demo version of *WinZip* 8.0, which is almost essential if you want to unzip update files after downloading them via the Net. The full versions of software all came with manuals and original CD-ROMs.

The included Millennium Help is a handy collection of basic music PC FAQs, links to manufacturers' web sites, clickable links to install various supplied utilities, details of how to contact Millennium, and a reminder of their Terms and Conditions, while all systems come with the customer's choice of two free sample CDs from the Time & Space Creative Essentials and Pro Samples ranges.

Attention To Detail

Like most specialist music retailers, Millennium check out each system thoroughly before it's packed and despatched, but I was

impressed to see a 'Computer System Checklist' accompanying the review system, which had a set of tick boxes for the full series of tests that had been carried out by Millennium. These included basics such as checking the security of expansion cards, ribbon cables and hard drives, and listing the correct installation of software, checking for IRQ conflicts, enabling DMA and measuring hard-drive transfer rate, as well as various soundcard and audio software tests.

The RME DIGI96/8 PST soundcard had been set up with a sensible 12mS latency (although I found

I could lower this to 6mS with no glitching), and a 'Milltest' *Cubase* Song file had been created using recordings of a test tone through both analogue and digital inputs, with various VST Instruments and plug-ins activated, to test out the system under stress.

The CD-RW drive and *Nero* CD burning software had been tested by burning an image CD-ROM of the C drive, which is a handy thing to have; a copy of Norton's *Ghost 2001* imaging software was also included. Where appropriate, the latest software updates had been installed (*Cubase* VST was at version 5.0 revision 6 for instance), and Millennium had even attached their own set of labels to all rear-panel sockets to make connecting up the system as easy as possible.

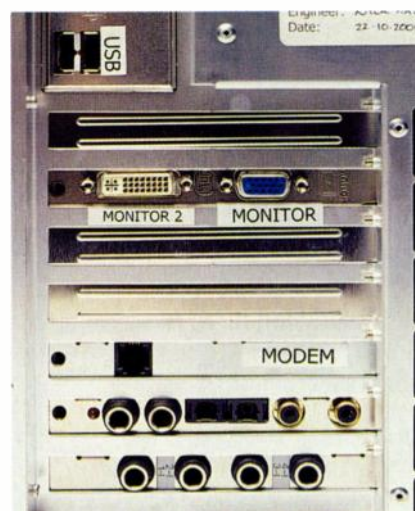
A little bit of detective work confirmed that all the appropriate tweaks had been applied. The BIOS had largely been left with its default settings, although Power Management had been sensibly disabled, as had Boot Up Floppy Seek (to speed the power-up time). The majority of the Windows accessories had been

installed, but with *config.sys* and *autoexec.bat* files cleared and Task Scheduler deactivated along with CD-ROM Insert Notification, Active Desktop, Power Management, System Sounds and Windows animation. Vcache had been fixed at 16384, Typical Role set to Network Server, and a permanent 512Mb swap file had been created.

Overall, I was impressed with the way the Millennium PC had been set up — after all, comprehensive optimisation for music is part of what you pay for when buying a complete system from a specialist retailer. My only niggle was that the reset button was a bit tricky to operate, as it's small and recessed, requiring a tool such as a pen, but hopefully you won't need to use it very often.

Performance

The *Dskbench* utility gave excellent results for the Seagate Barracuda IV drive. The C partition gave sustained transfer rates for both read and write of 40Mb/second, 160 theoretical tracks at 16-bit/44.1kHz with 128K buffer size, and 85 tracks with a 64K buffer, while the inner D partition dropped only to



The review PC was fitted with a dual head graphics card, allowing two monitors to be attached simultaneously, and an RME soundcard and daughterboard.

Millennium's Technical Support

Millennium Music Software have been building PC computer systems for a total of nine years, and therefore have well-established technical support facilities. They specify a three-year warranty against hardware failure on their PC systems, and all systems are guaranteed to perform as specified for a period of three months from the date of purchase. They are also happy to exchange any faulty or transit-damaged goods within 14 days of purchase, but as with most other companies, you must

contact them first to get a Goods Return Authorisation number before a PC can be returned. In the event of any such problems occurring within the first 12 months, labour and return carriage charges are also included. If you get an unexpected hardware problem Millennium will simply send a courier to pick up your system, and in most cases can have it repaired and returned to you within 48 hours.

Free technical support is also available via a dedicated phone number between 10am and 4pm on

weekdays, although as you might expect, this is only for items purchased from Millennium — no-one would expect them to fault-find software or hardware that you install independently after the original purchase. You can also use fax or email (the latter is obviously useful for receiving software patches), and in many cases your queries can then be answered outside of helpline hours. On-site maintenance can also be arranged on an individual basis.

Finally, for an extra £79.95,

Millennium can supply Symantec's *pcAnywhere*, a handy way to transfer files from one PC to another, or remotely control one PC from another, assuming the other also has *pcAnywhere* software installed. You can connect the two either by modem, a network, or a serial or parallel null modem cable (the cheapest and easiest option for a two-PC setup). With this option, Millennium can dial in to your computer and investigate hardware and software problems.

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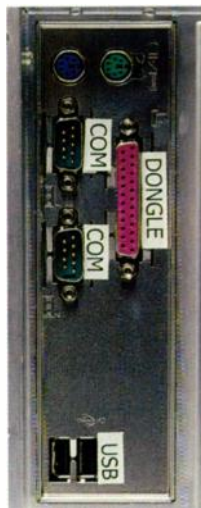


MILLENNIUM MUSIC PC

▶ 38Mb/second, with 157 tracks and 82 tracks respectively. With track counts like these I doubt that anyone could grumble, and even when running at 24-bit/96kHz you should still get up to 50 or so simultaneous tracks.

This is the first chance I've had to personally spend some time with a system featuring a Pentium 4 processor, so I was

interested to see how it performed in comparison with my own Pentium III 1GHz machine. With hard drive DMA keeping the processor largely out of the picture during audio recording and playback, performance is still largely dependant on the make and model of hard drive used, while processor floating-point performance is far more relevant when running plug-ins and software synths. With this in mind, I ran some



Millennium have helpfully labelled all of the rear-panel ports.

rough-and-ready tests using identical software in both machines. Since all but the most complex plug-in effects now consume well under 10 percent of CPU power even on my Pentium III 1GHz machine, I ran four of each type simultaneously and divided the figures down to make them more accurate.

For EQ I ran Waves' *Q10* and *Renaissance 6-band*, and Steinberg's *Qmetric*: in all three cases the P4 1.7GHz was just 3 to 7 percent

faster than my PIII 1GHz — obviously no P4 optimisation in these plug-ins! On the dynamics side, Waves *C1* and *C4* were both slightly slower on the P4 (95 and 83 percent respectively), but Steinberg's *VST Dynamics* was 29 percent faster. It was with the latest version 3.2.1 of Waves' *Renaissance Reverb* with PIII and P4 optimisations where the biggest 52 percent improvement appeared, although even here Waves admit that their code will not yet perform completely optimally on the P4 instruction set.

There were similar improvements with the VST Instruments I tried. Sixty-four notes of Native Instruments' *Pro 52* took 75 percent of my PIII 1GHz CPU power, but only 54 percent on the review PC — an improvement of some 40 percent — while the same test using Steinberg's *Model E* gave 54 percent improvement. I suspect this is partly due to the much higher memory bandwidth of the P4, which helps audio streaming.

Final Thoughts

As shown by my tests, the Pentium 4 doesn't yet provide the performance that one might expect from a Pentium III of identical clock speed, but then these don't exist. However, with a Pentium 4 of 1.7GHz clock speed, or even better the significantly more expensive 2GHz model, you do get a big improvement over a PIII 1GHz in the performance of soft synths and some plug-ins, especially those that have P4-optimised code, and things can only improve still further as more developers finally get round to carrying out P4 optimisation.

Mind you, the review PC is only one part of the range available from Millennium, and such is the rate of technological change in the PC market that Socket 478 Pentium 4 processors

Prices

- As reviewed with Hansol 520F monitor £2290.
 - With Viewsonic VE150MB monitor £2340.
 - As shown, with dual Viewsonic monitors £2699.
 - Price of system alone with no monitor, sequencer software, or soundcards £1330.
 - As above but with rackmount case £1255.
 - As reviewed but with no monitor £1930.
 - Upgrade to 2GHz P4 processor £200.
 - Midiman MIDIsport USB MIDI interface £50.
 - Extra 256Mb RDRAM £105.
- Prices include VAT, but not delivery.

at identical prices are already taking over, with their promise of even higher clock speeds in the future. With this in mind, Millennium are already favouring the Asus P4T-E motherboard, which supports these Socket 478 processors, and I would recommend you specify this version to give your new investment a longer life.

Throughout my time with the Millennium review PC I was impressed with its combination of quality components, low acoustic noise, careful assembly and setting up of both hardware and software, and good performance with a variety of music software, as I was with the depth of knowledge shown by their technical staff.

At £1330 for the basic system minus soundcard and music software I feel that this PC is good value for money. Yes, you could buy a high-street PC with a seemingly similar specification for less, but it would have a £40 generic case rather than the ATC CoolerMaster (which retails at over £200), and would be most unlikely to have a 60Gb hard drive and 12-speed CD writer installed, or a quiet power supply and CPU fan. In any case, if cost is a prime consideration, Millennium also have a black rackmount case that would lop £75 off the overall system price.

Although hobbyists could build themselves a PC for somewhat less money, according to my forays onto the Net you'd still pay at least £1100 just for the same set of parts, assuming that you had the knowledge to choose the right ones. You'd have to build and set up the machine yourself, and you'd still have no technical support or backup if anything went wrong. For both the beginner and professional musician, having a complete fully working system like this from day one would save an awful lot of time and effort that could be better employed making music. **SES**

Music And The Pentium 4

When it was first launched, initial reports of the performance of Intel's Pentium 4 processor with various types of software application were disappointing, and in many cases slower than a Pentium III when running at an equivalent clock speed. The main problem was that its new architecture required software to be optimised in a different way to take advantage of its new instructions. This, coupled with the fact that it also needed expensive RDRAM, meant that many punters remained unconvinced.

However, prices of both the Pentium 4 and RDRAM have since dropped significantly, and software developers have now had a chance to incorporate suitable optimisations into their code. So what's the picture like now for musicians? Well, it's still extremely confusing.

I was going to provide a list of Pentium 4-optimised software, but few developers provide this information with any detailed figures to back it up. One of the few I came across was Cakewalk, who have claimed up to 100 percent

performance gains over Pentium III PCs with *Sonar*, but in most other cases where P4 optimisation is claimed, only some portions of the code may have been rejigged. For instance, P4 optimisation of audio EQ in an audio editor or sequencer will make only a minimal difference in overall CPU consumption, since basic EQ algorithms aren't very processor-intensive. Most real-world figures still show the new Tualatin 1.13GHz model nipping at the heels of the Pentium 4 1.4GHz, as is AMD's Athlon 1.2GHz.

However, Pentium 4 processors are now available at clock speeds up to 2GHz, with promises of even faster versions to come, while the 1.7GHz model used in this Millennium PC now costs about the same as a Pentium III 1GHz, but provides significantly better performance in many areas (see main text), even with unoptimised applications. It should race ahead once software developers pull their fingers out and recompile their existing code, finally providing a threat to higher-speed Athlons.

information

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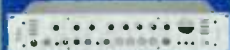
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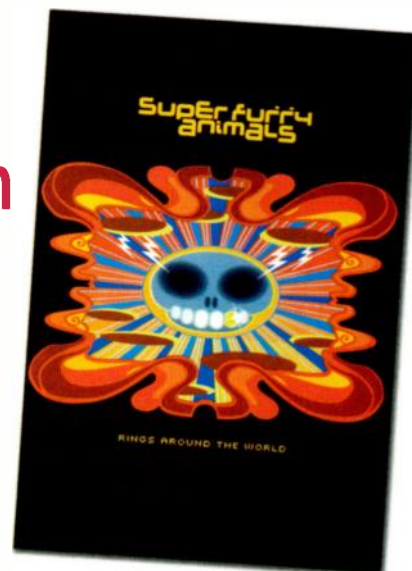
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Rings Surround The World

Super Furry Animals • Cian Ciárán Recording & Mixing In 5.1

Super Furry Animals' recent album *Rings Around The World* is one of the first to be released in a custom-mixed 5.1 surround version for DVD as well as on stereo CD. Keyboard player Cian Ciárán explains how and why they embarked on this groundbreaking project.



Matt Bell

In today's fickle world of rock music, it's increasingly common for newly signed bands to make ham-fisted attempts at stamping themselves on our collective memories as quickly as possible, even at the risk of their absurd proclamations or *outré* activities appearing cringingly embarrassing later on. With hindsight, it's difficult to regard, say, the attempts by Suede's Brett Anderson to pass himself off as bisexual, or the clumsy efforts of Jamiroquai's Jay Kay to present himself as some kind of environmental activist, as anything other than desperate tactics to provide the music press with something to talk about. And these are cases we can still call to mind — remember Thousand Yard Stare or Sheep On Drugs? Apart from their names, nor do I.

Today Wales, Tomorrow The World

Back in the mid-'90s, you could have been forgiven for assuming that psychedelic Welsh five-piece Super Furry Animals would live a short, bright life, like Rutger Hauer in *Blade Runner*, and then vanish from our cultural radar quicker than World Of Twist. The Furries were signed to a Cardiff-based label and sang in Welsh, but before it became trendy, they showed up to rock festivals in an armoured

techno-broadcasting tank, and they loftily forecast colossal future success for themselves. They claimed to be influenced by a bewildering, seemingly musically incompatible range of genres and bands, whilst still making themselves out to be utterly different from anyone who'd preceded them. In 1996, they explained simply, "We're not mods or rockers, or punks, or ravers, or romos — we're Super Furry Animals."

Romo, Britpop, and trip-hop have come and gone, but as 2002 dawns Super Furry Animals are still here (although they've sold the tank). They've been part of the now-defunct indie giant Creation Records and lived to tell the tale, they've put out an entirely self-funded record sung in Welsh and watched it become their most successful release, and they're now signed to the Sony label worldwide. Their most recent album *Rings Around The World* is a dizzying distillation of country rock, bubblegum pop, acid house, and death metal, to say nothing of the work of The Stooges, The Beach Boys, Ennio Morricone, Suicide, Status Quo, and Burt Bacharach. As if that weren't enough, the album was not merely released on an ordinary stereo CD, but also on a DVD featuring 18 tracks in custom-mixed 5.1 surround sound, with a video for each song. For all the bluster of their early years, they turned out to be quite right. They are Super Furry Animals, and despite all their influences, there is no-one

else quite like them anywhere.

How To Spend An Advance

Within minutes of my arrival at his Welsh studio, SFA's hirsute keyboard player and programmer, Cian Ciárán, is examining the *SOS* interview Walkman's tiny built-in mic and talking about recording some drums with it, just to see what the results will be like, exhibiting a willingness to experiment that is absolutely typical of his band. The studio, a recent acquisition, is located in an industrial unit and will eventually allow Cian to develop ideas, pre-program sequences, and make demos. At the time of *SOS*'s visit, however, much of the gear has yet to be connected up. There's still no computer capable of recording audio, only Cian's trusty Atari ST — although he does have a Carillon PC system on order. Despite this, there is already an extraordinary variety of keyboard and processing gear in the one-room unit, ranging from Cian's original DX7 and Korg Poly 800 (two of his earliest synths) to his highly prized Fender Rhodes Suitcase 88 electric piano. Grinning, Cian explains that most of it has been funded by record company advances for each of the band's albums (*Rings Around The World* is their fifth).

The Super Furry Animals' new record deal with Sony (Epic in the UK) has allowed them a great deal of creative freedom with the *Rings Around The World* project — none of the



ambitious surround or video plans would have been possible without the major label's financial involvement. Indeed, even ignoring the surround aspects of the album, the group have made it their most lavish production to date, with real string and brass sections being used on several tracks, notably the lush 'Presidential Suite', the bombastic 'Shoot Doris Day', and the summery hit single 'juxtapozed With U'.

Why Surround?

But why make a 5.1 version of an album? Well, although DVD film releases with a surround soundtrack have been commonplace for several years, the opposite concept — a DVD containing audio as the focus of the package, with video films as the supporting material — was virtually unheard of when the band began planning *Rings Around The World*. Surround-compatible remasters of old pop material previously released in stereo or quad were beginning to appear, but the idea of a modern album being finished in both stereo and surround formats was something hardly anyone has tried before or since. The idea of breaking new ground proved too interesting for the band to ignore once the Sony money was on the table. What's more, they have a long history of pushing themselves, ever since their first album for Creation, which was recorded in Anglesey on a miniscule budget. Cian explains: "We really went for it on that first album — because we thought it might be our last! And we've treated every album we've done since then with the same respect. You've got to really go for it, because it might be

Cian's main work area. His live rack is to the left, with a Sequential Pro One synth balanced on it. Top to bottom: Waldorf Pulse monosynth, Sherman Filterbank, Boss RSD10 half-rack delay and Kurzweil MicroPiano module, Akai S2000 sampler, Mackie LM3204 keyboard mixer, Lexicon JamMan sampler/delay. In the centre is Cian's old Atari ST running *Cubase*, his only sequencing capability until his new Carillon PC arrives. On the right, you can see a Roland TB303 Bass Line on top of a Kenton Pro 4 MIDI-CV converter, which will eventually be used to drive some of the analogue synths in the unit via MIDI. Also visible are a Novation Bass Station keyboard and Sherman Quad filter. To the extreme right, the edge of the band's Moog Taurus bass pedals can just be made out.



Cian Clárán in his Welsh studio unit.

► the last thing you get to do! Also, we all liked the idea of doing stuff that you know has never been done before — that's really the interesting aspect of surround. You can go down to much lower frequencies because of the subwoofer channel, and you can make things pan around you.

"We were a little worried at first that doing a DVD might seem elitist, because only certain people have DVD players and systems, even now. But hopefully, most people will have DVD playback systems at home within five years. Even if it doesn't take off, the stereo version of the album will always be there — and we treated that just like making any ordinary record."

Recording For Stereo & Surround

The band began recording in Monnow Valley studio, Wales, in April 2000, with co-producer Chris Shaw and engineer Eric Tew, and concluded there some months later after an interval recording in Bearsville Studios, New York. Much of the gear now in Cian's unit was shipped across Wales for use in the studio, including the Fender Rhodes that can be heard all over the album.

One of the earliest tracks to be recorded arose from a jam between Cian and guitarist Huw Bunford, the basics of which were recorded in the most rudimentary fashion. "We looped one bar of [drummer] Daf playing the kick and snare through an SMS7 plugged straight into my Akai S2000, just to give us something to play to. There was a baby grand piano in the studio, and I started playing on that. Then we set the mics up to record the piano and Bunf's guitar into the sampler. Later, we chopped the playing up a bit, and put some Sherman filter on to the drums and guitar to give them a bit more movement. They're still the samples on the actual record."

Eventually entitled 'Alternate Route To Vulcan Street', the moody, piano-led track eventually opened the finished album. "It was just something that started as a laugh, but Daf added more drum passes on brushes, we ended up getting a string arrangement for it,



One of Cian's most well-loved synths, his battered DX7, which can be heard in the frenetic techno workout at the end of the album track 'No Sympathy'. Just visible in the rear of this picture are (back to front): a Solina String Ensemble, a Jen SX1000, and a Roland JX3P.

Gruff wrote some lyrics, and finally it was a song!"

Even as 'Alternate Route To Vulcan Street' was being readied to receive its string overdubs (with a mournful arrangement by Sean O'Hagan of The High Llamas), the band, Chris Shaw and Eric Tew were considering how they'd need to record the basic tracks to enable an interesting 5.1 mix to be made later on, as well as the standard stereo version. Cian: "There's no real standard setup yet for how to record in 5.1. Chris and Eric had never worked with it either, so it was a learning curve for them as well.

"Obviously, it influenced how we recorded in some respects. We were adding more mics than we would normally use for stereo, with loads more ambient mics. This sounds anal, but one of the reasons we went to Bearsville was because of the drum and live room there — we did a lot of drum tracks there. Of course, we then omitted most of the signals from the ambient mics in the stereo mix, but used them in the surround version. And when we recorded the strings, we had an eight-piece string section at one point, and we used four mics in an arc, and we tried to



A Roland SH1000 sits atop Cian's treasured Fender Rhodes Suitcase 88 electric piano.

recreate those mic signals in the same positions in the surround mix, so that the listener would feel like they were in the conductor's position. It's stuff like that you try — things you could never do in stereo."

Another luxury the band explored while recording was the use of sub-bass, destined only for reproduction in the low-frequency subwoofer channel in the surround mix. "We used frequencies as low as 20Hz on the sub channel, which would blow ordinary speakers. That was a sound that I'd never worked with before, because normally people just put a shelving EQ to cut out anything as low as that. On one song on the album, 'A Touch Sensitive', which contains a Stooges sample, we made a bass line out of a TR808 bass drum, a real bass drum, and a 20Hz synth tone. You can't hear it on an ordinary stereo — you can only hear a 'splat' sound at the start of the note, not the sustained sub-bass tone — but if you're

Super Furry Sampling

Cian has mixed feelings on the use of sampled instruments, despite his band's widespread use of samples in many contexts. "We try to use real instruments where we can, especially if the budget's not too tight, which was more the case with this album. But it depends what the song needs — like the muted trumpet on the third part of 'Receptacle For The Respectable', or on

'Presidential Suite'. They're real. But then, if you used a sampled trumpet on the start of 'Presidential Suite', it would sound terrible! You can spot a sampled brass instrument a mile off in an arrangement like that.

"In other songs, though, you don't have to do that. Bunf used to play French Horn years ago. He can only manage about four notes now, but he played those

for me once and I sampled him. I spread those four notes over the keyboard, and got about two octaves' worth out of those notes before it started sounding stupid. Then I doubled that with a French Horn sound from an Emu Proteus and you get a nice sound that you can play a decent tune with. Sometimes using false instruments is a good thing. We're not purists, in that sense."

running it through a PA or a 5.1 system with a subwoofer, you'll hear the full thing. We did a similar thing on 'Juxtapozed With U', layering the 808 bass drum with Simmons electronic percussion."

Enter Pro Tools

Most of *Rings Around The World* ended up on analogue tape, but rarely without passing through a Digidesign Pro Tools system on the way, operated by the faithful Eric Tew. Though the Super Furry Animals experimented with Pro Tools on their last album for Creation, *Guerilla*, this was their first complete project with it. "We could see the benefits of using it back then, and it was something we really wanted to try out properly. We'd lay tracks down to two-inch tape first, until we had a decent take, and then we'd dump that into Pro Tools, work on it there, editing and overdubbing, and then put the results back on to two-inch analogue when we were happy. This meant we could edit some beats very precisely in Pro Tools, like the gated kicks at the end of the track 'Sidewalk Serfer Girl', but still do the final stereo mix from tape, so you get the tape sound — we like that."

Pro Tools also proved its worth on the multi-part track 'Receptacle For The Respectable', which, in true schizophrenic Furry style, undergoes a complete personality change over the course of four minutes, beginning as an acoustic guitar-driven pop song, passing through a brief intermediate phase as a Bacharach-influenced 'Raindrops Keep Falling On My Head' soundalike, before concluding as a tribute to death metal, complete with distorted, bellowed vocals. According to Cian, the song started life at Monnow Valley comprising just the first two parts, but by the time the group got to Bearsville, singer Gruff had written and added the third section. "We recorded it there as a three-part song played through from start to finish. The fourth part, the death metal part, came from just pissing about with Pro Tools. We looped a bass part from the last bar of the third bit by accident and that became the bass line to the fourth bit. It was still essentially a song that you could play on an acoustic guitar, but in the studio, it became one of those things that evolved. The only bit that wasn't 'played' as such was the last part."

"At one point, there was even going to be a fifth part based around the delayed siren sample and delay you hear right at the end of the track as it is now — that's my Boss RSD10



EDP Wasp (rear) and Octave CAT (front) synths.

When it came to mixing 'Alternate Route 10 Vulcan Street' the team decided to take a radical approach, creating something that could never have been achieved in stereo — the slow

department, including versions of the soundtrack in the three most popular audio formats: Dolby Digital 5.1 (AC3), DTS 5.1, and Dolby Stereo (the last of these derived from

Furry Vox

Super Furry Animals make no secret of their admiration for the vocal arrangements of The Beach Boys and ELO, and the harmonies on *Rings Around The World*, for example on 'No Sympathy', 'Receptacle For The Respectable' and recent single '(Drawing) Rings Around The World' seem to be their most complex yet. Is this deliberate? Cian confesses: "This is the first time we've been really meticulous about arrangements, particularly vocals — it's a lot to do with working with Chris Shaw. Usually, we'd just go in the booth one after the other, and keep singing until we came up with harmonies that worked. But this time, although we did a bit of that as well, we worked it out more; we'd say, 'Look, you're doubling up on that note, there's no point in that; you sing something different there...'"

"We also tried working things out on the piano, or a keyboard, or whatever was available that could give us a starting note. All five of us were involved, and the two engineers, too, trying things out. Sometimes we used *Auto-Tune*, but not on the finished recording, just to re-pitch existing lines to see if different versions of them would counterpoint correctly. Then when we'd worked them out like that, we'd learn the new lines and then go out and re-sing them properly. *Auto-Tune* is a good tool for that kind of thing, because sometimes when you try working out vocal arrangements for four- or five-part harmonies on a piano — especially when they're close harmonies — you can't quite grasp whether something's going to work or not. You need to hear a proper voice singing it to be sure."



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Top photo: Extasy Studios, North Hollywood, CA, courtesy of Genelec, Inc.

Rings Around The World is interesting and also fun on many levels — a true multimedia experience, to use a much-abused phrase. But is it the way of the future? Will all albums one day be made this way? Richard Wilkinson thinks so: "This band have always liked to push the limits of what's possible, and cover new ground. Projects like this are going to set the standard, but I do think a few of these groundbreaking projects are needed before other people have the confidence to try it themselves."

And what of Super Furry Animals? Will there be more surround DVDs? Cian, like the rest of the band, is reluctant to commit the Super Furry Animals to repeating themselves when they could be exploring the next big thing: "I don't know... Someone asked me recently, 'Will you go back now, and remix all your other albums for surround?'... but I think, 'nahh!' They weren't ever *supposed* to be in 5.1. Plus, we've got enough new ideas to use on new albums without using 'em up on old ones." **SCS**

► sampler/delay on there. We were going to chop that up in Pro Tools and stick a hip-hop beat over it to create another bit, but we thought 'enough's enough'. If you're going to do a fifth bit, you'd probably do a sixth, and before you know where you are, you're doing a concept album made up of nothing but bits!"

Off To Metropolis

After completing tracking in Monnow Valley in September 2000, the band booked time the following month to commence mixing in Metropolis Studios, London. Here they were aided by, amongst others, Assistant Mix Engineer Richard Wilkinson, who takes up the story. "We initially approached this album as though we were mixing an ordinary stereo release. The stereo mix was mainly done from two-inch analogue tape, with a few things in Pro Tools which it hadn't been easily possible



Super Furry Animals (left to right): Gruff Rhys, Huw Bunford, Cian Claran, Guto Pryce, Dafydd Iwan.

putting the stems into Pro Tools. For example, on the track 'Miniature', an EMT 244 digital reverb was used, with quite a definite sound. We didn't want to get into recreating that, so

had on/off automation on the centre and sub. As there are no surround panners on the J-series to smoothly alter the extent by which a channel is assigned to each of the master

plug-in folder

Waves Restoration Bundle

Formats: Mac RTAS, AudioSuite, VST, MAS; PC RTAS, AudioSuite, VST, DirectX

The Waves VST Restoration Bundle is available for both Mac and PC-based systems, and comprises four separate plug-in modules designed to remove or attenuate clicks, crackle, noise and hum with the minimum of audible side-effects. Authorisation is via the now familiar challenge and response system, and one welcome feature of all these plug-ins is that they are very simple to use.

The X-Click module is designed to work primarily with digital clicks and vinyl scratches. Once scratches are identified, a short section of audio is removed and replaced, presumably with material adjacent to the click. One slider sets up the threshold that determines what level of clicks are dealt with, while another sets the duration of the 'repair'. Most of the time, this is one of those plug-ins that you simply set up and then allow to run; to ensure that you're not removing anything that's important to the track, there's a 'Difference' monitoring function that allows you to hear just the clicks being removed. Additionally, a visual scope section shows the



Waves Restoration Bundle, clockwise from top left: X-Hum uses a series of linked notch filters to remove fixed-frequency interference such as mains hum; X-Crackle attenuates the surface noise that can afflict old vinyl; X-Noise tackles hiss using a 'noise fingerprint' algorithm; and X-Click removes individual pops and clicks.

waveform being treated with the detected clicks superimposed on it, which gives some clue as to whether you're overprocessing or not. A small number of presets is included to provide suitable starting values.

I tested X-Click with a vinyl record I'd transferred to CD without processing, and found that it removed virtually all the audible scratch clicks without altering the sound in any noticeable way, even though the original record had a few quite bad scratches. For those occasions where you only have a few clicks to deal with, though, the recommended procedure is

to record the 'clicks only' output to a separate audio track to act as a guide in locating the clicks, then use X-Click to process only the offending sections rather than the whole track.

The X-Crackle part of the program is used to reduce vinyl surface noise where the noise character falls somewhere between constant noise and individual clicks. This is technically a more complex process than de-clicking, because surface noise is virtually continuous. X-Crackle is best applied after X-Click has been used to remove individual scratches and clicks, and has a similarly simple control setup with sliders for the detection threshold and for the attenuation applied to the crackles. Once again, I found this worked well on typical vinyl records providing the original wasn't too badly damaged. Crackle is mainly a problem with vinyl and shellac records, so you probably wouldn't need this plug-in for other noise-removal jobs.

X-Noise is based around a multi-band filter bank, and its task is to attenuate background hiss and similar continuous

noise. A sample of the noise by itself is needed for the program to 'learn', but this need only be a second or less of noise at the start or end of a recording. This is used to set thresholds within all the filter bands so that noise is dealt with on a per-band basis rather than globally, as is the case with a simple gate or expander. The resulting threshold can be moved up or down by means of a slider and the amount of noise attenuation can be adjusted along with the global attack and release times of the noise-reduction process. An additional high-frequency cut shelving filter is available for reducing HF noise in material that has little or no extended high-frequency content.

In most respects, X-Noise works rather like the original Digidesign DINR, though it seems to produce far fewer side-effects, which suggests some intelligent interaction between the frequency bands. Clearly any system that is based on a 'noise fingerprint', as this is, can only work effectively when the noise background is fairly constant, but providing you can adjust the threshold to

Plug-in Tips

If you find yourself running out of CPU power and thus needing to bounce effected audio to hard disk, remember that some effects, most notably reverbs and delays, take time to die away, so you may need to create a bounced file that's longer than the original. Sam Inglis

Want some free VST plug-ins? Try downloading the demo versions of applications that come with their own bundle. Even if you're a Logic user, for instance, you can still get your hands on Cubase's

built-in plug-ins: simply download and install the demo version, then transfer the plug-ins to Logic's VstPlugIns folder. Mike Senior

In an application such as Cubase that provides a limited number of insert plug-in slots, which can't be reordered, it's often a good idea to start with the second or third slot, leaving the first one empty, then loading plug-ins onto that channel. You never know when you might want to incorporate another plug-in later on, at the start of the chain... Sam Inglis

get quieter parts of the mix sounding clean without introducing side-effects, natural noise masking should take care of the louder sections. Having a 'Difference' monitor to let you hear only what is being removed greatly simplifies setting up, as all you need to do is move the threshold so that the maximum amount of noise is audible but without any trace of the music coming along with it. As soon as you hear music as well as noise, all you have to do is to back the control off slightly so that the noise takes on a more even character and you're in business. A graphic display shows the level spectrum of the audio plus the threshold curve.

The final weapon in the noise abatement armoury is *X-Hum*, which comprises a high-pass filter to eliminate low-frequency rumble plus eight linked, very narrow notch filters designed to take out fixed-frequency hum both at the fundamental frequency and its harmonics. The high-pass filter can be set to 12 or 24dB/octave slopes and its turnover frequency is fully adjustable.

The harmonic notch filter section has a Frequency control for setting the fundamental centre frequency of the hum, while Global Q sets the width of the notch filters. Ideally these should be set as narrow as possible. The amount of cut can be set individually for each notch filter, and there are three link modes that provide different means of altering the filter gains. They can either all be linked to move together or be set to Odd/Even, which links the gains of odd-numbered filters and separately links the even-numbered filters. In Free mode, all the filters may be adjusted separately.

While *X-Hum* can be effective in reducing hum, even the narrowest notch filters have some effect on the material being processed, so it is important to use only as little processing as is necessary to achieve an acceptable reduction in hum. This is particularly

important in situations where the hum is wandering in frequency as it is then necessary to use wider filter settings, which in turn cause more noticeable tonal changes. Having said that, I was able to bring about a dramatic improvement in the hum level of a vinyl transfer without incurring any significant side-effects, just by not overdoing the amount of attenuation applied.

At £1110, the *Restoration Bundle* will not be a casual purchase, and Mac owners should also consider TC Works' *Spark XL* editor, which is substantially cheaper and includes de-noising and de-clicking plug-ins that, to my ears, are equally effective. Nevertheless, *Restoration Bundle* will be invaluable to many looking to rescue old vinyl collections or carry out basic mastering work where the source material is slightly noisy. All the processes work remarkably well, even the hum filters, and although high-end professional restoration systems undoubtedly do a better job, used with care these plug-ins can achieve what would have been regarded as little short of miracles a decade or two ago. Effective though the plug-ins are, they also remain easy to use, so the only advanced piece of kit you need to get the best out of them is a good pair of ears. *Paul White*

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ReFX Trasher

Formats: Mac and PC VST

It's always a pleasure to get something for nothing, and most budget-limited computer users will have long been in the habit of scouring the web for freeware plug-ins to expand their sonic armoury. There are many such freebies available, but the harsh

Plug-in News

IK Multimedia have launched a free version of their impressive *Sampletank* VST sound module. *Sampletank Free* provides the same playback engine and effects as the full version, but not the huge sound library. Instead, IK are making selected instruments available as downloads from their web site, the first of which is their Acoustic Concert Grand Piano. Meanwhile, the full version of *Sampletank* has reached version 1.1, and now includes MAS support for *Digital Performer*, optimisation for G4 processors on the Mac, dual-processor support on both platforms, and a new High Quality playback mode which, say IK, combines a flat high-end frequency response with negligible aliasing.
 W www.sampletank.com

Native Instruments have been busy converting many of their software instruments, as well as the unique effects plug-in *Spektral Delay*, for Digidesign platforms. So far, they have launched two products: *Spektral Delay* is available separately for £280, while the £650 *Studio Collection* comprises NI's B4 tonewheel organ emulation, *Pro 52* Prophet V copy, and *Battery* drum sampler. All the plug-ins run using the native processing power of the host machine: Digidesign's new HTDM format allows them to be run alongside DSP-powered TDM plug-ins, and they are also available in RTAS format for non-TDM Pro Tools users.

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reality is that you often only get what you pay for, and many free VST offerings are not really usable.

Trasher is different. This superb plug-in, developed and distributed by ReFX, authors of the highly-regarded *QuadraSID* and *TBL* shareware VST Instruments, is a rare example of a freebie that's every bit as good as its commercial counterparts. *Trasher* is a distortion box. Nothing too revolutionary about that, of course, but the care and

and high-pass modes, with a slope switchable between 12 and 24dB/octave. Each parameter has its own independent LFO, with Rate and Depth controls, which can be used to create some great modulation effects. Additionally, all manual parameter tweaks can be automated in the usual way, allowing for a great deal of flexibility in the mix.

Trasher is excellent for wrecking drum tracks, ideal for creating 'telephone' vocals and



attention to detail put into its development have ensured that it is a near-perfect example of the species. It offers controls for reducing the sample rate and bit depth of any audio passing through it, a Drive control to add some more analogue-flavoured noise to the proceedings, and a filter with adjustable cutoff and resonance, which is switchable between low-pass, band-pass

unique in its ability to reduce pristine, CD-quality audio to a glorious parody of the kind of noises output by the vintage Commodore 64 home computer on which its appearance is modelled. Available for both Mac and PC, and costing not a single penny, *Trasher* is little short of essential. You should already be downloading it... *Paul Sellars*

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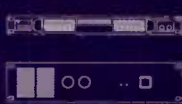
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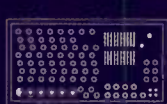
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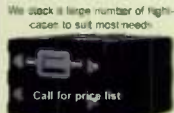
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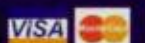
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Korg Triton Le

Keyboard Workstation

Korg have dominated the top-end workstation market for several years with their Triton range, but apart from the rack version, there have been no lower-priced spin-offs. The Triton Le keyboard changes that, offering many of the Triton's powerful features at a more affordable price.

If you've been living quietly in Outer Mongolia, with nothing but a nose-flute for company, it's possible you might have overlooked Korg's exploration of a concept they call the 'Music Workstation'. After a massive hit with 1988's M1, Korg released a succession of these increasingly sophisticated 'complete studio' instruments, the culmination of which has been the mighty Triton workstation. This is Korg's most powerful packaging of sequencer, synthesizer, sampler and effects unit, with expandability options, superb factory sounds, and more depth than Stephen Hawking in a mineshaft. Korg made few compromises with the Triton, and its price tag reflected that. Over a year later, they followed it up with a rack version, which offered greater expandability and digital connectivity. Now, another year on, the Triton Le is upon us. This re-instates the keyboard-based format, but retails for around £700 less than the original (in the UK, at least — in the USA the price for the Le has yet to be fixed at the time of going to press).

Clearly Korg must have juggled a few features and cut some corners to produce this 'entry-level' version, so the first question for me was: "how much of the Triton is left?" Now, I'm no Agatha Christie, so please don't be disappointed if I kill the suspense here and now. The answer is: "plenty!".

Before I plough on into the review proper, I'd recommend that you check out the comprehensive review of the Triton keyboard (see SOS June 1999 or



www.sound-on-sound.com/sos/jun99/articles/korgtriton.htm) and also the Triton Rack (SOS November 2000 or www.sound-on-sound.com/sos/nov00/articles/korg.htm). Since the rack has a slightly different feature-set (eg. digital output, mLAN connectivity, eight expansion slots), I'll keep things simple by concentrating mainly on the differences between the two keyboards. Thus, if I refer back to 'Triton' in my comparisons, it's the original Triton keyboard I mean.

Silver Dream Machine

After unpacking the Triton Le, I was first struck by how light and slender it was. Part of this can be attributed to the external power supply: a little box complete with a switch and a four-pin connector. It seems strange to have a switch on a floor-based adaptor, especially when the synth itself already has a power button. Surely it's just another thing to get trodden on and accidentally switched off, in the chaos of live performance?

The Le is reasonably solidly constructed, although I would recommend care with its thin plastic edge trimmings, which are a little on the flimsy side. The velocity- and aftertouch-sensitive keyboard feels light and is not as substantial as that of the Triton. Yet, overall, I couldn't fail to admire the Le's style: sleek and chic are descriptions that came to mind. The brushed silver metal finish exudes a feeling of cool quality, and only those plastic edges lower the tone slightly.

Triton Transformed

So what changes have come about in the transition to Triton Le? If you start with the rear panel, as I did in time-honoured reviewer fashion, the first thing that strikes you is the blanking plate: a sign that the Le is ready and waiting to accept the optional EXB-SMPL sampling board (sampling was, of course, standard on the Triton). As I also received this board to try, I'll talk about it in more detail later.

The Le has a main stereo pair and just

two individual outputs (compared to the four individuals of the Triton) and it has also dropped the dedicated PC/Mac interface (no loss there, in my opinion). The Triton's assignable pedal, switch and damper inputs are all present and correct, as are the obligatory three MIDI sockets.

I was pleasantly surprised to see the inclusion of a SmartMedia slot at the rear, something neither the original Triton nor the Rack has. Of course, this means that the Le has no floppy drive, which might add a layer of complication if you need to regularly transfer data between the Le and other models. For my money, the SmartMedia slot is an improvement, as it offers a far greater storage capacity than floppies (up to 128Mb) — and if your computer has a SmartMedia interface, it's a great way to pass large amounts of data between them.

If I didn't mourn the loss of the floppy drive, the same cannot be said of the ribbon controller. For me, the more performance tools that are added to synthesizers, the better — so it's a shame the ribbon had to go. Of the other compromises, the Le's display is considerably smaller (240x64) and, like that of the Rack, it lacks the touchscreen functionality. I didn't miss that too much — in fact my one observation about the screen was that it was slightly

SOUND ON SOUND

Korg Triton Le £1099

pros

- A lot of Triton for your money.
- Sampling option that also adds SCSI.
- Sounds superb.
- The arpeggiators are the business.

cons

- External power supply.
- No ribbon controller.
- None of the Triton's expandability.

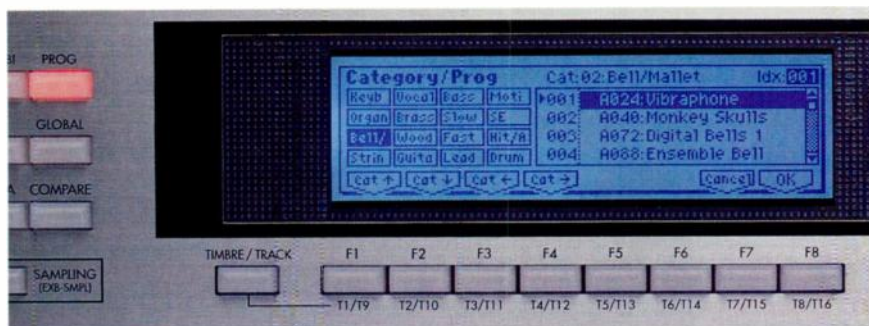
summary

Korg have a long history of top-notch workstation design. With the Triton Le, they have done more than release a simplified Triton; they've thrown down a challenge to all comers for a battle at the lower end of the workstation market. From where I'm sitting, the Triton Le looks like the one to beat.

Features At A Glance

- 61- or 76-note keyboard, with velocity and aftertouch.
- Four Banks of Programs (A-D) plus a GM sound set.
- Three Banks of Combinations (A-C).
- 62-note polyphony.
- 64Mb maximum sample RAM.
- 32Mb of waveform ROM.
- 200,000-note sequencer (resolution 192ppqn).
- Two main stereo effects processors, one stereo insert effect, master EQ.
- SmartMedia storage slot.
- External power supply.
- 240x64-pixel display.
- Two main and two auxiliary outputs.
- Optional EXB-SMPL sampling board.

KORG TRITON LE



The touchscreen of the Triton has gone, to be replaced by the more usual 'display and soft buttons' configuration seen here. Another difference is that the Le's buttons are fully backlit (as you can see from the illuminated Prog button in this picture), unlike the buttons on the original Triton, which featured embedded LEDs.

- ▶ slow to update in response to movements of the alpha dial.

The Le also lacks any expansion slots for options like Korg's add-on PCM cards or the MOSS board (essentially a multitimbral Z1 modelling synth). This expandability was a great selling point for Roland with their JV and XP series, and Korg added a similar feature in the Triton and KARMA workstations (two slots) and the Triton Rack (no less than *eight* slots). Leaving this expandability out of the Le renders it a far more closed system than the Triton.

Finally, the effects section has been pruned somewhat. The Triton's twin master processors and master EQ section are retained, but the insert effects section has been reduced from five processors to just one.

Le Sounds

Fortunately, everything that remains still manages to sound and perform like a Triton. You have the same 32Mb of base ROM waveforms, although this time around Korg have seen fit to program the Le with some far more dance-specific patches. However, music workstations all need a bit of everything, and so you won't be surprised to find a full complement of warm strings, (very) playable electric pianos, superb organs and, frankly, cheesy saxophones (why are they *always* cheesy?). There are also some truly inspired synth basses, swooshy pads, tons of general synth noises, ethnic instruments, and so on.

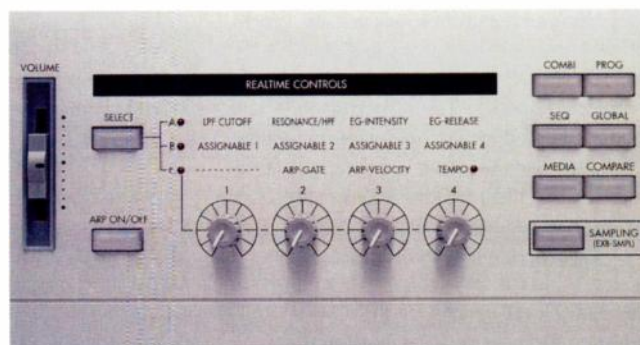
The sounds are demonstrated in style in many of the factory Combis — Korg's term for combinations of up to eight Programs arranged in layers with velocity splits. The Combis are almost complete tracks in themselves, full of movement and (sometimes) kicking, driving arpeggios. Normally, with my synth-purist hat on, I'd be a little snooty about such 'one-finger wonders' — but I challenge anyone not to find their sheer playability infectious. Indeed, I had so much fun, I was in severe danger of missing the review deadline, and, unlike the more complex arpeggiation seen on Korg's KARMA (an instrument which I confess was not my cup of tea), I felt I knew what was going on with the Triton Le and that I was actually in charge of it. You can find more on some of the Combis in the box below.

Given that Korg's Hyper Integrated Synthesis has been covered extensively in previous *SOS* Korg workstation reviews, I won't go here into the details of how the sounds in the Triton Le are programmed; it's basically the time-honoured method of multisampled sound sources being passed

through digital filters, amplifiers and finally the effects section, with comprehensive modulation options at all stages. Certainly, as a former Korg M1 owner, I can't help observing that Korg's synthesis has progressed considerably in the last decade. The two filters (a 24dB-per-octave resonant low-pass filter and a 12dB-per-octave low-pass filter plus high-pass filter) might not sound very analogue, but they're not bad all the same. More types would have been nice, however.

User Interface

The Le's real-time parameter adjustment knobs are laid out as on the Triton Rack; in other words, they are formed into a small 3x4 matrix incorporating arpeggiator controls, simple edit parameters and user-assignable functions. My personal gripe with these knobs is that they are too small; I can't



The business end of the Le, with the main volume slider, multi-function real-time control knobs, and main editing mode selection buttons. This is also where you access sampling facilities if you have the EXB-SMPL option installed.

understand why Korg have used them so often in their recent synths. Despite this lack of enthusiasm on my part, the user interface is really very easy to navigate — I hardly needed either of the two manuals at all.

There are a couple of buttons not seen on the Le's big brother: Category and Audition. The former lists patches selected from 16 categories, so you can easily locate any organ, vocal, bass or drum patch in an instant. The latter plays a small, appropriate riff for each patch — something probably of

Impressive Combis

It's almost impossible to pick favourites, especially from the Triton Le's wide selection of Combis, so here are just some of the ones from Bank A that I spent hours playing:

- A004: 'Trancy Euphoria'
- A020: 'Fantasmagoria'
- A023: 'Chill Factor'
- A036: 'Progressive Code'
- A038: 'Tribal Drum 'n...'

These are all examples of 'instant performances' with drums, arpeggios and several other layers too. Great fun!

- A018: 'Sailing'
 - A034: 'Phases of Angels'
- Two examples of lush, Wavestation-like textures.

- A032: 'Soft Piano Pad' — a warm pad and piano layer for those New Age moments.

- A009: 'Studio Orchestra' — a lovely orchestral collection, featuring strings, brass, and percussion.
- A028: 'The Guitarist' — someone with better technique than I have could make this one magical.
- A043: 'Universal Choir' — heaven in a keyboard!

To hear examples of these Combis in action, surf to: www.sound-on-sound.com/soundbank.asp

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JUST ARRIVED

KORG TRITON LE

► more value on a rack unit than an instrument with its own keyboard. In Program Edit mode, the Category button takes on a slightly different, but equally useful role: it filters the view of available waveforms according to the type you select, making it quicker to find the right basic building block for any patch you want to create.

A dedicated 'Menu' button can be used at any time to delve into more detailed menus (of which there are lots). This keeps the panel uncluttered yet pretty intuitive. The other buttons are self-explanatory: sequencer transport controls, bank selection, soft keys positioned under the screen, navigation keys — in fact, everything you'd want (and expect) on an instrument of this type. The two buttons above Korg's joystick controller (see below) are user-programmable, so you can use them to drastically alter or transpose patches, lock the current joystick value, add effects, and so on. They can even be programmed to act momentarily (ie. while



held) or as conventional switches on a per-patch basis.

Effects

No workstation would be complete without a generous splash of internal effects. The Triton was blessed with an impressive array of them: no less than five insert effects, two global effects and a master EQ section. As already mentioned, the Le offers a single stereo insert effect, but keeps the two master effects and EQ. A handy block diagram in the thicker of the two manuals (the Parameter Guide) makes it clear how everything fits together.

You can choose from 89 different effect types for both insert and master effects, divided into the following categories: Filter and Dynamics (eg. EQ and compression), Pitch and Phase Modulation effects (chorus and phaser), other Modulation and Pitch effects (rotary speaker and pitch-shifter), Early Reflections and Delays, Reverb, and

Test Spec

• Triton LE version reviewed: v1.00.

Onboard Sequencer

The Triton Le's 16-track sequencer is well designed, and provides a genuine alternative to computer-based recording. With an impressive 200,000-note capacity (double that of the Triton's sequencer) and 200 Songs, even the reduced screen size of the Le doesn't hamper things unduly. A range of features such as individual track looping, cue lists (ideal if you like to assemble songs starting with smaller segments) and song templates give you everything you need to hammer together arrangements with the minimum of fuss — and there's not a mouse in sight. As per the Triton, detailed edit functions are provided, and the sequencer can drive external instruments too if you want.

Mono chain effects (where two effects are connected in series).

The insert effect can be used to process sequencer tracks or individual Combi parts prior to the application of master effects. If

“Obviously, Korg have had to trim the Triton's features back in order to sell the Le at just over £1000, and yet the casualties are surprisingly light.”

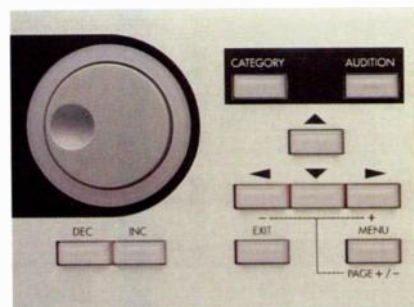
the sampling option is installed, the inputs may be routed via the insert effect before sampling, which is very useful. Each track or part has a send level to each of the master effects, and I can't say I ever felt short-changed by the single insert design. Certainly the quality is stunning — every bit as good as what the Triton offers — but if complex multitimbral arrangements are your bag, the additional processing provided by the Triton keyboard or Rack could prove significant.

Sampling

The Triton Le's 16-bit 48kHz stereo sampling upgrade is something many owners will want to perform at some time — especially bearing in mind the Le's lack of sound expansion slots. When you think about it, presenting sampling as an optional extra makes a lot of sense. Not everyone needs it in a workstation, but it's great to be able to add later if you change your mind. I always thought I didn't need it in a workstation either — until the Le arrived on my doorstep! Fitting the EXB-SMPL sampling

The Le retains the Triton's RPPR (Real-time Pattern Play/Record) for triggering of patterns and phrases via single keys, and you can put this to good use live, kicking off drum patterns, bass lines and sequences from any key over the range C#2 to C8. There are 150 supplied factory patterns, which are clearly conceived as drum patterns (and much more fun as accompaniment than a boring metronome when recording), and there's space for a further 100 user patterns too, which you can record in either real or step time. The onboard arpeggiators (see box below) sync happily to the song's current tempo, allowing you to either add patterns during song playback or record your efforts directly into the song.

board should take around 10 minutes, and it's straightforward even if you have never done so much as add extra memory or a new soundcard to a computer. First you remove one of the panels on the underside of the synth and then unscrew and remove the blanking plate at the rear. The



The new Category and Audition buttons have been sneaked on to the unambiguous front-panel design inherited from the Triton.

expansion board slots in relatively easily and connects via a supplied multi-way cable. Once installed, your Le is instantly promoted to the Big League, gaining the same input level control, Mic/Line switch and stereo audio inputs as the Triton. As SCSI connections are also included in the sampling upgrade, it also gives you direct access to external CD-ROM drives, hard

Arpeggiators Are Us

The Le's two polyphonic arpeggiators offer a wealth of creative possibilities — especially in Combi mode, where you can set different patterns to play over different keyboard zones, velocity-switch between two patterns, and generally head for arpeggio heaven. With 216 user patterns and five presets available, this is one of the best arpeggiators I have ever used, lacking only a dedicated Latch button to make it perfect. The on-screen graphical editor for user patterns is rather small (and not terribly user-friendly at first), but when you get the hang of it, the patterns you can produce make it all worthwhile.

disks, and so on. The upgrade is completed by opening the second underside panel and fitting a 16Mb SIMM (supplied with the upgrade) into one of the two available slots. If you wish to upgrade to the full capacity of 64Mb, you'll need to remove this and supply two 32Mb SIMMs of your own. Sadly, there is no option to add Flash RAM or an internal hard disk, although the SmartMedia slot goes some way towards compensating for this.

Once installed, all the features of the Triton version 2.0 appear at a press of the Sample button; in other words Waveform-editing functions such as crossfade looping, truncation, normalisation, time-slicing, time-stretch and sample-rate conversion. The sampler is compatible with various sample formats, including AIFF, WAV and Akai S1000/3000-format samples. Although the screen is a little small, it is still capable of a basic waveform display and compared to my Yamaha A5000 sampler, it's intuitive and enjoyable to use. I was pleased to discover that WAV files can be imported from SmartMedia, although if you don't have the sampling option installed, you can't edit them.

Conclusions

The Triton Le offers much of the full Triton at almost half the price (in the UK, at any rate). Obviously, Korg have had to trim the Triton's features back in order to sell the Le at just over £1000 (the clear intention being that it will eventually sell at a street price of £999), and yet the casualties are surprisingly light.

I did miss the ribbon controller, and felt it would have been nice to have at least one expansion port to accommodate a PCM card or the MOSS expansion board. At least the SmartMedia slot can be used to store additional programs (complete with their sample data) — but in order to use them you must import the samples first, so it's not quite as instant and convenient as the PCM route. And the loss of four insert effects is no small thing, but at the Le's price, I can't really rate this as a con.

The sampling option extends the scope of an already powerful workstation and, as I spent more time with it, I started to understand why a friend of mine sold up almost his entire studio and replaced it with a single Triton. I suppose that if you needed sampling from the outset, it makes more sense to stretch your budget for a full Triton but if not, it's great to know it can come later. For those who don't want a computer humming away while they are trying to compose, the sequencer is also good enough to assemble complete tracks, with double the Triton's capacity.

Throughout this review, it's been my task to point out the things that Korg have trimmed in order to release the Le at this price, but it is nevertheless a stunning workstation for the money. I particularly loved the arpeggiators, the effects and the new Programs and Combis. I can happily report that if I were looking for a new workstation, this would be it. **SOS**

Information

E Triton LE 61-note version £1099; EXB-SMPL upgrade £229. The price for the 76-note version is not confirmed at the time of going to press, but it is expected to be under £1350. Prices include VAT.

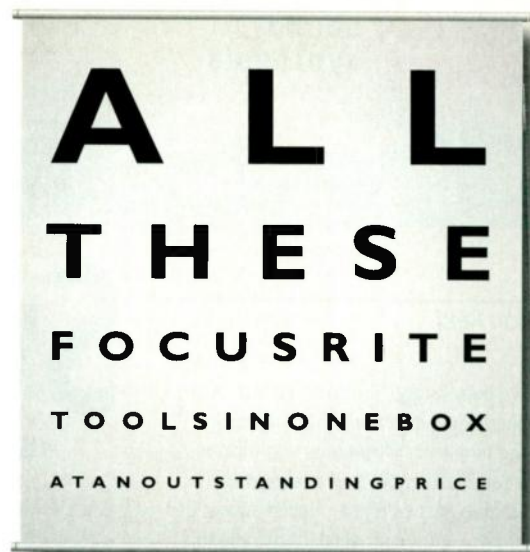
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Gordon Reid

Two months ago, I introduced into Synth Secrets the idea of membranophones, the family of instruments that includes all the common drums, and analysed the sonic characteristics of the pitched subset of that family. We then proceeded to apply this knowledge to the synthesis of timpani.

Enlightening though the process of synthesizing timpani is, I realise that you're more likely to be interested in synthesizing the types of drums used in modern music — bass drums, snare drums, and toms — all of which fall into the subset of *unpitched* membranophones. So this month, we're going to start looking into the analogue synthesis of common drum sounds.

We'll start by casting our mind back to the kettle drum. If you remember my analysis of two months ago, you'll know that the environment in which a membrane finds itself influences its modes of vibration. I covered some of this ground last month, but let's now go into a little more detail.

Figure 1(a) shows the idealised case of a circular membrane suspended in a vacuum. As we already know, it is this that produces the enharmonic set of frequencies determined

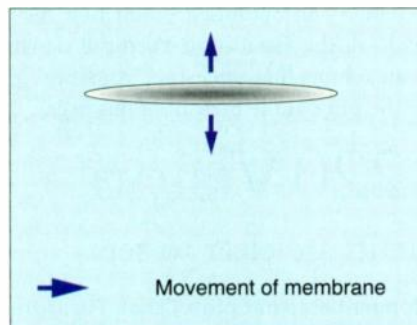


Figure 1(a): A membrane suspended in a vacuum.

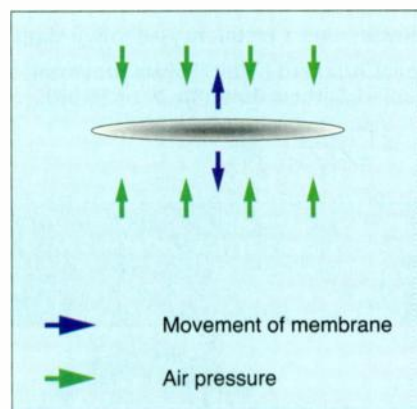


Figure 1(b): A membrane suspended in air.

Synth Secrets

Ever wanted to synthesize unpitched membranophones? No? Well, you might if you knew that bass and snare drums are of this percussion type. We show you how...

Synthesizing Drums: The Bass Drum

by the Bessel Functions. Of course, it's highly unlikely that either you or I will ever experience this sound. Firstly, no sound is carried in a vacuum. Secondly, much as I would like to eject most of my band's former drummers from the airlock of a passing Vagon Constructor Vessel, the opportunity to do so has not yet arisen. Therefore, we must consider the vibration of the membrane when suspended in the atmosphere, as shown in Figure 1(b).

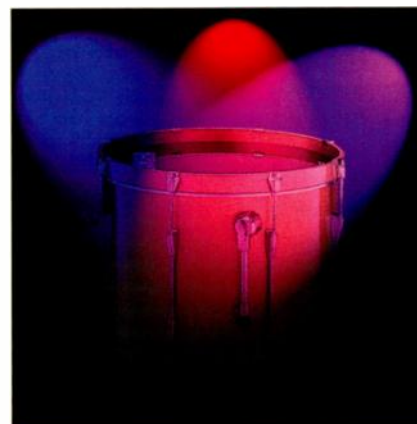
As you can appreciate, it's not a trivial task for the membrane to shift all the air adjacent to its surfaces, especially if it is vibrating at scores — if not hundreds — of Hertz. And the result of this effort is that the frequencies of the modes shift upwards, and that they become somewhat less enharmonic.

Despite the ease with which we can create this sound, it is still not one that you will often hear. No — the membrane sound we all know and love is the one produced when you stretch the membrane and mount it on some sort of shell.

The closed shell of the kettle drum discussed last month is a particular example of this, with the vibrations of the membrane strongly influenced by the modes of vibration of the air inside the shell itself. Nonetheless, as shown in Figure 1(c), the membrane still has to shift the air on its outer surface against atmospheric pressure.

The physics of this example is, as we have already discussed, rather complex, but we know that the consequences of mounting the membrane in this way are twofold. Firstly, the pitches of the modes rise even further. Secondly, the frequencies of the important radial modes become almost harmonic in their distribution.

OK, so far we've discussed nothing new.



But let's now take a step backwards, and ask what happens when we remove the body of the kettle drum and replace it with a tubular shell capped by a *second* movable membrane (see Figure 2, above right). Clearly, we have designed a conventional drum of one sort or another. Welcome to the world of the unpitched membranophones.

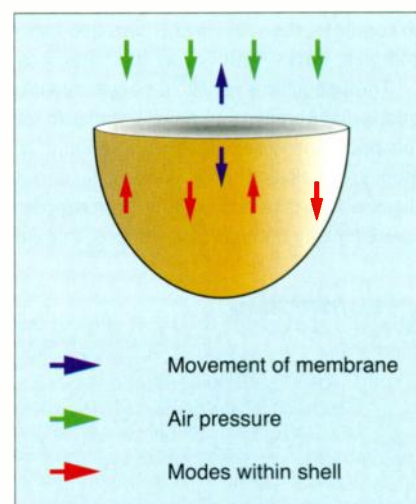


Figure 1(c): A membrane mounted on a rigid, fully enclosing shell.

Bass Drums — Frequency Content

Traditional bass drums are much as shown in Figure 2. The head that you strike is the beating head or batter head, while the other is the resonating head or carry head. Clearly, if the batter and carry are without holes, the air in the drum is trapped, and the membranes' modes of vibration will again be

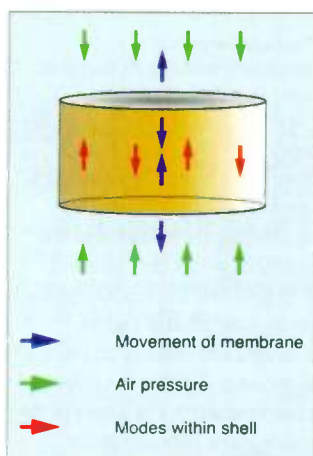


Figure 2: A membrane suspended on a shell capped by a second membrane.

influenced by the cavity modes. However, whereas the modes within the rigid kettle drum shell are easy to understand and calculate, those of the bass drum are not. This is because, whereas the kettle drum has two coupled resonators (the membrane and the cavity) the conventional drum, with its second membrane, has three coupled resonators.

The physics of this is too advanced for Synth Secrets, but we can

understand the measurements of its behaviour observed by academics. Let's start by considering Table 1, which shows a set of bass drum modes when both membranes are stretched to the same tension.

First, I had better explain why there are two frequencies shown for the 0,1 and 1,1 modes. Again, without describing the physics involved, we observe that the membranes' vibrations are affected by the air between them in such a way that, for these modes, not one, but two, frequencies are produced. Weird, eh?

Now, the frequencies in Table 1 may not seem related in any way, but when we plot them on a chart, something unexpected happens. If you look at Figure 3, the frequencies may look enharmonic, but if we remove the doubled 0,1 mode at 118Hz and the doubled 1,1 mode at 86Hz, we obtain Figure 4.

Yikes! I don't know how it looks to you, but to me Figure 4

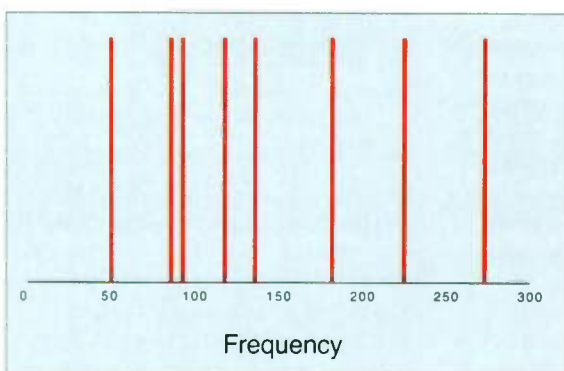


Figure 3: Frequencies of the modes of a bass drum.



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technique **sound synthesis**

► vibrations of the membrane. Therefore, no matter how hard or softly you hit the membrane, the frequencies of its modes remain tightly locked to those permitted by the air in the cavity. Figure 8 depicts the 0,1 mode of a kettle drum, showing how the vibration of the air is coupled to the vibration of the membrane.

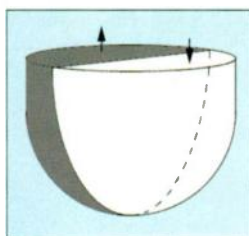


Figure 8: Coupling of the membrane and the internal modes of a kettle drum.

Now let's look again at the bass drum in Figure 7. This has a flexible interface with the outside world (ie. the air section at the aperture in the carry head), so the cavity modes are very much less constraining than those of the kettle drum. This means that, if the batter head wants to vibrate at a different pitch, it is relatively free to do so. But what would make it change pitch?

Consider Figure 9(a). This shows a stretched membrane seen from its edge. I have arbitrarily made it 30 inches in diameter.

Now let's beat the living daylights out of this, smacking it with a beater and displacing its centre by an inch or so. This is an unrealistically large displacement for any tightly stretched membrane, yet it only increases the distance across the surface by about one sixteenth of an inch, as shown in Figure 9(b) below.

What it does do, however, is increase the tension of the membrane by an amount that is proportional to the square of the displacement. And, since pitch is determined by tension, this increases the pitches of the modes by a considerable amount. It's a small leap of understanding to realise, therefore, that the pitch of every mode will be higher at the start of the sound (when the maximum instantaneous displacement is large) and will drop as the amplitude of the vibration decays. Indeed, the pitch of a typical kick drum can shift by a couple of semitones from start to finish, and we must build this into our patch if it is to sound realistic.

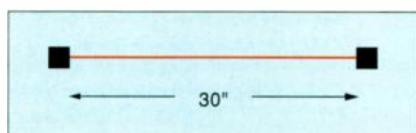


Figure 9(a): A membrane at rest.

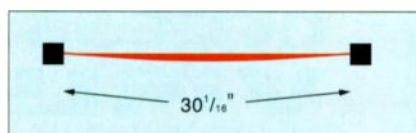


Figure 9(b): A struck membrane.

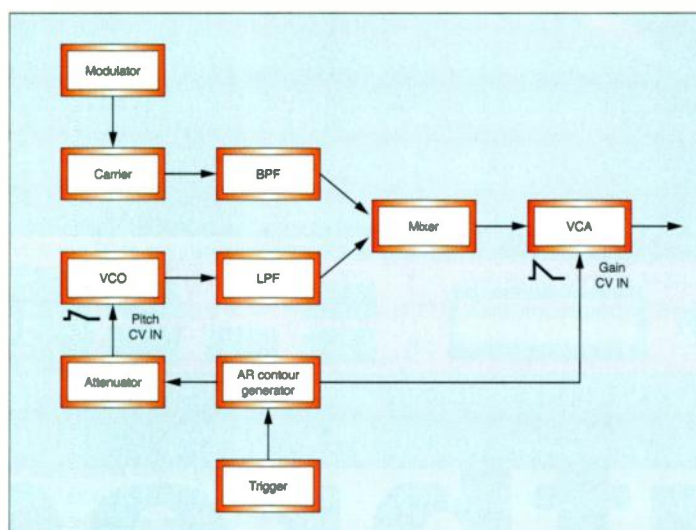


Figure 10: Using a single contour generator to modify loudness and pitch.

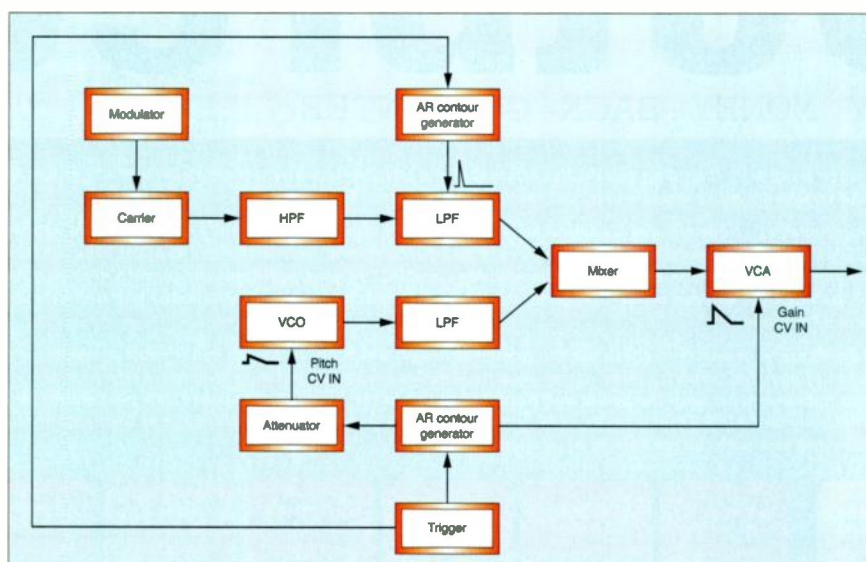


Figure 11: A bass drum patch with pitch-bend and click.

Fortunately, we do not need a second contour generator to implement this. After all, the loudness and the pitch of the sound are both determined by the maximum instantaneous displacement of the membrane, so a single AR Generator should do the trick. However, whereas the VCA Gain will change by 100 percent from the start to the end of the sound, the pitch should only shift by around 10 percent, so the patch requires some form of attenuator at the oscillator's pitch CV input (see Figure 10 above).

Finally, we come to the beater click. This is caused by hundreds of short-lived high-frequency partials that exist for just a few milliseconds after the membrane is hit.

There are two ways we can model this. One would be to use a short noise burst (which you would normally call a click); the other uses a contour generator to shape the spectrum of the partials generated by the FM components in Figure 10. If we choose the latter, we split the band-pass filter into its low-pass and high-pass components, and apply a rapid AR contour to the cutoff

frequency of the LPF. This allows many high-frequency components (almost a noise spectrum) to pass for a very brief time, before the patch settles down to the sound generated in Figure 10 (see Figure 11 above).

So there we have it: a simple bass-drum patch. Simple? Well, we've skirted over the true nature of the enharmonic partials, approximated the decay rates, disregarded the (albeit reduced) effects of the cavity modes, and totally ignored the presence of any shell resonances. Consequently, I think that it's fair to say that this is a simplified patch. Nonetheless, it will produce extremely usable results. If you have access to a patchable analogue synth with three oscillators, cross-modulation, three suitable filters, a couple of contour generators, a mixer and a couple of VCAs, you're in business.

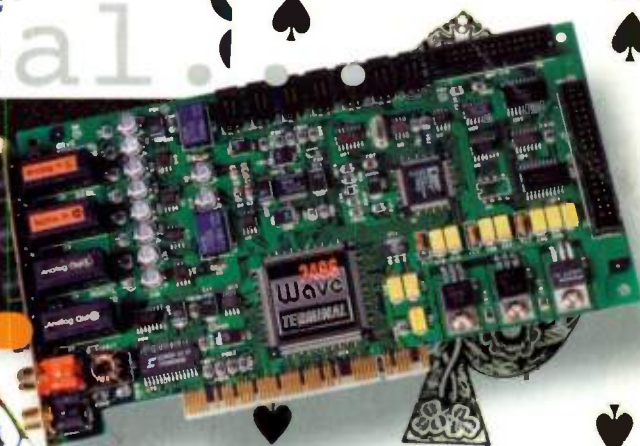
Unfortunately, few low-cost analogue monosynths have this degree of flexibility. So next month we'll set about programming some bass drum sounds on the synths you do own. Until then... **SOS**

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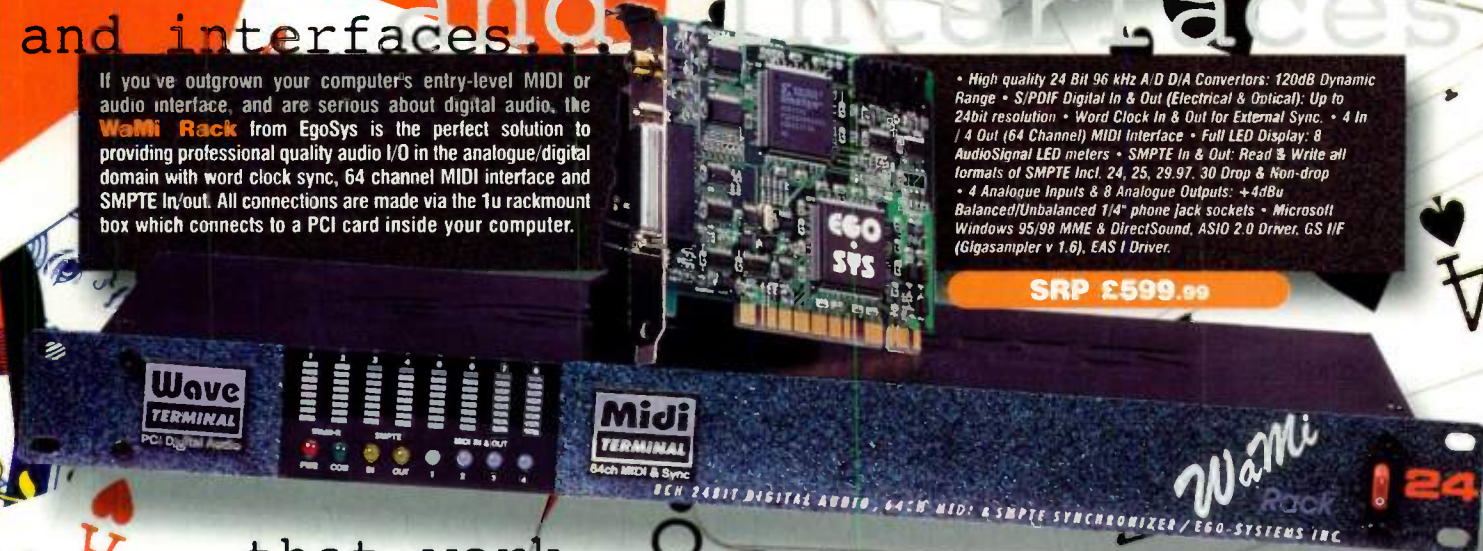


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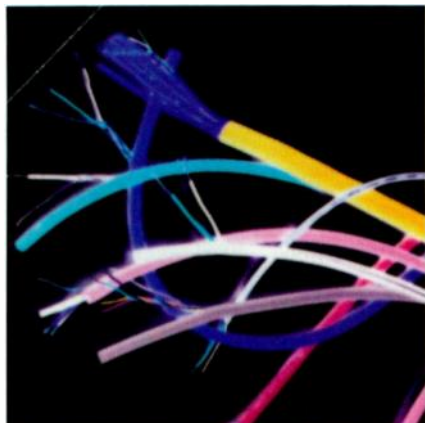
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Audio Cables & Wiring

All tangled up when it comes to audio leads? Here are the answers to the most common queries on the subject from SOS readers.

Paul White

Q What is the difference between balanced and unbalanced cable?

All audio signal cable is screened, which means that an outer conductor wraps around the other conductor(s) to shield them from electromagnetic interference. The outer screen, which may be made of wire braid, metal foil or conductive plastic, is usually connected to ground so that any induced currents (due to interference) flow directly to ground rather than being allowed to modulate the audio signal. However, screening isn't a perfect solution, which is why balancing was invented.

In an unbalanced cable, there's a single inner core that carries the signal while the outer screen

also doubles as the signal return path. Any interference that results in induced currents flowing through the screen conductor will cause these currents to be added to the wanted signal, so some interference problems are still possible, especially with long cable lengths or where there are nearby sources of strong interference. Though it's not often realised, screened cable offers very little protection against induced hum, as the cable is actually acting like a single-turn transformer, coupling energy from other mains conductors and transformers in the vicinity.

In a balanced cable, there are two inner conductors, often known as hot and cold. The screen is grounded, as before, but this time the screen is not part of the signal path. More importantly, balanced equipment is designed so that its hot and cold outputs carry the same signal but with the cold signal phase inverted with respect to the hot signal. At the receiving end, the balanced input stage re-inverts the cold signal and adds it to the hot signal, thus restoring the original signal. The clever part is that any interference that makes it through the screen is likely to have virtually the same influence on the hot and the cold conductors (as they are in more or less the same place). As a phase reversal is implemented at the input of the receiving piece of equipment, any interference common to both conductors will cancel out. The effectiveness of this system depends, amongst other things, on how well balanced the hot

and cold arms of the circuitry are at either end of the cable. Mic amps often have a specification for common mode rejection, which is a measure of how effectively the

circuitry rejects interference that is common to both hot and cold inputs.

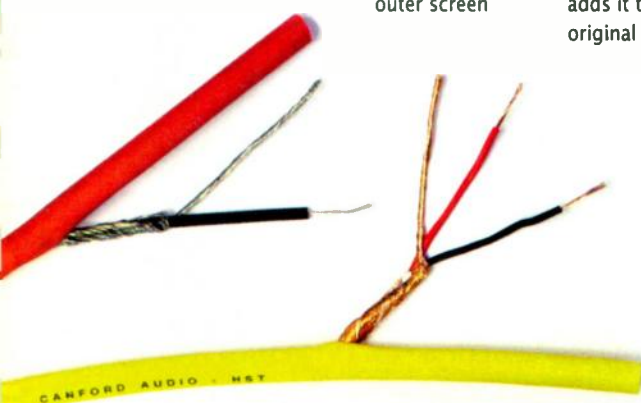


For the long cable runs used in live rigs, it is not uncommon to find Star Quad cable in use. This is a screened cable with four individual internal conductors, two of which are used for each of the elements of the balanced signal.

A further type of cable known as Star Quad was developed to further improve the immunity to interference, and this works by having two pairs of internal cables wired in parallel, but spaced (actually woven or plaited) so that any interference induced due to the cable cores not occupying exactly the same position in space is largely cancelled out. Star Quad seems to be used mainly in live sound applications where long cable runs are commonplace, but it is demonstrably more effective than conventional balanced cable.

Q Are all screened cables much the same, or are some better than others?

Foil or braid screened cables tend to be good from a screening point of view, whereas the type of cable that uses a bunch of unbraided wires wrapped around the outside is less



The red cable above is for unbalanced signals, and has two conductors: the wire screen and the single core. The yellow cable is for balanced signals, and therefore requires two central cores in addition to its screen.

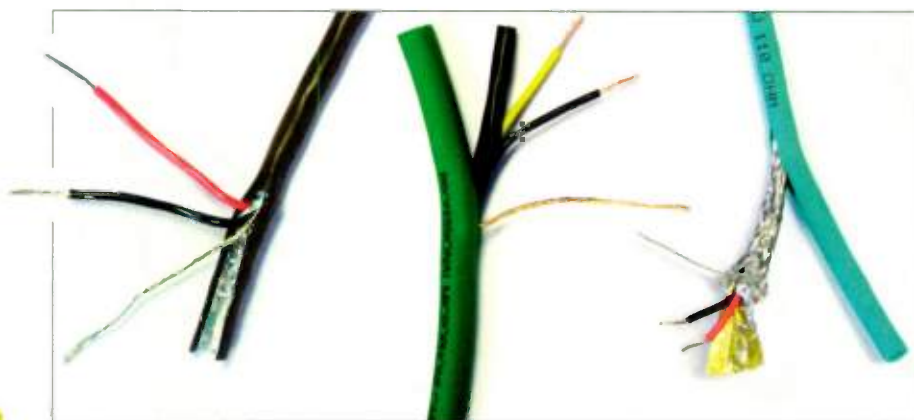
effective, especially if the cable is bent in such a way as to open a space in the screen. Another popular type uses a conductive plastic screen where a metal wire runs alongside the screen to permit connection. Over short distances at line level, most types of screening are adequately effective, though a woven metal screen or a foil screen is likely to be more effective than a conductive plastic or wrapped wire screen.



A simple helically-wound wire screen (as in the yellow cable) is fine for general-purpose audio cabling, but a braided wire screen (as in the black cable) will tend to give less handling noise with delicate mic signals.

Microphone cable choice is particularly important, as some cables can generate electrical noise when moved or bent. A woven screen cable designed specifically for use with microphones probably offers the most effective screening, coupled with low handling noise, but conductive plastic is also an effective solution for the cable lengths used in a typical small studio. Conductive plastic has an inherently low handling noise and is available in a range of colours that can help identify which microphone is connected where.

Foil-screened cables are rather rigid and don't take kindly to sharp bends, but they do offer excellent screening properties and smaller-gauge cables are available for such



Other screening options include foil (brown cable) and conductive plastic (green cable), both of which have a drain wire for soldering to your choice of connector. Some cables even combine different shielding types for improved performance – for example, the light blue cable uses both braided wire and foil screens to protect important AES-EBU digital signals.

jobs as patchbay wiring and permanent cable runs. Many multicore cables also use foil screening, and it's important not to coil such cables too tightly.

Q Can I use the same kind of screened cable for both mic and line signals?

There are no impedance issues with audio signal cables at the lengths used within studios, but you should take into account the fact that mic cables need a combination of good screening and low handling noise. Ease of termination and cable clamping may also be an issue.

Q Can I use an unbalanced signal with a phantom-powered mic input?

No. You can use a balanced dynamic microphone with phantom power switched ►



Many multicore cables use foil screening for space-saving purposes. However, if you need multicore which is more tolerant of sharp bends, it's worth going for wire screening instead.

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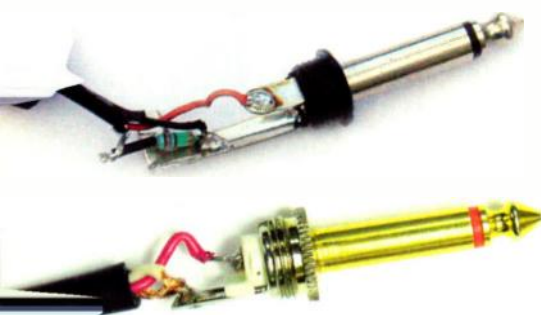
AUDIO CABLES & WIRING

► on, but the only way to connect an unbalanced source to the same system is to feed it through a balancing transformer first. If you were to connect an unbalanced cable, you would short out one side of the phantom power supply, and though a properly designed phantom supply will be protected against damage in this way, it's not recommended. More seriously, some or all of the phantom power voltage will be applied to the pins of the unbalanced device and this may cause damage to some studio units.

Q What's the best way to connect unbalanced signal sources to balanced inputs?

The traditional method is to use balanced cable and connect the cold to the screen at the unbalanced end. However, this can sometimes result in ground loop hum problems, so it is safer to connect the unbalanced end of the cable as follows.

Connect the screen to the ground pin via a resistor of between 100Ω and 500Ω or leave it disconnected altogether. Connect



The traditional way to feed unbalanced signals to balanced inputs is to have the screen and the cold core connected at the unbalanced end (bottom picture). However, this can sometimes result in earth loop hum problems, in which case you should either disconnect the screen altogether at the unbalanced end, or alternatively connect it via a resistor of between 100Ω and 500Ω (top picture).

the cold core of the cable to the connector pin normally used to connect the screen. Connect the hot core to the connector pin normally used to connect the hot conductor.

Q Can I use any phono cable for S/PDIF signals?

Many people do, and get away with it, but it really isn't a very good idea, as you can end up with clicks and glitches that seem to have no apparent cause. At the high frequencies needed to carry digital signals, cable impedance has a significant effect on the shape of the waveform being transmitted, and S/PDIF signals ideally need



Although you might be tempted to use ordinary hi-fi phono cables for S/PDIF digital signals, these cables can degrade the waveforms and increase the possibility of glitching.

to be fed via a 75Ω cable designed specifically for digital data use. If the cable and terminating impedance aren't correct, energy is reflected back down the cable, which has the effect of degrading the shape of the digital pulses. Poor quality connectors can also compromise the performance, so this is one instance where even the accomplished solderer of cables might be better off buying a ready-made cable of the right length. At longer cable lengths, it becomes even more important to choose a high quality digital cable and, as a rule, cable runs should be kept as short as is practical.

AES-EBU signals are more tolerant, though special cable (in this case 100Ω) is available for this format too. In the absence of a dedicated digital cable, conductive plastic screened microphone cables generally produce good results over short to medium distances.

Q What's the best way to connect a balanced source to an unbalanced input?

You'll need to check your equipment manual for this one, as the way you wire the cable depends on the design of the balanced output stage. In some cases you need to link the cold and screen pins at the balanced end (if the output stage is 'fully floating') while in others you must leave the cold pin disconnected. In situations that require the latter approach, you will probably find that the signal level is 6dB lower than when using the equipment balanced. This is because you're only using one half of the signal from the output stage.

Q Does it matter if mains cables run close to signal cables?

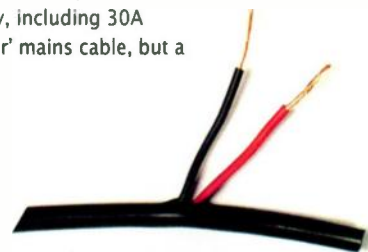
Mains cables carry relatively high alternating currents that can be induced into audio cables running alongside them, even if the audio cable is well screened. The longer the distance the cables run alongside each other, the greater the amount of interference (usually hum) that will be induced into the signal cable. When audio and mains cables must cross, try to arrange the crossing to be at right angles, as this is the angle of minimum coupling.

Q How long can audio cables be before the signal quality suffers?

This is one of those 'How long is a piece of string?' questions because the answer depends on both the cable type and on the impedance of the circuitry at either end. As a very general rule, high-impedance mics or feeds from high-impedance instrument pickups shouldn't be longer than around four or five metres, as the cable capacitance can cause the high frequencies to be attenuated, but low-impedance balanced mic cables can be tens or even hundreds of metres long if the sending and receiving devices are designed properly and the source impedance is very low. With semi-pro equipment, keeping balanced mic or line cables down to 10 or 20 metres maximum would be sensible, though it's still best to keep all cable runs as short as you can.

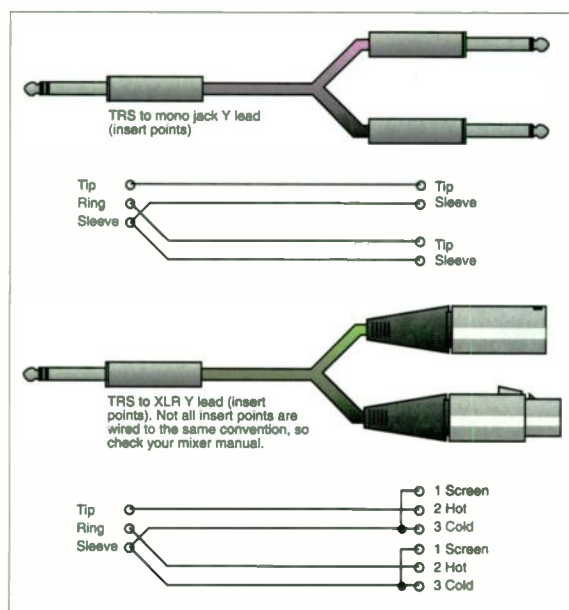
Q I've read a lot about specialist hi-fi speaker cable. Is this really necessary or can I use any twin-core cable?

Speaker cable needs to have a very low electrical resistance, so it needs to be fairly hefty and made from a pure material, such as oxygen-free copper (OFC). Impure material can introduce nonlinearities (the oxidised copper actually behaves as a semiconductor) that manifest themselves as increased distortion at low signal levels. There are many cables that qualify, including 30A 'cooker' mains cable, but a



There's a lot of hype about esoteric hi-fi speaker cable, but you're probably better off sticking with a good general-purpose speaker cable, such as that shown above, so you can spend the serious money on things which really make a difference.

Active speakers can be connected up using regular balanced mic cables, and the cable type will have no significant effect on the audio quality.



Wiring an insert 'Y' lead.

Q How do I wire an insert 'Y' lead?

A typical 'Y' lead has a conventionally wired stereo jack at one end of a run of balanced (twin cored cable), but at the other end, the cable splits so that the screen and hot core are wired to one mono jack and the screen and cold core are wired to another. The principle of operation is that each of the two cable cores carries one unbalanced signal, one from the mixer insert point to the external device, and one from the external device back to the mixer. Which way round the two connectors go depends on how the mixer manufacturer wires their insert points — tip (tip of the jack plug) send or tip return. Check your mixer manual to find out, and then label the two mono plugs accordingly. If you don't enjoy soldering, some companies make off-the-shelf 'Y' cables. **SOS**

Thanks to Canford Audio (www.canfordaudio.com)
for supplying many of cables used to illustrate this article.

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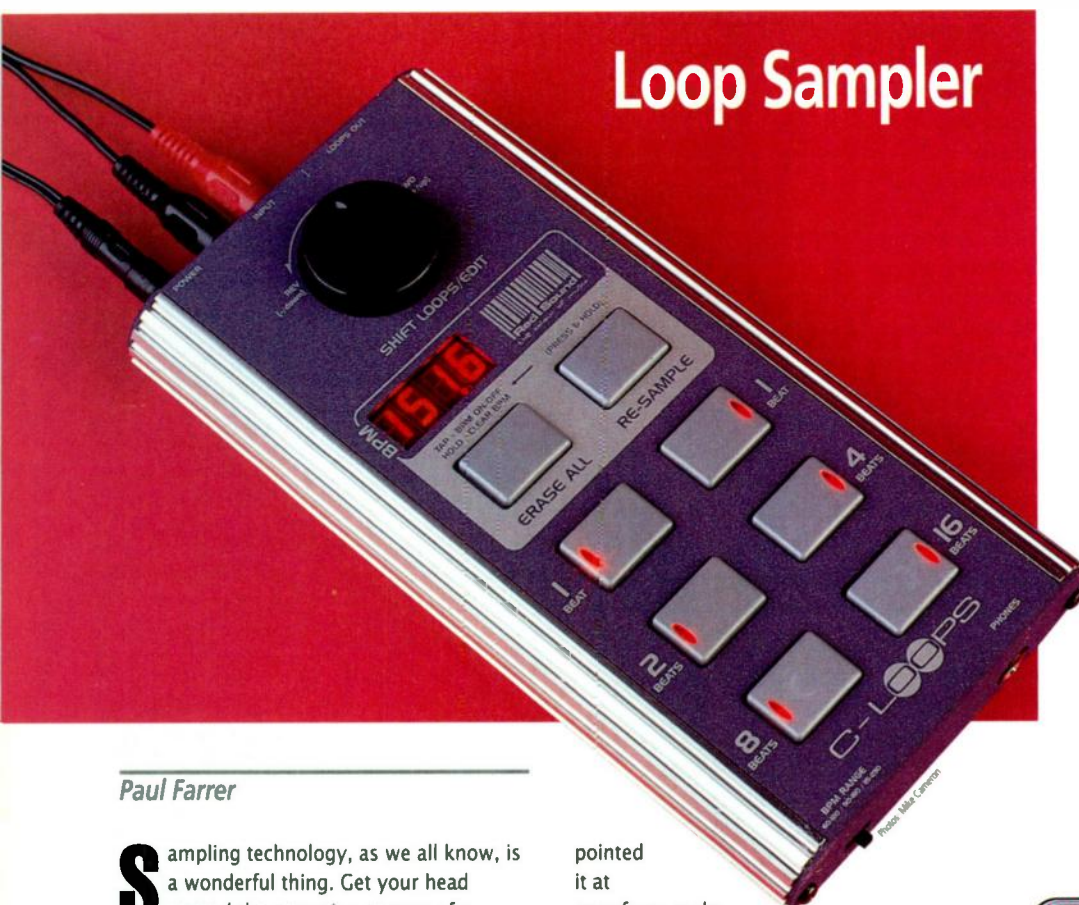
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Red Sound C-Loops



Loop Sampler

The unique new C-Loops from Red Sound Systems can automatically detect the tempo of incoming audio, sample it and chop it to length ready for re-triggering, as well as

automatically timestretching all its on-board loops to match any new tempo it receives.

Paul Farrer

Sampling technology, as we all know, is a wonderful thing. Get your head around the operating system of a sampler, and the world of audio manipulation is your oyster. The trouble is that samplers, whether they're based in software or hardware, aren't the most approachable bits of studio gear, and the process of getting a sound in, chopping it to size, and then being able to play it back can often be a time-consuming, fiddly and sometimes frustrating business.

UK-based manufacturer Red Sound Systems aim to put a stop to all that with C-Loops, a compact, six-voice sampler aimed at DJs needing to grab sections of audio on the fly and play them back over a CD or record. The clever thing here is that C-Loops makes use of Red Sound's impressive tempo-detection technology (as seen in previous innovative units like the BPM FX Pro), and can thereby sample and play back loops in perfect sync with the tempo of an incoming audio signal.

Meet C-Loops

Looking very much like the type of device that used to go 'ping!' when Leonard Nimoy

pointed it at styrofoam rocks in episodes of a certain '60s sci-fi TV series, C-Loops, with its curvy chrome side panels and functional styling, is visually extremely desirable. Its long and thin dimensions are actually designed to be attached to the side of a 19-inch rackmounted mixing desk (using the supplied brackets), which will doubtless please both DJs and studio users alike. At its budget price, you can't really expect too much in the way of serious general sampling or sample-editing power, and the range of controls and inputs and outputs reflect this.

The top of the unit houses two pairs of phono ins and outs along with the power socket leading to a 9V DC power supply. The bottom of the unit has just a single headphone socket and a three-stage switch that sets the approximate tempo range of the incoming audio track (60-120, 90-180 or 115-230). The front panel itself isn't much more complex either, largely opting for a 'one button, one job' approach. This means that not only is the 'getting to know you' time mercifully short, but you can be sure

SOUND ON SOUND

Red Sound Systems C-Loops
£275

pros

- Impressive tempo-detection abilities.
- Fantastically easy to use.
- Extremely useful for live DJ applications.
- Stored loops automatically time-stretch to incoming tempo — brilliant!
- Cool styling.

cons

- All samples are lost on power-down.
- Frighteningly easy to accidentally bulk-erase all your samples.
- A little too limited for serious studio use — although that's not really where it's aimed.
- Lack of through-monitoring via Output phono's might be problematic, depending on your setup.

summary

A unique, easy-to-use and immensely useful DJ gizmo that is the very definition of quick-fire sampling. While some studio producers might find its range of features restrictive, what it does do, it does so well that for the live DJ, this has to be the essential tool of the year.

that in the noisy and dimly lit confines of a DJ's mix pit you will have easy access to most of C-Loops' parameters. The simple four-character LED display shows the detected tempo of the incoming audio source brightly and clearly, and at the very top of the unit is a large cursor wheel which is used either to manually set the loop tempo value if no beat information is detected, or to manually adjust the synchronisation (start) point of the loops.

In Use

The short length of the instruction manual makes it clear that setting up C-Loops and getting it working is such a no brainer that even those who struggle with their own shoelaces should have no problems. Certainly, I found C-Loops to be one of the most intuitive and easy-to-use modules I've come across in recent years, with a learning curve that wouldn't give even an arthritic terrapin any trouble.

As with any tempo-detection process, it is the upfront bass and snare drums of modern dance music that enable the most reliable detection of tempo, and as this is the most likely type of music to appear in a DJ's arsenal of records, everyone should be happy (see box below). The tempo-range selector switch starts C-Loops hunting in the right area tempo-wise, and from there it is usually only a matter of seconds (depending on the rhythmic content of your input track) before it displays the incoming tempo and is ready to sample.

There are six sample pads on the front panel, and once a tempo has been



C-Loops' simple control panel, with its six sampling pads. Each offers access to storage locations of different sizes (ranging from one bar to 16). The tempo-selection switch, which helps the tempo-recognition engine to do its job correctly, is on the front of the unit (bottom left in this picture), along with the headphone jack.

detected, these flash in time with the incoming audio source. The six pads allow you to sample different lengths of loop; one pad enables 16 bars of recording, another allows eight bars, another four and two pads permit just

just dance music that can be 'C-Looped' — I had pleasing results from quite a few rock and nearly all pop tracks I tried. The secret seems to be in the accuracy of the timing of the source material, and since I can't remember when I last heard a modern track that has anything but rock-solid timing, you're unlikely to have problems.

Another possible use for C-Loops could be as a very basic form of studio remix tool should you want to synchronise new drum loops or grooves to a master recording without the aid of SMPTE code or similar. Load your grooves into C-Loops, then trigger the tempo engine from the rhythm sections of what you already have recorded. This isn't a foolproof system, but it's something that might just mean the difference between sync'ing and sinking!

To hear examples of C-Loops in action, surf to: www.sound-on-sound.com/ses/jan02/articles/redsound.asp

Tempo Detection & Studio Use

As mentioned above, any tempo-detection system relies heavily on prominent rhythmic elements. The most obvious are bass and snare drums, but having test-driven C-Loops (and other Red Sound products) across a wide range of musical styles, I've always been impressed by what their tempo engine can successfully analyse.

It's fair to assume that the majority of users of a device like C-Loops will be working with dance music of one sort or another, and when used with that style of music, there was nothing that gave the tempo engine any trouble, excluding drop-out sections in tracks where there is just an ambient pad and vocal. Obviously, C-Loops had no chance when confronted with such challenging material. However, within literally seconds of a single hi-hat pattern kicking in over the top of the pad, C-Loops had worked out the tempo, sync'ed itself up and was ready to sample.

You'll also be pleased to hear that it's not

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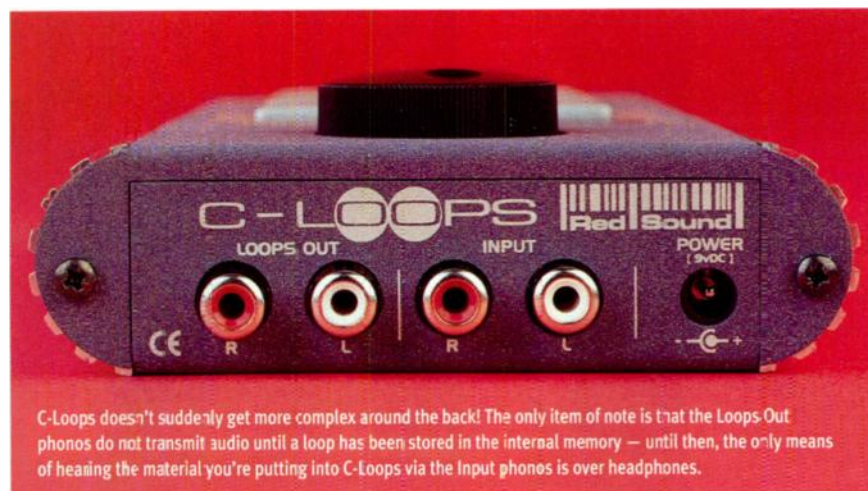
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RED SOUND SYSTEMS C-LOOPS



▶ one bar each. It's interesting to note that I couldn't find any reference to the maximum sample time permitted within the instruction manual or on Red Sound's otherwise excellent web site. Suffice it to say, though, that with a total of 32 stereo, 16-bit, 48kHz samples (or beats) at your disposal, you should have enough for live DJ applications.

Just a single touch of one of the sample pads begins recording and the screen displays a countdown of how many beats are left to record for each particular pad (16, eight, four, two, or one). Once a sample has been taken, the pad's LED lights continuously and instantly begins looped playback out of the main phono outputs which, incidentally, do not permit through-monitoring before a sample has been taken — this is where your headphones, which you can insert into the jack socket on the front, will come in handy.

One of C-Loops' great selling points is that playback of all the loops is synchronised perfectly with the incoming audio signal (utilising Red Sound's acclaimed V2 tempo-recognition engine), so once you have filled up all six pads with loops and effects you don't need to have the fingers of an ace percussionist to get them to trigger in the right place — C-Loops ensures that they all fire on the beat. One obvious downside to this could be problems with phase. If you have two sections sampled from different points in the same track, playing them both back at the same time might result in duplicated elements (typically bass drums) partially phase-cancelling one another. This is a small point to be aware of, but certainly nothing to get in a panic over.

Stored loops are also automatically stretched to fit with the tempo of incoming audio, irrespective of the tempo they were sampled at. This is a really useful feature — it means that it's now child's play to sample the main rhythm section of one

track and seamlessly morph the beats into other tracks, even ones at wildly different speeds.

The manual helpfully lists a number of possible applications for C-Loops, particularly with reference to being able to disengage the tempo-recognition engine (hold the Resample button, then press Erase All). This is intended to prevent erratic tempo detection while you cue a new record, but it does mean that you can set C-Loops running on its own at the last detected tempo while you put on another record. Alternatively, as the manual points out, in the event of total turntable or stylus failure, C-Loops can save the day — even if your decks pack up, the beats will go on!

Tweaking The Beats

There are a few editing features within C-Loops. The first allows you to trim the output level of each specific pad (with ranges of -9dB to +6dB) by holding down the pad and adjusting the data-entry wheel. You can also adjust the synchronisation (start) points for individual loops or for all the loops simultaneously — a feature that would be helpful if your source recording drifts out of time or the tempo-detection engine loses sync for any reason. There is also a crude but fun form of time-stretching, which is activated during playback by turning the data-entry knob backwards or forwards to speed up or slow down all the samples currently playing. This isn't really the type of scientifically precise tempo manipulation that users of computer-based audio-editing software will be used to, but it does offer instant and highly creative access to the kind of mega-granulisation effects that you'll recall from Fat Boy Slim's classic track 'The Rockefeller Skank'.

You also have the ability to resample the content of any number of pads. This is done by simply hitting the Resample button, and then selecting which pad to

re-record to. The other button I haven't yet mentioned on the front panel is Erase All, which, as the name implies, deletes all samples currently in memory. Whilst this straightforward approach is certainly welcome for most features, even the manual warns users to take care, as it only takes the slightest touch of the button to instantly send all your carefully collected loops the way of the dodo.

Conclusions

It would be fair to say that C-Loops is aimed at live DJs needing to quickly get hold of rhythm tracks, effects and instrumental grooves from an incoming audio source and loop them in time with any source recording. While there are unquestionably studio users who could find a creative use for such a device, it is live DJs who won't be bothered by C-Loops' paucity of more detailed sample-editing features, and indeed lack of backup facilities. However, I think these omissions are fair enough given the unit's price and primary target market.

There are a few niggles, the biggest being the ominous Erase All button, which does exactly what it promises, after just a single touch. Surely a better option would be to have this button only do its worst after keeping it pressed for a couple of seconds (busy-fingered DJs beware — you could be left seriously high and dry by this one). Also, although recording vocal and effects samples is, of course, just as easy as recording loops, it would have been great to have the option of 'hot-triggering' some of the pads (perhaps with the ability to adjust release time) so that effects or vocals could be 'stuttered' — as it is, you have to let them play back in their entirety each time you hit the pad.

One of the most impressive things about C-Loops, though, is the one thing that in using it you actually take for granted; namely the ability to auto-detect the tempo of a track, sample from it and have your loops chopped to length, looped and ready to fly instantaneously in time with pretty much any given audio source. If that doesn't sound like an attractive feature to you, there won't be much about this unit that will impress you, but if you're a DJ or live performance samplist and want to take your performances to another level, you really should give C-Loops a try. **SSS**

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The new AG Stomp physically models a miked-up acoustic guitar sound using the DI signal from an acoustic guitar piezo pickup, and also offers a variety of useful effects processors.

Yamaha

AG Stomp

Acoustic Guitar Modelling Preamp

Paul White

SOUND ON SOUND

Yamaha AG Stomp **£399**

pros

- Plausible modelling of different microphone types and positions.
- Onboard effects and anti-feedback filter bank.

cons

- Because the end result depends on the output from the guitar's pickup system, the mic emulation can only ever be approximate.

summary

Although of most use to the live performer, the Yamaha AG Stomp could save the day in the studio on those occasions where mics can't be used.

Yamaha's AG Stomp is a digital floor-standing processor designed for use with acoustic guitars fitted with piezo pickup systems, its aim being to process the pickup sound so that it sounds more 'miked up'. Applications include both live performance and recording, plus there's a useful headphone output for rehearsal purposes.

There's actually rather more to the AG Stomp than mic modelling, as it also includes a chorus/delay section, limiting and onboard reverb, plus a five-band feedback reduction

system and comprehensive tone controls. Eight mic models are available, arranged as four mic types used both close up and at a greater distance, the latter settings including some nicely simulated room reflections that are quite independent of the reverb section. The whole unit is built into the same metal case as the previous DG Stomp (electric guitar preamp) pedal and is powered via an included AC adaptor.

Like the DG Stomp, the AG Stomp is programmable and comes with 30 factory presets arranged as 10 banks of three sounds, as well as 30 more user memory locations. The outputs are stereo on balanced jacks, though short adaptor cables are included for

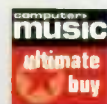
The first name in MIDI is the last word in Digital Audio.



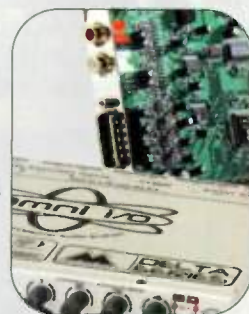
USB MIDISPORT 1x1 - 1 in/ 1 out MIDI interface.



DELTA 1010 - 10 in/ 10 out PCI digital recording system.



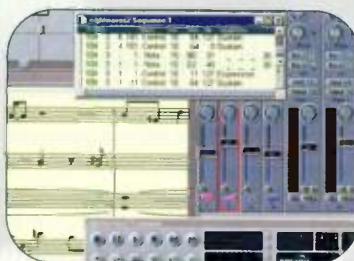
Computer Music says of the Omni Studio
the recording quality is supreme, the preamps sound utterly fantastic... versatility at its best. 10/10



Omni Studio - 24bit/96kHz integrated desktop audio station



USB MIDISPORT 2x2 - 2 in/ 2 out MIDI interface.



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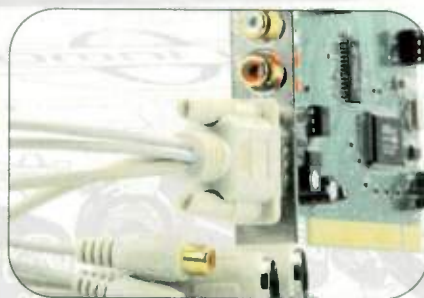


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► not enough reggae, blues, hip hop, rock, garage, folk, jazz, world, funk, soul, or *avant garde* on the radio.

3. Allow DJs to pick some (if not all) of their own music. It is vital that the people who play the music on the radio are passionate about it. The down side to this is that it would lead to a lot more activity in the less-than-honourable world of the plugger, so safeguards would need to be put in place (any DJ or producer found taking a bribe or a freebie would be fired).

No More Paid To Be Played

But I guess the most radical thing I would do about the music industry (and the one that I will, no doubt, get the most hate mail about) is reform the PRS (Performing Rights Society). At best it's a hit and miss operation, and at worst it's a lottery that favours the superstar elite.

Sums are collected for every shop, pub, town hall, cafe (and so on) that plays music, and then it is divvied out to artists *pro rata* (meaning that the rich get richer and up-and-coming performers have no chance).

The BBC pays the PRS many millions of pounds every year for the privilege of playing music on TV and radio. Every time a single is played on Radio One, the copyright owner is paid several pounds. They, in turn, pay a percentage to the composer of the tune and keep the rest themselves (supposedly to fund

Dotting The I's And Crossing The T's

The ideas I've put forward in the main body of this column are only an outline of what could be done, and I've already blagged three times my usual column inches. To detail every angle of my proposals would take the whole magazine twice over. But if I didn't believe in what I've written, and its workability, I wouldn't have written it.

So if you are someone with the power to implement any of what I've outlined, or maybe you've got a vested interest in maintaining the status quo and want to pick me up on my outrageous slurs, I'm not hiding. I can be contacted via email, on big.george@sospubs.co.uk, or by post, at PO Box 7094, Kiln Farm, MK11 1LL.

Finally, I would like to thank the big cheeses here at *SOS* for allowing me to write my column without interference or influence (every word I have ever written for *SOS* is on my web site, www.biggeorge.co.uk). There is no other

magazine available where this would be the case. My reasons for stopping are threefold. Firstly, I've said everything I had to say about what I know about this business, and I didn't want to start repeating myself. Secondly, there are other things I want to do with my life, like holding some seminars about the realities of this business, and doing a one-man show about my life in it. (These two ventures alone will make me totally unemployable, enabling me to spend more time with my family.) Thirdly, I'm planning to record a triple acoustic album of my introspective mystical concept songs (that's a joke, for heaven's sake).

But, as Arnie once said, I'll Be Back. Later this year I may turn up again, with occasional articles in which I plan to put the people who control the industry on the spot — from playlist compilers to A&R directors, retail stockists to celebrity managers.

and *pay* the musicians (now wouldn't that be a novelty?), while at the same time exploiting the rich potential of this country and improving the performing skills of many artists.

Whether this would be of any help to the so-called artists who get blanket coverage on the nation's radio and TV, but never seem to play or sing live (mime live, maybe, but I'm talking about music, not Marcel Marceau), is another matter. Have you noticed how, when you see these boy/girl/cardboard types perform two songs at a televised live event,

at the very least, a cool Urban Myth.)

If like-minded people can come together to do something fun, regardless of the threat of financial penalty, then I'm confident that music can win out over market-share mentality. Therefore my fight goes on, but not through this column.

I wish you luck in getting your music heard by a wider audience. And my final thought is this: the making of music is the single greatest achievement in the history of humanity. It has been around since before records began. The ability to create music is a gift more precious than a percentage. The greatest artists in history made music because they had to — any fame and fortune that came their way was a by-product. Do it for the fun of it, do it for art's sake, do it because you have the ability, do it to achieve excellence in your life! If you do good work without blind financial desire, the benefits will be great and plentiful.

Over and Ouch, and May The Force Be With You. *SOS*

“We live in a world where all it takes to become a big star (for a couple of days) is to be able to sing one song a bit like someone else.”

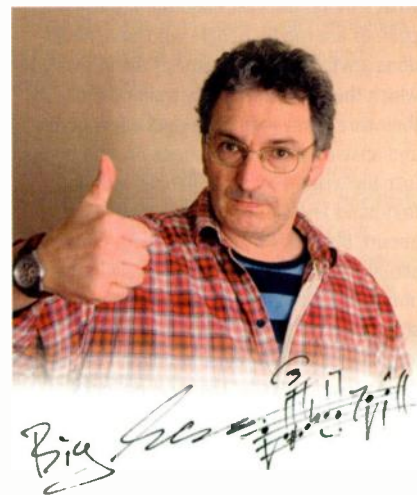
new talent, although you'd be hard-pushed to find any evidence of this). Now, since *none* of the major publishers are British, that means that tens of millions of pounds leave this country every year and never return — except in the form of Mariah Carey's promotional budget. (NB: Most local radio stations do it a little differently: they return what they play on just three days every month. Those tracks are multiplied by 10, then the money is put in a pot and dished out arbitrarily.)

My proposal is simple: rather than pay the likes of Robbie Williams and Sting a few grand per week to promote their latest releases and see millions of pounds every year leave the country to bolster the share price of large multi-national companies, I suggest the BBC keeps the money and invests it in music programming through its 38 BBC local stations. They could produce masses of high-quality local music output, of all flavours,

they do the dance and sing into their Captain Scarlet earpiece microphones, but when they give it large with a “Whoa!” and deliver their “this is our next single” spiel, they need to use a different microphone. Why is that?

The Final Act

There we have it: an end to two-and-a-half years of me venting my spleen and you putting up with it. It saddens me to hear so many people say “things will never change.” WRONG! Tell that to Emmeline Pankhurst — and what about the Berlin Wall or the Poll Tax? Cast your mind back about a year, when there was a campaign during the census to have ‘Jedi’ recognised as a proper religion. Big Brother warned that if not enough people stated that their religion was Jedi, everyone who did could face a fine for including false information. But enough of us stood up for Obi-Wan and Yoda, and now it's the law! (Or,



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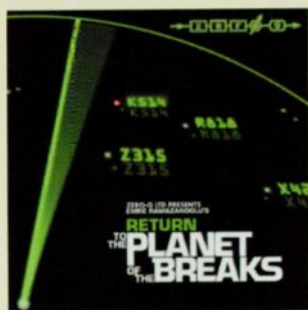
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Return To The Planet Of The Breaks

ZERO-G AUDIO & WAV/REX/RECYCLE
2-CD SET

Rawfunkindirtyassboogiebeats! That's a hell of a word to kick off a press release, but it's exactly how Zero-G describe the third volume in their award-winning *Planet Of The Breaks* series. Surprisingly, the man behind the first two CDs, Shawn Lee, is absent, and replacing him on the sticks for this collection is Emre Ramazanoglu. A session drummer/programmer who has worked with the likes of Mekon, Maxim and the Sneaker Pimps, and a composer in his own right, Emre has some big shoes to step into.

Spread over two discs (one audio and one containing all the first disc's loops as WAV, REX and Recycle files), *Return* serves up 76 tracks of live beats ranging from 57 to 169bpm (though one loop pogos in at 194bpm). In common with the previous *Breaks* volumes, the format is a simple one. Each track consists of three mixes of the same loop: a dry mix, an ambient mix (which

includes any external effects) and a full mix of the two together.

Enough background — you want to know how the loops sound. Bloody good, actually. The kit used is well chosen and the sound quality is excellent, ranging from crisp and clean to downright dirty in all the right places. The standard of playing is extremely high, with each beat given room to evolve and take on its own vibe. Emre's versatile style flows from sparse, laid-back grooves, through some truly heavy hip-hop loops, to faster, funkier patterns that would complement most modern dance genres.

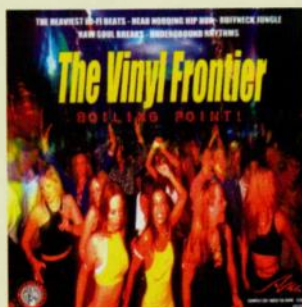
The processing and effects added to the ambient mixes are good (although hardly subtle in places), and include some nice reverbs and filtering. The addition of these 'ambient-only' versions allows the creation of personalised mixes of the dry and effected loops to fit all tastes. I must also mention the well-presented and informative booklet — a nice touch.

I'll admit that, as one of the many fans of the previous CDs (and Shawn Lee's impressive playing), I wondered if Zero-G had taken a risk in changing such a popular format. In fact, Ramazanoglu has risen to the challenge and has produced a fantastic selection of well-played grooves that manage to keep their own identity while remaining completely usable. For me, it's the crisp, sparsely funky, lower-tempo grooves that stand out.

It's true that no individual drum hits are included here, which might put off any producers who like to have ultimate control of their loops, but

that's not really the point of this collection. If you are a user or lover of funky, fresh drum loops played with bags of character and groove, *Return To The Planet Of The Breaks* is for you. A worthy addition to an outstanding series. Rawfunkindirtyassboogiebeats? You'd best believe it. *Oli Bell*

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The Vinyl Frontier 2: Boiling Point

AMG AUDIO/WAV
2-CD SET

You know, in my opinion you can never have too many drum loops. As a self-confessed beathead I'm always on the look out for the next loop that will get my creative juices flowing. It seems that I'm not alone in this quest, and to help us poor rhythm addicts along, AMG have served up a two-CD (one audio, one WAV) sequel to their well received *Vinyl Frontier* collection of drum loops.

CD one contains all the audio, with tracks 1-92 each featuring an extended drum loop. The beats cover a nice spread of tempos, from a chilled 58bpm to a head-spinning 187bpm, with each loop coming in at between 25 seconds and a minute in length. The last seven tracks (93-99) contain a hefty collection (over 100 kicks alone) of assorted single drum hits, to help with a spot of beat-based DIY.

Playing and programming is very good, with the emphasis on

urban breakbeat styles such as hip-hop and drum and bass, but the nice spread of tempos ensures that the loops included never get too 'samey'. The low-fi beats work well, with plenty of snap, crackle and pop, while the frantic drum and bass loops assault your ears with real ferocity. After a little editing, some of the more mid-tempo processed loops would slot nicely into most modern breakbeat productions, and the slower hip-hop grooves roll along well.

Processing of the loops is solid, with some good filtering and effective delays, but it is occasionally overdone, with the effects getting in the way of the loop's underlying groove. I would also have liked to see a few more dry loops with no processing at all, allowing the user to add his or her own effects.

One word about the track order: mixing up all the tempos makes sitting down and listening to the collection as a whole much easier on the ear, and speaking as a reviewer this is rather welcome, but speaking as a producer I would prefer the loops sorted into some loose tempo groups. This would make the more important task of finding the right loop for a track much quicker and easier.

Nevertheless, overall *The Vinyl Frontier 2: Boiling Point* is a solid and comprehensive collection of extended beats and grooves, featuring some quality programming and playing, that has something to offer a wide range of breakbeat-obsessed producers. *Oli Bell*

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Geneticz

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► houses all the audio, CD two the WAVs) is a collection of processed loops and sounds programmed by Digital Davy, a Dutch DJ and techno/gabba producer.

CD one kicks off with a suitably mad demo track. This is followed by 33 tracks of processed drum loops (330 loops in total), sorted into tempo groups ranging from 80 to 180bpm. As you might expect, these loops come in for some extreme filter and effects abuse, to the point where the original loop is replaced by something altogether stranger. Samples slosh across your head like tuned seawater, while others bleep and pop like a terminally depressed R2D2. Davy makes good use of the stereo field, as every sound-shaping trick in the book (and a few more besides) is thrown at these poor, unsuspecting samples. Manic flanges and phasing, extreme EQ and merciless filtering are all on display, but thankfully the majority of the mangling never gets too abrasive or adversely affects the interesting loops. Having said that, it would have been nice to have a few more loops with less startling processing, or to have access to the original, unprocessed sample, so that users could have mixed dry and processed versions to their own liking.

Tracks 35-55 contain bucketloads of single hits and sounds, split into various categories, such as padz, fx, alienz and ambientz (you may notice a preoccupation with swapping a perfectly good 's' for a 'z'). These sections, especially the subtle atmospheres collection, are well programmed and offer some good sweeps and textures, although I did find the selection of

bazz (sorry, bass) samples a little short (only 20 hits) and a touch tame. CD one is rounded off by 17 tracks of mashed-up single drum and percussion sounds.

CD two, where you'll find all the audio in WAV format, also includes an additional 700(!) bonus drum hits. Another nice touch is the inclusion of a nifty little Windows-based WAV browser utility to help sift through all those drum samples.

This collection will definitely be of interest to industrial and techno producers, as well as those making the darker styles of drum and bass. Of course, it is perfectly possible to produce very similar results with a selection of drum loops, a handful of plug-ins/outboard and a day off work. But if you haven't the time (or ears) for such sonic destruction, *Geneticz* is a good, ready-made collection of distinctive textures and loops to dip into. Zorted.

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Dan Dean Solo Brass

GIGASAMPLER/AKAI
CD-ROM

Dan Dean has already covered solo strings and solo woodwinds, and now he turns his attention to the brass family. Like the *Solo Woodwinds* collection (reviewed SOS October 2001), *Solo Brass* is a huge, 10-CD set supplied in a smart zippable wallet, with each CD dedicated to a specific instrument. The selection comprises bass trombone, cimballo (bass tuba), euphonium, French horn, piccolo trumpet (an octave above the standard instrument), trombone, trumpet, and tuba. Both trumpets are presented in vibrato and non-vibrato forms on separate CD-ROMs.

These unlooped stereo instruments are huge, ranging

from the 101Mb of the cimballo to 700Mb for each of the trumpets, and the collection totals some 4.8Gb. The reason for this is partly due to the wide range of basic articulations — *legato non vibrato*, *legato vibrato*, *staccato*, *portato* (mezzo staccato), *forte-piano*, *forte-piano* with long, medium and short *crescendo*, and straight mute — which together provide a huge range of expressive possibilities. However, this is also the first Dan Dean library to feature up to eight velocity layers for the smoothest ever transitions of timbre from soft to loud. This is particularly important with brass instruments, since their sound changes markedly the harder you blow!

Recording quality is excellent, conveying the lushness of the French horn, the tremulous brilliance of the trumpets, the fruitiness of the trombones (although the pitch-bend slide does have a tendency to 'step' unless performed slowly), and the gruff tones of the tuba. Enough note-to-note nuances have been left in to make this the first brass library that could fool me into thinking that the players were in the room with me. Because of the huge number of presets for each instrument, this set also provides similar versatility to that offered by a group of performers, with sounds ranging from subtle to full-bodied.

The French horn, for instance, has a total of 59 presets, with the different articulations presented in many variations, including presets where dynamics, attack type and different articulations are mapped to the mod wheel or breath controller, ones where different velocity layers are accessed by keyswitching, velocity-switched articulation presets, and — unusually for a solo library — even ensemble presets.

Up to four instruments can play in an ensemble, controlled by the position of the mod wheel, with each slightly detuned and panned to a different position.

You can bring them in at any time, even when notes are already playing, although this does mean that the four stereo voices are always sounding even when silent, and will take eight voices per note. However, they sound wonderful, and with 160-note polyphony available from *GigaStudio 160*, I doubt that many musicians will grumble. Ensemble presets are now also available to *Solo Strings* and *Solo Woodwind* owners as a free patch.

The same set of variations mentioned earlier is also presented in two 'light' versions for those with less RAM: LT1 has fewer notes but the same number of velocity layers, while LT2 provides different samples for every note, but reduces the number of velocity layers. Speaking of RAM, I'd advise anyone intending to make full use of *Solo Brass* to install 512Mb for buffering purposes.

Dan Dean Solo Brass sells for a hefty £429 in GigaSampler format, although it's possible to buy some of the CD-ROMs individually. Although I originally intended to give it four stars, knocking one off because it's even more expensive than *Solo Woodwinds*, it does contain almost double the amount of data as *Woodwinds*, and once I'd fully appreciated what *Solo Brass* is capable of, it just had to receive the top five-star rating. An Akai version is being finalised using the same samples, and should be available by the time you read this, but to keep file sizes down, the instruments are in mono rather than stereo, are looped, and don't have the keyswitched presets of the Giga version.

Martin Walker

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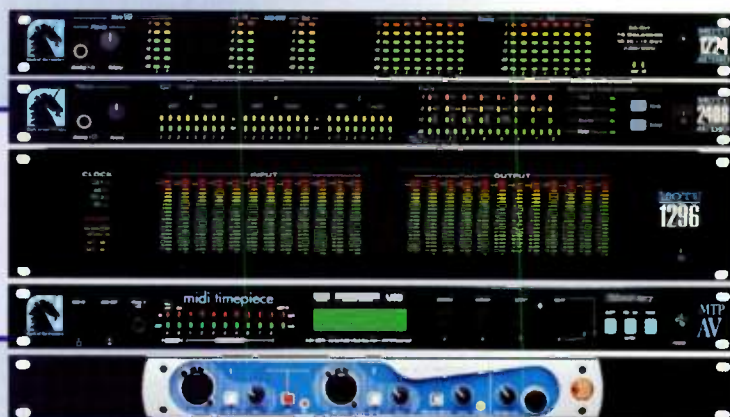
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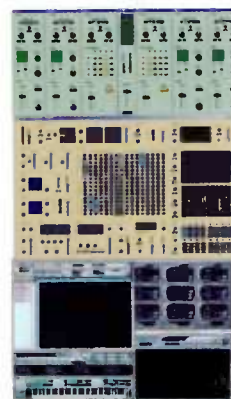
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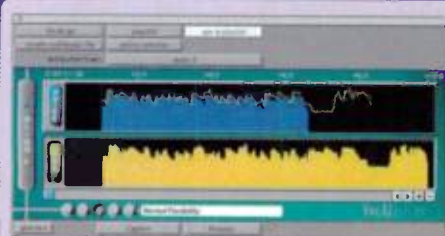


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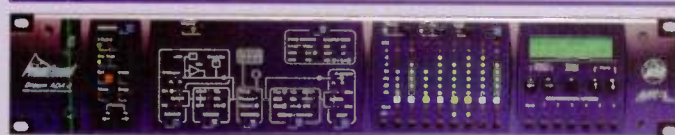


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We explore Pro Tools' many features specifically designed to help you undertake overdubbing, dropping in and out, and compiling tracks from different takes.

Simon Price

In the last instalment of Pro Tools Notes, I began a mini-series on using Pro Tools for traditional multitrack band recording, concentrating on configuring a PT system to replace a tape recorder, and subsequently getting a session under way. This month it's time to look at Pro Tools techniques for the next stages of recording: overdubbing and 'comping'.

Overdubbing

For general advice on this subject, I'd recommend the 'Basic Overdubbing' article, by Hugh Robjohns and Mike Senior, that ran in the March 2001 issue of *SOS*. Offered here is a Pro Tools appendix to that feature.

As Hugh and Mike pointed out, creating a good cue mix is probably the key to successful overdubbing. The mixer template I provided last month has provision for up to four different mixes, apart from the main, 'control room', mix. These different mixes are achieved using the aux sends on the sub-mix group faders, as well as the click and guide tracks. The sends go to spare outputs on your audio interface(s), which would then be fed to a headphone amp. To emulate an aux buss from a traditional mixer, each channel to be monitored has a send going to the same pair of outputs in the same send slot. This means that you can set the mixer display to focus on, say, send slot 'a', and use the mini-faders to balance that particular cue-mix (see cue mix screenshot, overleaf). You can set the cue mix from scratch, but if you have a TDM system there's a Pro Tools function for copying the main fader and pan mix (and even

automation) to the sends. Select the tracks with sends, then choose 'Copy to Send' from the Edit menu, and tick the relevant parameters.

Fast navigation around the song by the engineer is much appreciated by musicians when they're recording overdubs and drop-ins. In Pro Tools, one way to help yourself with this is placing some markers at chorus starts, verse starts, and so on, and keeping the Memory Locations window to hand.

If you're working with super-pro muso types, (perhaps our fictitious band, The Hyper Theticals, have printed out a score from *Cubase* for a cellist friend who's playing some string parts for them), they may request that you quickly locate to specific bar positions. No problem — hitting the star key on the keypad enters you into the main counter, where you can type in a bar number and locate directly there. It's useful to be just as speedy when setting record pre-rolls. A friend of mine once had a 'session from hell' during which an irritable (and famous) singer repeatedly demanded to be cued in quickly at exact numbers of bars before the 'in' point. One simple way to achieve this is to keep the Nudge value set to one bar and stay in Grid Edit mode. You can then find the desired in-point and use the minus key on the computer keyboard to Nudge back to exactly the place requested by the musician. It's also possible to set the pre-roll visually: drop the edit cursor at the recording 'in' point (or make a selection to set 'in' and 'out' points), then Alt-click in the



Comping a vocal track using Pro Tools' Related Take functions. The pop-up list on the waveform display is listing all other recorded versions of the highlighted section. I've already worked through the track, choosing the best takes for the different sections, and this is reflected by the numbering of the takes throughout the track.

track at the location where you want to start the pre-roll playback. There's also the option to type a global pre-roll setting into the Transport Window.

Dropping In

When dropping in over previously recorded material, there are two options for initiating recording. The first is to use Quick Punch mode to manually punch in and out of record during the pass. The second is to select the desired 'in' and 'out' points before the pass. Remember that either way there's no danger of losing any of the underlying audio, as it can be 'trimmed' back out from under anything recorded over it. It's usual to have 'Auto Input Monitoring' ticked in the Operations menu, so that tracks that are record-armed continue to play back existing material until the start of recording, after which the track switches to monitoring the input. However, if the musician wants to hear him/herself before the drop-in point, you should choose 'Input Only Monitoring'.

To enter Quick Punch mode, either select it from the Operations menu, or control-click the record button on the transport bar until a P appears in it. From here you can start playback at the

point requested by the artist (or drummer), then simply punch into record when required, using any of the normal shortcuts (or transport controls, if you have a hardware control surface). To use the method of first setting an in/out duration for the new audio, drag out a selection on screen where you wish to record, and set a pre-roll using one of the methods above.

Le Comping

No, it's not a French row of tents, but rather the editing process of compiling (comp'ing) the best bits of several takes into one final track. Although Pro Tools has a built-in set of tools aimed at this task (see method three, below), different people employ different strategies as a matter of personal preference. Here's a brief outline of three commonly used methods.

• Method 1: Multiple Tracks

The most basic way of facilitating comping would be to record each take on a different track, then compile the best bits from each onto a clean track using Copy and Paste, or employing the Separate Region command to chop out the bits you want. This method is simple and attractive, as everything is in front of you and at hand. However, the other two

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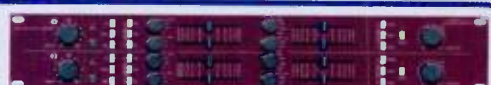
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logic notes

A customised setup can make sequencing in *Logic* much easier, so here's some help with tailoring the default Song to your needs. Plus, there's advice on mixing and suggestions for arranging your Screensets, as well as another bunch of handy tips and tricks from the pros.

Mike Senior

Once you've been using *Logic* for a while, you'll probably find that the standard setup which loads up whenever you create a new Song isn't very well suited to your needs. The good news is that you can change the default to something more useful if you wish, because it is stored as a special Autoload Song in your *Logic* program folder which can be edited to reflect your own working preferences. Here's how to do it, along with some suggestions for useful tweaks you can make to streamline your sequencing experience.

Updating Your Autoload Song

First off, before you even start up *Logic*, make yourself a safety copy of your existing Autoload Song, and put it somewhere safe so that you can always return to it if you mess anything up while you're changing stuff around. Now start up *Logic* and create a new Song if one doesn't appear automatically — this new Song will be based on the current Autoload Song in your *Logic* program folder.

Once you've made any tweaks you want, and have saved the resultant Song to your computer's desktop, you then have to transform this Song file into your new Autoload Song. You can do this on the Mac by renaming the tweaked song Autoload, and using it to replace its namesake in *Logic*'s program folder. Once you have done this, you also need to open the new file's general information window (by highlighting it and hitting Apple 'I') in order to select the Stationery

Pad option — this makes sure you don't accidentally overwrite the new default settings.

If you're running *Logic* on a PC, then you need to change the name of your personalised Song file to Autoload.LSO, before using it to replace the existing Autoload.LSO file in the *Logic* program folder. Now right-click on the program icon and select Properties from the menu, checking the Read-only option in the window which comes up.

You have now updated the default setup. If you choose New Song from *Logic*'s File menu, your tweaked setup ought to appear as the default, with the name Untitled. If you do any work within this Song which you wish to save, then you'll be prompted to choose a more suitable name.

Improving Your Environment

So now you know how to update the Autoload Song, what things are worth customising? The place many *Logic* users really like to make their own is the Environment. For a start, if you



It's much easier to manage a large Environment setup if you have selected appropriate object icons, possibly even with coded colours.

have all sorts of unused objects cluttering up your Environment, it can make it clumsy to select Track Instruments in the Arrange window. If you delete all those objects you never use it'll cut down the size of the instrument list. Alternatively, you can remove an object's icon from the list without deleting the object, simply by deselecting the button to the left of the icon in its Parameters box — for example, even if you feel the need to use a GM Mixer object, you're unlikely to want to select it as a Track Instrument. And while you're there, why not choose a more suitable icon by clicking and holding on the Parameters box icon? Or colour-code it using the Object Colours option in the View menu?

One of the great things about *Logic*'s Environment is that it allows you to set up separate Environment Layers to house MIDI control panels for external sound modules. Setups for common pieces of equipment are shipped with some versions of *Logic*, while others can be found on the Internet, and it's great to have these in your Autoload Song so that they're on hand whenever you need them. Similarly, any MIDI filtering or processing which

you want to implement can be carefully built and cabled in the Environment and saved for future use.

If you're using Multi Instrument objects, then it can make sense to enter the patch names for the instrument they control, so that you can call patches up by name while sequencing — Paul White covered this in depth in his December 2000 column. Again, pre-programmed Multi Instrument objects are available if you don't fancy entering all those names yourself. ▶

Logic v4.8.1

Emagic's web site now carries v4.8.1 updaters for both the PC and Mac versions of *Logic Audio*. For the PC, the main improvement is extended compatibility with DirectShow plug-ins, and a small software utility is provided for managing these. The Mac upgrade sorts out some problems users were experiencing with USB audio support and ReWire compatibility.

Logic Tips



If you need more attack on a dull drum sound or limp-sounding loop, the Enveloper plug-in could just save the day. Insert this processor into the track in question, and alter the following controls from their defaults: Lookahead to zero, Attack Gain to 50 percent, Attack Time to 10ms. Now adjust the Threshold control, starting at around 70 percent, for Transient Designer-style punch. *Mike Senior*



With many budget digital mixers, you have to be careful about internal clipping within equalisers or effects. However, you'll be reassured to know that *Logic*'s internal floating-point processing means that you never need to worry about this as long as you register no clipping on any of the Audio object level meters. *Paul White*

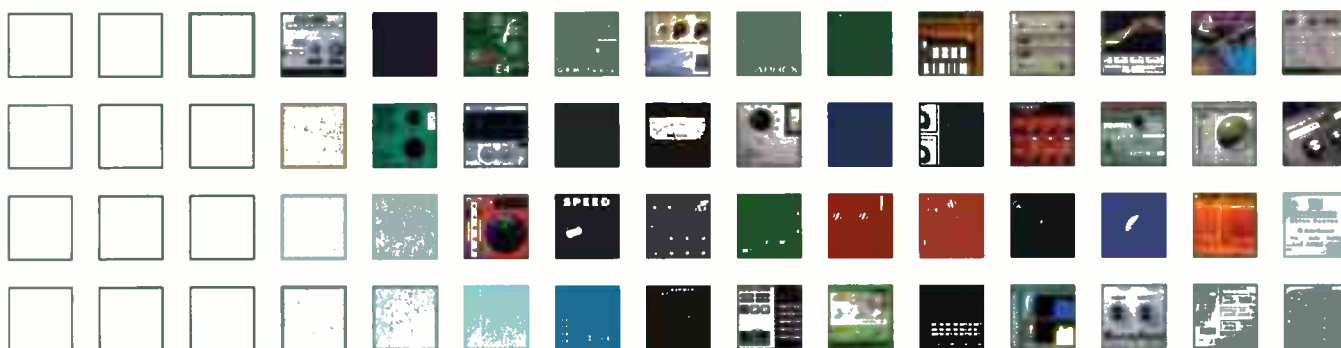


Although, strictly speaking, accidentals in music notation are normally only written once per bar, there are occasions when it can be worth reminding a performer of the correct accidental. In such cases, the accidental is usually given in brackets. To create this in *Logic*, highlight the note and select Guide Accidental from the Accidentals submenu of the Score window's Attributes menu. *Mike Senior*



On a normal Mac or PC keyboard, there are two sets of numeric keys, and it's a shame to have both accessing the same set of key commands, as they do by default. Fortunately, you can differentiate between them if you wish — you just have to use the Learn Sep Key button (rather than the Learn Key button) when assigning keys to actions in the Key Commands window. *Sam Inglis*

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► And, of course, the Audio Layer of the environment is worth setting up to suit your own way of working. For a start, you can decide how much of each object you wish to see, using the buttons in the Parameters box — I, for one, can do without the I/O selectors and channel EQ fields most of the time. You can also set up any preferred audio routing. For example, if you always use an external reverb with *Logic*, you could have the send and return routing already sorted out, as well having the relevant send on every channel assigned.

While the Autoload song is currently ideal for sorting out the various Channel Splitter objects

so that you always know which button to press for which set of views.

You can also set up your Arrange window so that you don't end up having to do the same setup tasks on every session. For example, you can make sure that there is a track for every one of the playback Audio objects and MIDI parts available to you. These tracks can be zoomed to the correct height, and you can maximise the potential of your screen's 'real estate' using the options in the View menu.

There are several preferences which are stored with the Autoload Song which are useful when working within other specific windows. For example, if



A variety of common instrument editor setups are shipped with *Logic*, including these ones for Roland's SC88 Sound Canvas (top) and Novation's BassStation (right).

for automation purposes, the automation system looks set to change in *Logic*'s new version 5 upgrade. That said, I imagine that even the new system will require some setting up...

Personal Preferences

There are many areas of *Logic*'s operation that can be customised to suit the way you work. One of the handiest of these is *Logic*'s Screensets function, which enables you to quickly switch between different window setups while you work. (See Ab Wilson's article in *SOS* February 2001 for some useful pointers on using these.) Your preferred set of Screensets can be stored in your Autoload song,

you make use of *Logic*'s Score window, it's worth knowing you can save all the Instrument Sets and Styles defined from the Score window, as well as the entire range of score-related preferences available from the Settings window. Similarly, your favourite Transform window settings and any custom Hyper Edit setups can also be saved.

An Autoload Song That Grows With You

Once you've caught the bug, it's natural to keep adjusting the default setup as you refine your working methods. Some musicians even find that they need to keep several default Songs available, using only the

Screensets: The Editor's Choice

There are more ways to set up your Screensets than there are *Logic* users, but what's a good way to set them up if you're just starting out with *Logic*? Here's the way I sort out the Screensets in my own system, which is a pretty good model to begin with.

Screenset one is my top-level song overview, and Screenset two is similar but with an environment window at the top showing my audio mixer channels — I use the latter for recording. The third Screenset is split between an Arrange window and the Audio window, and I find this good for importing files and for dragging segments of audio into my Song's

arrangement.

Screenset four is like the first, but this time with a Matrix Edit window at the top, and I use it as my main MIDI editing setup. The next Screenset replaces the Matrix Edit window with a Hyper Edit window for editing drum patterns, while the subsequent Screenset replaces it with the Sample Editor window. Screensets seven, eight, and nine show various different Environment views. I use the other Screensets for less commonly required views, such as the ones I use for working with Emagic's *Sound Diver* patch librarian. *Paul White*

most general-purpose one as the Autoload, because they need completely different setups for tracking, mixing, editing, or whatever.

The difficulty with updating your Autoload Song continually is that you'll inevitably find yourself going back to old projects which don't have the most recent set of Autoload tweaks in place. In this case, you need to update your old project's setup to reflect your new preferences. If you want to update the Environment to your new setup, ensure that you only have one *Logic* Song open, and then

navigate to the Import Environment submenu in the Environment window's Options menu.

I would suggest choosing

Update from this submenu, which should add in any recent Autoload Environment expansions, such as new editor Layers and Multi Instruments, without upsetting existing Environment objects already in the project. If the changes you've made to the Environment are not just additions, then you should probably opt for Merge instead, though it's more likely here that *Logic* may disrupt the odd bit of cabling, particularly on the Click & Ports Layer.

Even if you're happy with the Environment setup, you may want to update your Screensets, or the settings associated with the Transform, Hyper Edit or Score windows. In this case, all you need to do is pull down the main Options menu and head for Import Settings in the Settings submenu. This will bring up a dialogue box allowing you to select the types of settings you wish to import. *ESG*

A Better Mixer View

Logic's mixer is very cleverly designed, but if you have a lot of Audio objects in your Environment, you can waste a lot of time scrolling between playback tracks, busses and master faders. An easy way to avoid excessive scrolling is to use *Logic*'s ability to open two versions of the same window, using one window to show a number of track-playback Audio objects, whilst another shows only the Audio object for the master outputs (although it

could also contain buss outputs). This allows you to scroll within the first window to view any of the input channels, whilst your master object always remains visible in the second window. Bear in mind, though, that the level meters will only be active in the topmost window. This is such a useful configuration that it's worth saving as a Screenset, so that you are able to jump to it at any time using a single keystroke. *Paul White*

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Just like the VST Mixer, *Cubase's* Arrange window implements lots of little features that are there to make life easier, and this month's *Cubase Notes* explains how to make best use of them. There's also news of the latest *Cubase* 5.1 upgrade.

Mark Wherry

In November 2001's *Cubase Notes* I pointed out some of the lesser-known functions of the VST windows. This month, I'm going to do a similar thing, but focusing on the Arrange window. So if you've ever wondered how to make the structure of your songs clearer by using Marker tracks, Group tracks, and some of those commands in the Structure menu, read on...

Setting Up A Marker Track

The Marker track is a very useful way of giving human names to the sections that make up the structure of your arrangement, such as verse and chorus. To display the Marker track, simply click the Marker button on the Arrange window's function bar: if you know how to work with MIDI and audio parts, then you already know how to work with Marker parts as well. To add a new Marker part, click the pencil tool on the Marker track where you want the part to begin, drag the 'rubber band' to the length required for the new part, and then type a name when prompted. Alternatively, you can set the left and right locators and double-click in the Marker track area to create a Marker part between the locators. Marker parts can also be moved with the arrow tool, while their start and end points can be repositioned using the pencil, and a Marker part can be renamed by Alt (PC)- or Option (Mac)-double-clicking on it.

Once you've created some Marker parts in this way,

navigating your song and setting locators becomes much more convenient. When you're working with the Arrange window or any of the editors, you can access a pop-up menu containing a list of the Marker parts on the Marker track by holding down Shift+Ctrl (Mac: Option+Ctrl) and clicking in an empty space. Clicking on the name of a Marker will set the left and right locators to the start and end of that Marker, and clicking on the one of the start or end positions will move the song position line to that location.

The Structure Menu

The third section of the Structure menu is home to many oft-forgotten (but very useful)

✓ Intro	1. 1. 1. 0	5. 1. 1. 0
Verse 1	5. 1. 1. 0	13. 1. 1. 0
Chorus 1	13. 1. 1. 0	21. 1. 1. 0
Bridge	21. 1. 1. 0	25. 1. 1. 0
Verse 2	25. 1. 1. 0	33. 1. 1. 0
Chorus 2	33. 1. 1. 0	41. 1. 1. 0
Coda	41. 1. 1. 0	45. 1. 1. 0

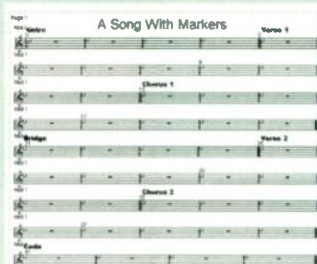
The Marker track pop-up menu.

commands for slicing up and adding space to your Arrangement. To start with, have you ever wanted to remove four bars from the middle of your song without having to use the scissors tool and then delete the parts manually? By using the Cut at Locators command, you can! If

Using Marker Tracks In The Score Editor

Working with the Marker track can become especially useful if you're doing any work involving *Cubase's* Score editor. Once the Marker track is set up, it can be used by the Score editor to automatically create rehearsal marks by selecting **Score / Format / Marker Track to Form**. This very handy feature adds a rehearsal mark at the start bar position of every Marker part, although because the vertical positioning of the added symbols isn't always as tidy as you might like, going through and manually tweaking them may also be a good idea.

Even if you're not creating rehearsal marks, the Marker track can still be useful to anyone working with the Score editor. If you select **Score / Format / Show Marker Track**, the Marker part labels will be displayed on your score, which is useful if you want to refer to sections of your music by name, saving you from referring back to the Arrange window. To hide these labels again at



These text labels are actively linked to the Marker track, which means it's possible to rename them by holding down Alt and double-clicking them.

a later stage, simply select **Score / Format / Hide Marker Track**.

If you don't like the font or text style used for the marker part labels by default, it's very easy to change them by selecting **Preferences / Scores**, clicking on the Global Text tab, setting the 'Font for' parameter to Marker Parts, choosing the font and style you want for the marker part labels, and, finally, clicking **OK**.

you want to remove the section of your song between bars 21 and 25, for example, simply set the left and right locators to bars 21 and 25 respectively, and select **Structure / Cut at Locators**.

Although you can undo this operation, unlike traditional clipboard-style commands, you can't paste the cut section to a new location later on.

In addition to removing sections of a song, there are times when you need to insert more empty bars at a given point. Let's say you wanted to add eight bars to your song at bar 5: simply set the left locator to the point you want to insert the empty bars, in this case bar 5; add the number of bars you want to insert to the

position of the left locator (in this case $5+8=13$), and set the right locator to this position, bar 13. Now choose **Structure / Insert at Locators** and eight bars will be created at bar 5, shifting the rest of the song forwards.

Another useful command for inserting and removing bars from an Arrangement is the cunningly named **Insert/Remove Bar(s)** command. This might appear to be superfluous after the last commands, but for the fact that it has a secret weapon. Going back to our last example of adding eight bars at bar 5, let's suppose the rest of your song was in 4/4, but you wanted to add eight bars of 6/8 time. Normally this would mean using **Insert at Locators** and manually adding the time signature changes, but when you use **Structure / Insert/Remove Bar(s)**, it's possible to specify the

Cubase Tips

A handy way to make multiple copies of a single part is to use the pencil tool, as if you were extending the part, but with the Alt/Option key held down. The part will be copied as many times as are required into the length that you dragged the rubber band to.

Alt/Option-clicking a part with the glue tool joins all the parts together from that point forwards, so to glue all the parts together on a track, simply Alt/Option-click the first part of that track.

As well as using the rewind and fast forward buttons, or clicking at the top of the Arrange window, you can change the location of the song position pointer by picking up the green blob in the Transport window with the mouse and moving it.



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..."**



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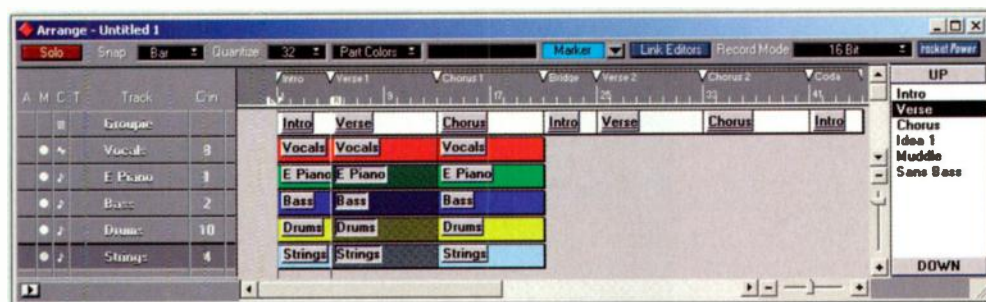
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The parts that make up the elements of this song have been Grouped for easier manipulation. Note that the original parts have been muted rather than deleted.

- time signature for the bars you want to add. *Cubase* automatically makes the change to 6/8 at bar 5, and then the change back to the original time signature at bar 13.

There are always times when you want to copy a chunk of your song to another location, and for these times there's the Copy Locator Range command. Simply use the left and right locators to mark the section of the song you want to copy, set the song position pointer to the destination where you want the section to be copied to, and choose Structure / Copy Locator Range. The other two commands in this section are also very useful when you want to split parts on multiple tracks in one pass. Split at Locators will split all the parts at the points where the left and right locators intersect, while Split at Markers will split all the parts at the points

where the markers you've set up on the marker track start and end. An interesting thing to note with the 'Split/Cut/Insert at...' and Copy Locator Range commands is that muted tracks are left unaffected, but the Master track, like any other, is affected.

Group Action

One aspect of the Arrange window that often gets overlooked is a feature known as groups, which has been included in *Cubase* since the early Atari days. Unlike folders, which are purely visual, groups allow you to take a number of parts and pack them into a single group part. Group parts can then be placed on Group tracks and manipulated just like any other part on the Arrange window, with the exception that you can't cut them up with the scissors or use 'Split at' commands. This method of

arranging is useful if you want to work with a more pattern-based approach to sequencing. For example, you could build groups for the sections of your song, such as verse, chorus, bridge, and so on — but these are only the most obvious examples. Any aspect of your song that might need to be repeated later on is eligible to become a group.

Packing a selection of parts into a group is very easy: simply select the required parts, choose Edit / Build Group or press Ctrl/Command-U, and then type a name for your group when prompted and press Enter. To hide and show the list of groups in your current Song, choose Edit / Show/Hide Groups or press Control/Command-J. I say 'current Song' because groups are global to the currently loaded Song, meaning that any Arrangement in a Song can share

the same group list.

Groups can be dragged from the group list onto Group tracks on the Arrange window, which are created by setting the track type of an empty track to Group track. A really neat feature when adding groups to a Group track is that if you want to insert a group part between two existing group parts, you can simply hold down Alt/Option when you drag the group and the existing group parts will be nudged along automatically to make space. The only thing to be careful of when working with groups is not to delete any of the original parts used in a group, because if you delete a part used in one of the groups, it's also deleted from that group. You'll need to keep the original parts, but mute them so you don't get any weird flanging effects by having the same thing played twice. **SOS**

Cubase VST 5.1

The deadline for this column coincided with the release date for the *Cubase VST 5.1* update, which should be widely available on the Net and from local distributors by the time you read this. The two headline features are a collection of 14 new plug-ins (including 11 effects and three instruments) and processor optimisations for the Pentium III and IV, AMD Athlon, and the G4's Altivec Velocity Engine.

Of the 11 new VST effects, only *DaTube* and *MIDIGate* are Steinberg creations. The other nine (*Autopole*, *BitCrusher*, *MIDI Comb*, *Mysterizer*, *PhatSync*, *Ring Modulator*, *Rotary*, *SubBass*, and *Vocoder*) have been licensed from well-known plug-in developers FXpansion and MDA. Many of these have been freely available for some time, although GUI front-ends have been created for the newly-licensed MDA offerings, which is a welcome addition.

The three new VST Instruments

are a big improvement over those previously supplied with *Cubase*. The flagship is *JX16*, a 16-voice virtual analogue synth licensed from MDA, closely followed by Steinberg's own *CS40*, a six-voice dual-oscillator virtual analogue synth. *LM9* has been superseded by *LM7*, a 24-bit 12-voice drum module which includes three new drum kits of a much higher quality than the old *LM9*, although this is still included for compatibility with older songs.

In some respects, *Cubase 5.1* is a slightly quirky upgrade, with so many well-known plug-ins being included, and it's slightly disappointing that Steinberg didn't take advantage of the marketing opportunity to include surround support in this update. However, processor optimisations are always welcome and, considering the upgrade is free, it would be churlish to complain, especially if you didn't already own the FXpansion plug-ins. And if you want

proof of the quality of results that can now be achieved using only a copy of *Cubase 5.1*, check out Peter

Gorges' demo song, which should be downloadable from Steinberg's web site by the time you read this.



Cubase 5.1 includes an impressive selection of new plug-ins.

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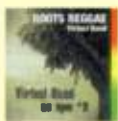
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► configured in the note list. However, MIDI data which might appear to be perfectly quantised on the screen might not be in reality — the Drum Editor quantises MIDI data 'visually', especially when longer note values are selected in the View Resolution pop-up menu. This isn't a problem as such, but something to be aware of. In any case, the Drum Editor's quantise options are one of its strongest points, with real-time (ie. non-destructive) Quantise, Groove Quantise and Humanise options available for individual pitches within a track. These are selected for each pitch in the Quantise pop-up menu, and their settings appear in the bottom left pane of the Drum Editor. Often this pane won't be big enough to view all the settings, but clicking the little square at the far left of the middle strip automatically arranges things so that all the settings become visible — clicking the square again returns the window to its former state.

In addition to Quantise and Humanise, each MIDI pitch in the Drum Editor can have its own Offset value — negative numbers move the note earlier in time, and positive numbers move it later. Along with Groove Quantise, different Offset values for individual drums (especially snares) can really change the rhythmic feel of a track, and are well worth experimenting with.

Those are the basics of the Drum Editor. Next month, we'll look at some not-so-basic points, such as advanced strategies for

getting the most out of it, and more tricks and tips.

New Toys

Regular readers of Performer Notes will know that I bang on a lot about Cycling 74's *Pluggo*, which is not only a collection of interesting (and sometimes plain weird) plug-ins, but a very good VST plug-in host too. There aren't many VST plug-ins that don't work inside *Pluggo*, and its big advantage over Audio Ease's *VST Wrapper* (at least for the time being) is its full implementation of *Digital Performer's* mix automation.

Well, it seems that Cycling 74 are getting ready to unveil version 3 of *Pluggo* early in 2002 — whilst there are no details as yet, it's definitely one for DP users to keep their eye on. The company is a lot more forthcoming about *Essential Instruments*, though. This is a collection of software instruments which includes samplers, modelling synths, granular, additive and FM synths, and (surely best of all) a Theremin emulator. It's not entirely clear whether these will be native MAS (MOTU Audio System) plug-ins, or if they'll run as VST plug-ins in the *Pluggo* environment, but either way, if they manage to retain some of the slightly rough-edged, anarchic feel that *Pluggo* has always had, they should be well worth having, especially given the price — a mere \$99.

Taking prizes for being the first real MAS instrument on the market, though, is IK Multimedia's *Sampletank* sample-replay plug-in. *Sampletank MAS* was somewhat unexpected, but it's a particularly welcome addition to the ever-increasing range of third-party MAS plug-ins which are now available. What's more, fill in a form on the *Sampletank* web site

(www.sampletank.com) and *Sampletank Free* can be yours for — you guessed it — nothing. There's a pretty good piano sound for download too, as well as the promise of new sounds each month. Of course, the full versions of *Sampletank*, which come with gigabytes of samples, are also available in MAS format. This should be a godsend for users who have been trying to get DP to play nice with other VST-based software samplers. The only downside seems to be that *Sampletank MAS* is fairly processor-hungry.

Although now somewhat overshadowed by *Sampletank*, the wait does seem to be nearly over for the MAS sample-replay modules from French company Plugsound. Unlike *Sampletank*, these focus on a single type of instrument, but individually they're cheaper (\$99.95 to be precise), although it remains to be

DP3.1 Rumours

Some rumours about the next update to *Digital Performer* have been floating around on the Internet recently. If they're to be believed, it seems DP3.1 will be blessed with unlimited levels of undo, as well as a 'timeline' undo, allowing undo actions to be applied to specific sequence sections when necessary. There should also be implementation of triplet note values in rhythm-grid pop-up menus.

sounding results with minimum fuss, for just \$149. Antoni also tells me he'll soon be making available a software bundle for DP users consisting of *StereoPack* and *MixPack* along with *VST Wrapper*. The web site at www.pspaudioware.com has lots of demos and more info.

TC Works, who make the Mac audio editor *Spark*, have just started selling *FXMachine SE* via



Muon Software's *Tau Pro* VST plug-in, seen here under *Pluggo*.

seen how they sound. Check www.plugsound.com for demo versions.

PSP Audioware, whose previous offerings include the *StereoPack* and *MixPack* VST plug-ins, have just announced a MAS version of their very tasty *VintageWarmer* plug-in. This is an emulation of a classic (though fictional) multi-band compressor/limiter — everything about it shouts 'analogue', from its chunky controls to the funky animated VU meters! Antoni Ozynski, the founder of PSP Audioware, let me have a VST version of *VintageWarmer* to play around with ahead of the release of the MAS version, and I can honestly say it's one of the nicest plug-ins I've used. It's rock-solid under *Pluggo*, and gives lovely

their web site (www.tcworks.de), and it's available in a dedicated MAS version. *FXMachine SE* is yet another VST host — and whilst it has no support for VST instruments or other plug-ins that utilise MIDI, it does offer very flexible effects routing, and could be worth the modest outlay of \$29.95 for anyone who likes complex effects processing.

Finally, I've long been a fan of Muon Software's *Tau TB303* emulator, and I'm happy to say that *Tau Pro* is now available for a measly \$20, and works a treat under *Pluggo*. *Tau Pro* is a seriously addictive little monosynth, capable of a surprisingly wide range of sounds, and is a must for anyone using DP3 for pop or dance music production. ☺



The VST version of PSP Audioware's *VintageWarmer* plug-in running under *Pluggo*.

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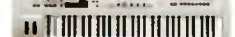


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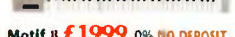
Motif 6 **£1499**
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The classic industry digital mixer at an amazing breakthrough price. **GAK Price from £3099**
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AT LAST - the rack version of the mighty Triton. Supreme performance modes, and powerful sampling, plus room for 8 expansion cards make this a must for every studio.
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Fantastic New 44 note analogue modelling keyboard with sequencer
RRP £749 **£565 = 0% NO DEPOSIT**



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Fantastic New Rack analogue monster
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TRITON

Probably the only keyboard you will ever need to buy, integrating sampling, sequencing and killer performance. Features with optional expansion boards! Without doubt the best value product of 1999.
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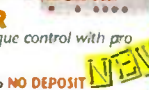
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New 12 track digital recording workstation
From £799 **24 x £33.29 0% NO DEPOSIT**



KAOSS MIXER

Combines Kaoss pads unique control with pro 2-channel mixer
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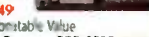
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Unmistakable Value X5 D **RRP £800 £399**



Superb entry level keyboard **EXCLUSIVE DEAL**



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MX2424

Digital 24 track recorder
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Portastudio 6 inputs with mid sweep EQ
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PORTA 02

Multitracker **£99**



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CDRW700

New Professional mastering CD recorder
RRP £499 **GAK Price £399 = 0% NO DEPOSIT**



DA20 MK II

Industry Standard DAT machine.
£429 = 0% No Dep



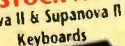
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SUPERNOVA

Valed bit synth of '98. Now 24 note polyphonic, 8 port multitrack. Amazing analogue modelling.
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LEAD 3 RACK

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MODULAR RACK

The industry's Best Kept Secret RRP £1299 **£989 0% NO DEPOSIT**

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LEAD 3 RACK

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LEAD 3 RACK

£1395 24x £58.12 = 0% NO DEPOSIT

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Multiband Denoiser **£109**

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Ultra-Lite Pro **£79**

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We've had a lot of requests for a Notes column on Cakewalk's new MIDI + Audio sequencer, *Sonar*. Well, here it is, with news of the latest upgrades and tips on vocal thickening, harmony generation and working with different track heights.

Craig Anderton

Welcome to the first instalment of *Sonar Notes*! I've contributed several articles to *Sound On Sound* over the years, but this is the first time I've had the honour of writing a column... and it's great to be here.

I became a *Sonar* fan for practical reasons: at present, it's the only program to combine deep MIDI editing, digital audio recording, and *Acid*-style 'on-the-fly' looping. This is a perfect combination for the kind of music I create and mix. I still use other programs, such as *Reason*, *Acid* and *Cubase*, but these days, the majority of my studio work and play gets done with *Sonar*. Hopefully, this column will become a clearing house for *Sonar* tips and information, so if you have suggestions, complaints, or ideas, please send your emails to sonarnotes@sospubs.co.uk. I can't promise to reply to every letter, but I will read them!

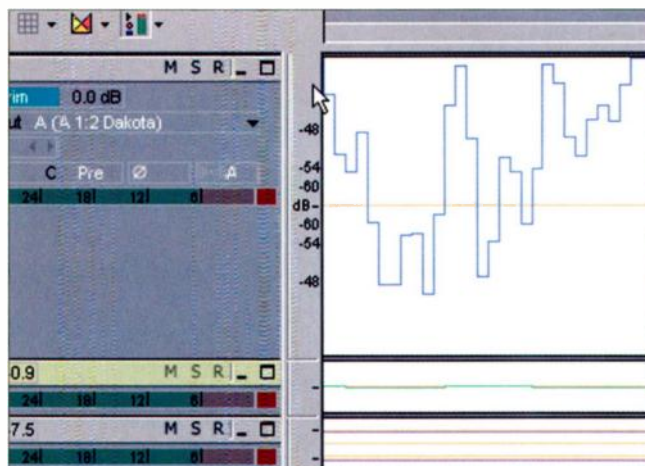
Upgrade Time

Just before I submitted this column, version 1.3.1 of *Sonar* appeared on the Cakewalk web site. If you haven't upgraded yet, go to www.cakewalk.com/Support/Sonar/patches.html and download the patch. It's about 5Mb, so even those with dial-up modems have no excuse to avoid upgrading.

Version 1.3.1 is well worth the download time for such new features as the Track View Scissors Tool. At first, I didn't see the value of this, because you can always split a clip by stopping, and hitting the S key (as in *Acid*, S

is the 'split' keyboard shortcut). But the key word here is 'stopping', and with the scissors tool, you can split a clip without having to stop. This is tremendously handy when looping, as you can cut up and modify a loop or clip in context with the music.

Audio scaling is another useful feature, as you can now change the scaling of the track's level display without changing the track height, by clicking and dragging vertically along a track's left edge. I've been surprised how much I use this feature to cut audio exactly on zero crossings, check for DC offset, and make sure that loop endings fade out properly. It's also handy for gauging the noise



This shows the highest vertical audio resolution, which displays signal levels below about -42dB. Incidentally, at normal resolution, the signal shown looks almost like a straight line. Keyboard shortcuts let you change resolution on all tracks simultaneously, or you can adjust individual tracks.

floor. If you right-click on the ruler, you can choose its calibrations as dB, percentage of full scale, or magnification amount. Double-clicking on the ruler restores the view to minimum resolution.

You can also change the resolution of all tracks simultaneously. This is important when splitting multiple tracks, as it's a good idea to inspect whether you're going to be cutting in the

middle of any signal that might cause a pop or click. Use Alt+up arrow to zoom in, and Alt+down arrow to zoom out. (You can also Ctrl-click and hold on the standard track height vertical zoom buttons to change scaling, but I prefer using keyboard equivalents for the fastest operation.)

There are many other goodies in 1.3.1, including the ability to extract timing information from digital audio. After installing the

Sonar's Vocal Harmony Generator

Have you used *Sonar*'s intelligent harmony generator function? Probably not, because it doesn't exist. But if you're willing to provide the intelligence (ie. teach *Sonar* the rules of harmony), *Sonar* will provide the harmonisation. Here's how:

The project in the screenshot, right, contains four tracks of vocals. The teal-coloured one at the top is the original vocal, while the violet one below that is the cloned version, which has been processed with the doubling technique mentioned in the main text.

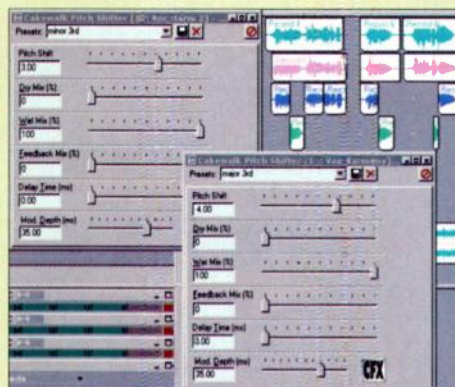
The next track (blue) is also a cloned track, but it's being processed through the pitch-shifter set to a major third. However, note that some elements have been cut from this track and moved to the next track down, which is processed through the pitch-shifter set to a minor third. As you've probably guessed, this is what I mean about teaching *Sonar* the rules of harmony: it doesn't know which

notes should receive minor third or major third harmonisation, so you have to cut the track appropriately, and assign the right phrases or notes to the right tracks.

hence the strategy of having entire tracks dedicated to major- and minor-third processing.

The standard caveat regarding pitch-shifting applies to this

application: the further you stretch pitch, the less realistic the sound. Also, the Cakewalk Pitch Shifter does not preserve formants during shifts, giving rise to the infamous chipmunk sound when you pitch up, and Darth Vader when you pitch down. However, I noticed when pitching up a major third that the formant change added a bit of voice-on-helium effect, which when mixed back in the tune, actually sounded pretty cool — if the Pitch



This may require zooming way in on the cloned track so that you can make cuts in the space between phrases. Also, note that although you can right-click on a digital audio clip to change its pitch, this works only if the clip is a groove clip. Odds are you won't be using the vocals as groove clips,

Shifter did have a 'preserve formant' option I wouldn't have used it anyway! Of course, 'human' harmonies will sound better than synthesized ones, but if you need a quick harmony line in a few spots, or find that the perfect harmony part is just outside your range, try this out.

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Linking & Resizing Track Heights

If you've used *Sonar* for any length of time, you've doubtlessly come to appreciate the way you can change the track view height to reveal fewer or more parameters. Doing this also changes the height of the digital audio waveform display, but adjusting each track to show exactly what you want (for instance volume, pan, trim, and meters) can be a tedious process. That's why the following shortcut is so helpful, as it can force any selection of tracks, or all tracks, to take on the same height as any individual track you adjust. Here's the process:

1. Select the tracks that should follow your 'template' track. If you want them all to follow, use Edit/Select/All, or the key equivalent Ctrl+A. To select or deselect tracks, Shift-click (Ctrl-click does the same thing) on the track number.

2. Press and hold the Shift key, then adjust the divider bar at the bottom of any of the selected tracks to set the track height.

3. After adjusting the track height, release the mouse button. Now all tracks are the same height, and display the same parameters. (Note: you could also

press and hold Shift after adjusting the track, as long as you haven't released the mouse button yet. Adjust as desired, then release the mouse button while the Shift key is being held.)

4. If you change your mind, just release the Shift key before the mouse button.

Incidentally, note that this doesn't work with the minimise/maximise buttons or any controls, just the track height. In other words, you can't for example select all tracks, hold Shift, minimise one track, and then have all the other tracks minimise when you release the mouse button.

Better Vocals

Here's a quick tip for thickening/doubling vocals: Select the vocal track you want to thicken, and choose Track / Clone. Tick the Events, Properties, and FX (if the track uses any effects) boxes, but do not tick Link to Original Clip — the clone needs to be independently editable. Click on the Clone function OK button, and you now have two vocal tracks.

Now, right-click on the copied track's FX field, and choose Audio Effects / Cakewalk / Pitch Shifter. Set the Pitch Shift parameters as follows:

- Pitch Shift: -0.24
- Dry Mix: 0
- Wet Mix: 100
- Feedback Mix: 0
- Delay Time: 2.61
- Mod Depth: 12.16

These are just suggested settings that work well with my voice — feel free to adjust for the best effect with your vocals. For the thickest, smoothest sound, pan the two vocal tracks to center. If you pan one vocal full right and one full left, you'll hear two individual vocals instead of a rich, composite vocal. Panning to opposites works very well for processing something like a background vocal chorus, as the individual parts should be thick enough by themselves: shifting pitch widens the stereo spread.

You could also try panning lead vocals slightly left and right (for instance with the left channel at 10 o'clock and the right channel at 2 o'clock). This gives a somewhat fuller sound and a somewhat wider



If you select all tracks and change the height of any one track (as shown in the upper view), when you release the mouse all selected tracks become the same height as the one you adjusted.

stereo spread, which can also be useful under some circumstances.

DXi Watch


One of the complaints about *Sonar* when it first appeared was that the availability of native DX Instruments lagged well behind that of those compatible with VST 2.0. I got around that problem by using FXpansion's *VST-DXi Adapter*, and had no problem getting VST Instruments working in *Sonar*. But that's becoming less of an issue as more DX Instruments show up. Native Instruments have been particularly good about adapting their products for *Sonar*, and FXpansion's *DR-008* drum


module is also *Sonar*-friendly.


The latest company to offer DXi compatibility is SpeedSoft, whose *VSampler* is, as you might suspect, a soft sampler.

Despite being quite inexpensive, *VSampler* has many very useful features, like being able to load patches for the two onboard virtual synthesizers, one FM and one 'analogue'. And yes, there are complete editing functions, including messing around with operator settings for the FM synth. It's great to see that more DXi devices are starting to appear — now if we can just get more DirectX 8-compatible audio plug-ins so we can have more fun with automation... [SOS](#)

Sonar Tips

 Lining up clips in the Clips Pane can be made a lot easier by switching on the Gridline display. Right-clicking in the Clips Pane and selecting View Options allows these vertical lines to be switched on.

 The Snap To Grid function provides plenty of control when placing or moving Clips around the Clips Pane. Snap To Grid can be toggled on/off via the button above the Track Pane or using the N key.

 The Shift+N keyboard shortcut quickly opens the Snap To Grid options dialogue, allowing the resolution of snapping (whole bar, half bar, quarter note, and so on) to be easily set. *John Walden*

Further Reading: Sonar Power!

It's been out less than a year, but already, third-party books about *Sonar* are starting to appear. *Sonar Power!* (Muska & Lipman: soft cover, 470 pages) from Scott Garrigus is written for beginner to intermediate readers who need assistance to get up and running in today's computerised world. It doesn't rewrite the manual, but covers much basics-oriented material and also gets a little deeper into *Sonar*'s fundamental concepts. The book is written in a friendly, relaxed, but not at all patronising style: quite frankly, even though I'm very familiar with *Sonar*, this book helped fill a few gaps in my knowledge.

Cakewalk get credit for technical editing, but unfortunately the book was published prior to the most recent program revisions. If you make it through *Sonar Power!*, though, you'll know enough to be able to make sense out of the update notes. If you actually read manuals, are experienced with computers, and familiar with Cakewalk's *Pro Audio* series, this book is probably redundant. But for those who want to get started with a good focus on the most important tools and techniques associated with *Sonar*, then *Sonar Power!* is an excellent point of departure. **W** www.muskallipman.com.

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Our usual cache of PC nuggets this month features news of the arrival of Windows XP, a review of a cost-effective and versatile FM synth plug-in, and info on the *HALion* software sampler's updated file export and import facilities.

Martin Walker

As I write this, Windows XP is being launched in London by Steve Ballmer, CEO of Microsoft Corporation, and my own review copy of the Home Edition arrived from Microsoft UK's PR company yesterday. This time around — and for the first time in my experience — music magazines like *SOS* are being approached directly, which is a good sign as far as I'm concerned, since it must mean that Microsoft have finally noticed the small throng of musicians on the periphery of their global multimedia empire.

I still don't think they realise that the first thing musicians do when approaching a new operating system is try to discover how many unwanted 'features' we can disable, to let the true sustained performance shine through — but then musicians don't use computers in a typical fashion, and after the sad demise of BeOS it seems we can't expect an OS dedicated to our goals.

Of course, whether or not we upgrade to Windows XP *en masse* will depend on the availability of suitable soundcard drivers, compatibility with the bulk of music software, and how we react to Microsoft's 'Product Activation Wizard', which requires you to activate Windows XP either on-line or via a telephone call. This technology is designed to stop casual piracy by home users and small businesses, but it has caused great consternation among potential users, since the code generated is based on what hardware you have installed, making it a strong possibility that you may need to persuade Microsoft to provide another

activation code after you install new hardware.

One thing is certain, though; with the twin claims of "a new level of reliability" and the ability to "handle digital media like a pro", Windows XP is worth a serious look by musicians, and this is just what I intend to do in next month's PC Musician feature, once the initial rush of lemmings has exposed its bugs, and music software developers have had a chance to make their feelings more generally known.

FM Heaven?

The hard-plucked basses, brass, organs, electric pianos, and delicate bells of FM synthesis, as featured in Yamaha's famous DX series, are once again fashionable, but you don't necessarily have to invest in hardware this time round. This month's shareware spotlight falls on developer Cesare Ferrari, whose *FMHeaven* incorporates all the best features of the DX7 in VST Instrument form, but then goes beyond the DX7's original spec, by replacing its 32 fixed algorithms with a Modulation Block that allows

unlimited combinations of its six Operators (oscillators).

The latest version of *FMHeaven* (1.3) goes even further, by substituting the fixed sine-wave Operators of the DX7 for eight different oscillator waveforms, just like the TX81Z, but without the latter machine's more limited four-Operator format and eight-voice polyphony.

FMHeaven's graphic interface is divided into six sections, starting with Osc-Tune on the left-hand side. Here you can tune each of the six Operators over an eight-octave range, with or without keyboard tracking, and choose between the eight waveforms mentioned earlier. From here the Operators pass into the Osc-Mod section, otherwise known as the Modulation Block. The user interface of this section of the instrument has been greatly improved since version 1.2, since parameter values can now be directly altered by dragging them up or down with the mouse. In the Volume section you can balance up the respective levels of the Operators; handy Mute buttons let you switch Operators in and out to hear their effect on the final sound.

However, the beauty of FM is the way sounds evolve over time and respond naturally to MIDI velocity, and these features are controlled in the Env section. Each of the six Operators has its own four-stage envelope, shown in graphic form, with adjustable rate and level for each stage, plus

Tiny Tip

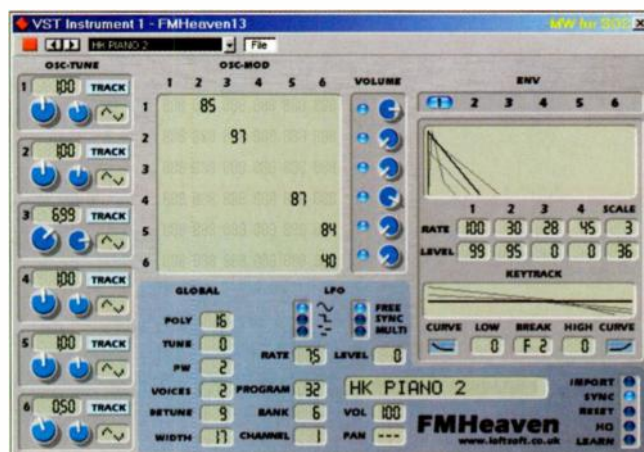
Here's a tip I discovered quite by accident this month, when trying to compare two versions of the same VST Instrument. I knew that if I dragged an identically named DLL file into my VST Plug-Ins folder it would simply replace the older one, but rather than creating a new folder I tried just renaming one of the DLL files, and leaving them both in the same folder. It not only worked for VST Instruments, but for VST plug-ins as well.

Most *Cubase* users already know that spending some time sorting your plug-ins into folders can make finding the right one a lot quicker. You can do this by effect type (EQ, Reverb, Echo and Delay, and so on), or by developer (Expansion, Steinberg, TC Works, Waves...). However, if, like me, you find it annoying that all your Waves plug-ins are at the end of a long list, simply because they start with a 'W', you can now rename them, or simply precede them with an underscore symbol (Shift+Minus), and they will magically appear at the start of your list.

a velocity sensitivity setting. Envelopes can also be copied from one Operator to another, making sound creation far quicker.

Keytrack lets you alter keyboard scaling around a selectable breakpoint, to fine-tune the sounds at each end of the keyboard. There's also an LFO section, offering sine, square, and sample and hold waves, and three LFO modes.

Another powerful new feature in this version of *FMHeaven* is the ability to increase the number of voices for each note played, to build fuller sounds. You can use up to 16 — which, in combination with the detune and width controls, allows the creation of wonderfully rich stereo patches. The Sync mode in the LFO section determines whether or not the six Operator waveforms are reset to the start of their cycles when the note starts. When Sync is disabled, multi-voice patches can free-run, for an even fatter effect. A Learn function lets you move an *FMHeaven* control and then send a MIDI controller message that allocates that control for automation purposes.



With an attractive, easy-to-use graphic interface, and the power to import DX7 and TX81Z SysEx files, *FMHeaven* must be the cheapest way to add FM sounds to your VST Instrument arsenal.

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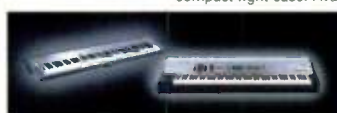


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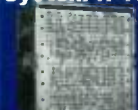
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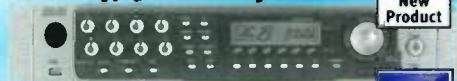
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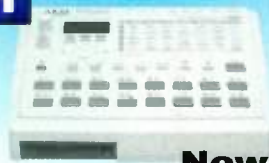
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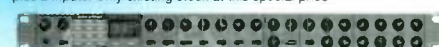
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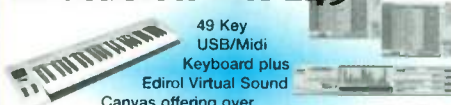
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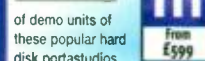
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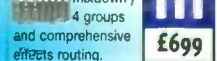
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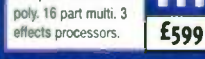
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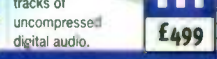
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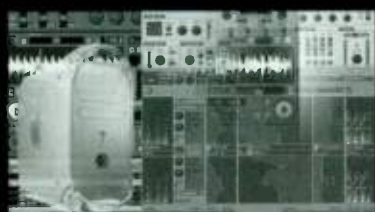
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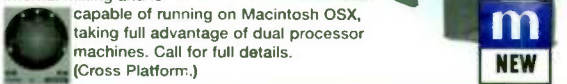
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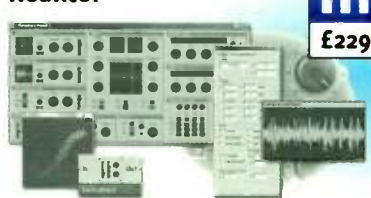
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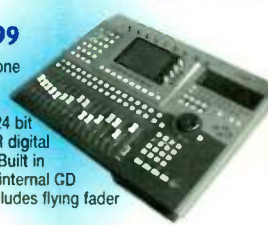
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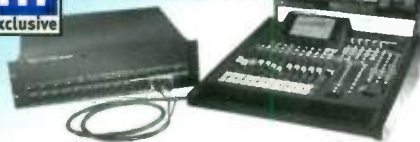
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RAMSA DA7 digital mixer including eight-channel A-D/D-A board giving 24-channels of pristine 24-bit mixing, fully automated, mint, £1950 ono, A-D/D-A board, £495 if sold separately = 0117 939 4241/079 7652 4951 (Bristol)

ROLAND E24 mixer, 24-channels of EQ with sweepable mids, four auxiliaries/returns, home use only, £375 Ovno. = Neil 01903 502000/690210 (West Sussex)

ROLAND SP808EX E-Mix Studio, complete with OP1 expansion board giving six extra outs, digital in and out, Zip, SCSI, 12 months old, boxed as new, £695, = 079 7652 4951 or email seanhockey@cableinet.co.uk (Bristol)

ROLAND VS1680EX effects board, brand new, boxed, £110 for quick sale = Steve 01429 222517 or email visio9@msn.com (Teesside)

SOUNDCRAFT RAC PAC sound mixer, excellent condition, £250 = Chris 01202 779000 or email chrishall@hallmarkproductions.co.uk (Poole, Dorset)

SOUNDCRAFT SPIRIT STUDIO 24:8 2 mixing console, studio use only, quick sale, £500 ono. = Leo 079 6762 5970/01254 832092 or email kushmusic@supanet.com (Chorley, Lancs)

STUDIOMASTER DIAMOND 16 2 entry-level mixer, 16 channels, two-aux send/returns, 16 XLR mic inputs, good condition, £210 = Jim 079 4486 4178 or email crestid@aol.com (Colchester, Essex)

STUDIOMASTER DIAMOND 12 2 12-channel XLR/line mixer, tape and phono in, aux/mon and stereo return, good nick, £150 = Dave 0114 255 8557 or email MBP95DH@sheffield.ac.uk (Sheffield)

TASCAM 348 tape recorder, good condition, complete with take up-spool and some tape, £250 = Graham 079 7075 2680 or email grantourer@aol.com (Kenilworth, Warwickshire)

TASCAM 788, £500, Quasimidi 309, £300, Aphex Exciter 104, £75 = 01474 356132 (Kent)

STUDER A807 two track, includes trolley, £450, Studer A62 vintage two-track with spares, £650, Scamp compressor/limiter, £350, Soundcraft 12:2 desk, £400 = 01246 275479 (Chesterfield)

TASCAM DA20 MkII, as new, hardly used, no box, £300 = 01438 229434 (Hertfordshire)

TASCAM TMD4000, 24 channels of T/DIF I/O, meterbridge, latest software version, condition as new, can demo, £1900. = Russ 079 7330 7158 (Hitchin, Herts)

YAMAHA AW4416 12Gb hard drive, CD writer, MY-BAD eight channel analogue input card, hardly used, boxed with manuals, £1850 = 077 5471 2880 or email john@monohub.co.uk (London)

YAMAHA AW4416, mint condition, hardly used, boxed with all manuals and software, £1500. = 01273 774557 (Sussex)

YAMAHA CD8AD eight in, eight out card for O2R, was £650 new, will sell for £425. = 01604 588618 or email versati1e@ntworld.com (Nothants)

YAMAHA 01V digital mixing desk, with rackmount case, £680 = Tony 01429 422216 or email tony.waite@ntworld.com (Hartlepool, Teesside)

YAMAHA NS10M studio monitors, excellent condition, £220 ono, Lexicon Alex effects unit, excellent condition, £90 ono. = 01293 446097 (Crawley)

YAMAHA 01V digital mixer, mint condition, £795 = 01432 760613 (Hereford)

YAMAHA 02R with meterbridge, digital I/O, analogue I/O card, full specification, v2 software, excellent condition, £2800; Digidesign SMPTE slave driver, very good condition, £400; Emu eight outs for E4/6400, £250. = 077 1019 9500 (London)

sequencers

ALESIS MMT8 eight-track MIDI sequencer, £80. = 01772 452036 or email MR-Hill@arcmedconsult.co.uk (Leyland, Lancashire)

ALESIS MMT8 eight-track MIDI sequencer, very good condition, £80. = Neil 077 1252 8345 or email neilprivate@yahoo.com (Sheffield, South Yorks)

ROLAND MC505 Groovebox, excellent condition, original box, manuals, video tutorial, £450 including postage and packing or swap for JP8000. = Ricky 028 9028 0608 or email richard.123@ntworld.com (Belfast)

ROLAND MC505 groovebox, good condition, manual and lead, £375 for quick sale. = 079 8995 0897 (Gwent)

ROLAND MC50 Mk1, boxed with manual and PSU, good condition, £100 = Rich 078 0295 7569 or email richard.jones@silvon.com (Bracknell, Berkshire)

YAMAHA M0F2 MIDI data file/MIDI file player, very simple to use, very reliable, sale due to upgrade to MC80, £125 = 077 7629 6791 offers near = Steve 01405 740301 or email elliotstave@btinternet.com (Doncaster)

YAMAHA RMIX sequencer and synth module, with many dance sounds, reluctant sale, £300 = 079 6092 4178 or email avill02@attglobal.net (Slough, Berkshire)

sampler

16Mb SIMMS, quality Kingston brand, fit for Akai S3000 and many other samplers, two available, £20 each or the pair for £38 = 020 8698 0945 or email will.b@btinternet.com (London)

AKAI MPC2000XL sampler, very good condition, eight outs, 32Mb, CD-ROM player, £690 = Frank 078 1616 5571 or email synthh@aol.com (Edgware, Middlesex)

AKAI S950, manual, disks, £195; Emu Vintage Keys Plus, boxed, manual, £220, both in very good condition = Rod 01273 571653 (Brighton)

AKAI S2000 with OS v2, EB16 effects board, loved and cherished excellent working order, £299 = Etienne 01273 770914 or email etn@mac.com (Hove, East Sussex)

AKAI S2800 perfect entry level sampler, no manual or box, £350 = Jim 079 4486 4178 or email crestid@aol.com (Colchester, Essex)

AKAI S3200 32Mb, second filter board, digital in and out, effects board, 10 outputs, SCSI, home use only, £500. = Leon 020 8444 9137 or email leoncar954@hotmail.com (London)

AKAI S3000XL 32Mb and manual, good condition, £400 = 079 3057 3840 or email steve.hellier@lineone.net (Brockley, London)

AKAI S3000XL, 24Mb, 10 outs, manual, good condition, 10 sample CDs, £430, EB16 effects board, £140; will sell both together for £500 = 020 8257 0739/020 7937 0470 or email solomon_p@hotmail.com (London)

AKAI S3000XL memory, also suits S2000 and MPCs, 2x16Mb, still have the packaging, £25 each; pro SCSI cables not needed as I have sold samplers, three meter cable with two 25-pin plugs, two meter cable with 50-pin plug-to-25-pin plug (suit Akai-to-CD-ROM) and one meter cable with two 50-pin centronics plugs, £15 each, one centronics terminator for £10 = (after 6pm) 020 8715 2198 (Surrey)

AKAI S3000XL 32Mb, never used, digital ins and outs, 10 outputs, £600, SCSI 8U rack, £60, flightcase, Roland S770 sampler, internal hard drive, digital in/out, a classic, selling with Philips colour monitor and Roland mouse, cost £6000 new, selling for £800 = 07802 485724 (Beds)

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STEINBERG MIXER 8 - 8 I/O MIDI INTERFACE	£219.99	£299.99
TERRETEC EVS 64 XL SOUND CARD + BREAK OUT BOX	£199.99	£449.99
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ROLAND VS1880GX HARD DISC RECORDER	£999.99	£1,399.99
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EMU E4KT TURBO SAMPLER	£1,374.99	£2,599.99
ROLAND VP9000 VARIPHASE SAMPLER	£929.99	£2,499.99
ROLAND SP808EX	£669.99	£1,269.00
AKAI S2000XL SAMPLER	£999.00	£260.00
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NOVATION SUPERNOVA 2 PRO RACK	£999.99	£1,399.00
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DD FEDERATION PRO FX	£299.99	£549.99
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YAMAHA CCR1000 CD RECORDER	£459	£1,175
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NEUMANN TLM 193 CONDENSER MIC	£699.99	£999.99
SOUNDCRAFT SPIRIT 328 AES/EBU INTERFACE	£199.99	£499.99
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YAMAHA CD8AT 02R ADAT CARD 1 UNIT	£189.99	£199.99
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AKAI 55000 78Mb RAM, USB board and AKSYS software, multi-effects board, mint condition, boxed with manuals and latest OS, limited home use only, £1100. ☞ Dave 079 7784 7922 (Manchester).

AKAI SAMPLER EXPANSION boards for sale, including EB16 effects board, £160; IB304F filter board, £160; IB208P eight output board, £110; all boxed as new, can dispatch if required. ☞ 079 7665 1230 (Leicester).

EMU E5000 Ultra, mint condition, upgraded to 32Mb, Internal IDE hard disk, external SCSI CD-ROM and Emu CD-ROMs (inc EOS Link), regrettable sale, £800 ono. ☞ Nick 078 9996 5766 or email nickhelliar@hotmail.com (Bristol).

EMU E6400 sampler, 128Mb, EOS 4.1, dual 24-bit effects, 12 analogue outs, Emu Orbit, Phatt and E-synth ROMs, mint condition, £1095 ono; may split. ☞ Sean 0117 439 4241/079 7652 4951 (Bristol).

EMU E6400, 32Mb RAM 1Gb internal hard drive, £390. ☞ Stew 01382 341 017 or email stew@vis-plc.com (Dundee).

EMU E6400, upgraded with digital I/O and balanced analogue I/O, 64Mb RAM, internal hard disk, external CD drive, rackmounts and manual, home use only, £850. ☞ 077 1583 1842 (Guildford).

EMU ESi2000, excellent condition, home use only, 18Mb, easy to follow manual, £400. ☞ 01875 612196 or email fraserfield@onetel.net.uk (Tranent, East Lothian).

EMU ESi4000 Turbo, extra outputs and effects, boxed as new with Zip disk drive and disks, £450. ☞ 0121 212 3052/077 7953 2193 (Birmingham).

EMU ESi4000, 18Mb, external 100Mb Zip drive four disks, as new, boxed with manual, £300. ☞ Seamus 020 7692 0360 or email quatur@ukonline.co.uk (London).

KURZWEIL K2000RS, 16Mb and internal 1Gb hard drive, £600; Sequential Circuits Prophet 2002 12-bit sampler, genuine analogue filters with self oscillating resonance, Wine Country expansion with eight outs and 1Mb, £300. ☞ Nick 01225 332454 or email vomdoot@hotmail.com (Bath, Banes).

ROLAND VP9000 sampler, makes clipping noise when in sample mode, may require attention hence £470. ☞ 020 8471 1668 or email josin.miranda@btinternet.com (London).

ROLAND VP9000 Variphase processor, extra RAM, £700 ono. ☞ 0121 523 0939 (Birmingham).

YAMAHA A3000 v2 with Zip drive fully expanded to 128Mb, boxed with manual, Zip drive, discs and SCSI leads, £470. ☞ 079 3902 1602 or email willmills909@yahoo.com (London).

drum machines

EMU DRUMULATOR, Emu's original 1980s drum machine, wicked sounds and good sequencer, excellent condition, £120. ☞ Steve 020 7734 4760 or email stevegal71@hotmail.com (London).

EMU DRUMULATOR drum machine, circa 1982, perfect condition, £195. ☞ 078 8798 5146 (Reading, Berkshire).

EMU SP12 turbo sampling drum machine, classic hip-hop sound, in excellent condition, £800. ☞ 01432 760613 (Hereford).

EMU SP12 Turbo precursor to SP1200, very similar specs but nowhere near as pricy, £650 or £670 with external floppy drive; buyer collects. No offers. ☞ Nick 01225 332454 or email vomdoot@hotmail.com (Bath, Banes).

KORG ER1 analogue modelling drum machine, great dance sounds and recordable knob changes, in excellent condition, boxed with manual, PSU £185 ono. ☞ David 01904 410163 or email parkie68@btinternet.com (York).

NOVATION DRUM STATION, fully programmable 808 and 909 sounds, boxed with manual and power supply, £180. ☞ Jim 01332 775693/077 7582 1595 (Derby).

QUASIMIDI RAVE-O-LUTION 309 fully expanded and in good condition, mint condition only, £300. ☞ Jason 01737 772939 or email JC3D@JC3D.FSNET.CO.UK (Redhill, Surrey).

ROLAND TR808 vintage drum machine, all those classic sounds, excellent condition, complete with manual, £490. ☞ Steve 020 7734 4760 or email stevegal71@hotmail.com (London).

SEQUENTIAL DRUMTRAX classic E-PROM-based drum machine, with MIDI, individual outputs, manual, great condition, £295. ☞ 078 879 85146 (Reading, Berkshire).

YAMAHA RX21 drum machine, very good condition, £50 ono. ☞ Brian 020 7923 7638 or email ezra65@freeuk.com (London).

personnel

BASS PLAYER wanted to join mature band playing blues/rock for fun and occasional great gigs, no Jaks or Jacos, just someone who can punch that downbeat. ☞ John 078 7969 3720 or email johnm.green@ntlworld.com (Leamington Spa, Warwickshire).

MODERN PRODUCTION TEAM will take songwriters' most simple ideas and help play and produce them. ☞ Phil 079 3097 2185/079 3097 2185 (London).

PERFORMER wanted to write and perform with new rap/dance team, must be motivated, male or female, possible album release demos welcome. ☞ Ked 077 9882 8305 (North Wales).

SOUND ENGINEER and producer available to hire for your project. ☞ 020 8985 2289 or email bfrisch@freetenname.co.uk (London).

SONGWRITER/MUSICIAN with excellent songs and stunning female vocalist seeks producer with studio to record chart-bound pop/dance such as All Saints, Sugababes, Gabrielle, house, soul and R&B. ☞ Mick 020 8287 8064 or email micklee@hotmail.com (London).

computers/software

ADAPTEC 2940U SCSI card for PC, nice and fast for samplers such as Akai 'S' series, £40. ☞ Will 020 8698 0945 or email will.b@btinternet.com (London).

APPLE 9600/350 six PCI slots ideal for Pro Tools, good condition 192Mb RAM, £475. ☞ 01604 588618 or email versati1e@ntlworld.com (Northants).

APPLE G3 DAW package, 233MHz, Korg 1212, 4Gb plus 4Gb audio hard drive, Adaptec SCSI, 19-inch monitor, Yamaha CD-RW, Steinberg Cubase, Digidesign Pro Tools, will split, £750. ☞ 020 7737 2171 or email post2north@aol.com (London).

APPLE MAC 5300 Powerbook with serial MIDI interface, £250. Adaptec Power Domain 2930 SCSI PCI card, for Macintosh only, £30. ☞ Tony 01429 422216 or email tony.waite@ntlworld.com (Hartlepool, Teesside).

APPLE MAC G3, 266MHz, 192Mb, four 8Gb drives, Sonorus Audio card (two ADATs and S/PDIF), Emagic Logic Platinum 4.7, Intellicolour display, Steinberg Recycle, plug-ins, £1100. ☞ Mike 020 8747 4883 (London).

APPLE MAC G4 tower, 10Gb hard drive, 184Mb RAM, CD, Korg 1212 card, SCSI card, x4 CD-R, eight in/out, Fostex AD converter, 17-inch Formac/Sony monitor, Steinberg Cubase 4.1, £950. ☞ 078 1542 3307/01766 590402 or email jony.easterby@virgin.net (Birmingham).

ATARI 1040 STE, 2Mb, SM124 hi-res monitor, latest version of Steinberg Cubase Score v3.1 with dongle, spare 1Mb, 520 STE, in perfect condition, £250 ono. ☞ Sean 0117 439 4241/079 7652 4951 (Bristol).

CREATIVE LABS SOUND BLASTER LIVE! 5.1 including drive bay, remote control, £90. ☞ 077 7606 7265 (London).

CREATIVE SOUNDBLASTER PLATINUM, excellent condition, including box, manuals, all software, leads, live drive, £105. ☞ Ryan 079 0395 0120 (London).

DIGIDESIGN 888/24 interface, two months old, unregistered, boxed, still has protective film on bar meters, £1500. ☞ Will 020 8743 1869 or email willjohnstone@hotmail.com (London).

EMAGIC MT4 USB MIDI Port, two in, four out, loads of extra channels for your PC, USB cables and full software CD, £70. ☞ James 01252 345185 or email skribble@totalise.co.uk (Aldershot, Hampshire).

EMAGIC SOUND DIVER v2 synth control program, great for getting the right sound using a computer screen, £100, Omega Jazz 2Gb drive plus three disks, SCSI interface, boxed with manuals and disks. perfect condition, great for backing up samples and song data, £280. ☞ Antony 078 0312 7166 or email antony@madmoose.co.uk (Slough, Berks).

ECHO DARLA SOUNDCARD 24-bit soundcard, two balanced ins and eight balanced outs, £150. ☞ Dave 077 1324 8543 or email phoenix.empire@virgin.net (Hornchurch, Essex).

IOMEGA 250Mb external Zip drive, never used, boxed with SCSI cable, mint condition, good offers. ☞ Simon 078 1619 6393 or email simon.wilkinson@ntl.com (Bingham, Nottingham).

M AUDIO DELTA 1010 interface for sale, two available, provides first-class audio recording and playback, boxed with manuals, will add looms and patchbay, £930. ☞ James 01332 775693/077 8901 8759 (Derby).

MIDIMAN WINMAN 4x4 MIDI interface, four ins and four outs with SMPTE capability, fits in ISA slot, comes with drivers for Win 98, Win ME and NT, manual and leads included, £55. ☞ 020 7542 4745 or email robert.d.smith@reuters.com (London).

MOTU 2408 hard disk recording system, ADAT light pipe system, £300. ☞ Jim 079 5656 1428 or email jimdisalvo@hotmail.com (London).

MOTU MIDI Time Piece, eight in, eight out (128 channels) serial MIDI interface for Mac, cost £500, will sell for £150. ☞ Steve Allen 01507 463182 or email sa.music@virgin.net (Alford, Lincs).

PENTIUM PC with Soundblaster Live Platinum soundcard, Emagic Logic Audio Silver sequencer, Steinberg Cubasis VST and other software, £425; Roland MC303 Groovebox, £225, reasonable offers considered. ☞ 01273 297680 (Brighton).

TOSHIBA SATELLITE laptop and soundcard, one year old, PIII 450 with 6Gb hard drive, DVD, TV-out, Wami box PCMCIA soundcard, two in, four out, MIDI, S/PDIF and optical, effects/sampler, with Cubase 5, Halion, Win 98SE, £1100. ☞ Tibo 01223 331808 or email t1224@cam.ac.uk (Cambridge).

YAMAHA SW1000XG soundcard, over 1200 sounds plus great effects, £200. ☞ Gerry 028 3026 4747 (Co Down).

YAMAHA SW1000XG soundcard, boxed, manuals, latest drivers, hardly used, £220 or swap for Terratec EWS 88MT, Midiman Delta 66. ☞ Scott 078 6662 2317 or email satsuma68@aol.com (Leicester).

miscellaneous

ADA MP1 programmable valve preamp with MIDI controller, £200 ono. ☞ Brian 020 7923 7638 or email ezra65@freeuk.com (London).

FENDER 1978 Musicmaster guitar, dark red with black scratch plate, very good condition for its age, comes with OHSC, great sound and very playable, £350 ono. ☞ 079 8054 7051 or email gareth@olympia50.freeseve.co.uk (Gainsborough, Lincs).

GIBSON LES PAUL STUDIO, black with gold hardware, recently had set-up by Chandeliers to make it play like a dream, £500. ☞ Antony 078 0312 7166 or email antony@madmoose.co.uk (Slough, Berks).

HOSA QUARTER-INCH jack insert cables, two meter, many unused and in original packaging, £5. ☞ after 6pm) 020 8715 2198 (Surrey).

KLARK TEKNIK DN60 audio spectrum analyzer, calibrated microphone, good condition, must sell immediately, £375 ovno. ☞ Frank 01638 713649 (Bury St Edmonds).

QUIK LOK RACK 20U angled trolley rack, very sturdy, includes lots of cage nuts, £70. ☞ Gavin Hughes 0117 9085 588 or email gavinhughes5@activemail.co.uk (Bristol, Avon).

RANE SM26 six in, six out splitter mixer, ideal for guitar racks, £135. ☞ 01604 588618 or email versati1e@ntlworld.com (Northants).

ROLAND OCTAPAD 2, good condition, piezos replaced as new, highest offer secures. ☞ 020 8348 9932 (London).

SONY CDP597 CD player with remote control, very good condition, £45. ☞ Chris 01202 779000 or email chrishall@hallmarkproductions.co.uk (Poole, Dorset).

SONY CDP313 stand-alone CD player with remote, perfect condition, £35. ☞ John Springate 020 8853 0728 or email jtspringate@aol.com (London).

YAMAHA 9000 drums, black, mint condition, 10-inch, 12-inch, 14-inch and 15-inch plus 22-inch bass drum, stands included, £1200. ☞ 01803 854566 (Devon).

wanted

AKG C414B wanted, must be in good condition and preferably boxed, please deliver down chimney on 24th December or contact. ☞ Paul Draper 0118 988 3660 or email paul.draper1@btinternet.com (Reading, Berkshire).

ALESIS Q57, Korg N264, Korg Trinity Pro, Roland XP80 all wanted, must be at a reasonable price and in good condition, Boogie 1x12 combo also wanted. ☞ 01685 883758 (South Wales).

ANY TRUMPET, Cornet, Flugelhorn or similar wanted cheap for beginner, preferably with case. ☞ Tibo 01223 331808 or email t1224@cam.ac.uk (Cambridge).

APPLE MAC G3 or G4 keyboard and mouse wanted, must be in good condition. ☞ Andy 01633 613342 or email andy@rpmusic.co.uk (Newport, South Wales).

ATARI 1040 plus SM124 and Steinberg Cubase wanted, will swap my hard-earned dosh for your antique, can collect. ☞ 01733 770933 or email fjwoods@uk2.net (Peterborough).

BASEMENT/ROOM room in central Brighton wanted for use as rehearsal and recording room. Preferably about £40 to £60 per week. ☞ Dom 078 5562 0537 or email formant@altavista.co.uk (Worthing, West Sussex).

DIGITECH STUDIO VOCALIST, Yamaha W7 keyboard and Yamaha KX5 keyboard wanted. ☞ John 01484 546062 (Huddersfield).

EMAGIC LOGIC Platinum and Steinberg Cubase v3 both wanted, PC versions only, cash waiting. ☞ 020 7267 1447 or email mixplus@hotmail.com (Aberdeen).

EMU MO-PHATT or Korg Wavestation A/D wanted, I'm looking for either of these items, cash waiting. ☞ Den 01484 340587 or email orion7290@yahoo.com (Huddersfield, West Yorkshire).

EMU PROTEUS 3 wanted. ☞ Mick 01203 306130 (Coventry).

EMU PROTEUS 2000 wanted, must be boxed as new, will pay £400 for basic module or £450 if it includes an expansion board, £400; MOTU 828 also wanted must be boxed as new, £500. ☞ 078 8772 4744 or email peter.lawford@idealproductions.co.uk (Hull, East Yorks).

EMU TECHNO5YNTH Construction Yard board for Proteus 2000, will pay around £80. ☞ 079 7665 1230 or email nsw.1@ntlworld.com (Leicestershire).

EMU TURBO BOARD for Mo Phatt module, will pay up to £140; Techno Synth and Orchestral Sessions expansion ROM, will pay up to £50 each; Echo Gina 24, will pay up to £160; UAD1 card, will pay £260; also SCSI card for Mac, will pay up to £80. ☞ 020 8902 9784 (London).

ENSONIQ PARIS EDS1000 card and C16 for Paris wanted, plus anything else you might have. ☞ Arthur 01294 823990 (West Kilbridge).

KORG X5D keyboard urgently wanted, will pay £180 for X5, £200 for X5D; Korg Poly 800 also wanted, will pay £80; cash waiting. ☞ Mark 078 8430 5300 (Fort William).

M AUDIO DELTA 1010 soundcard urgently needed, will pay £350 cash, and will collect if it's geographically possible, thanks. ☞ Jason 01276 857733 or email jason@webpuppy.co.uk (Chobham, Surrey).

NOVATION BASS STATION or Super Bass Station and a Roland MC303 wanted in any cosmetic condition for a cheap sale (as long as they work perfectly). ☞ 077 6024 1530 or email metapod3@hotmail.com (Leicester).

SAMPLER WANTED: I need a basic soft or hardware sampler for a home studio, not much money to spare so try me; I also need a decent sound module for first home studio, will pay up to £200. ☞ Octave 079 4964 8795 or email brendon95@talk21.com (London).

SAMSON SERVO 260 amplifier wanted in good working condition, will pay around £90 including postage and packing. ☞ Ricky 028 9028 0608 or email richard.123@ntlworld.com (Belfast).

SIMMONS SDS7 brain wanted, must be in good working order, with five modules or more, will pay up to £100. ☞ 020 88382816 (London).

SOLINA STRING SYNTH waned, good price paid for decent working example. ☞ Tracy 01254 777957 or email m.j@virgin.net (Darwen, Lancs).

STEINBERG CUBASE wanted for Atari 1040, v3 preferable, dongle and manuals, will pay reasonable price, also want Alesis HR16B drum machine, good price paid. ☞ Rob 078 9030 0181 (Hants).

TRACE ELLIOT speaker cab rated at 200 or 300 Watts wanted, ideally with horn. ☞ Andy 01926 770971 or email admin@i-futures.com (Leamington Spa, Warwickshire).

VOICE ROMs and sequencer expansion cartridges for Ensoniq ESQ1, Korg M1 voice cards, Roland D110 manual, cheap Ensoniq Mirage keyboard or rack sampler with library. ☞ Phil 01639 768103 (Glamorgan).

WURLITZER EP200, Roland Space Echo and Fender Rhodes all wanted, can pay cash and collect the same day. ☞ 01432 760613 (Hereford).

YAMAHA A5000 wanted, must be in good condition and still have its box and manuals, I will pay £500 cash. ☞ Craig 078 7968 3576 or email craigy57@hotmail.com (Worcester).

YAMAHA MV100, Kawai K4R, Roland JV1080, Korg MS2000, Korg ER1, Novation Supernova, Roland JP8000, Waldorf Micro Q. ☞ 020 8364 9194 (Herts).

YAMAHA 01V digital mixer, must be in excellent condition, not a scratch on it, will pay a good price. ☞ (any time) 0161 620 3669/079 4923 0629 (Lancs).

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 *Target* 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

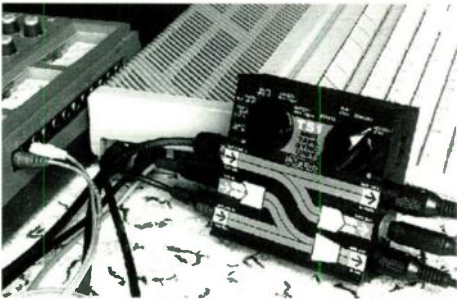
TS1 for SMPTE to MTC

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.

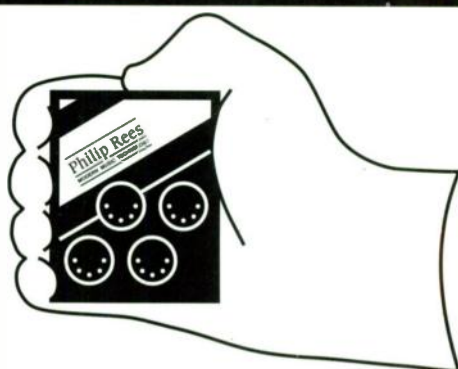
The **TS1** is ideal to use as a tape sync unit with any decent analogue multitrack tape machine. When you start, stop or shuttle your tape back and fore, **TS1** tells your MIDI sequencer to play in time, just as if your MIDI voices were extra tracks on the tape.

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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MODERN MUSIC TECHNOLOGY

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The MIDI Files

by Rob Young 294 Pages

How can you make your MIDI recordings sound more professional? How can you make your instrument programming more realistic? How can you do this without spending a fortune on new technology? In this new edition of the popular The MIDI Files, experienced programmer and musician Rob Young explains clearly and simply how you can get the max from MIDI. Going far beyond the contents of equipment manuals and user guides, The MIDI Files 2nd Edition is a comprehensive guide to everything you ever wanted to know about MIDI. This book includes MIDI Basics, choosing and using MIDI hardware and software, setting up a MIDI home studio, general MIDI, and much more.

CODE B417
£24.95

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Behind The Glass

Howard Massey 328 Pages

Thirty seven of the world's top Record Producers share their creative secrets and nuts-and-bolts techniques in this prime collection of firsthand interviews. These masters of their trade offer real-world advice you can apply to your experiences in the studio — whether you're a musician, producer, engineer, student, or just want to know how the hits are made. From creating room treatments to choosing a song's best key, you'll view the recording arts with the keen perspective of the pros behind the glass. Plus, you'll get inside stories from professionals who worked the boards for such classic tracks as Led Zeppelin's *Stairway To Heaven*, and Pink Floyd's *Dark Side Of The Moon*.

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Recording & Production Techniques (2nd Edition)

by Paul White

192 Pages

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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Creating A Music Website

by Mike Simmons 104 Pages

Creating a Music Website takes you through the basics of setting up your own site, points out some of the pitfalls, and helps you to produce your own unique presence on the Internet. It introduces HTML, shows you how to brighten up your site with graphics, tables and frames, and shows you how to add files of your own music, even a band video. Written by a man who's been there done that (check out www.musicfromthemountains.com) this book will help you bring your music to a worldwide audience. This will cover PC and Mac, designing your site, adding text, pictures, sound and video. Streaming sound, MP3 files, uploading files to your site, and more.

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basic

by Paul White

The essential ingredients of Paul White's individual bestselling books have been condensed down into this superb range of pocket books. Don't let the 'basic' title fool you, these little gems offer an enormous wealth of practical advice and tips for all levels of reader in each of the subjects he covers. Keep them by your mixer or take them with you on gigs, you never know when you might need them!

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Desktop Digital Studio

by Paul White 240 Pages

10 years ago, recording studios were usually racks of effects boxes, recording equipment and mixing desks that seemed to go on forever, all hooked up to a writhing mass of cables and connectors. Today, however,

modern studios are more likely to be based around a single computer system, digitally performing all of the tasks that it used to take a whole studio full of equipment to perform. This is a step-by-step guide to setting up a digital recording environment capable of computer-based MIDI sequencing, audio recording and editing, sound synthesis and effects processing. With a full glossary of terms and diagrams, it offers the soundest advice money can buy, for beginners and intermediates alike.

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MIDI For The Technophobe

by Paul White 184 Pages

When Paul White first encountered MIDI, the main impediment to his progress were the very books claiming to explain it! Yet, the basic principles of using MIDI to make and record music have direct counterparts in everyday life which

we take for granted, such as television and the telephone.

In this book the absolute beginner is introduced to the concept of MIDI by way of analogy with familiar technology. In just a few hours, with no confusing jargon, you'll find out how MIDI works, what hardware is needed to build your own MIDI system and how to use that system to create, record and edit your own music.

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Music Technology A Survivor's Guide

by Paul White 330 Pages

Music Technology — A Survivor's Guide highlights common problems in recording and mixing music, addresses equipment dilemmas and offers troubleshooting advice. Most importantly it provides answers.

Whether it's the debate on MIDI recording versus conventional multitracking, the basics of soundproofing, how to rescue an unsatisfactory mix, how to put together an accurate monitoring system or how to organise a recording session! this is the book for you. It also provides an overview of equipment types: for example, the pros and cons of hard disk recording compared to analogue, and the various types of studio outdoor equipment. Ideal for any music technologist.

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World Radio History



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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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 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 you 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

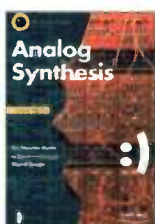
by Ralf Kleinermanns

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.

POSTAGE: UK £4.40 EUROPE £5.10 WORLD £8.40

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£23.95



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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BEAT IT!

by Joe & Pauly Ortiz of

Heavenly Music

110 Pages

This book which comes from one of the top MIDI programming teams, is designed to help you play on an actual drum kit or, if you use midi setup, you will find subjects that help you to programme your own realistic drum and percussion patterns, with examples depicted in familiar 'grid' style. The patterns and the files on disk (which is found attached to the back of the book) are loosely grouped into styles like 50s and 60s, Pop, Soul and Dance, Rock and R&B, and Jazz and World Rhythms (which include patterns like Reggae, Soca, Calypso and Latin). You can also use the files to rehearse or jam along to, or to incorporate into your own demo songs or ideas.

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Electronica Dance Music Programming Secrets

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sounding off

Richard Leon

It's 1975. Capes, long hair, and 45-minute concept albums abound. (Luckily for everyone, 45 minutes is about all that can be squeezed onto two sides of a crackly, rotating vinyl frisbee.) The standard music rig of the day is a Minimoog, a Rhodes piano, a Hammond organ, maybe a Mellotron or two, and perhaps a Moog modular for the elite few tax exiles who can afford one.

Fast forward to 2001. Sports clothes, sideburns, piercings and 160-minute double-CD dance compilations abound. The standard music rig of the day is a couple of turntables, some boxes full of crackly, rotating vinyl frisbees, and a club PA powerful enough to do intestinal massage. The people who actually create music, as opposed to mixing it up, have retreated out of sight to back bedrooms and project studios. Armed with computers that would put an '80s-vintage Cray to shame, and more software than anyone can ever keep track of, they barely use hardware at all any more. And just what noises can this software bonanza make? Some very fine reproductions of the Minimoog, the Rhodes piano, the Mellotron, the Hammond, the Moog modular...

I'm sure I can't be the only one who feels there's something wrong with this picture. Is this the best we can expect after 30 years of white-hot technological advances? Looking back, it's obvious that as soon as the first Moog systems appeared, the music technology industry immediately started looking for ways to improve on the original inspiration. In short order, we had more stable tuning, sequencer

control, more polyphony, and computer patching. Soon after came digital technologies such as FM, sampling, and physical modelling. And then various spin-off technologies — including vector synthesis, S+S (Sample + Synthesis), and Kawai's partial synthesis.

But then dance music happened, everyone wanted that analogue sound again, and all further progress stalled. Synthville split into three ghettos: digitally-modelled analogue, Sample + Synthesis workstations and sequencing toys, and soft synths. From a programmer and sound designer's point of view, all of these are pure retro, with no really new developments for at least five years now.

Don't get me wrong — I'm not complaining that I can download a free vocoder plug-in from the Net, when 25 years ago I might have had to pay £20,000 for a big box, complete with obligatory wooden end-cheeks, to do the same job. But still, all that anyone is ever going to get from these technologies are sounds and effects that have been heard thousands of times before.

We, as music consumers and music producers, have only ourselves to blame. While the music business has to take some of the rap, its failings aren't the whole story. The problem is us — the fact that when we're supposed to be creative, we'd rather spend our time and money on the safe, familiar and backward-looking.

In the '70s, a classic album such as Tangerine Dream's *Phaedra* could sell into six figures. Today, music with the same sense of risk would be released on an obscure label no one has ever heard of, and might sell a few thousand copies.

Meanwhile, back at the patchbay, exponents of traditional electronica are still in the 'floaty chord and sequencer' space TD were pioneering 30 years ago. Too much dance is just second-rate sequencer work, glammed up with the loop of the week and some entirely predictable filter sweeps, and rock is living up to its name by evolving at truly geological timescales.

Is there hope? Surprisingly, yes. There's an array of frighteningly powerful music-making software tools out there, but because they're considered 'hard' they don't get the same publicity as the latest toys available at your local music shop. Names like *Csound*, *Max/MSP* and *PD* may mean nothing to you, but these and other packages have been delighting and terrorising audiences the world over. Some of them will cost you no more than a short download and a lot of head-scratching. If you run them on a laptop, you can even carry them under your arm and use them live. And unlike hardware synthesizers, they're getting better all the time.

True, they don't deliver instant gratification. Like real instruments, they can be seriously frustrating and hard to master. So if you want to play safe, run up a few sequences, add a loop or two, sweep a filter live, and do what everyone else is doing, these tools are not for you. On the other hand, if you want to shred sounds into oblivion, morph them, bend them, twist them till they scream, and make music that literally no one has ever heard before, it might be time to start wondering if perhaps there's a world out there beyond the safe and familiar. ☺



About The Author

Richard Leon writes words and music, both of which he sometimes gets paid for. His favourite synthesizer is a Pocket Piano which he bought for a fiver from the Early Learning Centre.

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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