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cart before horse?

Sometimes it's difficult to imagine that the people who write the music software we use ever actually run the stuff themselves, while in other cases the programs are obviously the work of genius. Yet even the most well-written software seems to suffer from obvious omissions that you can't believe were overlooked even in version one, let alone several versions down the line. There's no denying that the guys who write the software so many of us depend on deserve to be recognised for their contributions to the art. However — to use my favourite car analogy — we still have too much emphasis on heated seats and touch-controlled CD auto-changers, and not enough on basics like brakes, gears and steering. For example, my sequencing software of choice has accumulated many fabulous and sophisticated features over the years, yet the one thing all professionals need is still plainly missing from it.

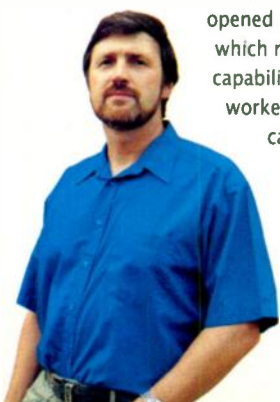
I'm talking about a simple 'copy entire project to a new folder' function that would allow me, via a single menu command, to create a folder that contains the song's MIDI file and all its audio, plus any samples needed by the virtual sampler that's used in the song. I don't want to store complete audio files, because in most cases I only use a few regions taken from longer files, but I do want to be absolutely certain that when I back up this 'project' folder I have everything I need to get the song back again. Perhaps an option to automatically convert virtual instrument tracks to real audio files (without losing the original MIDI parts, naturally) should also be offered, so that if the project is opened in another studio, which may have different capabilities, it can still be worked on. Of course, you can do all these things manually, a stage at a

time, but it's easy to miss something, and it would make so much sense to have a single command to do the whole operation for you.

Taking this idea further, how about a system that recognises when a plug-in specified by the song isn't available and offers alternatives from those that *are* available, based on a database of common plug-in file names? (This would be updatable online, naturally.) For example, your mate doesn't have the reverb plug-in you used originally, so you go to the plug-in window, which, instead of staring blankly at you, shows a screen snapshot of the missing plug-in (created when you saved your project), so you can read off the essential parameter settings. It also offers a list of reverb plug-ins that are available in the current system, allowing you to set up a working alternative. Not rocket science perhaps, but to me it's far more of a 'professional' feature than yet another bit-mangling plug-in or a data-transform function that lets you multiply the velocity of every other MIDI note by the number of characters in the song title, but only on the second Thursday of the month!

My other really great dream is to have error messages that actually tell you what's wrong (and, better still, offer some advice on sorting out the problem), rather than simply saying "an error type -6042 has occurred and your audio playback is now seriously bugged!" Is it really just me who wants this stuff, or are there thousands of us being individually fobbed off with the old "You're the only person who's ever asked for it!" routine? Well, now you can find out for yourself, because as some of you have already discovered, the *SOS* web site now lets you create your own polls to see what other readers think. I'll be keeping a close eye on the results!

Paul White *Editor*



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Kipper, keyboardist and producer for Sting, takes a short break to savour Sting's freshly pressed olive oil.

Definitely Fresh.

It's certainly wonderful to have your own studio in Tuscany. Beyond that though, Sting dedicates himself to the production of fine wine and olives, to the particular delight of his producer Kipper – who appreciates freshly pressed Italian olive oil as much as German software packed with fresh ideas. A long-time Logic Audio advocate, Kipper has high regard for its flexibility and reliability, and especially its innovations. Logic Audio has introduced many fresh ideas that have since become classics – this trend continues with such features as the Unified Classic and Virtual MIDI Engine, hierarchical menus, Surround mixing for TDM, plus many more. Logic Audio – definitely the right choice.

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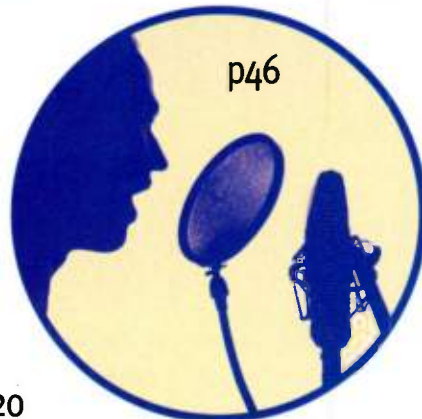
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● prize time

First American wins SOS comp

Just one competition drawn this month, but it represents a first: Seattle-based Don Gunn is our first American competition winner, and he is now the proud owner of an Alesis Masterlink (courtesy of Sound Technology, +44 (0)1462 480000), which was up for grabs in our November, 2000 issue. Dan's a recording and mastering engineer, and is currently producing the soundtrack for a feature film, *The Trouble With Boys and Girls*. He also reckons the Masterlink will fit nicely into his rig, as he can now master his final mixes in 24-bit directly from his Apple G4. Thanks to Sound Technology in the UK and also to Alesis in the United States, who shipped the prize.



● dealing a new card

Lynx launch their second PCI soundcard

The recent Amsterdam AES (Audio Engineering Society) convention saw HHB demonstrating a new Lynx Studio Technology PCI soundcard for the first time in Europe. The LynxTWO offers a choice of analogue I/O configurations (four-in/four-out, two-in/six-out, and six-in/two-out) with 16-bit to 24-bit A-D conversion at sample rates of up to 192kHz. Digital I/O is offered in both the professional AES-EBU and domestic S/PDIF formats, at 16-bit, 20-bit and 24-bit, with support for sample rates up to 96kHz. The LynxTWO also features digital I/O support for Dolby Digital and HDCD (High Definition CD) bitstreams.

HHB are also pleased to announce that they have recently been made exclusive distributors of Lynx products in many countries worldwide.



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● forging ahead

Version 5 update for Sound Forge PC editor

Sonic Foundry's *Sound Forge* audio editing program has reached version 5. The new version features 20 DirectX audio plug-ins and offers a suite of audio effects that include amplitude modulation, chorus, delay/echo, distortion, dynamics, compression, pitch-bend, pitch-shift, reverb and vibrato, plus graphic, paragraphic and parametric EQ, and time-stretch. Third-party DirectX plug-ins are also supported.

Of course, *Sound Forge* is primarily an audio editor, and has dozens of editing features — cut, paste, move, delete, mute, reverse, fade, crossfade, trim, normalise, pan, resample, enhance, and insert silence, to name just some. The program is compatible with audio files at resolutions of up to 24-bit, 192kHz, and is capable of track-at-once CD burning and CD ripping. It can also save in MP3, WAV and WMA formats. The new version costs £379, and upgrades from previous versions cost £91.99 including VAT.

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W www.sonicfoundry.com

● twice as nice

Joemeek overcome optical design restrictions to produce stereo voice channels

Joemeek report that customers regularly ask for stereo versions of their optical device-based voice channels, but there are apparently problems inherent in designing such devices. Now, though, Joemeek designer Ted Fletcher has overcome these problems and produced the TwinQ, a dual-mono/stereo-linkable voice channel. TwinQ



features two channels of Joemeek's new CurrentSense mic preamp, 'classic' optical compression, and three bands of Meequalizer EQ. Phantom power is also specified, along with phase-reverse, a high-pass filter and dual metering of level and compression. The processor can also be upgraded to 24-bit digital output by adding

Joemeek's existing VC1QD digital option. The TwinQ costs £799 including VAT, or £949 with the digital output option.

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● totally tascam

Integrated MIDI and audio workstation covers all the bases

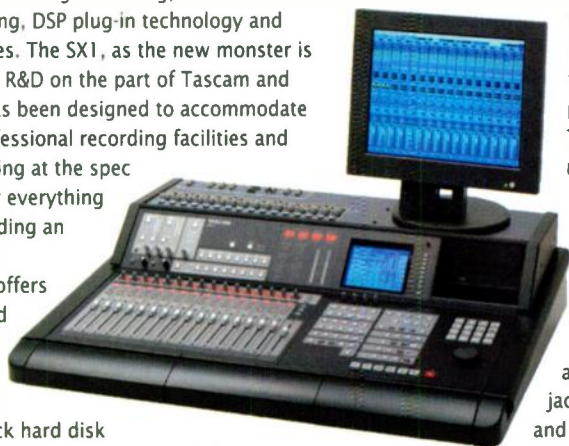
There's a surprise all-in audio workstation on the way from the Tascam stable, combining automated digital mixing, hard disk recording, MIDI sequencing, editing, DSP plug-in technology and multi-format mastering capabilities. The SX1, as the new monster is known, is the result of two years' R&D on the part of Tascam and TimeLine Vista in the USA, and has been designed to accommodate the needs of project studios, professional recording facilities and film/video post-production. Looking at the spec sheet, it really does seem to offer everything except MIDI sound sources, including an LCD monitor!

The SX1's 40:8 mixer section offers 100mm touch-sensitive motorised faders, built-in dynamic automation, and 16 phantom-powered mic preamps. Audio is routed to a 48kHz, 24-bit, 16-track hard disk recorder that uses an internal IDE disk drive. Additional drives may be installed into a front-panel slot or connected via a rear-panel SCSI interface. Surround mixing is implemented; the SX1 is able to record a full 5.1 surround mix to the internal hard disk, in addition to the main 16 audio tracks.

A 128-track, fully-editable MIDI sequencer offers real-time and step-record modes, with timing derived from the SX1's internal sample clock. Full editing of waveform, MIDI and automation data is

possible, and audio and MIDI can be simultaneously scrubbed, courtesy of a large jog/shuttle wheel. Surround and stereo mixes (uncompressed or in MP3 format) can be burned to the internal CD-RW drive, which can also be used for data backup. DSP plug-in technology offers built-in effects by Tascam, TC Works and Antares as standard; new effects can be added in future.

Interfacing with the real world has been well thought out, with 16 balanced XLR inputs, 16 quarter-inch balanced line inputs, inserts on each analogue input, eight channels of ADAT I/O, two sets of S/PDIF I/O, word clock, two MIDI inputs, four MIDI outs, a SCSI port, two USB ports, a 100Mbit Ethernet jack (for FTP network capabilities), separate studio and control-room monitoring, and built-in timecode/sync support via SMPTE/LTC, video sync, and Sony P2. Expansion slots for 24 more channels of digital (including Tascam's own TDIF) or analogue I/O are provided. In addition, the SX1 can be cascaded with Tascam's DM24 digital mixer to add more inputs.



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W www.tascam.co.uk

● is it analogue, or is it fatso?

Empirical Labs processor emulates the analogue tape sound

If you're recording with a digital system but still miss the warmth and compression of the analogue tape sound, Empirical Labs' Fatso could be worth a look. The EL7 Fatso is a digitally-controlled analogue processor that aims to add the characteristic effect of many of the musical properties of magnetic media, valve gear and class-A discrete circuitry.

Fatso offers three processor variations, namely Harmonic Generation and Soft Clipper (distortion generation), High-Frequency Saturation (for warmth), and Transformer and Tape Head Emulation. The two-channel Fatso also features stereo Empirical Labs compression, with several types (offering fixed attack and release times) to choose from.

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● skb take flight

New range of rack gear and mixer cases

Flightcase specialists SKB have two new ranges of cases. Their new 10-inch deep moulded X-rack series comes in 2U (£49.95), 3U (£59.95) and 4U (£69.95) heights, and can hold a wide range of rackmounting equipment — effects units, amps, line mixers, CD players and so on — without the need to unplug the units to close the back panel. The new Mixer Safe (pictured below) is also available in a range of sizes, and is designed to safely convey a large mixer to a gig or location recording session. The case uses the internal corner moulding shown above, which allows virtually any non-rackable mixer to be housed. Four sizes are available: 30 x 26 inches (£279.95), 33 x 31 inches (£299.95), 34 x 23 inches (£289.95), and 40 x 31 inches (£349.95).

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● emagic moments

Hardware and software news from the home of *Logic*



The latest hardware from *Logic Audio* developers Emagic is the EMI 2/6, a USB digital audio interface designed for use with laptop computers (though, of course, this VHS cassette-sized interface could also be used in a normal studio situation). Offering two recording and six playback channels, the EMI 2/6 features 24-bit converters and true plug-and-play operation. It doesn't even need a power supply, since it draws its power from its USB connections. In addition, hardware monitoring means that latency problems can be avoided during recording and overdubbing. Emagic suggest that the six 24-bit outputs of the EMI 2/6 make it ideal for monitoring surround formats with a maximum of six channels (such as 5.1). It also goes well with the latest surround-supporting versions of *Logic Audio*. Digital interfacing is also provided, in the form of co-axial S/PDIF I/O.

The EMI 2/6, which has a list price of £399 including VAT, ships with EASi and ASIO drivers for Mac OS 9.0.4 and higher, and EASi, ASIO, MME and DirectSound-compatible drivers for Windows Millennium Edition.

Also new from Emagic is the v4.7 update to *Logic Audio* itself. Enhancements include better virtual instrument support (instruments now have access to all of *Logic Audio's*

Environment objects, such as arpeggiators, with sample-accurate timing), and additional TDM features for use with Digidesign audio hardware (including eight-channel surround support and inserts with *Logic Audio Platinum*). Other additions include extra navigation/zoom features, hierarchical flip menus, and support for the new *EVP88* electric piano. The v4.7 updater will also update *EXS24* to offer customisable sample instrument sub-menus, Samplecell and Soundfont2 sample support, a search/find function, and Akai-format sample import improvements. The v4.7 update is available at no charge to current users of v4.x.

Emagic have also expanded their range of software instruments by one: the *EXS24* sampler and *EVP88* piano have been joined by *ES2*, a 16-voice polyphonic, three-oscillator analogue-style virtual synth. Oscillators 2 and 3 are sync'able to oscillator 1, and a range of analogue and digital waveforms is available, along with a noise source. Frequency and ring modulation can be

applied, and sound-shaping facilities include three envelope generators, two LFOs, and two self-resonating filters, which run serially or in parallel. One filter is a multi-mode design with distortion circuit; the other is a low-pass filter with selectable slope and 'fatness' parameter. There are plenty of routing options, and the finished sound can be treated with distortion and a simple built-in effects processor, which offers chorus, flanging and phasing. *ES2* will retail in the UK for £199 including VAT.

T Sound Technology +44 (0)1462 480000.

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W www.soundtech.co.uk

W www.emagic.de



bullets

Digital Village tour with new custom music PCs

News reached us just as this issue of Sound On Sound was due to go to press that Digital Village have announced a new range of custom PCs for music recording applications. The retail chain is organising a nationwide tour of its stores to demonstrate the new system — precise details were still unconfirmed at the time this page was being completed, but Digital Village say that they should be including full date and location information in their series of ads on pages 75-87 of this issue. Alternatively, give them a call on +44 (0)20 8440 3440 for details.

W www.digitalvillage.co.uk

DVD-R discs take their place in HHB media range

HHB have added a 4.7Gb DVD-R blank to their range of professional recording media, which already includes DAT, CD-R, ADAT, DTRS, MD, MO and DVD-RAM formats. The decision has been spurred partly by Apple's decision to include a DVD-R writer in the new G4 computers. The new disc, according to HHB, uses a specially formulated recording dye to achieve "exceptional levels of performance, compatibility and archival security."

W www.hhb.co.uk



PC editor for Kenton MIDI controller

Kenton Electronics have made available a PC editor for the Studio Edition of their Control Freak MIDI controller — that's the 16-fader version mentioned in *SOS's* News pages way back in March '99. The software is downloadable from their web site; Control Freak users visiting the site will also find that downloadable profiles have been reorganised, and that several new profiles have been added, including ones for selected VST instruments, Emu's Proteus 2000, and Creamware's Pulsar system.

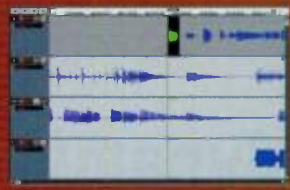
W www.kenton.co.uk

USB and FireWire interfacing on new LaCie CD recorder

According to LaCie, their new CDRW-16x10x40x CD recorder is the first to offer both USB and FireWire interfacing on the same drive. The drive can be used with compatible Macs and PCs, and is fully hot-swappable. The FireWire connector offers the fastest speeds: 16x writing allows a complete CD to be burnt in under five minutes, while rewriting is at 10x; the drive can read at speeds of up to 40x. Interfaced via USB, the drive slows to a more sedate 4x4x6x. It retails for around £316 including VAT, and is bundled with cables, one recordable and one rewritable disc, and a suite of software including *EasyCDcreator* and *DirectCD* for Windows 98SE/2000/ME, and *Toast* for Mac OS.

W www.lacie.com

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



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New hard disk recorders are popping up all over the place.

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

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HDR24/96 editing features include:



8 takes per track with nondestructive comping, nondestructive cut/copy/paste of tracks, regions, drag-and-drop fades & crossfades, 1x/2x/4x/8x/24x waveform views, bidirectional cursor scrub locators

and loops... with 999 undos — but without requiring an external computer! Coming soon: extended DSP processing and editing functions.

- Built-in 20-gig Ultra-DMA hard disk plus front panel bay for additional easily available pullout drives
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● dynamic duo

Two new processors for SPL range



Launched at the recent Frankfurt Music Fair, the new SPL Track One recording channel (£599 including VAT) incorporates high-specification amplifiers optimised for microphone, line and instrument signals and offers a chain of processes comprising de-esser, compressor/limiter, and three-band EQ. Track One's output stage offers PPM metering for both output level and gain reduction, and two units can be linked for stereo operation of the compressors.

Also new at Frankfurt from SPL was the Kultube 'universal compressor' (£999). This stereo compressor/limiter features a tube with an variable harmonics control, to enable the user to apply precise amounts of enhancement. The Kultube incorporates master/slave linking facilities for stereo and multi-channel applications, or for processing

various sub-groups under the control of one master unit. According to SPL, the Kultube's new Advanced Time Control allows attack and release parameters to be under manual control, yet still interact with the auto time-constant circuitry, thus combining the advantages of both automatic and manual control. SPL claim that the Kultube is able to control time constants in less than 20 microseconds, and thus keep the processor free of the side-effects associated with less precise envelope control. The Kultube also features side-chain access and a de-compression function, which may help to rescue material that has already been over-compressed.

T Pure Distribution +44 (0)20 7328 0660.
F +44 (0)20 7372 6370.
E sales@pure-distribution.com
W www.pure-distribution.com

bullets

Free Korg Karma synth demo video

A demonstration video of the Karma workstation synth, which was reviewed in last month's *SOS*, is available free from Korg UK. The video includes live footage from the synth's official launch at January's NAMM show in Los Angeles, and features a number of international artists, including David Was and Greg Phillinganes, putting the Karma through its paces. Call Korg on +44 (0)1908 857150 and they'll send you a video and information pack while stocks last.

New UK distribution for RME PCI cards

The RME range of PCI audio cards and DA/AD converters — their Project Hammerfall series may be familiar to many readers — is now being distributed in the UK by new company X-Vision Audio UK.

T X-Vision Audio UK +44 (0)1803 209239.
W www.xvision.co.uk

Audio Technica expand web presence

Mic manufacturers Audio Technica have launched their new European web site. Surfers will find full spec sheets for AT mics on line, along with a technical Help Desk section. Press releases will also be featured on the site, as will an archive of product reviews. Other content includes an audio exhibition calendar, and a selection of useful audio links.

W www.audio-technica.co.uk



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● mobile corner

Windows CE sequencing from Jaytrax for PocketPC

As you will see from the rest of this 'corner', there's plenty of music activity when it comes to the Palm platform. We've also got news this month of a software synth and sequencer for the PocketPC, a PDA (Personal Digital Assistant) family which runs Windows CE. *Jaytrax for PocketPC* is based on a package that runs on the full-blown version of Windows, and lets you access similar facilities while on the move. Basically, the software allows you to design and tweak sounds and instruments to be used in sequencer songs; sounds can be made from samples, or synthesized from scratch. These sounds can then be arranged into small musical 'patterns', which are in turn organised into a song. If you own the full PC version of *Jaytrax*, you can have the Windows CE version for free; otherwise, it's just US\$30.



W www.jaytown.com/jaytraxppc/Index.htm

miniMusic BugBand

An inexpensive piece of software from miniMusic aims to teach users of Palm OS handheld organisers to read and play music. BugBand is an educational game involving animated bugs (I'm sure it's a lot nicer than it sounds...) which crawl across a musical staff on the organiser's screen when the correct notes are played by the user. Notes can be played with an on-screen keyboard or guitar fretboard. Treble and bass clef exercises are provided, and sharp and flat notes are covered. The software runs on any handheld organiser running Palm OS 2.0 or higher. It can play notes via the built-in speaker, or an attached electronic music instrument via MIDI, and costs an almost comical \$11.95 US from the miniMusic web site, where a free demo can also be downloaded.

MiniMusic have also launched a Windows synchronisation utility for their Palm software. *NotePad Conduit* allows music written with their *NotePad* music notation software to be exported to a Windows PC; songs written on the Palm are automatically updated on the desktop machine. Exported files are in MIDI File Format, which allows them to be loaded into virtually any MIDI software package. This export and sync option is already available for Palm users who also have a Mac. Planned upgrades of *NotePad Conduit* will allow songs to be imported from the desktop computer, so that they can be played or edited anywhere on the Palm device. *Conduits* are also planned for other miniMusic applications, including the *BeatPad* sequencer. Any Palm OS handheld computer can run miniMusic's software, including Handspring Visor and Sony Clie.

NotePad Conduit is freely available for all current owners of *NotePad*, and it will be bundled with that software's upcoming v1.1 update. *NotePad* costs US\$29.95 from the miniMusic web site, or selected dealers. It's also included in the US\$49.95 miniMusic *Mobile Software Pack*. The latter includes *NotePad*, *BeatPad*, Pete Moss's *Theremini* application and a Palm-to-MIDI interface.

W www.minimusic.com

Swivel Systems SG20 GM module

Swivel Systems are taking advance orders for their SG20 General MIDI sound module for Palm OS portable computers, which should be out by the time you read this item. A bundle will be available consisting of the SG20 itself, cables, batteries and all of miniMusic's software titles (mentioned above), costing US\$200 plus shipping. There is apparently a discount available to those who already own the software.

The SG20 GM module will clip on to a Palm handheld computer, and with the right software will turn your portable computer into an equally portable all-in-one music creation tool. It features a stereo mini headphone jack, volume control knob, bass-boost switch, and a connector for a detachable MIDI/audio expander cable which provides full-size standard MIDI In and Out ports, plus left and right audio phono jacks. The SG20 is up to 24-voice polyphonic, and features a standard GM set of 16-bit, 44.1kHz sampled sounds. It's directly compatible with all Palm III- and VII-series handhelds, IBM Workpads, and TRCpro systems.

W www.swivelsystems.com

● pedal pushing

Tube-driven distortion pedal launched by Electro-Harmonix

Electro-Harmonix must be one of the longest-lived names in guitar effects, and the company are still producing new processors, hand-made in New York. The latest in the stable is the Hot Tubes distortion/sustainer pedal, a valve-driven unit capable of creating tones ranging from "mild tube overdrive to searing, over-the-top tube-driven screams", according to Electro-Harmonix.

Hot Tubes uses two selected 12AX7 vacuum tubes and offers control over master volume, gain, drive,

bass and treble. The new pedal comes packaged in a pine box and costs US\$278 to purchase. But don't panic: although Electro-Harmonix may not have UK distribution, many domestic and European dealers stock their products. Visit their web site at the address below for details.

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 W www.ehx.com



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education corner

Newcastle University

Newcastle University's music department have just spent over half a million pounds upgrading their music-technology facilities. Two new studios have been built, and both feature fully isolated live rooms. One studio boasts a Sony DMXR100 digital mixer, while the other is equipped with a Mackie D8b desk. Hard disk recording is provided by Fostex D2424s and PCs, and the studios are kitted out with a wide range of outboard and synths. There are also three separate PC-based workstations with outboard mixing, sampling, synthesis and effects, and a suite containing 10 workstations.

The new facilities have been put in place for the Department's BA in Music, BMus with Foreign Exchange, and BMus in Popular and Contemporary Music programs. Starting in September of this year, there will be two post-grad courses on offer: an MA in Creative Music Technology, and an MMus programme offering opportunities for all kinds of advanced creative musical practice, including studio-based work.

T Music Department Secretary
+44 (0)191 222 6736.

E music@ncl.ac.uk

W www.ncl.ac.uk/music/

Brighton School of Audio 'Live'

Having perceived a lack of interactive live-oriented courses in the UK, two live sound engineers, Jon Burton and Mark Jones, have joined forces to launch Brighton School of Audio Live, a training forum for young people interested in a career in live sound engineering. Both claim to have teaching experience in addition to their technical expertise (they've engineered for artists including Pulp, The Levellers, James, The Lighthouse Family, Radiohead, Suede, Bryan Ferry, Morcheeba, Republica and more). BSA Live's 'Foundation in Live Sound Engineering' course is open to students with little or no previous experience. The course, which will be restricted to 10 students, will run for eight weeks, three days a week, and will be based at two locations: the Brighton School of Audio at the Metway Centre in downtown Brighton, and The Concorde 2, a working live venue on Brighton's seafront. Topics covered will include basic sound theory, sound reinforcement, the components of a PA

system, microphones, speakers and amplifiers, the mixing desk, processing and effects, setting up and design of systems, safe practices, mixing techniques, and running a show.

Students will be continually assessed, and on completing the course will undertake both practical and written tests leading to certificates of ability and related NVQ levels. Short courses are also planned. So far, BSA Live has gained support from several companies in the audio industry, including XTA and Drawmer.

T BSA Live +44 (0)1273 884650.

E info@bsa-live.co.uk



Jon Burton (left) and Mark Jones of the newly launched BSA Live sound engineering training project.

Berklee College of Music

Noted Boston-based music school Berklee College of Music has recently outfitted over 200 computers with the Emagic *Logic Audio* series of MIDI + Audio sequencers. The college's Music Synthesis department have used Emagic's *SoundDiver* editing program for some time, and Emagic products can now be found in Berklee's Music Production, Engineering, Film Scoring and Music Education departments.

W www.berklee.edu

W www.emagic.de



Swindon Community Video Centre

Cre8 Studios, Swindon's Community Video Centre, is running an introductory short course in creating music for film, video and TV. The course is aimed at complete beginners and is designed to give aspiring composers a look at techniques such as creating atmosphere, designing and using sound effects, hitting and counterpointing key points in the action, and building and releasing tension. Software used on the course will include Adobe's *Premiere* video editing package, *Acid*, the loop-composition software from Sonic Foundry, Syntrillium's *Cool Edit Pro* audio editor, and Steinberg's *Cubase VST MIDI + Audio* sequencer.

The course runs for six evenings in central Swindon, starting 21st June, and costs £117, or £82 at the concessionary rate. You can call Cre8 Studios on the number below for more information, or book a place through the box office on +44 (0)1793 463210.

T +44 (0)1793 463725.

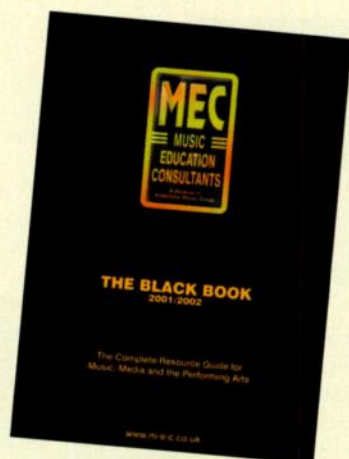
Music Education Consultants

The latest catalogue from Guildford's Music Education Consultants (MEC) is called *The Black Book*, and as befits the name, it's crammed with listings of contacts for studio builds and hi-tech equipment supplies, the latter presented in a useful 'equipment guide' format with colour photos, brief spec and prices for the equipment listed. MEC supply a wide range of hardware, software and computer systems to schools, colleges, universities and professional studios, and were responsible for the design of the music technology resources at the Academy of Contemporary Music (ACM) in Guildford, and the new Mackie Digital Studio at the Worle School, amongst many other music technology in education projects around the UK. MEC are holding their annual Music Technology in Education conference at the ACM, Guildford, on July 1st this year. Events planned for the day include lectures and practical workshop sessions focusing on products such as Steinberg's *Cubase VST Score*, Emagic's *Logic*, and the *Sibelius* notation program, plus recording skills and techniques, mastering, mixing and using portable multitracks. The day costs £55 including lunch and a complimentary

PC Publishing book.

To obtain a copy of the 156-page Black Book catalogue, you can call MEC on the number below, or email your details to blackbook2001@m-e-c.co.uk

T +44 (0)1483 456888.



Kaleidoscope

The first CD from Kingston's Kaleidoscope youth, community and drug treatment project is being launched with the help of singer/songwriter Billy Bragg. *K2000: The Winter Of Our Disco Tent* is a compilation of music from local musicians, and will be celebrated at the project's club with live performances. The CD was made possible by Making Music, the national organisation supporting amateur music in the UK. It costs £5 and can be ordered from the Learning Centre at Kaleidoscope.

T +44 (0)20 8549 2681.

E communitymusic@yahoo.com

National Foundation For Youth Music Offer Grants

The National Foundation for Youth Music's latest funding programme is designed to encourage children and young people to use technology to make music. Youth Music is offering grants of between £7500 and £30,000 to community groups, arts organisations, local education authorities, and consortia of schools and youth clubs, to run music projects for under-18s that "make creative use of the tools that music technology offers, from DJ decks to MIDI

didgeridoos." Another initiative, Plug Into Music, with funding backing of up to £1 million, is looking to encourage and support music projects working across different styles and traditions, including classical and non-Western, as well as composition, DJ-ing and dance music.

Attending Plug Into Music's launch party at London's Ministry of Sound were DJ Pete Tong and Culture Secretary Chris Smith, who helped to set up Youth Music in 1999. The programme is open for grant applications from now until 1st March 2002, and anyone requiring an information pack should use the contact details below to request one.

T +44 (0)8450 560560. For further information about Youth Music or any of its funding programmes, call +44 (0)20 7841 0800.

F +44 (0)1772 836199.

E youthmusic@ltfs.co.uk

W www.youthmusic.org.uk

Exeter College

Exeter College has just taken delivery of more than a dozen Apple computers — 10 iMacs and three G4s — plus a range of other new equipment, all supplied by Project Music of Exeter. The College runs a range of full-time courses, including a BTEC National Diploma in



Popular Music and NCFE Sound Recording, and plans to offer part-time courses in music technology to the general public. Initially, recreational part-time evening courses in using *Logic* and *Cubase* are projected; a variety of evening, weekend and summer courses will follow.

T +44 (0)1392 205255.

E lpugh@exe-coll.ac.uk

● come together

Otari and Yamaha team up for second-generation mLAN chip development

Otari, manufacturers of upmarket mixers, multitracks and digital audio products, are the latest company to announce support for Yamaha's long-awaited FireWire/IEEE 1394-based mLAN digital audio/MIDI interfacing technology. The two companies have launched a joint project to develop a second-generation mLAN chip that meets the specific requirements of high-end pro audio; the new chip should be able to handle four times the channel capacity of current chips, offering



32 input and 32 output channels at 24-bit/48kHz. Up to four chips can be cascaded to provide 128 bi-directional channels. Otari plan to use this chip in their development of new audio network technology; chip samples will be available to mLAN licensees during this year.

Coming soon from Otari is the FS96 digital format and sample-rate converter, a solution to the problem of transferring multitrack digital audio between different platforms. It supports all common formats, including AES/EBU, TDIF, ADAT and SDIF2 (Sony Digital Interface), and converts a maximum of 24 channels of up to 24-bit/96kHz digital audio. Multiple units can be linked, with sample-accurate sync, for transfers requiring more than 24 channels. In addition, the FS96 converts sample rates from 32kHz to 96kHz and bit rates from 16-bit to 24-bit, and *vice versa*. The system automatically detects the incoming format and sample rate, making the output signal available in all supported formats.

T Stirling Syco
+44 (0)20 7624 6000.

F +44 (0)20 7372 6370.

W www.stirlingsyco.com

● the compleat microphone

The name Rycote is most readily associated with their ubiquitous windshields and suspension mountings for microphones, and with their business firmly focussed in this area, naturally the company has been able to create and maintain close relationships with all the major mic manufacturers around the world. This has placed Rycote in an ideal position to offer unbiased information about microphones in general, and they're now launching the *Microphone Data Book* (edited by Chris Woolf), a massive compendium of every mic in professional use. At over 1000 pages, this book is huge, and each mic is given its own page, complete with essential technical details, plus a picture. Usefully, the book applies a common format to all entries; reference data has been standardised to allow direct comparison between mics from different manufacturers. Thumbnail frequency graphs and polar diagrams even have a fixed scaling to aid such comparisons. Multiple indexes are offered, with headings for preferred use, price range, polar pattern and transducer type, as are several articles on mics from well-known names in the field.



The *Microphone Data Book* (ISBN 0-9539354-0-X) is a pretty serious book, and it has a price to match: £75 plus p&p.

T Dormouse Distribution +44 (0)1905 381725.
E dormouse.distribution@cwcom.net

● loud speakers

Live sound speakers from JBL offer power ratings up to 600W

Two new ranges of sound reinforcement speakers have been introduced by JBL Professional under the MPro name. The MPro 200 Series features carpet-covered plywood enclosures and 250W power ratings (500W for the dual subwoofer in the range), while the MPro 400 Series comes coated in JBL's patented hard-wearing DuraFlex material and has 300W-600W power ratings.

The 200 series currently consists of the MP215 15-inch two-way speaker and the MP255S 15-inch subwoofer, while the 400 series comprises the MP410 10-inch two-way speaker, the MP418S 16-inch sub, and the MP418SP 18-inch powered sub. MPro speakers feature a special baffle, whose smooth, rounded contours and seamless one-piece structure aim to reduce distortion by keeping turbulence and diffraction effects at bay. High-frequency components are protected by JBL's SonicGuard, which is designed, say JBL, to offer protection without changing sound character. All MPro speakers have pole-mount receptacles for easy setting up.

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Times have changed since the D24's introduction in 1998. Back then, the only serious rival for 24bit 96kHz multitracking was a Genex at well over five grand! So Yamaha's ground-breaking sub £2000 pricetag made their new D24 a sheer bargain for any quality conscious studio. Today however, many manufacturers have 24/96 machines on the market priced between £2k and £4k, so where does this leave the Yamaha? With this amazing from Turnkey, still the best value for money by far!

For only £699.99 you can own a D24, including one MY8 ADAT, AES/EBU or TDIF digital interface board of your choice (worth £199 alone!), factory installed and ready to go (other boards available at extra cost). The D24 records onto Magneto Optical disks (MO) - a very secure format with no physical contact to the disk surface, unlike hard drives. These disks are removable just like ADAT tapes, so you can simply record your audio and press eject. No lengthy backup to DVD-RAM or tape drives, no need for hard drive caddies or burning dozens of CDRs, just pop the disk out - it's that easy! They're cheap too, and much quicker and easier than buying and swapping hard drives in caddies. You can fit two or three typical songs on each disk.

Now, if you're thinking: "It's only got 8 tracks! I want 24 tracks like the big machines have got" - no problem (in fact, you get 64 tracks to pick and choose from since each has 8 virtual tracks as well) - just buy three machines at £699.99 each and you've got 24 track non-linear 24 bit multitracking, with 12 tracks in 96kHz mode, for under £2100, including the digital I/O boards! And with onboard time-stretching, varispeed, jog/shuttle wheel and non-linear editing, you are getting top notch features as standard (more about these on the right).

If you've ever wanted to own a professional multitrack but couldn't afford it, don't miss this once in a lifetime opportunity while stocks last. Unfortunately we have only a limited quantity and must fulfill orders on a strictly first come, first served basis.

ALSO AVAILABLE 640 MB OPTICAL DISCS only £8.99 each or only £6.99 each for 5 or more!

RRP £2199
£699.99
YAMA-D24

D24 plus 01V Digital Mixer **SAVE £2058!**

It's hard to believe that you can now buy a complete 8 track of 24 bit recorder and a 32 bit digital mixer package for such a low price. A few years ago this type of system was the reserved domain of professionals only. Now anyone with a bedroom setup can record themselves at higher digital resolutions than they can even hear. The price includes ADAT boards for recorder and mixer and two 5m optical cables. The mixer features 18 analogue inputs plus 8 digital I/O via the card, and offers 4 band fully parametric EQ for all the main inputs, 2 stereo multi effects processors, moving faders, dynamic MIDI automation and brings sound quality and ease of use together.

SAVE £2408! D24 plus 03D Digital Console

An unbeatable good package bringing you a first class digital mixing station with total analogue 8 channel parametric faders, 4 band parametric EQ and dynamics on every channel, and a dual independent stereo effects processor board. Your digital I/O is standard on 8 PCI slots and AES/EBU, plus the optional 8 channel digital I/O interface will be added to the D24. The price includes ADAT boards for recorder and mixer and two 5m optical cables. The 03D 26 inputs & 18 outputs, 32 bit internal DSP, 112x3 dynamic range 20 bit converters, 5.1 surround mixing and fast, easy operation via the large screen and any PC mouse which just plugs in.

D24 plus 02R Digital Console **SAVE £3908!**

Yamaha's industry standard professional digital mixer runs in Version 2 providing a host of extra facilities. This great 8 track package with one D24 includes ADAT boards for the recorder and mixer and two 5m optical cables. It can easily be expanded to 16, 24 or 32 tracks of 24 bit 48kHz if necessary, without ever needing to upgrade the mixer. Get a 16 track price for only £4999, 24 tracks for only £5999, and 32 tracks for only £6799. (Minor package items are included - boards + plus - add £799 to package prices.)

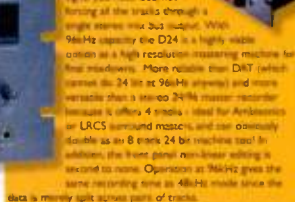
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This also has a limited number of 8 track D24 packages available, which we can offer at this special price. Offers are limited and fully guaranteed.

NEVER MIND THE WIDTH FEEL THE QUALITY!

The D24 may be an eight track, but this is a top end machine and should not be confused with some of the cheaper digital portable multitrack units out in this price range - 3 feature genuine lower 24 bit record and mix!

The D24 is a professional multitrack recorder with 8 individual inputs and 8 outputs to fully recover every signal you recorded, not having all the tracks through a single stereo mix bus input. With 96kHz capacity the D24 is a highly visible option at a high resolution operating machine for first recordings. More notable than D17 (which cannot do 24 bit at 96kHz anyway) and more versatile than a stereo 24 bit master recorder because it offers 4 stereo slots for Ambisonics or LRCS surround mixes, and can obviously double up to 8 stereo 24 bit machines too. In addition, its front panel multi-layer sliding a second to name. Operation at 96kHz gives the same recording time as 48kHz mode since the data is merely split across pairs of tracks.



EXPANDABLE MAINFRAME

Conceived by Yamaha as an ideal partner for their 01V, 03D and 02R mixers to offer 24 bit recording, the D24 is totally compatible with just about any popular format for multichannel digital interfacing and is making it not feasible. It has four interface cards - each of which may house an 8 channel I/O card so you could theoretically fit four 8 channel cards and have complete ADAT, TDIF, AES/EBU and 20 bit analogue eight channel I/O onboard your machine. As standard the bare machine comes without cards - however our format card gives you one year of your choice (at £199 value) to start with, which may well be all you need. Besides this, the D24 has stereo in and out on SPDIF coaxial and a very handy front panel headphone socket for two channel 20 bit analogue monitoring. The rear panel also includes BNC wordclock, iVideo, MIDI, SCSI 2 and serial I/O interfaces, SMPTE timecode I/O or XLRs, and a section for the optional RC D24 remote control.

LONGER LASTING

As well as 24 bit recording mode, the D24 may also record at 20 bit giving you 20% more recording time, or at 16 bit giving you 50% more time. If you need even more time, say for an long classical recital, you can even record to an external hard drive over SCSI. The D24 can easily be used as a replacement for other tape based digital eight tracks, and up to eight D24s can be spliced together using D-Sub cables for 64 tracks!

NO SAM, DON'T PLAY IT AGAIN, LET'S JUST EDIT

Not only do you get all the benefits of removable media and a dedicated hard drive recorder, but the D24 provides facilities that tape based machines can only dream about. You can have up to 8 virtual tapes per track and the D24 has auto buffers, copy, merge, erase, delete and merge functions for non-linear editing, and a time stretching from 50% to 200% forward & reverse playback, with punch in/out. You can edit with variable speed cutting from 1/16th to 4x normal speed. The main transport path range for the whole machine is 66". There are also 99 locate points which you can instantly call up without any tape rewinding time, and no danger of tapes getting chewed up after a few false starts. All in all, a seriously professional machine at a bargain basement price.

REMOTE CONTROL ALSO AVAILABLE

The RC D24 remote controller has an LED indicator of the buttons pressed and can be used with any computer system and can be used with up to 8 machines spliced together only £199.99 RRP £299



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

Repair:

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

Stock Availability:

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

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

Turnkey Deal Guide

YOUR KEY TO A BETTER BUY!

percentage off RRP
product model name
manufacturer
product description
product details
media deal
supplementary offer
turnkey product code
turnkey price
illustration
recommended retail price (RRP)
turnkey price

ORDER FORM

PLEASE USE BLOCK CAPITALS

Send to: Turnkey 114-116 Charing Cross Road London WC2H 0JR

Items Required (use product codes found in price boxes)

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1.
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Sub Total	
P & P	
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Name: _____
Address: _____
Post Code: _____
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Expiry date: _____
Issue No. (debit cards only): _____
Issuing Bank: _____

Please note: credit card orders will only deliver to the registered cardholder address. Please ensure cardholder's name is on the order form.

Allow 10 days for cheque clearance payable to Bank Southdown Ltd. All other payment methods immediate payment. We accept Visa/Mastercard/American Express/Switch/Debit. Bank card registered overseas, bank building society, debit, postal orders, and government purchase order.

23.00 orders next working day delivery in mainland England and Wales and some parts of Scotland up to 1kg. £13.00 under 250 value & 1/2 kg weight plus 28 days.

Please call for details of other delivery types and prices for other cities.

We reserve the right to charge extra where maximum postage limits have been exceeded.

TEN THOUSAND POUND GIVEAWAY

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

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

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

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

EUROPE'S LOWEST

digidesign

UK's NO.1 MAC MUSIC DEALER

CONTROL 24

Engineered by Focusrite and Digidesign, Control 24 gives the ultimate combination of class A mic / line pre-amps 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 motor zed 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 outputs • Touch-Sensitive automation of plug-in parameters using faders via Plug-In Flip Mode



RRP £7037
£POA
CONTROL 24

DIGIDESIGN 001

18 simultaneous inputs and outputs on dedicated external hardware, including two high quality mic pre-amps. Ships with Pro Tools 5.0 LE software offering 24 tracks of audio with real-time effects and up to 128 tracks of MIDI. Max external inputs in conjunction with your recorded audio. The ultimate studio bundle on a budget.

Apple G4/466 inc 256 Meg, 10 Gb internal drive, DVD/CD ROM, Formac 17" Monitor, Digidesign 001 Including Pro Tools 5.0 LE

RRP £3257
£2649
001 BUNDLE

PROTOOLS 24 MIX

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

Digidesign ProTools 24 MixPlus, Apple G4/466 with 256MB RAM 20Gb internal drive, Apple Studio 17 inch monitor, DVD/CD Rom, Adu Dual Channel SCSI Accelerator card, Seagate Barracuda 18Gb fast and wide (SCSI3) drive & CDR in external 2U rack, 888/24 interface, this offer includes the following plug-ins free from Digidesign: Bruno / Reso, Line 6 Ampfarm, Focusrite D2/D3, Drawer Dynamics, Digidesign's D-Verb.

RRP £13939
£12399
MIX PLUS BUNDLE

DIGI 001 COMPUTER STUDIO

Digidesign's Pro Tools system has remained the top choice for most budget studios, but their latest 24-bit hardware line and software package offers 18 internal I/O with 8 analogue, ADAT and SPIDF. This includes 2 phantom powered XLR mic inputs, monitor out, headphone out, and even a patch bay front panel. The bundled software is the new Pro Tools 5 LE offering 24 track audio editing with new RealTime Audio Suite plug-ins and MIDI sequencing.

RRP £979
£799
DDES-DIGI001

VX POCKET MkII PCMCIA SOUND CARD

A PCMCIA soundcard to take your laptop into a mobile recording studio, with a lifetime lease for "unlimited" gig recording in and out, and SPIDF output which allows the card to support up to 24 bit file exchange. Includes AIO drivers for Mac and Windows.

RRP £311
£425

UNITOR 8 MkII USB MIDI INTERFACE

Keeping it in the family. Emagic can also offer you a full MIDI and USB interface package with their 17" independent Unitor 8 interface. Full integration with Logic Gold or Platinum providing 8 MIDI in and 8 MIDI out, SPIDF and ADAT opto. Logic MPE pairs in the front of the unit for easy access. The first choice for Logic users and performs so well that users of other software should also take a look.

RRP £500
£449

OASYS V2 DSP SYNTH & FX I/O CARD

At under half price, the Oasys interface is more of a bargain than ever, especially with the new version 2 software, giving you 24 bit, stereo PCM support. The standard holds 143MB of waveform data (43MB of waveform data - almost all the Triton's internal ROM and first three expansion banks, giving over 3900 samples and 546 subharmonics). There are 16 new PCM based synth plug-ins, including features such as DSP-rate envelopes and multiple, complete, Diff rate MIDI-synthesised LFOs as well as hundreds of new Programs and Mixes. The Oasys V2 offers a vast array of professional synthesis including the world of analog modelling derived from Kong's research into their Oasys keyboard synth. This card is capable of modelling numerous forms of synthesis as well as physical synthesis, resonators and instruments, and contains over 100 alternating effect algorithms. Even better, it's linked by a powerful system of distributed DSP, leaving your main CPU free to play back more... and even free-wheel plugins. The IO architecture is based upon the 121PCI card offering a total of 12 inputs and outputs ADAT, SPIDF and analogue in built in 24 bit converters with very low latency. It supports all major audio and MIDI standards, for compatibility with virtually every audio and MIDI program. AIO drivers for Mac OS and Windows provide direct compatibility with Catalina's Metro, Cubase VST, Digital Performer Logic, Audio Vision DSP, Studio Vision Pro, and more. We can't hold this deal forever - place your order today!

RRP £1299
£599
KORG-OASYS

"The sales assistant could not be faulted"

M.J. (Kent)

MIDISPORT 2x2 MIDI INTERFACE

The introduction of the Apple range of Mac and PC/G4 computers without standard serial ports pushed forward the advantages 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 fits beneath the Midiman shield with Windows drivers too.

RRP £200
£59

24i + CORE AUDIO INTERFACE

At a Ternary price point, this complete CORE audio interface brings you the MOTU PCI 32e card with Audiolab software to interface with the proprietary Audiolab format of the 24i iLink unit. Operating at 44.1kHz or 48kHz sampling rate, the outstanding multichannel converter is an ideal front end and gives you 24 analogue input channels, main and headphone stereo outs and SPIDF out plus BNC wordclock I/O. Converters are 24 bit with 114db dynamic range and ultra balanced jacks.

MOTU 24iCORE ALSO AVAILABLE ONLY £899.99

RRP £1496
£799
MOTU-24iCORE

SAC-2K ASSIGNABLE CONTROLLER

A sleek hardware interface with eight 100mm motorised touch sensitive faders, scrub wheels, transport controls and big 8 digit LED readout for LCD displays. Three blocks of 2 line LCD displays can be used to mine 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, pan, location points, reverb, compression, 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!

FACTORY DIRECT
£1249
RAH-SAC2K

MIDEX 8 USB MIDI INTERFACE

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

RRP £300
£265

CM AUTOMATION MOTORMIX

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

RRP £799
£LOW
CMAU-MOTORMIX

CREAMWARE PULSAR 2

Software MIDI + audio music workstation. Software synth, sampler, virtual mixing, editing, ADAT and SPIDF digital patching, phone. Includes 4 SPIDF DSP output.

RRP £300
£889

EMAGIC AUDIOWERK 8

PCI audio recording card. 2 in 1 8 out analogue. SPIDF I/O. Works with all major software.

RRP £200
£289

MIDIMAN MIDISPORT 1X1

Single port MIDI interface for USB. 1 in 1 out MIDI in 16 ch. Self-powered, no PSU. Includes 6 ft USB cable. Includes drivers for Mac OS 8.8 and Win 98.

RRP £59
£49

MIDIMAN MIDISPORT 8X8

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

RRP £300
£249

MOTU MIDI EXPRESS XT USB

8 in 8 out MIDI interface. 128 MIDI channels. 8 ADAT in/out sync. Required 1U rack.

RRP £399
£339

RME HAMMERFALL LE

Hammerfall Lite comes without the daughterboard but may be upgraded later. PCI soundcard with ADAT optical I/O and SPIDF. 16 in 8 out ADAT Sync socket. SPIDF coast breakout lead. Ultra low latency. Windows 98, Mac and Linux drivers.

RRP £329
£299

KENTON CONTROL FREAK 16

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

RRP £299
£249

PEAVEY PC 1600X

Hardware real-time MIDI controller. 16 faders, 16 buttons, 2 pedals, data wheel. 100 Scene memory. MIDI merge, V2 upgrade.

RRP £349
£349

ADAPTEC SCSI CARDS

Adaptec are the industry leaders for reliable SCSI interfaces on PCI cards. Range covers SCSI 2, 3, 50 pin, 68 pin, SCSI-3, includes Enhanced Channel software & SCSI-3 driver.

RRP £49
£49

CREAMWARE POWER SAMPLER

Sampler on a PCI card. Latency under 2ms. 16 in 16 out, 16 bit, 10.24MHz DSP engine. Reads AAX and Goldmaster format sample libraries.

RRP £500
£399

EMAGIC AMT8

USB multi port MIDI interface. 8 MIDI in/out. Real-time editing. Stackable up to 8 units giving 64 MIDI ports!

RRP £300
£289

MIDIMAN MAC MAN

1 in 3 out MIDI interface for Apple Macintosh. Serial, Fire and G4Port compatible. Built in external powered LED state indicators.

RRP £59
£59

MIDIMAN MIDISPORT 4X4

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

RRP £149
£119

MOTU FAST-LANE

22 channel USB MIDI interface. MIDI compatible and expandable with a built 100% compatible with OAS and ProMIDI. Range of colours.

RRP £69
£69

MOTU MTP AV USB

Versatile USB MIDI patchbay interface. Tricode synchronisation, LTC, SMPTE, ADAT. Digital audio - video sync via computer.

RRP £649
£569

STEINBERG USB2 NEW

2 in 2 out MIDI interface. 32 assignable MIDI channels. MIDI activity indicator. Hot plugable so can be reconnected while the computer is running.

RRP £69
£64
STEI-USB2

KEYFAX PHATBOY

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

RRP £149
£135

PHILLIP REES CF16

Assignable hardware MIDI controller unit with 16 assignable MIDI channels. 24K resolution faders for any MIDI controller. 100 preset settings. Built in game PSU.

RRP £349
£149

YAMAHA CDR8824

External SCSI CDRW. 8x write speed for CDR. 2x ReWriting speed. 24K resolution faders. Large 4MB buffer memory. SCSI-3 50 pin connector. YAMAHA-CDR8824E

RRP £349
£229

PRICES GUARANTEED*

See the Carillon ad on pages 94 & 95 of this issue for more information!



DEDICATED AUDIO PCs

New British company Carillon Audio Systems have developed the first ever "audio computer" specifically for serious music recording studios, where noisy components, RFI interference and unreliable flimsy hardware are absolutely unacceptable! The heavyweight aluminum and steel 4U rackmount design is built to last, won't rattle or vibrate, and provides considerable sonic and electrical isolation for the carefully selected quiet components inside, including Carillon's own UltraMute PSU, plus super low noise fans, a hard drive sleeve, and many other innovations, including sorbothane anti-vibration feet and rackmount dampers. The AC-1 computer is over 5dB quieter than a Mac G4 and over 8dB quieter than a Dell PC of the same spec! Many other musician friendly features include front-panel Neutrik XLR or TRS sockets, and a choice of optional front-panel transport buttons or MIDI assignable control knobs.

Perhaps the most important feature though, is that Carillon offer a range of music application oriented system packages (initially sixteen) incorporating the best popular music software and soundcards etc., from a songwriter's multitrack to a leading edge 160 voice sampler. Each system is carefully matched up, tested and pre-installed ready to use, out of the box and comes complete with extensive on-screen browser manuals for the system as a whole (CarillonHow), taking away any hassle. An extensive troubleshooting section (CarillonHelp) with FAQ and internet updates, plus as a last resort, Carillon tech support engineers can remotely control your computer via the included 56K modem and fix the problem for you (CarillonFix)! (Bare-bones machines or customised systems can also be ordered - without the system manuals.) Carillon AC-1 includes thousands of samples onboard and an exclusive version of the Loopstation search engine for access to our new royalty-free sample library, available free online. Below are a selection of available Carillon systems, but please call for a free 32 page full colour catalogue for the full details of the computers themselves and the complete specifications of the systems. Call us today to transform your experience of computer music making!



Please call for a free 32 page full colour brochure

VST FOUNDATION SYSTEM

- Intel Pentium III 600MHz
- 512MB 133MHz RAM
- 20GB 4.20 GB ATA100 12000 rpm HDs
- 48x IDE CD-ROM Drive
- 15" SVGA Monitor
- Windows 98, Keyboard & Mouse
- Fastest Music Card
- 48x IDE, 3.5" Floppy, Dual USB (1.0)
- 16x IDE, ASIO v2.0
- Ultra Low Latency
- Custom VST 3 Audio Separation

FACTORY DIRECT
RRP £1399
£1299

PRO TOOLS LE WORKSTATION

- Intel Pentium III 600MHz
- 512MB 133MHz RAM
- 20GB 4.20 GB ATA100 12000 rpm HDs
- Yamaha 2020 CD Recorder
- 17" SVGA Monitor, 16 MB Mouse
- Windows 98, Keyboard & Mouse
- RTW 17 Transport Control Panel
- HighQuality MIDI Card & Interface
- 10x IDE, ASIO ADAT
- 10x S/PDIF I/O
- Pro Tools SE 4.0 Software

FACTORY DIRECT
RRP £2499
£2499

ULTRA SAMPLER

- Intel Pentium III 600MHz
- 512MB 133MHz RAM
- 20GB 4.20 GB ATA100 12000 rpm HDs
- Yamaha 2100 CD Recorder & Zip Drive
- 17" SVGA Monitor, 16 MB Mouse
- Windows 98, Keyboard & Mouse
- 16-Audio Output 100% Card & Interface
- 8 Balanced In & Out, S/PDIF, MIDI
- HighQuality 160 Sampling & 7.67
- SoundStage IP & GigCardKit

FACTORY DIRECT
RRP £3299
£3299

OTHER SYSTEMS INCLUDE:

- Logic Foundation System
- Time Sampling System
- VST Sampler
- Logic Pro Sampler
- NET Native Workstation
- MT Pro Studio
- MT Pro Studio
- Track Technology
- Ultimate Symphonic
- Cool Edit Broadcast Workstation
- Music Workstation
- ProTools SE Workstation
- ProTools SE
- Basic Station systems from £1099

ECHOD DARLA

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

RRP £299
£249

ECHO GINA/24

- 24 bit PCI audio card
- 2 inputs & 8 outputs
- Wegott breakout box with 15 pin connections
- ADAT and S/PDIF in/out

RRP £429
£369

ECHO LAYLA

- Outgoing multitrack solution
- 8 inputs and 10 outputs
- Rack-mounted external converters
- MIDI in/out and thru

RRP £799
£779

EGO-SYS U2A

- 4x 8 duplex 2 in 2 out USB audio interface
- Up to 24 bit 48kHz bits
- High I/O conversion
- S/PDIF optical & coaxial
- Simultaneous analogue and digital monitoring
- Includes 2m USB cable

RRP £199
£199

EMU E-CARD

- Card only has balanced stereo analogue I/O and S/PDIF coaxial digital
- 64 voice sampling
- Real-time DSP effects
- Includes WaveLab 1.6 and Cubesix software free
- Also available with audio expansion bay only £269.99

RRP £299
£269

MIDIMAN DELTA 44

- 24 bit 96 kHz full duplex PCI card + breakout box
- Up to 100000 samples
- Includes driver software
- 16 bit 120dB SNR ratio
- Win, Mac, PC, Mac & Linux

RRP £349
£195

MIDIMAN DELTA 66

- 4 balanced analogue I/O
- S/PDIF coaxial I/O
- 24 bit stereo converters and supported data rates
- PCI card + small external breakout box with cable

RRP £349
£275

MIDIMAN DELTA 1010

- 8 balanced analogue I/O
- S/PDIF coaxial I/O
- MIDI in and out (16 ch)
- Wordclock I/O on BNC
- 24 bit 96kHz supported
- 1 PCI card + 1U breakout
- 100% Win, 2K, Mac & Linux

RRP £699
£529

MIDIMAN AUDIOPHILE

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

RRP £179
£169

MIDIMAN PORTMAN PC/P

- Parallel port MIDI interface
- Simple MIDI in/out
- Rugged build quality
- Used for laptops and desktops

RRP £89
£49

NEW MAYA SOUND CARD

The AudioTrak Maya 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 a S/PDIF digital output supporting up to 20 bit data and a 1/4 inch jack output for mix input. The card offers low latency and has ASIO2, HME, DirectSound and Gigasampler drivers. To complement the overall packaging style, even the Windows control panel has a nifty matching Aztec / Maya normal brick design!

RE 2x2 MIDI ALSO AVAILABLE only £49.99

FACTORY DIRECT
RRP £129
£129

AUDIOTRAK MAYA

FACTORY DIRECT
RRP £129
£129

EXTRA 10% OFF

Available on fully guaranteed

Please ask your sales assistant for details

MIDIMAN DMAN PCI

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

RRP £149
£95

PASSPORT MUSICTIME DLXE & MK10

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

RRP £179
£59

BRENELL PCs

CUBASE VST STARTER PACK

- Intel Pentium III 733MHz
- 64 Mb 100 MHz RAM
- 13 Gb ATA66 HD
- 32x speed CD-ROM drive
- 15" SVGA display
- Windows 98 CD, keyboard & mouse
- Cubase VST

Midiman DMAN PCI Audio card
Top Quality GM Synthesizer
1st MIDI interface software
Installed and ready to go!

RRP £1479
£899

Brenell

PACKAGE DEAL
RRP £1479
£899

MT4 MIDI INTERFACE

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

RRP £159
£119

ROLAND UA-30

- External USB audio interface for PC
- 2 ch analogue I/O on phones with mic line level switching
- 2ch digital I/O via S/PDIF optical or coaxial
- Not compatible
- Built in headphone socket

RRP £199
£199

ROLAND UA-100G

- USB interface for Win 98 and 16 bit converters
- Stereo analogue in/out
- 32 channels of MIDI I/O
- New quality improved version
- Includes Civil Edit Lite audio editor software

RRP £229
£229

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 in input and 4 ch output with mixer and effects - plus additional parameters EQ Digital I/O in the form of S/PDIF input and output for the highest quality connections. The Wami Box is not just an audio interface - it also contains a 64 note polyphonic synth engine on matrix response playback, and has 16MB sample RAM onboard.

RRP £429
£399

EGO-SYS WAMI BOX

RRP £429
£399

US428 INTERFACE

Tascam's US428 helps you bridge the gap between analogue and digital software packages designed for multi channel recording and mixing. You get 8 busses, with preamps and EQ pots and a master fader, plus a set of transport keys at large data wheels. These can be freely assigned to your software parameters. Besides better control, the Tascam also gives you better audio interfacing with its 24 bit converters, 12 bit mic inputs, 4 track line inputs, S/PDIF and two MIDI ports. All of this audio and MIDI data is transferred easily via the single USB cable connection.

RRP £449
£429

STEINBERG NU CARD

- 3x ADAT digital I/O (24 ch)
- ADAT 9 pin D-sub type in
- S/PDIF stereo digital I/O
- BNC word clock I/O
- Breakout ports for coaxial S/PDIF connectors
- USB & full duplex stereo rate for 52 channels

RRP £399
£399

TERRATEC EWS88MT

- Semi-rigid + external A/D and D/A converter box
- Guardies up to 24bit digital
- 6 analogue in/out
- S/PDIF coaxial in/out
- Includes ASIO2 and Win 95/98 MT drivers

RRP £399
£319

WAMI RACK 24 MIDI INTERFACE

A 1U rack professional 24 bit audio A/D and D/A converter and integrated MIDI interface, providing 8 mixing inputs and 4 mixing outputs plus S/PDIF 2 channel and coaxial digital I/O with 16MB work block which supports 48kHz, 44.1kHz, 32kHz sampling rates as well as Digimix 25kHz Superbits. Results DIFTE (Invisible) and processes in 4 out MIDI interfacing for 64 channels. Driver software included for ASIO2, EAS1 and Gigasampler platforms.

RRP £619
£529

EGO-SYS WAMI RACK 24

RRP £619
£529

EWS88D SOUND CARD

Turning things you've always had to be satisfied with into the very powerful PCI soundcard with two channels of stereo and output using 34 bit converters. Eight of these are on ADAT digital format and the remaining two channels are the analogue ones, which are parallel to S/PDIF digital I/O in input and output format. Additionally, the EWS88D gives you two independent MIDI outputs for 32 channels of I/O. It is even possible to have up to three operations simultaneously, cascaded together within single sample accuracy.

RRP £209
£169

YAMAHA DS2416

- Including Free AT16 Dual ADAT I/O card
- Extending capabilities of the DCR on a single card!
- Drive bay option for multiple analogue I/O
- Now fully VST2 & Logic
- Ultimum compatible
- ASAT (ASIO2) professional expansion also available £109.99

RRP £399
£475

YAMAHA UX256

- MIDI interface with 128 in and 128 out channels
- High speed USB port
- S/PDIF coaxial in/out
- Includes ASIO2 and Win 95/98 MT drivers
- Driver software included

RRP £199
£179

AUDIOWERK 2 SOUND CARD

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

RRP £199
£169

EMAGIC AUDIOWERK 2

RRP £199
£169

SW1000XG SOUND CARD

The ultimate standard that offers a complete solution for your home studio. It has the sounds from the celebrated MU1000 card module, it has 20 bit stereo analogue input and also a digital output. An on-board DSP chip provides professional independent effects on 12 separate stereo channels MIDI in/out also included. What else could you need? Have fun on an IPX VL or for monster digimixer of 'We've got those too! Fully compatible with all standard MIDI software. A leading card at a fantastic price!!!

RRP £499
£349

YAMAHA SW1000XG DAUGHTERBOARDS

TWO new groundbreaking daughter cards 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-PF NEW Piano board
- PLG100-DX Gives you a bank of DX7 sounds
- PLG100-VL Virtual Acoustic Modelling
- PLG100-VH Vocal Harmoniser... and more...

RRP £99
£99

EUROPE'S LOWEST

MARIAN

FULL MARCS!

MARC 4 MIDI PCI SOUND CARD

Ideal for recording and sequencing software. The Marc 4 MIDI combines 4 analogue I/Os with 2 MIDI I/Os to give you the ideal companion to Cakewalk, Cubase, Logic or any other MIDI and audio sequencer.

Designed to the very highest specifications, the Marc 4 MIDI can handle audio at data rates of up to 24 bit 96kHz so you can even monitor high resolution files at their native rates, giving you stunning quality and resolution. Advanced driver architecture also means latency levels are kept at a minimum - as low as 2ms when using ASIO or DirectX drivers. The Marc 4 MIDI is the ideal trade up sound card for the home or studio musician who is beginning to find the limitations of existing hardware, and it's audio clarity lends it to use in broadcast, music and multimedia recording work.



RRP **£229.99**
MASS-MARC4

MARC 2 24 BIT 96kHz SOUND CARD

The Marc 2 PCI sound card offers two channels of analogue input and outputs via 1/4" stereo jacks, along with 2 channels of SPDIF digital input and output via RCA or optical connectors. It handles full duplex recording and playback at up to 24 bit 96 kHz, and includes an internal digital connection for your computer's CD audio input. It is possible to sync up to four Marc 2 cards on the PCI bus for more I/Os and more flexibility. Includes drivers for Windows 95/98/NT/ME/2000, DirectSound and ASIO 2. (Mac drivers coming very soon.)



RRP **£199**
MASS-MARC2

NEW EVERPACK

New from DUY, authors of such renowned TDM plug-ins as DiPiRe and Dsd Vibe, a plug-in bundle aimed at users of Mac native audio software. This Everpack provides an unrivalled package of five plug-ins which can be used with Cubase MOTU MAS, Dig 001 or any program which supports the AudioSuite or Premiere platforms. These tools will be invaluable for mixing or mastering with any of the above software.



RRP **£399**
DUY-EVERPACK

EXS24 SOFTWARE SAMPLER

A software sampler which supports WAV, AIFF, SDI and ARAI formats, up to 24 bit, and offers 32 voice polyphony. In fact you could stretch 16 of these together in Logic Audio. Sound design tools include multi-mode filters, lissim from the ES1 envelope generators, LFOs for pitch, pan, volume, and HPF sweeps. Includes hard-on (with cross-on) sliders and knobs, for adding effects like parameters.



RRP **£259**
EMAG-EXS24

LOGIC SEQUENCER RANGE

Range sporting DirectX VST plug-in compatibility
LOGIC PLATINUM - Up to 128 audio tracks, 31 included real-time DSP effects, support of multiple high-end hardware.
 RRP £549 OUR PRICE £429.99! EMAG-LOGSP MARC
LOGIC GOLD - Up to 96 audio tracks, real-time DSP effects, supports Audioworks 8 and Korg 1212.
 RRP £399 OUR PRICE £309.99! EMAG-LOGSOL MARC
LOGIC SILVER - Up to 24 audio tracks, 3 effects buses.
 RRP £199 OUR PRICE £159.99! EMAG-LOGSIL MARC



"Nothing could have been better"
J.S. (Oxford)

USB ONE AUDIO INTERFACE

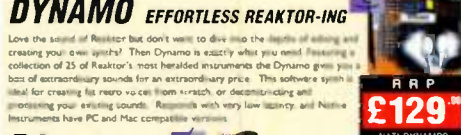
The USB One is an external audio device for easy connection to numerous audio sources and ideal for laptop use, where you can't install a PCI card and you only want to use the interface occasionally, or you're moving from one computer to another and need to ensure your audio quality is maintained. It gives you 2 analogue in and 2 analogue out via 1/4" stereo jacks as well as SPDIF digital inputs (both RCA and optical). The USB-One requires no external power source and is only slightly larger than a standard audio cassette.



RRP **£139.99**
MASS-USB

REAKTOR SOUND GENERATION MACHINE

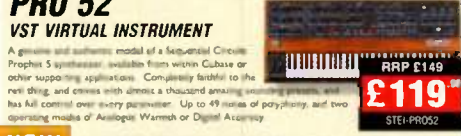
Reaktor 2.3 is the latest version of the award-winning mission-critical synthesizer and sampling development. An amazing piece of software that transforms your PC or Mac into a professional fully featured synthesizer and sampler without the need for additional DSP hardware. For pure sound creation using professional sampling and effects processing then Reaktor is unparalleled. Combining the power of both Generator and Masterformer in a single dazzling package the potential of Reaktor is incalculable. Build your synths powered by samplers, cross format filters with oscillators and modulators. Most form to be believed!



RRP **£229.99**
NATI-REAKTOR

B4 SOFT ORGAN

Another superb software synth from Native Instruments, this time designed to model the famous Hammond B3 organ, including the valve amplification and rotary speaker cabinet. The unit has control over 9 drawbars for each manual layer and 6 for the two octave pedalboard. Parameters such as key click, percussion, harmonic distortion and sustain robbing add a realistic dimension to the emulation, and smaller yet softer, player's shapers on a MIDI keyboard, or very careful sequencing programming, you can add uncanny realism. Hammond B3 organ parts to your tunes.



RRP **£129.99**
NATI-DYNAMPC

PRO 52 VST VIRTUAL INSTRUMENT

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



RRP **£119.99**
STEI-PRO52

NEW REASON SOFTWARE

As a self-contained synth system, everything you need is there, including a fast and flexible sequencer with powerful, dedicated event editors for each type of device. Reason ships with a large (500MB+) sound bank with all the sounds you need to get going. Hundreds of loops, drum kits and samples from e-LAB, hundreds of multisampled instruments from Dublab and hundreds of MIDI patches. Full MIDI control of all the gear you use from a single platform.

ARBORETUM HYPERPRISM

Set of 30 Direct X Plug-in effects, including...
 - Reverb, flange, echo, chorus, gate
 - M-S stereo, pan, ring mod
 - Dynamics, pitch, vocoder
 - A complete palette of DSP
 - New version 2.5 software



RRP **£279**
ARBO-HYPERPRISM

BIAS PEAK VST

New VST version now supports VST Plug-ins
 - 2 track digital audio editor for Windows
 - Sample conversion editing
 - Import/export to most major samplers via SCSI
 - Playlist editing



RRP **£349**
BIAS-PEAKVST

CAKEWALK PRO AUDIO DELUX V9

Massive software bundle! Includes the following:
 - Pro Audio Delux V9
 - Nemesis Gigasampler LE
 - CogsPiano 2GB sampler
 - Cakewalk Audio FX 1, 2, 3
 - Musician's Toolbox III



RRP **£499**
CAKE-PROAUDIO

DIGIDESIGN REVERB ONE

Straightforward digital reverb TDM plug-in
 - Independent control over early reflections, stereo spread, and reverb
 - High quality processing
 - Range of factory presets



RRP **£879**
DIGI-REVERBONE

DUY ANALOG TDM

Bundle pack comprising:
 - Dsd Vibe TDM plug-in for retro tube style colouration
 - Dsd Tape TDM plug-in for over-sampled saturation effect of analogue tape
 - DUY's Analogue bundle puts the grunge back into your sterile digital tracks



RRP **£499**
DUY-ANALOGTDM

EMAGIC ES1

Virtual synthesizer with up to 8 ES1 instruments within Logic application
 - Up to 16 notes poly synth
 - Integrated effect plug-ins have Logic's mixer



RRP **£149**
EMAG-ES1

EMAGIC SOUND DIVER

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



RRP **£169**
EMAG-SOUNDDIVER

NEMESYS GIGASAMPLER LE VERSION

The Prince of Software Samplers
 - Patches up to 4GB size
 - 48 note polyphonic
 - 16 part multitrack
 - LE version now includes ARAI format support



FACTORY DIRECT **£79**
NEME-GIGAPLE

PASSPORT MASTER TRACKS PRO

64 Track MIDI Sequencer
 - Import & Export Standard MIDI Files
 - Cut, copy, & paste sections of music with simple mouse click commands
 - Sync to multiple tracks
 - Video, tape, and more



RRP **£299**
PASS-MTRXPRO

PROPELLERHEADS REBIRTH RB-338

Two TB303e
 - One TR808
 - One TR909
 - All on your Mac or PC!
 - Edit on screen or via MIDI controllers



RRP **£119**
PRO-REBIRTH

ANTARES AUTOTUNE

Automatic intonation correction
 - Retune flat vocals
 - The plugin that makes the famous sound good
 - Now available as a VST
 - NATI version available



RRP **£89**
NATI-AUTOTUNE

CAKEWALK PYRO

Ripping, burning and conversion for CD MP3
 - MP3 to WAV, WAV to CD or MP3
 - CD to WAV, WAV to MP3
 - WAV to MP3 (lossy encoding)
 - Direct X plug in support



RRP **£39**
CAKE-PYRO

CODA FINALE 2000

Top notation and score editing software
 - Academic editions
 - Easy editor to use
 - Learning professional printout



RRP **£499**
CODA-FINALE

DUY SPIDER TDM

40 separate modules that can be user customized into any routing for DSP
 - 220 presets an standard Comp, reverb, EQ, de-ess, FX, noise gates, 3D effects, de-esser etc.
 - Read only Serial only £349.99!



RRP **£799**
DUY-SPIDERTDM

DUY GLOBAL

TDM plugin bundle
 - ReoSpace over 220 FX!
 - Dsd Vibe simulator
 - Dsd Taping tape simulator
 - 3 band limiter
 - Max 32 bit sound level normalizer
 - DUY Wide stereo imager



RRP **£999**
DUY-GLOBAL

EMAGIC WAVEBURNER

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



RRP **£149**
EMAG-WAVEBURNER

NEMESYS GIGASAMPLER FULL VERSION

Full version includes 1 GB grand piano multitrack, CD-ROM
 - The King of Software Samplers
 - Patches up to 4GB size
 - 48 note polyphonic
 - 16 part multitrack



FACTORY DIRECT **£199**
NEME-GIGAPC

NEMESYS GIGASTUDIO

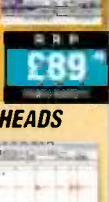
The god of software samplers
 - Patches up to 4GB size!
 - 160 note polyphonic
 - 96 part multitrack
 - Built in studio effects and mixing
 - Realtime antialiased
 - 160 note polyphonic giga studio also available for only £445.98!



FACTORY DIRECT **£269**
NEME-GIGAREPC

PG MUSIC BAND-IN-A-BOX

World leading intelligent arrangement software
 - Full backing band from emerging chart letters
 - Full CD or MP3 availability
 - Can export MIDI files



RRP **£89**
PG-MUSIC

PROPELLERHEADS RECYCLE

Loop tool for samplers
 - Cuts loops into component parts
 - Suggests all major samplers
 - Samples received from samplers via SCSI/MIDI



RRP **£165**
PRO-RECYCLE

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.



RRP £149
£109

FOLIO F1 14 & 16 INPUT STEREO MIXERS

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



RRP £279
£225

SPIRIT FOLIO FX-8/FX-16 16 CHANNEL MIXERS WITH FX

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



RRP £349
£249

SPIRIT FOLIO SX 16:4 PORTABLE MIXER

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



RRP £329
£329

DPS16 STUDIO DIGITAL PERSONAL STUDIO

Another exclusive Turnkey offer! Akai's self-contained nonlinear 10GB hard disk recorder and mixer with a flip-up screen which can record 16 tracks at uncompressed rates of up to 24 bit 96kHz. It has a further 250 virtual tracks available to filter all your overdubs safe, and can store 100 favorite points per song. The main 16:2 digital mixer section has 3 band sweepable EQ with parametric midrange and snapshot memories for the whole mixer setup, permitting a degree of automation via MIDI. The included EB4M FX board provides 44 effect types and can be routed internally from the 16 in 4 bus sends. Backup is easily achieved via SCSI to a hard drive or CD/RW burner for which the DPS16 has driver software, so you won't even need to fiddle up your computer. The main stereo digital Vocoder is SPiDF Coaxial. The large screen allows all menu navigation and setup a breeze, so you can master the whole operation. Don't miss out on this incredible one off deal - this price is a STEAL!



RRP £1099
£1099

BR8 PORTABLE 8 TRACK STUDIO

Records 8 tracks of digital audio and up to 64 virtual tracks into a built in 100MB Zip drive with 3 recording modes at various digital rates. The highest quality MT2 mode uses up to 20.1 data reduction to give 50 minutes of 8 track onto the Zip file. Integral 8 channel mixer, guitar tuner, phrase sampler, CORN installed effects, reverb, chorus, delay, DO, pan, frequency boost, 1 disc track, 2 mic inputs, and SPiDF direct digital output.



RRP £599
£495

NEW VM-3100P DIGITAL 12:8:2 MIXER

Unsurprisingly, this is our best selling mixer compact digital mixer which offers 12 analogue input channels and 8 buses. This 2-in extension additionally includes some extra FX, and a 25 pin D-sub interface giving 8 tracks digital channels plus multitrack tape returns, bringing the number of inputs from 12 to 20, via dual XLR inputs with a twin-finger auto-mute function. The 12:8:2 digital mixer has 24 bit converters, and outputs have 24 bit converters, and there are I/O sockets for SPiDF or other self control, and even XLR line inputs. The format of this 8 channel 24 bit digital I/O is Roland's proprietary R-DR II (Roland Multipurpose Digital Bus II) you may know) which can be used for both V-series equipment - much like Akai's ADAT format, but on a 25 pin D-sub rather than a single fibre optic lead. Roland's new DIF-AT interface has two variants RMD II to ADAT or Tascam TDF which you might want. The full MIDI command set for sequencing, solo, mute, pan, insert, and the 16:2 stereo mixer section includes reverb, delay, chorus, guitar amp simulator using Roland's CORN simulation, and many more interesting effects, in addition to our compressors which may each be individually selected for a particular channel. The EQ is a three band parametric type, with every input channel. Strictly limited stocks only!



RRP £699
£399

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

D8 DIGITAL WORKSTATION



ALMOST
35% OFF!

SCSI interface as standard, plus a whole range of built in digital effects ideal for guitar and vocals, including reverb, chorus etc, and even a guitar level input to do away with DI boxes. Very limited stocks only - call now to avoid disappointment.

RRP £849
£529

D16 HARD DISK 16 TRACK



OVER
45% OFF!

Another Turnkey exclusive, bringing you an unbelievable price on the feature packed D16, offering an impressive 16 tracks of real uncompressed linear 24 bit recording at 44.1kHz rate, with non destructive, non linear editing and 99 undo layers, and an integral 16 channel digital mixer, which is automated with EQ, fader and pan. The built in 2.1GB hard drive may hold over 17 minutes of solid 16 track audio at this quoted rate, although multiple tracks can be digitally bounced down to a stereo pair to expand the capacity still further. There is a built in drum machine with 200 loops, which can serve as the foundation of your track, and up to eleven simultaneous effects, which include Korg's modelling algorithms eg guitar amp simulator etc, and which can be controlled by a foot expression pedal. Extra bonus features are a metronome, chromatic tuner and built-in mic, and the touch screen! Your sixteen track recording can be mixed by the D16 to its stereo outputs, or exported as track pairs, to backup for example, via SPiDF digital I/O or SCSI. Buy now while stocks last!

RRP £1499
£799

MACKIE 24/8

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



RRP £2685
£1900

MACKIE CFX12

• 12 channel 4 bus live mixer
• Built in digital effects
• 3 band master graphic EQ
• 9 bus sends, 3 band EQ with sweepable midrange
• Extra micro Submixer out with 70Hz LPF
• 6 mic inputs with inserts



RRP £499
£499

MACKIE CFX16

• 16 channel 4 bus live mixer
• Built in digital effects
• 9 band master graphic EQ
• 2 aux sends, 3 band EQ with sweepable midrange
• Extra micro Submixer out with 70Hz LPF
• 12 mic inputs with inserts



RRP £699
£699

MACKIE CFX20

• 20 channel 4 bus live mixer
• Built in digital effects
• 9 band master graphic EQ
• 2 aux sends, 3 band EQ with sweepable midrange
• Extra micro Submixer out with 70Hz LPF
• 16 mic inputs with inserts



RRP £899
£899

MACKIE 1202VLZ PRO

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



RRP £329
£190

MACKIE 1402VLZ PRO

• Compact very high quality
• 14 inputs on 80mm faders
• 3 band EQ with 72Hz HPF
• 2 aux sends, mute & solo
• Tap out, mix - monitor
• New XDR mic preamps



RRP £451
£190

MACKIE 1604VLZ PRO

• New version of Mackie's most popular 16:4 mixer
• 3 band sweep mid EQ
• 6 auxes, HPF, 4 buses
• New XDR extended dynamic range preamps
• Physically protected I/O connectors with locks



RRP £921
£699

MACKIE 1642VLZ PRO

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



RRP £885
£699

MACKIE D8B

• 36:8:2 digital console with integrated masterbridge
• 24 analogue + 24 digital ins via expander boards
• Dynamics, 4 band EQ, 12 aux sends, surround pan
• Full dynamic automation, UFX2 encoding
• Optional effects plug-in eg. Antares AutoTune



RRP £955
£190

SOUNDRAFT GHOST 24LE

• 24 channel, 8 bus in-line recording mixer
• 8 bus sends, 4 band EQ with auto parametric mids
• Optional masterbridge
• LE reverb does not have 100ms latency and hence is much more effective!



RRP £859
£190

SOUNDRAFT GHOST 32LE

• 32 channel, 8 bus in-line recording mixer
• 8 bus sends, 4 band EQ with two parametric mids
• Optional masterbridge
• LE reverb does not have 100ms latency and hence is much less expensive!



RRP £4805
£190

SPIRIT 328

• 8 bus 24 bit digital mixer with motorized faders
• Built in effects by Lexicon
• 16 analogue + 16 digital inputs
• 3 band EQ with HPF
• 6 aux sends, inserts, 16 global dynamic limits



RRP £2489
£190

YAMAHA O3D

• 4 Band fully parametric eq
• 5 dynamics on each ch
• Fully automated digital signal
• 28 ins, 4 buses, 4 auxes
• 2 built in stereo effects processors
• Motorized faders



RRP £2099
£1799

AKAI DPS12i

• 12 track non-linear 16 bit hard disk recorder
• 1100 store + 160 minutes compressed audio with EQ, time-stretching, pitch editing and optional FX
• SCSI backup or CD/RW



RRP £795
£795

YAMAHA FADERS

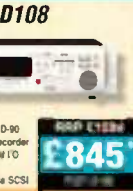
YAMAHA-100AD Analog 8 Channel I/O card (SR & DR) 799
YAMAHA-100AB Analog 8 Channel I/O card (DR) 799
YAMAHA-100AE AEX 4 Channel I/O card (DR) 799
YAMAHA-100ADT ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT2 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT3 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT4 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT5 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT6 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT7 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT8 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT9 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT10 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT11 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT12 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT13 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT14 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT15 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT16 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT17 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT18 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT19 ADAT 8 Channel I/O card (SR & DR) 799
YAMAHA-100ADT20 ADAT 8 Channel I/O card (SR & DR) 799



RRP £2099
£1799

FOSTEX D108

• Replaces Fostex's D-80
• 5 track hard disk recorder
• ADAT optical digital I/O
• 99 locate points
• Beads WAV files via SCSI



RRP £1299
£845

FOSTEX D160

• 16 track 16 bit HD recorder
• SCSI interface, ADAT digital I/O
• Non-linear editing, 99 locate points



RRP £1699
£1649

FOSTEX VF08

• 8 track hard disk recorder
• 10GB drive for up to 4 hrs of 16 bit 44.1kHz
• 8 channel mixer with two XLR mic inputs
• 8 channels of effects, EQ and compression
• Backup to CD/RW via SCSI



RRP £549
£190

HBB CDR830 BURN IT

• More affordable version of popular CD/RW
• Uses SCSI interface
• Includes of balanced XLRs
• Includes SRC and 24 bit converters plus a CD-TEXT



RRP £499
£389

EUROPE'S LOWEST

Focusrite MASTER OF ALL!

Focusrite go quadruple Platinum - introducing their fourth processor in this series, which yet again, offers the versatility of a Swiss army knife, but with the precision of a surgeon's scalpel - when it comes to finding its "niche market" in the D.I.Y. mastering field.

A stereo-linked analogue processor with balanced ins and outs on TRS jacks and XLRs, and a range of features usually only found on more expensive digital multi-processors, but this time implemented with high quality Focusrite circuitry. The process of mastering is usually reserved for finished mixes, so the MixMaster treats its inputs as a stereo L / R pair. You get a separately switchable expander / gate (with threshold & release controls), and a three band manual compressor (with adjustable crossover slope and relative balance.) Next up is a three band sweep EQ with fully parametric midrange, followed by a balance trim, stereo width adjuster (via M+S type stereo difference level) and a master fader and output limiter. All processes are well metered on LED bargraphs, and there's even a phase correlation meter which shows the coherence (mono compatibility) between the left/right channels, and an optional 24bit 96kHz stereo A/D converter may be fitted for AES/EBU and coaxial S/PDIF digital outputs. **Polish up your mix!**

- Analogue 3 Band Compressor, and 3 band EQ
- Built in noise gate, stereo expander and phase meter
- Optional 24 bit 96kHz converter board for digital out



RRP £749
£695
FOCU-PLATMIX

DIGITAL PROBLEM SOLVERS



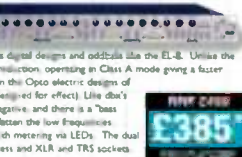
A crystal clear 24 bit digital environment for music would be a beautiful thing if all the silly irritating problems could be overcome. Too many pieces of gear seem to run at 48kHz only, especially sound modules and early Adat optical peripherals. Too many manufacturers seem intent on having their own proprietary formats that no-one else can use without their converter box. How many times has your digital routing almost worked apart from wordclock hierarchy? Only amateurs say "let's just go analogue..." Professionals need a range of digital interface solutions that get things sorted. FriendChip provide an efficient answer to these needs at cost efficient prices.

FriendChip's current range includes:

DT-11 PRO CD-R 24BIT 96kHz + AES/EBU + FireWire 24bit 96kHz	£129.00
DT-11 PRO CD-R 24BIT 96kHz + AES/EBU + FireWire 24bit 96kHz	£129.00
DT-11 PRO CD-R 24BIT 96kHz + AES/EBU + FireWire 24bit 96kHz	£129.00
DT-11 PRO CD-R 24BIT 96kHz + AES/EBU + FireWire 24bit 96kHz	£129.00
DT-11 PRO CD-R 24BIT 96kHz + AES/EBU + FireWire 24bit 96kHz	£129.00
DT-11 PRO CD-R 24BIT 96kHz + AES/EBU + FireWire 24bit 96kHz	£129.00
DT-11 PRO CD-R 24BIT 96kHz + AES/EBU + FireWire 24bit 96kHz	£129.00
DT-11 PRO CD-R 24BIT 96kHz + AES/EBU + FireWire 24bit 96kHz	£129.00
DT-11 PRO CD-R 24BIT 96kHz + AES/EBU + FireWire 24bit 96kHz	£129.00
DT-11 PRO CD-R 24BIT 96kHz + AES/EBU + FireWire 24bit 96kHz	£129.00

COMPOUNDER COMPRESSOR

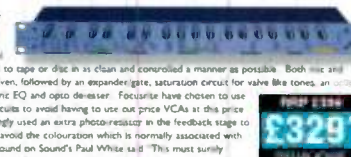
The CompoMaster looks like a major compressor in absolute terms against almost any other 1u rack compressor, excepting high-end or high-res digital designs and oddballs like the EL-8. Unlike the other Platinum models, it uses a VCA for gain reduction, operating in Class A mode giving a faster response and more accurate limiting action than the Opus electric design of the VoiceMaster and ToneFactory (which are designed for effects). Like the EL-8, the ratio setting can go positive to negative, and there is a "bias expand" which puts an inductor in circuit to lessen the low frequencies. There is a useful expander / gate and limiter, with metering via LEDs. The dual mono unit includes stereo limiting, sidchain access and XLR and TRS sockets.



RRP £385
£385

VOICEMASTER CHANNEL STRIP

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



RRP £329
£329

AIR FX REALTIME STEREO EFFECTS

There have been infrared effects controllers before, some as stand alone units and others built into synths and groundstations. Roland's D-beam for instance, is very popular - but it's just a single beam. Alesis however, has rethought this concept and developed a patent pending technology they call "Axy"™ which creates a 3D sphere of infrared light sensor response - that's not just one hand motion up / down, left / right and forward / backwards giving you three axes of modulation. Look at the sensors! The stereo digital effects are exemplary Alesis quality with 50 types leaning towards the wild, wild and weird!



RRP £199
£169

MOOGER FOOGER FILTER & RING MODULATOR

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



FACTORY DIRECT
£219

3630 COMPRESSOR / GATE

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



RRP £798
£109

ISA-430 PRODUCER PACK

CompoMaster proliferates the outboard market, but your choice is still quite restricted if you hanker after a top quality high-end signal path. Today's most desirable mono-channel-strip-in-a-box has to be the Focusrite Blue series ISA-430, which follows Focusrite's philosophy of adding subtle colouration (some say warmth) to the audio signal giving that familiar polished studio sheen. The transformer coupled I/O stages and legendary 4 band parametric EQ section are greatly responsible for this, along with the VCA compressor, wide bandwidth mix preamp and noise gate. Optional 24bit A/D converter.



RRP £299
£2099

VC30 JOEMEER

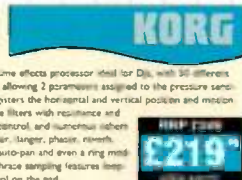
Joemeer's latest revision of their bestselling VC3 unit is the new VC3Q which now features an equaliser instead of the azotic! For most circumstances where a channel strip is needed, the EQ is far more useful, particularly with live sources or DI instruments such as guitar or bass, or a radio mic receiver.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



RRP £199
£149

KAOSS REALTIME EFFECTS

Stereo digital realtime effects processor ideal for DIs, with 50 different effects algorithms, allowing 2 parameters assigned to the pressure sensitive pad which registers the horizontal and vertical position and motion. Includes sweepable filters with resonance and cutoff under pad control, and numerical filters such as push-shifter, flanger, phaser, reverb, echo, distortion, auto-pan and even a ring modulator. A 5 sec phrase sampling feature keeps and speed control on the pad.



RRP £299
£219

M-ONE MULTIEFFECTS

The M1's multi-effects unit has 20 basic algorithms including reverb, delay, pitch-shift, chorus, flanger, tremolo, and even several dynamic algorithms. All effects are fully editable, and there are 128 user patches to store your favourites using the 128 factory presets. The M1's dual engine architecture can run two simultaneous full stereo effects, or two reverb or delay plus multi-tap delay. There's a coarse S/PDIF digital interface, 40 bits in 24 bit converters with balanced TRS jack connections which proliferate up to +20dB output with a 93dB dynamic range. The unit is MIDI addressable and has a footpedal jack socket input which can work as a bypass switch, tap tempo or parameter control. TC have built their reputation on effects boxes like this.

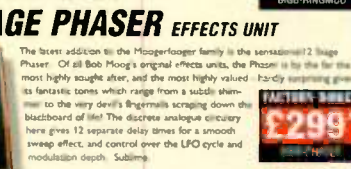


RRP £399
£359

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

12 STAGE PHASER EFFECTS UNIT

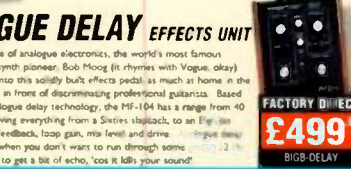
The latest addition to the Moogertogger family is the sensational 12 Stage Phaser. Of all Bob Moog's original effects units, the Phaser is by far the most highly sought after, and the most highly valued to the very devil's fingertips scragging down the blackboard of life! The discrete analogue circuitry here gives 12 separate delay times for a smooth sweep effect, and control over the LFO cycle and modulation depth. Sublime.



FACTORY DIRECT
£299

ANALOGUE DELAY EFFECTS UNIT

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



FACTORY DIRECT
£499

CP251 CONTROLLER ALSO AVAILABLE only £299.99

VF1 MULTIEFFECTS

Compact digital multi-effects utilizing algorithms from the signal-to-noise range Boss VG-8 guitar modelling effects. The VF1 has 24 bit A/D and D/A converters, and offers 100 factory presets plus 200 user programs. It includes S/PDIF digital signal out as well as a front panel headphone socket. Effects types include COSM based modelling reverb, chorus, delay, distortion and numerous modulation FX.



RRP £399
£299

FILTER FACTORY

MIDI controllable stereo resonant filter with LFO jack and phono input with switchable RIAA input. Filter works as stereo 120dB/oct or mono 24dB/oct (4th order) HPF, LPF, BPF or notch. LFO controller section includes tap tempo to easily match sweeps to your music. The "Buz" section engages a controllable distortion effect, and the main outputs have FX wet/dry mix.



RRP £300
£289

D-TWO DIGITAL DELAY

The D2 provides 10 full seconds of delay with tap-tempo buttons, readouts in ms or BPM accurate to 0.1 BPM and up to 128 user patches in addition to the 50 factory presets. Uniquely, the tap tempo function also allows you to set or recall the delay repeats can then mimic, or even step cut and quantify them. Offers level, pan, feedback level, feedback pan and no. of repeats, along with special freeway ping-pong, special (phase inverted) delays, reverse echo, dynamic level control of echo based on input signal amplitude and various delay-based effects like chorusing and flanging. Echo taps may be filtered to simulate natural HF rolloff or an analogue tape echo style effect.



RRP £499
£369

266XL DUAL COMPRESSOR GATE

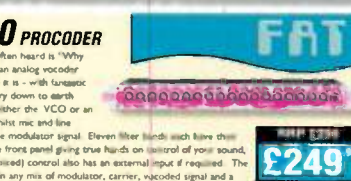
Two channels of classic filter compression with new Auto Dynamics™. Astadi and Release controls, program-selectable expanders/gates, balanced inputs, precision LED metering and sidchain inputs. Front-panel selection of stereo or dual mono operation, all in a scintillating IU rack design and at an unbelievable price. Now with new auto sweep mode!



RRP £129
£129

PCP330 PROCODER

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



RRP £300
£249

FINALIZER EXPRESS 24 BIT 3 BAND COMPRESSOR

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



RRP £899
£699

PRICES

GUARANTEE*



IMPROVE YOUR PERSONAL SPACE!

Ask just about any recording engineer for their opinion on who makes the finest reverb and effects processors, and you will get just one answer - Lexicon. Their 224 was the first digital reverb made, and even now twenty years on, is still much sought after. The current mid-priced range of the PCM81 and 91, together with their price-breaking MPX1 and MPX100 bring that famous Lexicon sound to a more affordable reality, and offer some of the most classy reverb algorithms in the business.

MPX1 MULTI EFFECTS PROCESSOR



price. Up to 5 simultaneous effects are available including pristine quality stereo pitch "morphed" from one algorithm to another, as pioneered in the Vortex. All new operating system includes on-line help and database for sorting presets - achieving quality results is as stress free as possible.

For those of us who need top quality reverb & multi FX but cannot stretch to the expense of the PCM81 or PCM91, Lexicon have released the MPX-1. Featuring the famous 'Lex' DSP chip for reverb and another separate DSP for multi FX, the MPX-1 brings you all the best in signal processing for an incredibly low

RRP £1199
£529.99
LEXI-MPX1

MPX500 MULTI EFFECTS PROCESSOR



knobs, MIDI and a big LCD. It uses 24 bit converters with balanced XLR & jacks I/O, plus S/PDIF coaxial digital I/O

Lexicon's newest multi-effects unit has a whole host of top quality studio effects and offers remote MIDI control of up to 16 parameters in realtime. Its dual channel processor handles the DSP and provides 240 presets, 30 user patches, 4 edit

RRP £499
£379
LEXI-MPX500

MPX100 MULTI EFFECTS PROCESSOR



effects each with 16 variations, not to mention MIDI control and tap-tempo delay times, but for many it will just be used as a primary reverb - why? Because everyone knows Lexicon's reputation for artificial reverb is without peer.

One of the first budget digital effects units to include S/PDIF coaxial digital output as standard, to preserve those smooth Lexicon reverb algorithms. A well-equipped multi-effects processor, giving 16

RRP £249
£179.99
LEXI-MPX100

ALESIS MIDIVERB IV



• 18 bit stereo digital FX + soft rubber buttons!
• Up to three effects at once, 128 preset user
• Automatic level sensing and set up utility
• On screen HELP pages describing each effect

RRP £366
£174

ANTARES ATR1



• Adaptive digital pitch correction for your studio out-of-tune singers!
• Easy setup & LED meter
• Present and user definable note scales, and ranges
• Almost 100 segments in use

RRP £799
£599

APHEX TYPE C2



• From Aphelex the inventors of the EXCITER™
• Biased extra ring treble harmonics
• Bass section compresses for more impact!
• Balanced TRS jacks

RRP £295
£139

DIGITECH VOCALIST WORKSTATION EX



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

RRP £599
£LOW
DTEC-VOL3VISEX

DIGITECH STUDIO QUAD 4



• Discrete 4 channel effects
• Twin Stereo lineable
• 20 bit converters
• Auto input leveling
• Full MIDI implementation
• Reverb, delay, chorus, pitch, EQ - variations

RRP £399
£LOW
DTEC-STQ104X

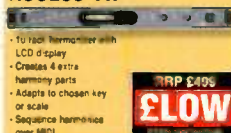
DIGITECH TALKER



• Mic or guitar input, footswitches
• Digitally mimics vocal sounds & FX
• Vocodex, Autowah, Duet
• Drone pitch, Alien, Gated reverb
• As used on Otis's voice in the song "Believe"

RRP £319
£LOW
DTEC-TALKER

DIGITECH VOCALIST ACCESS VR



• 10 track harmonizer with LCD display
• Creates 4 extra harmony parts
• Adapts to chosen key or scale
• Sequence harmonies over MIDI

RRP £496
£LOW
DTEC-VOL4VR

DIGITECH VOCALIST PERFORMER



• Digital harmonizer with reverb
• XLR mic input. Adds 2 harmonics
• Major/minor chords adapted to key
• Presets allow A/B switchovers

RRP £319
£LOW
DTEC-VOL5PER

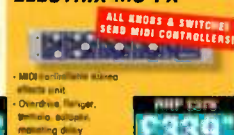
ELECTRIX WARP FACTORY



• MIDI controllable stereo vocoder with XLR mic in
• XLR mic input. Adds 2 harmonics
• Major/minor chords adapted to key
• Presets allow A/B switchovers

RRP £349
£289

ELECTRIX MO-FX



• MIDI controllable stereo effects unit
• Overdrive, flanger, tremolo, auto wah, multi delay
• Inlet ports: XLR, TRS, RCA preamp and footswitch

RRP £379
£339

ELECTRIX EQ KILLER



• Stereo 3 band EQ with knobs for sweepable crossover frequencies
• +6dB boost, -6dB cut for each band
• Kill switches and muting
• Ideal for DJ effects

RRP £199
£149

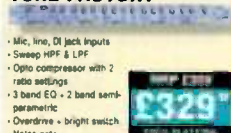
ELECTRIX FILTER QUEEN



• Stereo analogue resonant filter effects
• LPF, BPF, HPF or notch
• Sweeps track external key input or built in LFO
• Switchable square, triangle, random, linear sawtooth waveforms.

RRP £199
£159

FOCUSRITE PLATINUM TONE FACTORY



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

RRP £329
£229

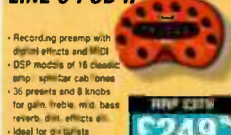
JOEMEKK VC1QCS



• New redesigned channel strip with OS Control
• Sensing mic preamp
• New EQ based on 4 band 'stepped' equalizer
• Exciter with drive and Q
• Classic Joemekk triple electric compressor

RRP £399
£499

LINE 6 POD II



• Recording preamp with digital effects and MIDI
• DSP modes of 18 classic amp
• 36 presets and 8 knobs for gain, treble, mid, bass reverb, dist, effects on
• Ideal for guitarists
• Bass Pod and rackmount versions also available!

RRP £379
£249

TC ELECTRONIC FIREWORX



• 24 bit multiFX & AES
• S/PDIF & ADAT I/O
• 8 multi-effects effects real time control
• Digital crusher, ring modulator, vocoder, formant shifting & more.

RRP £199
£LOW

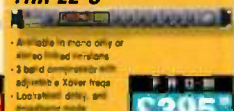
SPL VITALIZER STEREO JACK



• Combined controls for stereo operation
• Frequency dependent phase shifting based on programme dynamics plus loudness boost
• Soft-Tight EQ for auto bass compressor
• Mass effect stereo width

RRP £399
£139

TC ELECTRONIC TRIPLE-C



• Available in mono only or stereo linked versions
• 3 band compressor with adjustable Xover traces
• Look-ahead delay, and
• Attack release gain for envelope gating

RRP £399
£395

TLA IVORY 5050



• Mic, line & DI jack (with HPF)
• Master compressor, GR meter & bypass
• Output attenuator & jack

RRP £299
£249

TLA CLG1 CLASSIC



• TLA Audio's C1 soft knee valve compressor gets a new look!
• New round VU meters & chunky 6mm front panel
• 2 mic preamps - aux in
• Very smooth XLR - jack

RRP £499
£1099

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

PRO R3 DIGITAL REVERB

This 2u rack effects unit uses the same 32 bit chip as Yamaha's O3D and O2R digital mixers but focuses on reverbs which can incorporate echoes, chorus, flange, pan or pitch shifting effects. A pre or post 3 band sweep EQ with four param knobs is available, and there are also compression, filter and noise gate settings across the 90 preset and 90 user programs, while MIDI implementation allows remote control of programs and parameters etc. Analogue connections are on balanced XLRs and jacks. Take advantage of this incredible Turnkey megadeal now, while stocks last!



RRP £999
£329
YAMA-PROR3

EFX-10 STUDIO MULTI-EFFECTS

Viscount's entry into the fully professional effects market features authentic sound quality delivered by 24 bit processors with 128s over-sampling. Delta Sigma conversion. True stereo -20dB-40dB connections. Built-in MIDI control, large backlit display, high range of effects including reverb, delay, chorus, flange, pitch-shift, with phasing, auto modulation, etc. Unbelievable clearance price!



RRP £199
£99
VISC-EFX10

RFX-1000 MULTIEFFECTS RACK

The RFX1000 is similar to the RFX2000 below, but with analogue connections only. It has a similar range of different effects equal across 19 different algorithms, in three different levels - reverb, effects, and Filter + EQ. The reverb time and reverb character can have parameter control knobs, alongside the standard Input / Output level and wet / dry mix. The most optimised effects found on the RFX2000 live also here, and there is a mix input on the front panel for just high impedance dynamic mics.



RRP £149
£99
ZOOM-RFX1000

RFX-2000 MULTIEFFECTS

The RFX2000 is the top of the range in Zoom's new multi-effects line, with S/PDIF digital output as standard. Eight variations each of six different effects groups covering reverb, delay, pitch-based effects like flange and chorus, also standard effect processes like a Vocoder (with mic input), Ring Modulator, Time Trim, Distortion, Bouncer, Comb, Step Crop, Resonance and many others. There are parameter control knobs and the unit is MIDI addressable. The RFX2000 includes patch saving built-in on CD-ROM for PC, and Mac, which also includes an extra effects bank.



RRP £329
£149
ZOOM-RFX2000

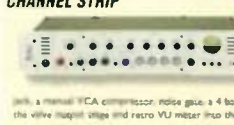
RFX-300 DESKTOP MULTI-EFFECTS UNIT

Zoom are synonymous with great live effects units, and live always been their focus for many years. But with our massive 30% discount, the RFX300 is a bargain too good to miss. It provides 22 presets cover the numerous popular digital effects, along with some interesting analogue simulations, stereo width enhancers and a "Vocal Filter" effect to actually filter the vocal perceived volume from within a composite stereo mix. Similarly the "Mix Limbiter" is designed to impart the presence and detail of an expensive limit compressor in any dynamic mic input, feed in through the built in mic preamp. This is a limited offer so get your order in quick!



RRP £109
£69
ZOOM-RFX300

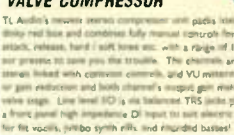
5051 CHANNEL STRIP



The only hybrid valve channel strip with a mono gain expansion! TL Audio's 5051 brings you a pre-amp with two 4V1s or Hi-Z

RRP £445
£425
TLA-5051

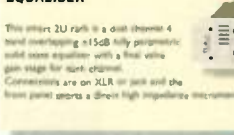
FAT-1 VALVE COMPRESSOR



TL Audio's new valve compressor unit packs itself into a very real size and contains fully manual controls for threshold, attack, release, hold & soft knee etc. with a range of 15 compressor presets to save you the trouble. The channels are always stereo linked with common controls, and VU meters for level or gain reduction and both channels' output gain mixing are a valve gain. Line level I/O is via balanced TRS jacks plus there is a front panel high impedance DI input for safe electric guitar or bass etc. Great for live vocals, hi-hat synth fills, and drummed bass!

RRP £349
£269
TLA-FAT1

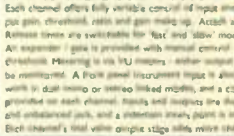
IVORY 5013 EQUALISER



This offers 2U rack in a dual channel 4 band overlapping 15dB fully programmable solid state equaliser with a real valve gain stage for each channel. Compressors are on XLR or jack and the front panel offers a direct high impedance instrument input jack.

RRP £445
£425
TLA-5013

IVORY 5021 HYBRID VALVE COMPRESSOR



Each channel offers fully variable control of input and non-par gain, threshold, ratio and mix-up. Attack and release times are variable for 'fast' and 'slow' modes. An expansion gate is provided with manual control of threshold. Metering in its VU meters, output level or gain reduction will be minimised. A front panel instrument input is also included. The unit will work in dual mono or stereo linked modes, and a compressor bypass switch is provided on each channel. Inputs and outputs are balanced XLR and unbalanced jack, and a reference delay pulse is included on each channel. Each channel's full valve analogue stage will retain characteristic characteristics.

RRP £445
£425
TLA-5021

EUROPE'S LOWEST



FACE THE TRUTH

Nearfield monitoring has become such a standard way of working in project studios, it's a shame there's never been a speaker under a grand that's really up to the task - until now!

Getting low bass out of a small speaker cabinet is one of the biggest challenges for a speaker designer. Small domestic midi systems often have distortion or compression deliberately introduced to boost the perception of what little bass there is. Take a listen to the average 15 inch disco PA speaker - all boom around 80 - 150 Hz which sounds impressive for a while - a heavy throb when you turn the volume up - but where's the real low bass !!! Completely missing, of course!



Most designs use vented ports to add tuned resonances, while other designs employ transmission lines or belt driven servomotors which are noisy. Mackie have utilised the silent passive radiator method, at the rear of the cabinet where it helps couple to the rear wall. This honeycomb membrane is a 12 inch x 6 inch ellipse, whilst the main woofer is an 8.5 inch cone driven by a 150 watt amp using negative feedback to increase the damping factor. The cabinet is foam-lined 3/4 inch MDF with a 1 inch baffle. The waveguided alloy dome tweeter is driven by a 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 Omron laser vibrometry measurements to fine tune the design.

A very realistic pair of nearfields at a very realistic price.

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

RRP £1099
£1099*
MACK-HR824

M1 ACTIVE NEARFIELDS

Unbeatable end of line deal on Alesis superb M1A - the active version of the extremely popular Monitor One. A 4 inch ported two way nearfield design with an asymmetrical silk dome tweeter, hornloaded cabinet, and a 4 inch carbon fibre woofer. Individually shielded, in a rugged single case. This is designed to fit 15 and 7.5 inch speaker cabinets with standard LN, noise, and crossed over with very simple adjustability features to accommodate the full 1.5kHz crossover range, where they are also aligned. Exclusive to Turnkey - order now while stocks last!

RRP £549
£399*
ALES-M1

ABSOLUTE ZERO PASSIVE NEARFIELDS

There are several well thought out points of good design in Spirit's dinky little Absolute Zero in this form, and to be honest (as always) they are arguably the best performing monitor-speakers you'll meet for under £200, with a very acceptable sound - it's not too bright and raspy, and neither is it over-muffled and busy. The overall sonic balance is good, any benefits from their porting, rounded edges and a recessed, rim-angled tweeter. Woofer is 6.5 inch woofer, a 1.5 inch voice coil impedance is 8 Ω nominal, for a load 95 watts RMS at 0dB SPL per watt.

RRP £199
£159*
SGRA-AB0

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 is bringing £150W into mono BLK (hence the name). The RA300 also 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 180W into 4 Ω (bringing in 300W into BLK). Both units feature balanced TRS inputs and damping factors of 200 - with a high 80VdB/imp rise and 100dB/imp rejection.

FROM
£199*
ALES-RA150

ABSOLUTE TWO PASSIVE NEARFIELDS

The Spirit Absolute Two monitors, deserve special credit for being size of the low end two-way nearfield design rated to handle 100 watts RMS, which combined with their high 90dB/imp sensitivity gives drive ample headroom for peaks at typical close field monitoring levels. The distinctive blue cabinet 4.5 inch woofer & front port and achieves a -3dB point of 45Hz. The tweeter is a silk dome model with a treated silk diaphragm. Nominal impedance is 16 Ω and the enclosures have a slightly concurred front baffle and are very solidly built.

RRP £269
£179*
SGRA-AB2

ALESIS MONITOR 1 MKII

- Small two way nearfields
- New reduced cabinet edges
- 6.5" rear ported woofer
- Silk dome tweeter
- 4 Ω nominal load
- 60W RMS 80dB SPL/watt

RRP £274
£229*

DYNAUDIO BM15 A

- Two way front ported active nearfields
- 10" woofer with 4" voice coil + Elocac tweeter
- Tweeter amp + 100W
- Woofer amp + 200W
- 30 - 21,000 Hz 3dB

RRP £1750
£1299*

GENELEC 1030A

- Small two way active nearfields
- 80W amp drives 8.5 inch woofer
- 50W amp drives metal dome tweeter
- Front ported, max 99dB SPL

RRP £949
£799*

HJB CIRCLE 5

- Popular low cost nearfields. Pink cone
- 8 inch woofer, silk dome tweeter
- Front ported, 8 Ω nominal load
- 60 Watts RMS, 87dB SPL per Watt
- Active version also available only £359.99

RRP £339
£315*

JBL CONTROL 5

- Two way front ported speakers, 80W into 4 Ω
- 6.5 inch woofer runs up to 3kHz crossover
- Metal dome tweeter
- 89dB SPL per Watt @ 1m

RRP £439
£249*

JBL CONTROL 1

- Mini 1.6kg two way passive speaker
- 5 inch woofer, 2cm tweeter with grille
- 75 Watts max, 87dB SPL per Watt
- 4 Ω nominal load, -10dB at 70Hz

RRP £199
£99*

SPiRiT ABSOLUTE 4P

- Two way rear ported active nearfields
- 6.5" woofer with 1" voice coil + soft dome tweeter
- Built in 100W amp + approx 1120Bpd max
- Fourth order

RRP £769
£479*

F11 ACTIVE NEARFIELDS

Quested's most affordable self powered nearfields are the F11. A two-way bass reflex enclosure with 8.5 inch woofer and active 24dB/oct crossover and Bi-amped 100W + 50W power output. The cabinet uses a polypropylene composite material more rigid and denser than conventional plywood or MDF, which helps to reduce any nasty cabinet resonances. Amp noise is 100dB below clip wtd-0.1% THD (-70 SdB) System response orders 10Hz - low EQ tweeter and the "B" setting is -3dB at 60Hz.

RRP £1149
£799*

1029A BI-AMPLIFIED MONITORS

The excellent compact 1029As are powerful nearfield monitors for your home studios, DAWs, and surround sound use. They feature a rigid cast aluminium die-cast magnesium alloy housing for durability, the entry single unit includes active electronic crossovers, variable protection circuitry and two power amplifiers, one for each driver. They defy their size in out performing many much larger monitoring systems.

BUY WITH SUB WOOFER FOR ONLY £699.99

RRP £749
£479*
GENE-1029A

REVEAL PASSIVE NEARFIELDS

A magnetically shielded two way nearfield monitor with its remained in baffle. The 8 inch woofer is now ported in a 12 liter cabinet and achieves a -3dB point around 80Hz. The port is taken to approx 40cm. The design uses a silk dome tweeter and offers 50 watts power handling at a sensitivity normally 87dB SPL/W with passband ripple around 2.3dB above 80Hz. The drivers are crossed over at 3kHz with good timing coherence.

RRP £249
£179*
TANNOY-REVEAL

VS2205 ACTIVE MONITOR

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

RRP £1699
£1199*
QUEST-VS2205

SERVO 170 TWO CHANNEL POWER AMP

A power amplifier for the budget conscious in a small 2U rack housing. The amp has sophisticated peak inputs and peak limiting output terminals, and provides a low frequency damping factor of up to 100. Power rating: 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*
SAMS-SERVO170

YST-M8 & MSW10 MULTIMEDIA SPEAKERS

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

RRP £299
£179*
YAMAHA

VS3208 ACTIVE MONITORS

A new model in the Quested line-up, offering tri-amp monitoring with a line-level XLR input and IEC mains connection. The cabinet is heavily built with slightly rounded edges and two large ferrofluid firing bass ports way down to the tweeter. Each of the dual 8 inch drivers (which are side by side, off-axis rather than d'Appolito style) has its own internal chamber, and the midrange is a soft dome unit with a 3dB point is quoted as 80Hz which gives them a similar pricing to Tannoy's better priced NS10 nearfields.

RRP £449
£299*
YAMAHA-MSP5

SERVO 260 TWO CHANNEL POWER AMP

A higher power version of the Servo 170 offering with the same connections and 2U rack form. The 260 weighs just 5.5 kg, yet offers 85 -100Watts per channel into 8 Ω , 130 watts per channel into 4 Ω or up to 280 watts into a single 8 Ω load with both channels bridged (hence the name).

RRP £299
£179*
SAMS-SERVO260

YST-M8 & MSW10 MULTIMEDIA SPEAKERS

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

RRP £299
£69*
YAMAHA

PRICES GUARANTEED



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. Beyers 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: 8 Ω , 400 Ω , 2k Ω - please specify when ordering.



RRP £125
£85.99
BEYE-DT100/4

DT100 EAR PADS
Replacement earpads to fit the DT100 above
Large cushioned circumaural design
Easy to install
One size fits all!
RRP £15
£11

DT100 CABLE
Replacement headphone cable for Beyers DT series
3 metres long
Standard 1/8 inch stereo jack plug
High quality screened connection cable
RRP £24
£19

DT100
Closed back circumaural design
80 Ω nominal, 100dB SPL/mW
Response -10dB, 10-30,000 Hz
250 Ω version available
RRP £109
£85
BEYE-DT250/25

DT75

Lightweight open back circumaural dynamics
1/4 inch plug adapter
Single sided cable
Adjustable headband
RRP £29
£24

DT231

Closed back supra-aural dynamic headphones
32 Ω nominal, 50mW max
95dB SPL/mW sensitivity
-10dB at 20-18,000 Hz
Stereo minijack 3.5 adapter
Translucent blue backs
RRP £39
£34

DT250

Closed back circumaural design, 15dB isolation
80 Ω nominal, 100dB SPL/mW
Response -10dB, 10-30,000 Hz
250 Ω version available
RRP £109
£85
BEYE-DT250/25

DT770 Pro

Closed back circumaural design, 15dB isolation
600 Ω nominal, 96dB SPL/mW
Response -10dB, 5-35,000 Hz
Single-sided cable
RRP £116
£116
BEYE-DT770PRO

DT150

Closed back circumaural design
250 Ω nominal, 97dB SPL/mW
Response -10dB, 5-30,000 Hz
Extended bass response
RRP £119
£119
BEYE-DT150

DT990 Pro

Open back circumaural design
800 Ω nominal, 96dB SPL/mW
Response -10dB, 5-35,000 Hz
Single-sided cable
RRP £139
£139
BEYE-DT990PRO

C1000S CONDENSER MIC

A laced electric condenser mic with battery + x-r platinum power suspension. The polar response is cardioid but the included PNC1000 adapter, if fitted over the mic capsule, will convert the response to hypercardioid. There is a noiseless built-in attenuator and AKG's famous treble ring, and the mic has built-in output sensitivity at 200 Ω impedance. AKG's unshielded elvier version also has a pressure boost adaptor for a treble peak centred around 6-7kHz. Unparalleled value price.



ALMOST 40% OFF!
RRP £199
£119
AKG-C1000S

C3000/B LARGE DIAPHRAGM MIC

Phantom powered large diaphragm laced electric condenser mic, with an unusual design, comprising one large 1 inch main diaphragm and a small internal diaphragm behind it which superimposes the details to achieve either a cardioid or a hypercardioid polar pattern. Available in high pass filter and 10dB pad. The frequency response covers around 50Hz to 20kHz, with a low loss roll-off below 120Hz, below -10dB. The mic exhibits the typical bright, crisp presence of other AKG large diaphragm mics, like the C414, and is a popular entry level model.



OVER 50% OFF!
RRP £299
£149
AKG-C3000/B

NT1 LARGE DIAPHRAGM MIC

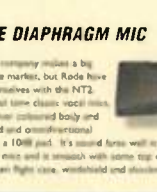
Rode, having quickly made a name for themselves with the popular NT2, were first to succeed with the NT1, one of the best selling budget condenser microphones we've ever witnessed. The gold plated large diaphragm capsule gives it sparkling response and is great for all round use and particularly good on close miking live vocals. You could pay more than this for a dynamic - the NT1 has to be a bargain!!



OVER 55% OFF!
RRP £329
£139
RODE-NT1

NT2 LARGE DIAPHRAGM MIC

It's no secret that a new company makes a big impact in the microphone market, but Rode have certainly established themselves with the NT2. Inspired by some of the all time classic vocal mics, the NT2 has a chunky silver coloured body and stylish look, with cardoid and omnidirectional polar patterns, as well as a 10dB pad. It's sound focus will set it apart from other mics with similar priced mics and is smooth with some top end sizzle. The package includes aluminium flight case, windshield and shockmount!



ALMOST 40% OFF!
RRP £499
£275
RODE-NT2

LIBERATOR RANGE 21L LAVALIER SYSTEM

The Lavalier system has the six clip mic on a flying cable connected to the beltpack transmitter. The receiver is the alpha wireless system.



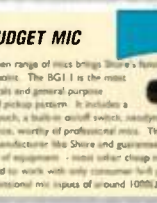
INC FREE MIC STAND!
RRP £199
£119
LIBERATOR-21L

22 HANDHELD MIC

This system features the condenser mic in the form of this dynamic hypercardioid 600 Ω Audio-Technica stage mic. Features of pulse antenna receiver.

BG1.1 BUDGET MIC

The entry level Beta Green range of mics brings Shure's historic reputation to an all time low price point. The BG1.1 is the most popular for handheld vocals and general purpose recording with a cardioid pickup pattern. It includes a stand clip and carrying pouch, a built-in on/off switch, condenser magnet and a nice low 150 Ω impedance, worthy of professional mics. This comes as no surprise from a serious manufacturer like Shure and guarantees the BG1.1 is compatible with all kinds of equipment - notes surface clamp must have a high 600 Ω impedance designed to work with only professional bulk dynamic, but come off bulky with professional mic inputs of around 1000 Ω .



RRP £149
£149
SHUR-BG1.1

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 purely live sound. It has a cardioid response and an early standard bass pickup to 40kHz, and is supplied with a stand clip and case.



OVER 30% OFF!
RRP £112
£75
SHUR-SM57LC

ECM907 STEREO MICROPHONE

A large low cost stereo microphone, which includes an ultrasonic signal speed for subliminal measuring. The stand has a threaded hole so it can also be screwed onto a mic stand. The ECM907 is a back electret condenser and uses an internal battery rather than phantom power. There is a response level from 20kHz to 20Hz, and the mic comes with a nice smart carrying case and stand clip supplied. Comes with a 2 metre long audio cable jack plug.



RRP £99
£99
SONY-ECM907

SM58 INDUSTRY STANDARD DYNAMIC MIC

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



OVER 30% OFF!
RRP £109
£75
SHUR-SM58LC

DDO SR460H

5 way headphone distribution amp
Balanced and unbalanced stereo line inputs
Six individual volume knobs up to 1000mW per ch
AudioRamp start-up overload protection
RRP £169
£109
DDO-SR460H

SAMSON Q5

Five way headphone amplifier
Over 1000mW using balanced pins
Individual volume controls for the five outputs
Three stereo outputs
Up to 1000mW per channel
RRP £119
£119
SAMSON-Q5

AKG K141M

Semi-open back
600 Ω nominal, 200mW, 97.5dB SPL/mW
1.4 inch plug adapter
3 metre OFC cable
-10dB, 20-20,000 Hz
RRP £99
£49
AKG-K141M

AKG K105UHF

Wireless stereo dynamic headphones with integrated UHF receiver
Battery charging circuit
Small transmitter unit with antenna
Cables included to attach transmitter to source
RRP £69
£69
AKG-K105UHF

SENNHEISER HD25

Closed back dynamic headphones
Padded double headband
70 Ω nominal impedance
Response -10dB, 16-22,000 Hz
RRP £159
£129
SENN-HD25

SENNHEISER HD25SP

Closed back padded supra-aural dynamic headphones
200mW @ 100dB SPL/mW
Low loss impedance
Lightweight, and very portable, especially for DJ monitoring in noisy club
RRP £89
£79
SENN-HD25SP

SENNHEISER HD250II

Closed padded circumaural design
300 Ω nominal, 200mW, 94dB SPL/mW
Response -10dB, 10-25,000 Hz
3 metre detachable OFC cable
RRP £149
£149
SENN-HD250II

SENNHEISER EH2200

Closed back circumaural dynamic headphones
200mW @ 100dB SPL/mW
64 Ω load impedance
12 - 22,000 Hz @ -10dB
106dB SPL/mW sensitivity
RRP £49
£49
SENN-EH2200

SENNHEISER HD570

Mid range dynamic headphones
Open back, circumaural design
64 Ω nominal impedance
Response -10dB, 18-22,000 Hz
RRP £89
£89
SENN-HD570

SONY MDR-V500DJ

Super-aural dynamic headphones
Designed for DJs with swivelling earcups
Closed back design
RRP £59
£59
SONY-MDRV500DJ

AKG DRUM MIC SET

AKG D112 is an industry standard kick drum mic with presence lift and High SPL handling
Four C418 mics are included for snare, hi hat, toms, cymbals
Hypercardioid condensers with gooseneck clip
version also available only D112-99
RRP £449
£449
AKG-DRUM-SET

AKG C2000B

Large diaphragm cardioid condenser mic with pad
Switchable 500 Hz low-cut
200mV Pa sensitivity
200 Ω inherent impedance
Includes stand adaptor and elastic suspension
RRP £385
£385
AKG-C2000B

AKG D112

Industry standard bass drum mic
Dynamic cardioid, takes high SPLs
Presence lift for better click
Right-angle pickup from clip
RRP £219
£149
AKG-D112

AKG SOLIDTUBE

Budget active mic capsule
Includes PSU
Shockmount, cables
Interconnects and
Cardioid pattern, 100Hz HF + pad
Hybrid active preamp
Output transformer
RRP £385
£385
AKG-SOLIDTUBE

AKG C414

Multi-pattern large diaphragm condenser mic
Omni, cardi, hyper & Fig-8
Switched 110dB 20dB pad
Switched 75Hz - 150Hz HPF
Accepts 9V - 52V phantom
Characteristically bright sound with resonant tip end around 15kHz band
Industry standard mic for recording acoustic guitar
RRP £459
£459
AKG-C414

MXL 2001

Large diaphragm front address studio condenser mic
Cardioid polar pattern
Gold splattered diaphragm
130dB SPL peak handling
Includes elastic shock mount and XLR cable
RRP £199
£199
MXL-2001

RODE NT-3

End fire small diaphragm condenser microphone
Hypercardioid response
16.9dB SPL self noise
-11.2 mV/Pa sensitivity
Battery or phantom power
Includes carrying pouch, stand clip, thread adaptor and foam windshield
RRP £119
£119
RODE-NT3

SHURE ETV 58S

There's a most affordable S48S based system
Dynamic cardioid
Upgrade from S48S
Up to 18 hours from its battery in use
Single antenna receiver with quietest companion
Twin antenna diversity also available
RRP £199
£199
SHURE-ETV58S

SHURE ETHD

WH20 headset mic, T11 bodypack radio transmitter and T3 receiver unit
Cardioid dynamic mic has gooseneck adjustable and inflexible headband
Single antenna receiver has flexible antenna and jack output
Diversity system available
RRP £319
£319
SHURE-ETHD

SHURE BETA 58A

The new improved Beta version of the all-time classic dynamic S48S
Neodymium magnets are lighter and more efficient
Transient performance is improved, along with better extension
Less handling noise due to capsule suspension
RRP £195
£149
SHURE-BETA58A

THE FUTURE OF MUSIC TECHNOLOGY

Video and audio technologies are converging in all sorts of ways: musicians can now consider creating demos on DVD, and developments in digital video may show the way for better ways of recording digital audio.

Dave Shapton puts it all together.

Remember Zip drives? You've probably got one, possibly even attached to a sampler. About five years ago they were a great solution to all your storage problems. Seventy floppy-disks' worth on a single Zip disk. Fantastic.

They're a bit slow, though, especially if you use the parallel-port version. I'd even prefer ironing to waiting for the 20 minutes that these things can take to copy 100Mb of data. That's over three hours per Gigabyte. (They go faster on some computers, depending on how your parallel port is set up.)

The only reason for talking about Zip drives (apart from wondering aloud why anyone would buy them, now that CD-R blanks offer storage for a fraction of the price per Megabyte) is to provide a framework for comparison with a device I came across a couple of weeks ago at a product launch.

The beast in question was the new Apple G4 733 with a SuperDrive, the new Pioneer-sourced DVD-R drive. It had eight 18Gb 15,000rpm (revolutions per minute) SCSI drives configured in a Raid level 0 array, which basically uses the drives in parallel, giving access to their combined data rates. It also had a Gigabyte of RAM. And that's the boring bit — because this particular Apple artifact also had the most powerful video capture card in the universe.

It's called the Cinewave and is made by Pinnacle, one of the more innovative manufacturers of professional digital video

equipment. Cinewave is special because it not only works with uncompressed PAL and NTSC video, but with uncompressed High Definition video as well.

I know I'm always banging on about data rates and compression ratios in this column, but, like it or not, our experience of digital media (and hence, to some extent, the world out there) is completely bound up with how much data we can move around in a given time. This quantity is referred to as bandwidth, and it is easy to understand the most basic rule about it. There's never enough.

Because there's never enough, we have to squeeze our media data into a smaller volume, so that it can get from A to B using whatever bandwidth is available — and though compressed data can be good, it's never going to be as good as the original. That's not an issue with Cinewave, because it doesn't have to use compression.

This is great news for video makers, because it means that it's now possible for them to work with totally broadcast-quality video (and audio, to some extent), with no fear whatsoever about quality issues.

Films Without Film?

Before I go on to explain what High Definition video (as mentioned above) actually is, and what it has to do with music and musicians, here's a bit of background about HDTV. A very little bit, in fact, because the history of TV broadcasting in the last 20 years is a litany of unsuccessful attempts to

establish an HDTV standard, and I'm not going to waste any more of Cutting Edge's column space on it than I absolutely have to. The fact is that HDTV is something that the Americans have now, and we don't. (What we have instead is Widescreen TV, which is actually even lower quality than ordinary TV, because it works by taking a normal TV picture and stretching it. In other words, the same amount of information as before is spread over a bigger area.)

But that's not the end of HDTV for us. At least, not if we go to see the next edition of *Star Wars*. Amazingly, George Lucas is filming the next epic on HD video tape, and in selected cinemas it will be shown on video projectors. It will be the first major feature film whose images have never been anywhere near film stock. And, if he wanted to, George could edit his next episode on a desktop Mac running *Final Cut Pro*, in native HD resolution. To me, that's a pretty important marker in computing's historical timeline.

Remember those Zip drives that take up to 20 minutes to transfer 100Mb? Fair enough — that's a lot of data. It's equivalent to 70 floppy disks, and you can get a fair sized book on a *single* floppy, as long as it's in plain text. Now get this: High Definition Television gobbles up data at the rate of 125Mb per second.

That's one and a quarter Zip disks, or around 100 floppy disks, every second of every minute of every hour.

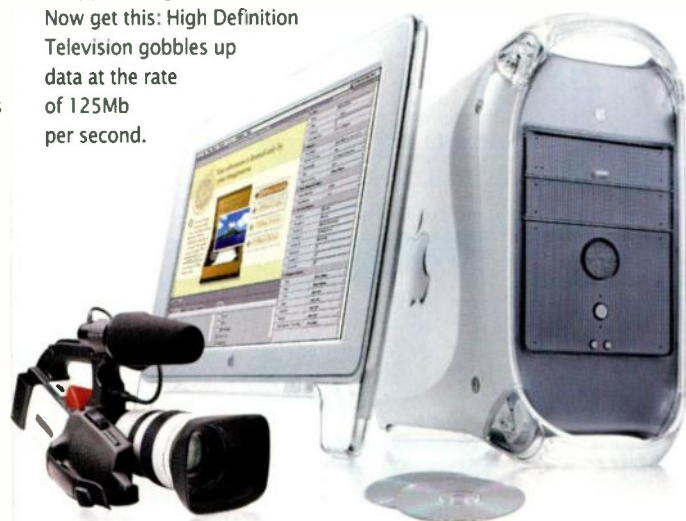
Needless to say, at the Cinewave product launch the G4's drives were working so hard it looked as though they were formatting themselves! It's staggering to think that a data stream of 125Mb (or one gigabit) per second could supply over 700 simultaneous tracks of 16-bit audio, or nearly eight thousand MP3 streams. Enough, in fact, to play an entire record collection simultaneously.

The G4/Cinewave combination is a stupendous technological achievement. HDTV on a desktop computer is something that would have seemed impossible even last year. It still seems impossible, but it isn't.

Seeing Is Believing: DV Projectors

The demonstration I saw could have been even better if Pinnacle had been able to use a projector capable of displaying the resolution of the video it was being fed. Coincidentally, I came across an ideal device when I visited JVC Professional recently.

JVC use a technology called D-ILA in their video projectors, and they claim that it produces



With the addition of the new Pinnacle Cinewave video capture card, an Apple G4 733MHz (seen here running Apple's own *DVD Studio Pro* software) is a digital media powerhouse, capable of working with uncompressed broadcast-quality video and audio.

TRIPLE • POWER

TOP END PROCESSORS YOU CAN AFFORD!

M•ONE

DUAL EFFECTS PROCESSOR

DUAL EFFECTS PROCESSOR

The M-One comes with Dual Engine structure enabling you to run two of the best sounding reverbs or other quality effects simultaneously without compromising

sound. The M-One gives you a wide range of high quality reverbs from the classic Halls and Rooms to new and grainy snare reverbs such as Live and Plate.

TC Electronic's M-ONE and D-TWO are very powerful yet affordable new multi-effects units from one of the most highly respected names in signal processing. [...] I highly recommend the M-ONE and D-TWO.

Mike Collins - Electronic Musician



M•ONE FEATURES

- 20 incredible TC effects e.g. Reverb, Chorus, Tremolo, Pitch, Delay and Dynamics
- Analog-style User Interface
- 100 Factory/100 User presets
- Dual-Engine design
- 24 bit A/D-D/A converters
- S/PDIF digital I/O, 44.1-48kHz
- 1/4" Jacks - Dual I/O



RHYTHM TAP FEATURE

TC introduces the truly musical RhythmTap feature: Not only tempo, but actual rhythm patterns can be tapped directly - or quantized according to a specific tempo and subdivision. The delays and rhythm patterns can be up to 10 seconds each. Control the exact number of repeats with Absolute Repeat Control.

D•TWO

MAIN FEATURES

- Multi-tap Rhythm Delay
- Absolute Repeat Control
- Up to 10 seconds of Delay
- 50 Factory/100 User presets
- 24 bit A/D-D/A converters
- S/PDIF digital I/O, 44.1-48kHz
- 1/4" Jacks - Dual I/O

D•TWO

MULTITAP RHYTHM DELAY

A studio effects processor dedicated solely to providing digital delay is a rare thing in this age of all-singing, all-dancing multi-effects units. [...] In the D-TWO, TC have produced a very attractive delay unit that sounds exemplary and offers some unique features as well as all of the expected ones.

Paul White - Sound On Sound (UK)

TRIPLE • C

COMPRESSION MEANS EXPRESSION



THE ONLY INSERT COMPRESSOR YOU WILL EVER NEED !

TRIPLE•C can deal with virtually any given source material. The three Compression techniques combined with an analog style user interface, presets and full MIDI automation make TRIPLE•C the most versatile and ergonomic Compressor on the market. Insert TRIPLE•C on a single channel or on a Sub group and achieve comprehensive results.

MULTI-BAND COMPRESSION

Multi-band Compression allows TRIPLE•C to spectrally Compress your source material in three bands independently.

ENVELOPE COMPRESSION

Alter the dynamic envelope of the incoming source by changing the Attack and Release gain.

TRIPLE•C is available in both Single and Stereo channel versions.

FULL-BAND COMPRESSION

TRIPLE•C simulates the best from the analog world's compressors and allows you to achieve full-band Compression sound instantly.

50 Factory presets + 100 User presets.
24-bit digital In/Out.

t.c. electronic
ULTIMATE SOUND MACHINES

YES! I'd love to have a FREE DEMO CD feat. M•ONE, D•TWO & TRIPLE•C material

Name: _____

Address: _____

City: _____ Postcode: _____

Country: _____

Phone: _____

E-mail: _____

▶ significantly better results than competing techniques. I must say that the pictures I saw were absolutely stunning, and when the mechanism was explained to me I realized that there are a few lessons that digital audio could learn from these video devices. (More of that later.)

JVC's projectors can display HDTV in the truest sense. They have plans to produce a model with a resolution of approximately 4000 pixels by 3000. (A pixel is a 'video atom', the smallest unit that can convey different information from the one next to it. The more pixels per unit of area, the higher the resolution of the device.) To put those figures into context, our domestic television standard specifies 768 x 576 active pixels.

One of these projectors costs about the same as a Ford Mondeo. That sounds like a lot, but it's not when you consider that this is essentially all you need to set up a cinema. Well, you need a building and a screen as well, but the point is that for about the same price as a small house (in the South East of England) you could set up an independent film theatre. Of course, you'd have to get your films transferred to a digital format, but over the next couple of years or so films will be distributed in a digital state anyway, possibly even by direct satellite link.

Movie Democracy?

To me, there's something about these HDTV developments that's even more exciting than the technology buzz: it's that at last there will be a way for talented film-makers to get their works seen. Over the last few years, as mainstream films have become little more than vehicles for special effects, the chances for talented independent film producers to get their films distributed have continued to diminish. So it would be nice to think that the same frantic technological progress that is turning the popular cinema experience into little more than a theme-park ride could also democratise film making and distribution.

With the ability to edit video at film resolution on the desktop, and the knowledge that they could show their work in a local independent, fully digital cinema, film-makers would be much better able to get funding to pay the actors, and to hire the HDTV cameras, which cost around £600 per day. That may seem like a lot, but it's almost trivial compared to the cost of using film, and getting it edited conventionally.

All of this would be great news for musicians, because if you're anything like me, you'd love to write a film score.

A Sound Vision

I mentioned earlier that JVC's D-ILA video projectors use techniques that can teach us a thing or two about digital audio. I know it sounds like a bizarre connection, but whether we're talking about video projection or digital audio, what we're actually doing is converting digital media to analogue, and doing it, we hope, in the best possible way.

Until recently, the problem with digital video projectors has been that if you improve their optical performance all that happens is that you can see more clearly the pixels that make up the picture. That would be a bit

like having loudspeakers so good that you could hear the individual samples. (You'd need ears that went up to 48kHz as well!). JVC's D-ILA projectors get round this by actually abolishing the fixed pixel-based structure completely. By using a free-form 'lake' of liquid crystal, and stimulating it directly from the surface of a CMOS (Complementary Metal Oxide Silicon) imaging chip, their technology completely eliminates pixelation, since adjacent pixels simply 'blend' with each other. The effect is not hard to describe: it's just like looking at a 35mm transparency. To me, this is an almost ideal way to do digital-to-analogue conversion. Best of all, it's resolution independent. It doesn't matter how many pixels make up the video you feed into it — they all get smoothed out anyway.

What I'm describing here is nothing other than a low-pass filtering process. It smoothes out the sharp transitions between the edges of the on-screen pixels, and is related to what happens when we remove as much as possible of the original sampling frequency during reproduction of digital audio. With audio, the filtering process is carried all the way to the final stage of analogue

reproduction: the loudspeaker. Speaker cones have a certain mass and that means that they have momentum, or a reluctance to stop moving. It is this unintentional side-effect that prevents them from accurately reproducing any raw samples — which are essentially high-frequency square waves — that may be left in the audio signal. This won't, however, remove any artifacts such as aliasing that may have occurred upstream in the signal path, because they are the result of interaction between the wanted signal and the sampling frequency, and the effect of them is to produce nasty noises back in the audible spectrum.

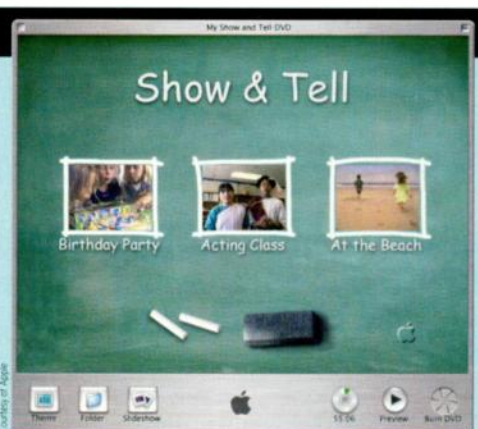
We can learn from the way physical devices 'smooth out' digital's sharp edges. You see, it is possible to represent digital media as pure curves, rather than infinitely small dots in space and time (sampling, in other words). Postscript and TrueType fonts are typefaces described by curves, and not by a pattern of dots. Audio waveforms are *already* curves before we begin the process of trying to represent them digitally. Maybe we should be looking at techniques to keep them that way. [EOS](#)

DVD On The Desktop

PCs and Macs have been capable of creating DVDs from the desktop for a year or so now, but the arrival of the latest G4s makes the process affordable at last, because they include the DVD-R Superdrive, which can make DVDs that play in computer drives as well as standard, domestic DVD players.

DVD authoring is an arcane process, and most of the DVD authoring packages do little to shield the user from its intrinsic complexities (apart, perhaps, from Sonic Solutions' *DVD-IT*, a PC-based authoring program). At first sight it looks as though Apple's *DVD Studio Pro*, which is an option with the Superdrive-equipped G4s, doesn't do much to simplify the process. It reminds me of some of the very early attempts to 'windowed' programs that were fundamentally command-line driven. (Every command-line option is given either a button or a menu option, leading to what seems like a very disjointed work-flow.) Having said that, *DVD Studio Pro* is a powerful program that, once tamed, can produce great results within the highly restricted format that is DVD.

DVD's restrictions are hardly the fault of Apple. As I mentioned a couple of months ago, the format is so constrained that to make the most of it you need a program that will let you get into all the dark corners. My experience of DVD authoring is that a complex project can tie up several graphics artists, programmers and musicians for several months.



Apple's *i-DVD* program has a simple interface that aims, as this screen shot implies, to make child's play of creating your own DVDs.

Don't let this put you off making DVDs, though. They do make a great replacement for VHS tapes, to distribute demo material. The good news for new Mac owners is that Apple throw in the *i-DVD* program as well. It has "a simple one-window interface for assembling a DVD", and it automates most of the process, letting you concentrate on your audio and video content rather than its packaging and presentation.

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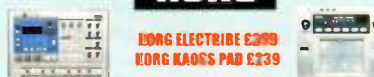
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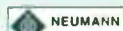


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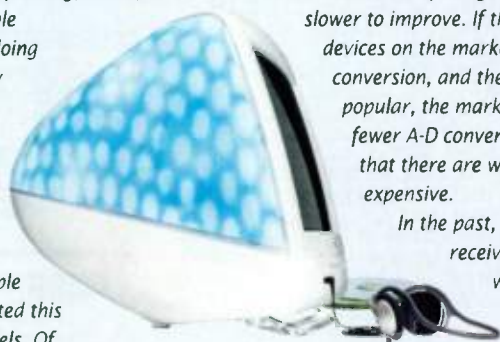
Q Are the new iMacs good enough for serious audio work?

With the advent of the new iMacs with CD-RW drives, I wondered if it would be possible to run *Logic* to record directly into such an iMac, and then master it onto CD? Or is this a job better suited to the G-series Macs?

David Ankrah

SOS Apple Notes columnist Paul Wiffen

replies: Actually, strictly speaking, David, the iMacs are the only Apple computers now suited to doing what you describe, as they are the only shipping machines with audio inputs. To do what you are describing on a G4 or Powerbook would require adding a device with an audio in, since Apple in their wisdom have omitted this from the most recent models. Of course, you might think that audio input is fairly cheap and easy to achieve, but if you look at my previous pieces on USB audio expansion, and my forthcoming article on PCI cards, you may be left with a different conclusion. FireWire expansion is proving more reliable than USB and less of a palaver than PCI card insertion, but for the moment, at least, it's fairly expensive, as the professional



solutions are the first ones hitting the market. The first company to produce a £99 FireWire audio-in box should do very well.

So, for the time being, buying an iMac is the fastest way to get audio input on an Apple computer. The big question is whether the quality of the built-in A-D converters is good enough for serious recording. For some time now, the D-A converters in most computers have been pretty good. Thanks to the huge number of other consumer devices (CDs, MiniDisc, even TVs and DVDs) with digital sound to be output, high-quality D-A converters are now plentiful and cheap. Computer companies such as Apple have taken the opportunity to seriously upgrade their output sound quality with the many cheap and good devices which have flooded onto the market in recent years. This makes sense for them, as consumers are hearing better sound on all the other devices in their homes/cars/offices. However, most consumers do just that — consume sound recorded by others, rather than recording any themselves — so the A-D conversion side of things has been slower to improve. If there are fewer devices on the market needing A-D conversion, and they are less popular, the market will require fewer A-D converters, and those that there are will be more expensive.

In the past, the standard received wisdom would have been that you shouldn't even think about recording anything seriously through A-D converters in a computer. However, I have to say that recently I got stuck without any other way of recording some audio into the Apple desktop (no input on my iBook), so I used the audio input on my sister's Graphite iMac, and the results were pretty darn good (I was recording an entire mixed stereo signal, too). They are certainly good

enough for recording single instrument or vocal parts to be put together in a final mix, especially when you have the full EQ and effects capabilities of something like *Logic* to bring to bear on any problems in recording. You might find the odd instrument — say, *Taurus* bass pedals — whose full frequency range is not faithfully captured by the built-in A-Ds, but then they would probably not be ideally recorded with many of the next level of USB or PCI devices either, so I wouldn't lose any sleep over that.

In any case, considering the appalling recording quality of many of the multitrack cassette machines which musicians have been using for years, I can't see any reason to warn anyone off the infinitely superior sound quality of the iMac's A-D converters. We then have to ask whether there are any other parts of the recording, mixing and mastering process the iMac can't handle? Well, the 600MHz G3 processors in the top iMacs are far faster than anything in my studio, and will cope admirably with a fair amount of effects and EQ processing. Even the IDE drives which are standard in both iMacs and G4s these days will give you audio track counts unheard of from the more traditional SCSI devices of a few years back.

So let's look at the software you mention. Although in the premier league of the MIDI/audio recording software, and therefore ideally suited to stages one and two of the process you describe, *Logic* itself isn't a mastering program in the traditional sense of the word (although many of the plug-ins you get with it can certainly be used for standard mastering tasks, such as loudness maximising and EQ). However, a good mastering program like IK Multimedia's T-Racks or TC Works' Spark would make up for that, and I think would be advisable to really pep up tracks before burning them to CD.

Just one thing that always seems to be forgotten. Although you can get *Logic* to run in the 64Mb of RAM that the iMacs come with, I strongly recommend that you get at least an

quick fixes

Q I need some advice about purchasing a sound module, for which I have a budget of £650. I have so far seen the Roland Sound Canvas SC8850 for around that price.

John Haines Jr

A The Sound Canvas is a good 'bread and butter' module — that is, it produces a wide variety of reasonably good emulations of real instruments, plus a lot of useful synth sounds and drums. What you should buy depends on what kind



of music you want to play, however: if you're into cutting-edge dance music, the Sound Canvas might not be the best choice. If a general-purpose type of module is what you're interested in, you should probably also check out the N-series modules from Korg, and Yamaha's MU128R, which are fairly similar in scope and aims. Sam Inglis

Q I have a dual-processor Mac G4/450 running *Logic Audio Platinum 4.6.3*. If I install Native Instruments' *Dynamo* software synth and try to use it, I start to get ASIO errors (when dual processing is

enabled). If it is not enabled, everything works fine, and if I uninstall *Dynamo*, I can use my dual processors. Is *Dynamo* dual-processor compatible? Den

A From what I'm told, *Dynamo* is not yet dual-processor compatible, but will be updated for DP compatibility later this year. In the meantime, you'll need to turn off DP mode before using *Dynamo*. At the time I reviewed the software (April) we didn't have any dual-processor machines to test it on, so this limitation went unnoticed. Paul White

Q I'm looking for a Marshall V67 studio microphone. Are there any dealers in the UK? Gregory Maston

A Marshall Electronics have a web site at www.mars-cam.com. Their UK distributor is K-Tech (UK) Ltd, 4, Oban Court, Hurricane Way, Wickford Business Park, Wickford, Essex SS11 8YB. Telephone +44 (0)1268 767304; fax: +44 (0)1268 768021; web www.ktechuk.com. Give them a call and I'm sure they'll be able to point you towards a local dealer. Matt Bell

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Q&A

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▶ extra 64Mb — although 128 would be better, and memory is cheap at the moment. So in short, add 128Mb and T-Racks or Spark to your shopping list, and an iMac/Logic system will give you some fantastic results, and with a lot less fuss than adding sound input capability to a 'more professional' Mac.

Q Which soundcard will accommodate my record decks?

I need a recommendation, or advice at least on choosing a soundcard. I want to work with both audio and MIDI. At some point I want to use a keyboard, but what I mainly want to do at this time is run my two turntables (four phono leads altogether) through the soundcard. My PC has an internal CDR, so would I be right in saying that I do not need another I/O in order to accommodate my CD player?

Also, can any soundcard go with any software, and vice versa, or are there specific software requirements for certain soundcards?

Harry Michaels

Assistant Editor Sam Inglis replies: If you're taking the outputs directly from the turntable, rather than via a DJ mixer, you'll need to put them through RIAA preamps to equalise them correctly before you can get the sound into the analogue input of a soundcard, unless you can find a soundcard with an RIAA preamp built in. Swissonic's USB Studio D rackmount recording interface, reviewed SOS March 2000, is not a soundcard, but it does have an RIAA preamp and can substitute for a soundcard. However, it only has one stereo phono connection. Terratec's £149 EWX24/96 2-in/2-out soundcard also has an optional RIAA preamp, which costs

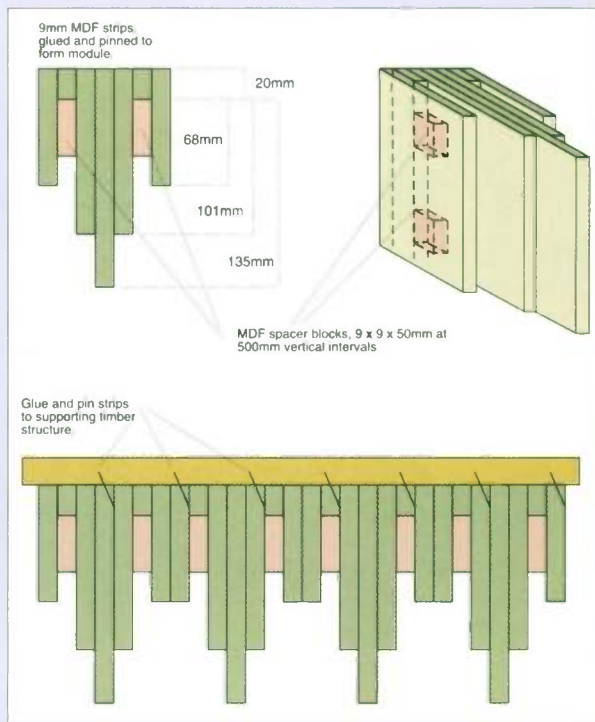
extra. However, it may be more flexible for you to get a separate RIAA preamp (Maplin and Studiospares both sell them), or take the signal from an amp/mixer, in which case any four-input soundcard should be fine. Incidentally, Steinberg's Clean Plus audio restoration program, which costs £79, comes with a little RIAA stereo preamp (which makes sense, as one of the program's main uses is probably for cleaning up audio off vinyl records). The record deck connects to the preamp's phono inputs, and the preamp then connects to a soundcard by way of a mini-jack.

Regarding the CDR: it depends what you want to do with it, really. If you just want to extract audio from CDs, the CD-ROM should be fine. And to answer your last question, there are various driver formats (MME, ASIO, DirectX, EASI and so forth), and you need to make sure that both the software and soundcard you choose support at least one of the same driver formats. ASIO is usually the best one for serious music recording.

Q How can I build a Schroeder Diffuser?

I'm trying to find a diagram of a Schroeder Diffuser but cannot locate one anywhere. I've found references for them on your archives but no diagrams. I'm collaborating on the building of a small project studio, and would be very appreciative if you could help me out on this one.

Craig Ray



Construction of a Schroeder Diffuser.

Assistant Editor Debbie Poyser replies: Schroeder Diffusers are used in studio acoustic design and are stepped panels designed to spread reflections over a hemisphere. There's more information in the 'Control Room Design' article from SOS January 1997, plus an equation (below) for calculating the depths of the panel's 'wells' (d=depth; w=well number; n=prime number on which the sequence is based; L=wavelength of lowest operating

$$d_h = h^2 \text{ mod } N \frac{L}{2N}$$

frequency), and a diagram. The article is on the SOS web site (www.sospubs.co.uk/sos/1997_articles/jan97/controlrooms.html), but you won't find the diagram on the site, so we're reprinting it here for you.

quick fixes

Q I have been searching the web for hours trying to find schematics or a manual for a Minikorg 700, because mine is broken and I'm desperate to have it fixed. I found Gordon Reid's retrospective [April 1998], and I was wondering if he or anyone else would be able to help me. *Monkey*

A Gordon only knows of one place to get Minikorgs serviced: Korg UK, where Paul Bundock still services them. Korg can be reached at +44 (0)1908 857100, or at www.korg.co.uk. According to Paul, there never was a full service manual, but the circuit diagram

is available, with a few service notes. Korg UK are happy to sell you a photocopy. *Matt Bell*

Q Some friends and I are thinking about starting a small vinyl press, but we're having problems locating sources for the necessary equipment. Alpha-Toolx and Neumann seem to have made the best stuff, but neither seem to make vinyl pressers/cutters any more. *Rupert Nixon*

A Vestax have released, or are about to release, a product called the VRX2000 Vinyl Cutter. We ran a news

item on the product, which you can read at www.sound-on-sound.com/sos/jan00/articles/dj_news.htm. Or you can visit Vestax's website, where they have more information, plus a list of dealers. The address is www.vestax.co.uk. *Tom Flint*

Q I seem to remember seeing an article on your web site regarding some kind of shareware plug-in that allows you to use VST plug-ins in programs other than Cubase. However, I now can't find the information again. Can you help? *Tom Kriewall*

A I think the product you're referring to is FXpansion's VST-DX Adapter, which has now become a range of three programs. Check out www.fxpansion.com for more details. *Sam Inglis*



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Q&A

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Q Can I reduce equipment noise?

I am having problems controlling all the noise generated by the equipment on my desk. I have two Roland VS1680 multitrackers, both with CD-ROM drives, a Behringer headphone amp, a Mackie 1604 mixer, and an external hard drive, all on the same desk. All of this generates hum and other noises, which are amplified by my Quad Amp, driving a pair of Spirit Absolute 2 Monitors, as well as a pair of big Mission hi-fi speakers. Although it seems to be mainly from the CD drives, I can't seem to stop all of the noise. If it is creeping into the Quad amp through the cables, which ones? The inputs to the preamp, or the cable between the preamp and the power amp?

William Walker

Editor Paul White replies: While some of your equipment will produce physical noise (sound), there's really no reason why the audio part of your system shouldn't be quiet, providing you are using reasonable quality cable and balanced connections wherever possible. It's more likely that hum is being caused by ground loops, and though these aren't always easy to remedy, here are a few things to try.

You can only take full advantage of balanced interconnects when the equipment at both ends is balanced, of course, but where an unbalanced source feeds a balanced destination, it's worth making a special cable with a conventionally wired balanced connector at the balanced end but with an unbalanced connection at the other end which leaves the cable screen disconnected. Instead, connect the cold wire (often blue) to the pin or solder tag where the screen usually goes.

Finally, when connecting unbalanced equipment together, you

quick fixes

Q I need an article I once read in your magazine about all the universities in the UK that teach audio or similar. I truly don't remember what date! Maximiliano Iglesias

A In the August 2000 issue of *Sound On Sound* we published a Net Notes column dealing with many of the educational institutions in the UK offering audio training, with a list of their web sites. This article is free to read on the SOS web site. The URL you need is www.sospubs.co.uk/sos/au000/articles/netnotes.htm.
Debbie Poyser

Q I have a home studio and I'm trying to record drums to a guitar track. The problem is that I can't hear the guitar track, because the drum sound in the room is so loud. Any tips on how to fix this? Jeddie Van Halen

A You need loud, enclosed headphones such as the Beyer DT100s or DT150s, used in studios around the world for exactly



this application. They are effectively a combination of ear defenders and headphone capsules and, while probably not the best-sounding phones, are undoubtedly good for drummers doing overdubs.
Paul White

Q I'm trying to find a sample CD called *Fairlight IIX Library*. It was from a firm called Digital Domain and was priced at around £50. Plank

A The Fairlight IIX Library CD is available from US sound and

can try connecting the cable screen to the connector via a small 220 Ohm resistor rather than connecting it directly, as this can help disperse circulating ground currents.

Once the cabling has been sorted out, ensure that audio cables and mains cables don't run together, and also try plugging any computer peripherals or CD recorders into a separate mains outlet.

Q What's wrong with my keyboard?

I'm having a bit of trouble with one of the songs I'm working on in *Cubase VST*, running on a PC with Yamaha SW1000XG audio card and *XG Edit*. Whenever I play over a certain range on my keyboard, the keys I press stop making or controlling sounds and take control of VST's transport functions! It only happens on this one song and if I simply select 'New', to create a new Song, I can play fine in any octave; from this I deduce it cannot be the keyboard or any settings in *XG Edit*. I've looked for differences in various settings between the troublesome Song and the Default, or any other, Song, and can't seem to find any at all.

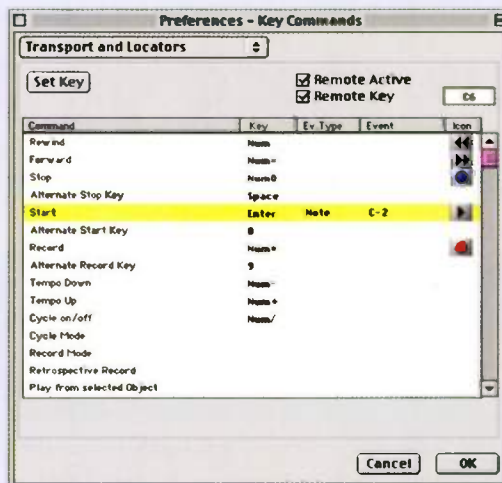
Nick Alexander

SOS contributor Derek Johnson replies: Something similar happened to me when I recently took delivery of v5 of *Cubase VST* for the Mac: just one key at the extreme right of my 76-note master keyboard wouldn't play. I couldn't tell what it was doing, but no matter what I did, that one note was always silent. It definitely wasn't the keyboard, as it worked as expected with other sequencers and MIDI sound sources.

The problem baffled me for a bit, and then

I had a look at the Key Commands sub-menu under Preferences (in the Mac version, Preferences are found under the File menu), and I found that this one note was assigned as a remote control. I forget now which function it had been assigned to (it had no obviously visible, or otherwise audible, effect while the problem was happening), but I simply disabled it, and I got my key back. To do this, double-click on the entry in the command list; a little dialogue pops up on screen, and you click 'remove'. Problem solved. There should be a similar strategy that you could follow on the PC; you'll have to search through the whole list to find the rogue assignments.

Otherwise, *Cubase's* Key Commands are one of the software's secret weapons: virtually any function can be operated remotely, and



Cubase's Key Commands allow you to set up a MIDI keyboard to control sequencer functions remotely.

the user has almost complete control over which keys — from the computer keyboard or an attached MIDI keyboard — do the controlling. It's ideal for people using *Cubase* on stage, or working at the other end of a studio from their computer. **SOS**

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shock tactics

AUDIO TECHNICA AT3035 CARDIOID CAPACITOR MICROPHONE

The influx of affordable, good-sounding capacitor microphones into the project-studio market must have had a serious impact. The established names in microphone manufacture have already responded with low-cost microphones of their own (AKG with their C2000 and C3000, for example), which means that the home studio owner can now make exceptionally good audio recordings for a fraction of what it would have cost them a decade or so ago.

AT Attack

The AT3035 is Audio Technica's first counterstrike in response to this new competition, and it is a very aggressive one indeed. This new condenser mic is beautifully engineered, incorporating a large-diaphragm capsule with a fixed-cardioid polar pattern. A serious shockmount and a carrying pouch are also provided, yet the whole package retails in the UK at under £200. We're told that good capacitor mics are very labour-intensive, and hence expensive, to build, but Audio Technica make the AT3035 in their own factories using high-quality materials. So how is this sub-£200 price possible?

For a start, many of the manufacturing stages normally undertaken by hand have been automated to reduce labour costs and aid mass production. Surface-mount electronics replace traditional hand-built circuit boards, and the upper half of the elegant body shell is machined from tubular stock rather than from a solid block of metal.

Audio Technicalities

The mic measures 170 x 52mm and weighs a reassuring 390g. The metalwork is finished in an attractive metallic grey, with the 25mm-diameter capsule physically protected by a single-layer, steel mesh basket. Switches are provided on the body of the mic for low-cut filtering and a 10dB pad, and these are recessed to avoid accidental



A large-diaphragm Audio Technica condenser mic, with shockmount, for less than £200? **Paul White** rubs his eyes and believes his ears...

operation. Output is via an XLR with gold-plated pins. The simple shockmount has been very cleverly designed and is made from reinforced plastic. It is surprisingly secure and the swivel joint is reasonably resistant to drooping if tightened adequately.

Because the microphone uses a permanently charged, back-electret capsule, there's no need for a high polarising voltage, so the mic can run from phantom power sources from 11 to 52V DC without a problem. Its frequency response is nominally flat from 20Hz to 20kHz, with a less obvious presence peak than many other large diaphragm mics. From the supplied curve, the high end response starts to roll off at around 15kHz and is down by about 3dB at 20kHz. When switched in, the low-cut filter (12dB/octave at 80Hz) helps to counter the proximity effect when the mic is used close up. The maximum SPL handling is 148dB, and increases to a massive 158dB with the pad switched in, so the mic should be just as at home recording artillery as vocals!

AUDIO TECHNICA AT3035 £200

pros

- Nicely styled and engineered.
- Attractive price.
- Included shockmount.

cons

- No significant cons at the price.

summary

A more than worthy entry into the budget mic market. It looks good, it's very solid and it has a well-balanced character that should suit most singers.

SOUND ON SOUND

information

- E** £199.95 including VAT.
- T** Audio Technica UK
+44 (0)113 277 1441.
- F** +44 (0)113 270 4836.
- E** sales@audio-technica.co.uk
- W** www.audio-technica.co.uk
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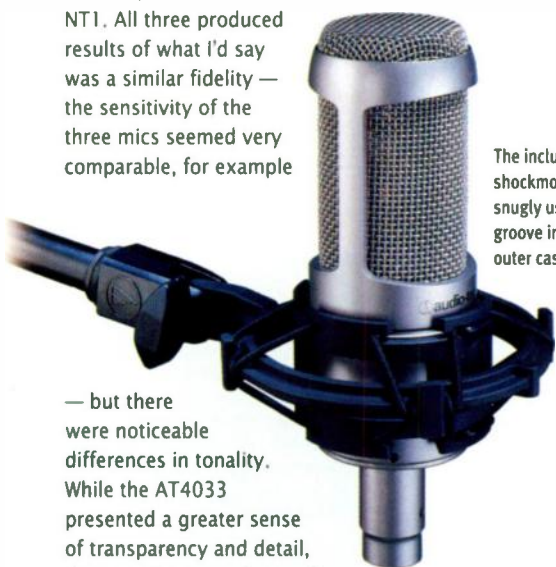
Not having a Chieftain tank in my equipment rack, however, I was unable to test this...

In spite of the ability to handle very high SPLs, the mic has a noise figure of just 12dB SPL, which equates to a signal-to-noise ratio of 82dB (1kHz at 1Pa) — not atypical for this type of microphone. The quoted sensitivity of 25.1mV/Pa compares well with similar mics, and the off-axis response is pretty consistent at angles of up to 90 degrees.

In Action

The AT3035 is a mic that works very well in real-life situations, especially where you need just a little high-frequency presence. The mic needs to be used with a pop shield when close-miking vocals, as is common with studio mics of this type. More unusually, however, I noticed while I was checking the mic's sensitivity to handling noise that the metalwork of the AT3035 has a tendency to 'ring' slightly when tapped with a fingernail — certainly more so than with other mics I've tested. I couldn't think of any situations where this would be a problem, given the quality and effectiveness of the shockmount, and I couldn't detect any resultant coloration in the sound of the mic during normal use, but it is as well to know that this body resonance is there if you plan to use this mic in any particularly demanding application.

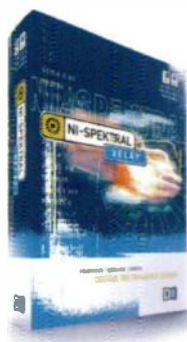
I set up the AT3035 alongside the more expensive AT4033, and a Rode NT1. All three produced results of what I'd say was a similar fidelity — the sensitivity of the three mics seemed very comparable, for example



The included shockmount fits snugly using a groove in the mic's outer casing.

— but there were noticeable differences in tonality. While the AT4033 presented a greater sense of transparency and detail, the AT3035 seemed a touch weightier at the low end. The Rode was slightly warmer-sounding still, though that mic's less-than-flat high-end response meant that the AT3035 had more presence.

On the whole I'd say the AT3035 has a nice balance between accuracy and flattery with a convincingly natural sound that should suit most vocalists. It also works fine on just about any acoustic instrument — its high SPL handling means it won't flinch at loud percussion or guitar amplifiers. At street prices, the obvious competition for the AT3035 is the Rode NT1, the AKG C2000 and C3000 and the Octava MK219/219A models. Each has a slightly different tonal character that will suit some singers better than others. I don't think it's possible to say which of these is best, as 'best' can mean different things to different people, but given its sound, its build quality and its bundled shockmount, I think the AT3035 will have no trouble attracting admirers. **SOS**



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ACCESS VIRUS INDIGO

Ways not to start the day: 1) Find a leaking radiator flooding the floor behind a large, vintage — and probably irreplaceable — Yamaha synth. 2) Hear a nasty rattle when removing the Access Virus Indigo from its box, and disassemble it to remove the unattached screw lodged among the tracks and exposed connections on the keyboard decoder board. As Arthur Dent said in the original *Hitchhikers' Guide To The Galaxy*, "It must be Thursday. I never could get the hang of Thursdays."

Apart from the rattle, the thing I first noticed about the Indigo was its weight. I had no idea that its chassis and chunky aluminium (note to American readers: that's a word with two 'i's) end-cheeks would be quite as substantial as they are. This may only be a three-octave instrument, but it has the weight and presence of many five-octave synths. This is good... flimsy is bad.

Before proceeding any further, I ought to explain that this is essentially two reviews in one: a look at the Indigo itself, and the v4 operating system that drives all the latest models of the Virus. So, for those of you unacquainted with the Virus family, I recommend a quick trip back to *Sound On Sound's* May 1998 and February 2000 issues (or www.sospubs.co.uk/sos/may98/articles/access.html and www.sospubs.co.uk/sos/feb00/articles/accessvirus.htm respectively), in which Paul Nagle reviewed the earlier original Virus (now known as the Virus a) and the later, still current Virus b and kb models. I'm not going to retread old ground here, and will concentrate on the differences between the Indigo and its siblings, and on the enhancements offered by the new operating system.

Beauty Is Skin Deep

Let's start by getting the hype out of the way. Access call the Indigo 'The Virtual Roadster'. I'm not sure what this is supposed to mean, but maybe they think it implies the open road, the sun in your hair, a beautiful woman gazing adoringly into your eyes as you sweep towards a horizon of endless possibilities... Oops, sorry. To me it means comfortable suspension and every mod con imaginable, and, for me, this is something the Indigo does not really deliver — as you will see.

Nevertheless, it's worth taking a moment to admire the Indigo. In a world of conservative Japanese keyboards, and ghostly German/American synths that try to be stylish, but end up looking cheap and garish, the Indigo is a rarity — something unconventional that looks excellent. It's no bigger than a small '70s monosynth, but shares the clean-cut good looks of the rare and lovely Akai VX600.

Unfortunately, there's a downside to the Indigo's compact design. Unlike on the Virus kb, the performance wheels are above, rather than alongside, the keyboard. I hated this layout on the Moog Rogue and the Crumar Bit One, and I still do. The Indigo's size has also prevented Access from

mood indigo

ACCESS VIRUS INDIGO/VIRUS OS V4

Originally planned as a limited edition, the 37-note Virus Indigo virtual analogue keyboard synth surprised even its makers — demand ran so high that it became a separate product. **Gordon Reid** considers the newest strain of this retro Virus, and the latest v4 OS software revision.

enlarging the LCD. With so many keyboards now offering large, graphic displays, the provision of a 2 x 16-character screen and the inevitable reliance on abbreviated parameter names is most unwelcome. Worse, the three-octave velocity-sensitive (but unweighted) keyboard feels cheap. I liked the keyboard on the Virus kb, so I have to ask why the Indigo's feels like such a step backwards. The Indigo also lacks the ability to generate channel pressure data, although it responds to it well enough. The Virus kb has aftertouch, so what are Access thinking of?

As for the keyboard length... in my opinion, 37 notes aren't enough on a monosynth, let alone a 16-part multitimbral polysynth like the Indigo. On the other hand, a small synth is ideal for chucking into the back of the car to go to a mate's, or for grabbing a pair of headphones and hiding yourself away in the spare bedroom.

The OS v4 Upgrade

If, like most people, your last encounter with a Virus was somewhere in Version 3-land, you'll find that v4 offers many additional benefits. For me, the most important of these are the new reverbs and improved delay effects. Although this isn't so important in the studio, I find keyboards without reverbs a real pain when I play live. This is because, whenever I need to use dedicated outboard effects (as opposed to simple FOH ambience) it doubles the number of cables in my rig, and significantly

ACCESS VIRUS INDIGO/OS V4 £1150

pros

- Thanks to OS v4, the Virus now sounds better than ever.
- OS v4.02 (the latest) is glitch-free.
- High-quality reverbs and delays.
- Quad surround capability.
- Improved arpeggiators in OS v4.
- The Indigo itself is built like a Panzer tank... a sexy Panzer tank!

cons

- The Indigo's unweighted keyboard feels cheap, and there's no aftertouch except over MIDI.
- The keyboard will be too short for many players.
- Reverb/delays not multitimbral.
- The manual is poorly organised, with no index.

summary

The v4 Virus (in all its forms) is almost a classic synth. Indeed, with a handful more hardware and software updates it could be the best analogue-style synth on the market. The Indigo is an interesting new slant on the style and form of powerful modern synthesis — sure to appeal to some players, but unsuitable for others.

SOUND ON SOUND



Photo: Mark Lewis

increases setup times.

The reverbs themselves ('Ambience', 'Small Room', 'Large Room' and 'Hall') are more than acceptable, and you can program each of the algorithms in one of three modes: as a standard digital reverb, 'reverb+feedback1', and 'reverb+feedback2'. The last two of these are the same as having a delay line followed by a reverb; they treat the pre-delay within the reverb algorithm as a repeating delay (which you can sync to the internal clock if desired) and then regenerate the reverberant effect for each of these repeats.

The delay is also great fun. This is not just because it offers numerous patterns, modulation, ping-pong effects, and synchronisation to the master clock. It's because you can tweak the parameters in real-time without generating digital glitching. I did this in the 1970s using a Pearl analogue delay, and it's a potent way to generate weird effects during performance. Set the feedback to maximum, play a few notes, and then sweep the delay time... it's hugely effective, and without artefacts. Oh yes, and while on the subject of effects, v4 offers an additional saturation stage as well as distortion and a range of grungy 'lo-fi' effects. Nice!

On the other hand, Access claim that the Virus now offers up to 82 simultaneous effects, but this doesn't stand up to scrutiny. Sure, five effects are available on a 'per-part' basis, and with up to 16-part multitimbrality, this suggests that 80 is the correct number. But look at the effects list... 'Ring Modulator', 'Distortion', 'Analogue Boost', 'Phaser', 'Chorus'. When did you last see a ring modulator described as an effect? In my opinion, that's part of the voice structure, as is 'Boost'. That leaves the distortion, phaser, and chorus. Hang on... where is the reverb/delay? Well, this is only available as a master effect applied to an entire Multi. That's right... there's just one of 'em, no matter how multitimbral you are trying to be. This is more Waldorf Q than Novation Supernova, and very disappointing given the quality of the effects. Nonetheless, it's an inevitable consequence of the

Software Support & Upgrades

• EDITING SOFTWARE

Access provide two flavours of Virus editor via Emagic's *SoundDiver* editor/librarian software. Firstly, there's a free plug-in for all registered owners of the full version of *SoundDiver* (v3.0.1 or later). This supports Virus OS v4.00 and above. The editor isn't bug-free, but a new revision is in the works, and everything should be sorted out soon. Secondly, the company has just announced a low-cost OEM version of *SoundDiver* that edits *only* Viruses, and should be available by the time you read this.

• OS V4.02

On 15 January 2001, Virus OS v4 reached v4.02, which fixes a number of bugs in v4.00 and adds a couple of minor features. You can

download it from the Access web site, and it should be compatible with any Virus b, Virus kb, or Indigo. Some users have complained that the 233k v4-to-v4.02 upgrade file is problematic, but a 'clean install' seems to cure the problems. OK, so this requires a 3.7Mb download, but isn't it better to be safe than sorry?

Note that the original Virus a cannot use OS v4 in any of its forms. However, in March 2001, Access announced what they claim will be the final revision of the operating system for the Virus a. This is OS v2.8, and it should be available by the time you read this. The new version will include the Indigo's Analogue Boost effect, the improved arpeggiator, sound categories, and the random patch generator.

ACCESS VIRUS INDIGO

► Virus's single 56303 processor. To paraphrase a *cliché*: you can't pour a quart from a pint pot.

The arpeggiator in v4 is a huge leap forward from the rather mundane implementation in previous OS versions. There are now 40 rhythmic patterns that you can apply to the six arpeggio modes: 'up', 'down', 'up and down', 'as played', 'random', and 'chord'. There's also a Swing parameter that does as you would expect,



The Virus Indigo's comprehensive I/O facilities: stereo analogue ins for external audio processing via the synth engine, three pairs of analogue audio outputs (four of which can be used to produce a quadrophonic output), MIDI In, Out and Thru, the headphone socket, and pedal inputs.

with all timings referenced to the synth's master clock. Unfortunately, the Indigo has no front-panel controls for the arpeggiator: no latch switch, no rate knob... nothing! I thought that this was a bit naff on the original Virus a and, with all the additional capabilities of v4, it's doubly so.

Moving on, v4 now lets you process incoming audio through the Indigo's effects section without using up polyphony. This makes the synth a powerful stand-alone audio processor, with up to seven simultaneous effects in series. If you want to mutilate your audio even further, you can pass it down the internal signal chain, through the filters, overdrives, and envelopes, even gating it with the arpeggiator to chop it up into unrecognisable little chunks. Whatever turns you on, I guess.

There are no radical changes in the voicing, but Access have added three more

things that make v4 sexier than earlier Viruses. The first of these is a random patch generator. This offers two parameters; one to determine how many parameters will be changed, and another to limit the amount by which the generator is allowed to affect them. Used with restraint, this can create interesting results, but when given free reign... it's fun, but in many hours of pressing the button, I didn't once create a patch that

I considered worth saving.

The next upgrade is, for me, more interesting, because it creates genuinely new synthesis possibilities. It's a Surround capability that allows you to position the sound in a quadraphonic space. You can distribute a signal between four of the six outputs, panning it left/right and front/back in real time. You can even modulate this to send the audio swirling around your head in ways that The Moody Blues and Keith Emerson could only dream about in the '70s.

Finally, Access have added sound categories to the Virus. You can allocate two out of 16 such categories to every patch. Then, using the Find command, you can search for patches within these classes. Unfortunately, you can't define your own category names, so the facility is of annoyingly limited use.

Wish List

I first encountered the original Virus back in 1998, and I was very impressed with its sound. Indeed, my thoughts at the time were that analogue die-hards should be sent to their bedrooms and only allowed out when they had had time to reconsider their anti-DSP prejudices. The Indigo does nothing to change my view, and I would challenge anyone to spot its digital heritage in a mix, unless I was intentionally creating sounds of a digital nature.

Sadly, the factory sounds do nothing to demonstrate the breadth of the Indigo's capabilities. I found little that stepped beyond dreamy, ethereal pads or the limited, and limiting, sounds of hardcore techno, industrial and trance. What's more,



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Apologies From Access

In a curious and possibly unprecedented move, Access' CEO, Christoph Kemper, has apologised on the Access web site for the late delivery of the Indigo. He attributes this, in part, to a level of demand that, he says, is far greater than expected. It appears that Access thought that the Indigo would be a Special Edition, whereas the public has taken it to its heart, and made it a mainstream product. This must be frustrating for Access, because there's a lot of extra cost and work in those side panels and the improved hardware. Maybe that explains why the Indigo costs almost as much in the UK (and exactly the same in the US) as the full-size Virus kb...

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ACCESS VIRUS INDIGO



▶ the arpeggiated patches are becoming clichés in their own lifetimes. So here's the first item on my wish-list: voice programmers with a bit of imagination who can demonstrate this instrument's huge range of sonic capabilities.

There are also several areas in which the Viruses themselves could be improved. For example, the filters will not self-oscillate without input from the oscillators. Sure, all filters need a small kick to get them going, but it should not be necessary to have a permanent input driving them.

I would also love to see more waveshapes on board. I've long been a fan of the PPG Wave, and sweeping through the Virus's existing 64 waves can be very gratifying. OK, so I'm converting the Virus from a Virtual Analogue to a Virtual Wavetable Synth, but why not? The Waldorf Q does this, albeit in limited fashion.

On the functional side, the Virus could still do with a handful of tweaks. For example, there's still no way to copy effects from one patch to another, and — notwithstanding the limitations of the reverbs/delays — this can be a real pain when trying to recreate a Single within a Multi. Furthermore, it's all very well having 32 modulation sources and 97 destinations, but you need more than three source and six destination slots in the onboard modulation matrix if you're going to take full advantage of this.

I also want another manual. Not to augment this one, but to replace it. It tries to be clear and instructive, but with no index, no block diagrams, and no specifications, it's more trouble than it's worth.

But now for the biggie... Given the number and importance of the software upgrades to the Virus' OS over the past two years, I think that Access should have taken the opportunity to redesign the Indigo's front panel in a much more significant fashion. I'm not complaining about the clearer graphics and the improved panel hardware, but why not find room to give the third oscillator and arpeggiator their own

controls (they're still buried in a menu), and bring some of the effects to the front? Sure, you would need a bigger panel, but I'm not a fan of the Indigo's size, anyway. Imagine how much better it would be with a 61-note keyboard, and a comprehensive control panel. Virus Pro, anybody?

Conclusions

• VIRUS OS v4

This software upgrade incorporates several improvements that have been on owners' wish-lists since the launch of the original Virus in 1998 (and more improvements are on the way — see the 'Software Support & Upgrades' box elsewhere in this article). For me, the reverbs and the enhanced delay algorithms are the most important of these, and they make an already first-class synth sound better than

The Virus Indigo's control panel, like those on the other Viruses, resembles a modern take on the Minimoog's classic layout. The big difference is the inclusion of an LCD and data-entry keys to access those functions which have not been given their own physical knob or button.

Brief Spec

VOICING

- Polyphony: 24 notes maximum.
- Multitimbrality: 16 parts.
- Oscillators per voice: Three plus sub-oscillator.
- Analogue-style waveforms: saw, pulse, sine, triangle (all with pulse-width modulation).
- Spectral waveforms: 62.
- FM: Two-operator.
- Filters per voice: Two.
- Filter modes: Low-pass, high-pass, band-pass, band-reject.
- Filter routings: Four.
- Maximum filter cutoff slope: 36dB/octave.
- LFOs per voice: Three.
- LFO waveforms: 68.
- Maximum number of mod-matrix routings: 6.
- Mod matrix sources: 32.
- Mod matrix destinations: 116.
- Other modulation routings: Assignable for LFO1 and LFO2, plus fixed routings.
- Envelopes per voice: Two.
- Envelope: ADSTR (T=Time).

OTHER FEATURES

- Arpeggiators: 1 per program (up to 16).
- Maximum simultaneous 'insert effects': five per voice (but see text for restrictions).
- Master effects: Delay/reverb.

MEMORIES

- Programs: 512 (in four banks of 128).
- ROM preset programs: 256.
- RAM program memories: 256.
- Multis: 128.

INPUTS & OUTPUTS

- Analogue signal inputs: Two.
- Resolution of inputs: 18-bit.
- Analogue signal outputs: Six.
- Resolution of outputs: 24-bit.
- Calculation depth: 24-bit.
- Sampling rate: Not specified.

DIMENSIONS

- Size: 54 x 34 x 11.5cm.
- Weight: 7.5kg.



ever. Nevertheless, I can see that random patch-generation, the sound categories, and the improved arpeggiator are going to be just as attractive to many people. Other upgrades such as the lo-fi effects, the improved processing of external signals, and the pattern delays are aimed squarely at modern dance music, and bring the Virus more into line with competitors such as the Supernova II. Some people may bemoan the lack of a step sequencer, but I'm not one of them. I'm pleased that Access have concentrated on producing an excellent OS with so few bugs.

but always *played* it via MIDI from a 76-note, pressure-sensitive Roland JV1000 or Trinity Pro. Why? Because the Indigo sounds great, and it deserves to be played across a much wider range than its own hardware permits. Furthermore, the Trinity's ribbon controller offers many possibilities that the Indigo can't provide.

Of course, using the Indigo in this way demotes it to the role of a sound module, so you may be tempted to ignore it altogether and wait for the forthcoming Virus Rack. Unfortunately, it is already clear from Access' advance publicity that the sound engine in the Rack is significantly inferior to that in the Indigo (see the 'Other Modules' box elsewhere in this article). Consequently, pose-value and flashing blue LEDs notwithstanding, I can't help feeling that — provided you have the space — you would be better off with a Virus kb, or a Virus b hooked up to the controller keyboard of your choice.

Now, I wonder where that screw came from? **SOS**

• THE VIRUS INDIGO

Now let's consider the Indigo... That it's super-cute, sexy, and will appeal to players for whom style is a major attraction is without question. That — from a traditional keyboard player's point of view — its cheapo three-octave keyboard is about as useful as a one-string guitar is also without question. So let's accept that you're unlikely to see Vladimir Ashkenazy, Oscar Petersen, or even Tony Banks playing one, and admit that there are many other ways that synths are used in 2001. As a compact sound effects generator on a small stage, as a sound source and signal processor in a tiny studio, or in any other discipline where piano-style playing is not required, the Indigo's amputated design could be a benefit rather than a hindrance.

But despite trying to maintain these positive thoughts, I soon found myself treating the Indigo like the Nord Modular Keyboard. I occasionally used the Clavia's itsy-bitsy keyboard when programming,

Information

£ Virus Indigo £1149.99; Virus kb £1299.99; Virus OS v4 is available free from the Access web site (address below). Prices include VAT.

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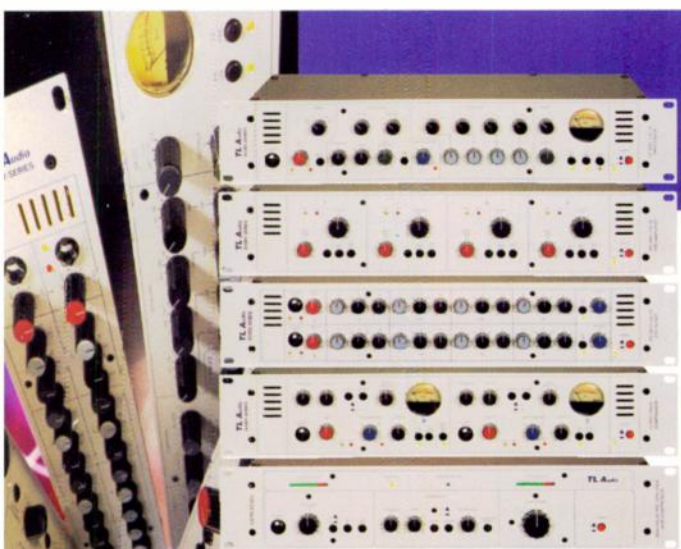
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Other Hardware & Software Modules

The Virus Rack should be with us soon. The bad news is that this will offer 16 voices rather than 24, and eight-part multitimbrality rather than 16. It also loses the Indigo's third oscillator and several of its effects, including the phaser, distortion, and surround capabilities. The good news is that Access have undertaken to develop a hardware upgrade to allow the Rack to run v4. Why the company would announce this before releasing a hamstrung version is beyond me.

In addition, if you have a Digidesign Pro Tools TDM

system, you can now buy a 'virtual' Virus plug-in. This too offers just 16 voices per DSP chip in your Pro Tools system, although you can use multiple chips to run more voices. However, like the forthcoming Rack hardware, the TDM version offers only eight-part multitimbrality, no reverb, no phaser, no distortion, and no surround capabilities. Furthermore, it does not appear that there will ever be an upgrade to OS v4, so if you want the new operating system, you'll still have to buy one of the physical versions of the synth.



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RECORDING LEAD VOCALS

A great lead vocal sound can make all the difference between an average demo and a potential single. **Paul White** and **Mike Senior** answer some of your questions on vocal recording.

One of the most common concerns of *SOS* readers is that their recorded vocals leave something to be desired. The lead vocal inevitably generates the largest number of vocal-related reader queries, and rightly so — many tracks have been transformed into hits simply by an inspired vocal. It is in recognition of the importance of the lead vocal that top producers often spend such a large amount of time and money working on this one element of a finished track.

Looking through the *SOS* mailbox, there are numerous queries from readers starting out on recording vocals, so we've collected them all together here and provided answers which should help you get the clear, upfront sound you're after.

Q I'm currently using a dynamic mic for recording vocals, but I've heard that capacitor mics are better. What difference would I notice if I bought one?

For a start, capacitor (or condenser) mics are generally more sensitive than dynamic mics, which means you'll need less preamp gain to get the same signal level. However, when close miking lead vocals there is seldom a problem in getting sufficient signal level. The main difference you're likely to notice moving from a dynamic to a capacitor mic is that the capacitor mic reproduces high frequencies more faithfully, producing a more open sound than a dynamic model with much more clarity and definition.

Q Does it matter much which capacitor microphone I use for vocals?

There are tonal differences between the various mics, but you might be surprised at how little difference in fidelity there is between cheaper and more expensive models. For example, many people would be unlikely to perceive a vast improvement in the faithfulness of the recording when moving up from a Rode NT1 or AT3035, both under £200, to a mic costing over £1000, even though the technical specifications might be better.

So why pay the extra? The reason people are willing to pay for more expensive mics is because each of these has its own unique tonal identity, and there are few situations where the tonal identity of a mic matters so much as when you are recording lead vocals. It is for this reason that you should make



FREQUENTLY ASKED QUESTIONS: RECORDING LEAD VOCALS

every effort to try out as many different models of microphone as you can when you're planning to record vocals. It's by no means a foregone conclusion that the most expensive mic, or the one with the most prestigious brand name, will sound best for the singer you're recording.

Having said this, it's as well to point out that many singers favour the sound of large-diaphragm capacitor mics, so it would be worth making sure that you try at least one or two of these. Tube mics are also often considered particularly suitable for vocals, as they impart a subtly flattering warmth to the sound. However, tube mics are more expensive, and it's worth remembering that their sonic signature won't necessarily suit the voice you're wanting to record.

Q Do I need a shockmount or are they just for posers?

A suspension shockmount of the type normally seen on large-diaphragm condenser mics isn't just for show — it can be extremely effective in reducing the levels of unwanted noise recorded. A studio mic can be very sensitive to mechanical vibrations, so the elasticated suspension is used to isolate it from the stand, reducing the degree to which stand-borne vibrations can reach the capsule.

If you're overdubbing vocals in a quiet room with a solid floor, then you can get away without a shockmount — provided that you're not in the habit of tapping your feet! But a shockmount can be very important in studios with wooden floors, or where several musicians are playing together in the same room.



A condenser mic will usually produce better results in the studio than a dynamic mic designed primarily for live performance.

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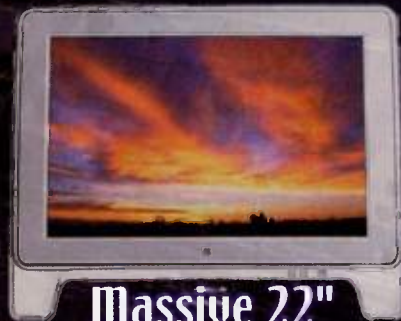
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RECORDING LEAD VOCALS

► **Q What polar pattern should I use?**

Most engineers will use a cardioid pattern, which is more sensitive to sounds arriving from the front than from the back and sides, as this avoids capturing much in the way of ambient sound. However, cardioid designs colour the sound in a variety of ways. The most obvious of these is that they exhibit the 'proximity effect', whereby low frequencies become more pronounced the closer you move to the mic. However, the sound will also change if the singer moves off axis — in fact, even if the singer remains in front of the mic, any reflected sound arriving at the sides or rear of the mic capsule will still be subject to tonal change.

Some recording engineers occasionally use omni-pattern mics instead, which pick up sound equally from every direction. While this can often result in a more transparent sound, it is at the expense of a higher level of recorded ambience.

Q Should I use the microphone's low-pass filter?

Any filtering introduces artefacts into the audio signal, even at frequencies that are well above the filter's cutoff, so it's best avoided if possible. However, there are cases when it can be useful, most notably in reducing the level of handling noise or vibrations transmitted through the mic stand to the body of the mic. Some filters are designed to compensate for the proximity effect, and while these can be useful, it's probably better to deal with this type of problem by repositioning the mic while recording or by using a well-specified parametric equaliser at mixdown.

Q My mic comes with a foam pop shield. Should I use this when recording vocals?

Foam pop shields are actually not very effective in reducing popping and their presence can also compromise the high-frequency performance of the microphone. A fine mesh pop shield mounted midway between the mic and the singer will work much better, and it ought not to significantly affect the sound. You can either buy such a pop shield (which often comes with an attachment to clip it onto the mic stand) or you can improvise your own using a wooden hoop or wire frame with a piece of nylon stocking material stretched over it. You can even use the fine wire-mesh splash guards used to cover frying pans, as these also work perfectly well.

Q How far should I be from the microphone when I sing?

There is some leeway here, but between six and eight inches (15 to 20cm) is generally alright. If you get too close when using a cardioid mic, the bass boost caused by the proximity effect will increase, though this is sometimes the effect which is desired. The important thing is to try to keep the distance

between the singer and the mic constant if you want to keep the tonal balance consistent — even slight movements can dramatically alter the sound if the mic is at all directional.

Q Where's the best place in the room to put the microphone?

Most of the time when recording vocals it's best to keep the effect of the room on the sound to a minimum, so keeping well away from the walls is a good idea. In particular, try not to have a reflective wall directly behind the singer. Another thing to avoid is recording in the exact centre of a room, as any standing waves will be in phase at this point, and this will tend to exaggerate the room resonances in the recording. Balancing these two considerations means that you're likely to wish to record close to, but not directly at, the centre of the room.

If you're still getting a boxy sound, no matter how you position things in the room, the first thing to try is working a little closer to the mic — it is usually the nature of the recording room's ambience which causes boxiness. Obviously, the proximity effect may often limit you a little here, and so four inches (10cm) is probably a sensible minimum distance — this will still improve the direct-to-reflected sound ratio. The other thing you can do is ensure that there's something non-reflective behind the singer. Use curtains or hang up drapes, duvets or sleeping bags to soak up the reflections. If the sound is still boxy then it may be that the room is simply too small or too badly behaved and that you should try a different room. However, this is a rare occurrence, except in the case of poorly designed vocal booths.

Q Should I EQ vocals as I record?

My approach is not to use any EQ when recording, as this gives me more scope for adjustment when mixing. In any event, a good mic in front of a good vocalist should sound 90 percent of the way there before you add compression or EQ. Furthermore, you can never really tell what EQ is needed until you hear a sound in context with the other elements of the mix. However, some engineers prefer to EQ as they record, particularly if they wish to take advantage of analogue equalisation before recording onto a digital medium. If you'd like to work this way, be sparing with the processing you



Studio condenser microphones are very sensitive to handling noise and mechanical vibrations, and a suspension mounting such as that shown above is often a necessity.



Although commercial pop shields are widely available to purchase, you can make something quite usable for yourself.

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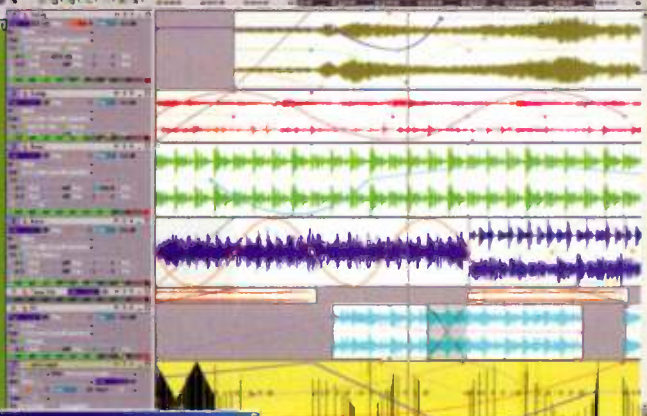
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RECORDING LEAD VOCALS

► do — you won't necessarily be able to remedy any problems later. My recommendation would be to start working without EQ at the recording stage, but if after a period of time you find yourself repeatedly adding similar EQ at the mixing stage, then try using this during recording instead.

Q What do people mean when they talk about using EQ to add 'air' to vocals?

A broad-band, high-frequency EQ can often be useful to enhance the sense of clarity of a sound, and such processing is often referred to as 'adding air' to a recording. Typically, this is achieved using a parametric equaliser set to a fairly wide bandwidth and with a centre frequency of between 14 and 16kHz. In fact, it is because analogue equalisers can often do this without introducing harshness that many engineers prefer to add at least this EQ while they record.

Q Should I compress vocals on the way to the recorder?

If you have an analogue compressor, perhaps as part of a voice channel, then adding a little compression during recording is a good idea, helping to even out the signal levels and also maintaining a good signal-to-noise ratio by using up more of the available recording headroom more of the time. A compressor can also prevent the singer from overloading the input of your recorder, and this is particularly important with digital recorders which can produce ugly distortion if their A-D converters are clipped. Nevertheless, remember that it's not easy to reverse the effects of overcompression, so err on the side of undercompressing — you can always add more in the mix if you need to.

If you're using a digital recording system then any compression you do during recording should be carried out in the analogue domain in order to get the best out of your A-D converters.

Compressing in the digital domain during recording will have no audible benefits over doing this same processing during mix down, so it is probably best left until then.

Q What's the best way to get a good performance out of a vocalist?

The complete answer to this question probably requires a degree in psychology, but there are a few simple things you can do. Firstly, set up a headphone monitor mix which is comfortable for the singer, with a little reverb on the monitored vocals to aid natural performance and pitching. Be careful, though, to avoid adding too much reverb — keeping the reverb time below about one second ought to keep you out of trouble.

Some singers have trouble pitching when wearing headphones, because it can be difficult to

hear yourself. Sometimes inverting the phase of the vocal's cue feed can help here, because this changes the way the direct sound (via bone conduction in the singer's head) mixes with the sound from the cans. You'll also find that some singers work best with one earpiece on and one off. If this is the case, try to arrange your headphone feed so that you can switch off the phone not being worn, otherwise the sound will leak back into the vocal mic — panning the mix to one side is often possible. (The art of setting up a good cue mix was dealt with in depth in *SOS* March 2001's Basic Overdubbing feature, if you're after some more tips.)

A singer's environment can make a great difference to the way in which they perform, so many engineers pay special attention to this. This can simply be a question of providing the singer with their choice of refreshment, but can also extend to using subdued or coloured lighting and checking that the recording room is the right temperature. Unnecessary onlookers (and even necessary ones!) can be intimidating to singers, so find out if they prefer to be in their own booth.

If the singer is isolated in a separate room, for whatever reason, then it is extremely important that talkback is used at every opportunity to communicate with and encourage them. Much of the art of producing a great vocal performance is in knowing what to say to the vocalist in between takes. Without a doubt, the best general advice for the aspiring vocal producer is to take any opportunity to encourage and compliment the singer

“If you're using a digital recording system, then any compression you do during recording should be carried out in the analogue domain in order to get the best out of your A-D converters.”



— don't underestimate how much a singer's performance depends on his or her emotional state. If there are problems with a vocal part then suggestions, rather than criticisms, are usually the best bet, for example. If you can keep your vocalist feeling good, the performance will only gain from it.

A final thing to remember is that the first takes a singer does can often be the best. For a start, singers often get fatigued more quickly than instrumentalists, particularly if they are straining to produce their vocal sound — Curt Kobain could apparently only do about three takes of certain songs before his voice was wrecked. Also, many singers find it difficult to sustain their emotional involvement with the song beyond a few takes. For these reasons, many top engineers record even the level-setting run-through, as this can sometimes be the most vibrant and uninhibited performance. **ES**

Although voice channel processors allow significant manipulation of tonal balance and dynamics during recording, any mistakes made at this stage can be very difficult to remedy at mixdown.

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PRODUCING 'WHOLE AGAIN'



BILL PADLEY & JEREMY GODFREY: PRODUCING ATOMIC KITTEN'S 'WHOLE AGAIN'

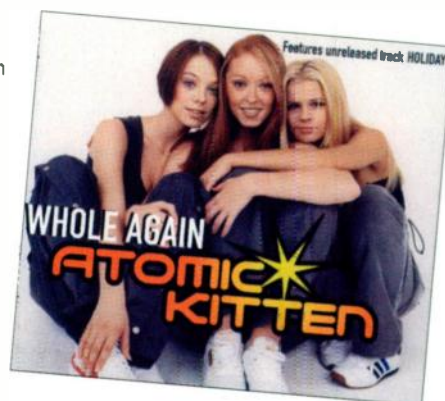
It's less than two years since Bill Padley last graced the pages of *Sound On Sound*. Then, he was dispensing advice on radio editing and plugging, and putting together a new division of Wise Buddah, the company he co-founded, to break into the world of pop songwriting and production. This move has proved so successful that Wise Buddah Music's very first co-written and co-produced single crashed straight into the British charts at number one and remained there for four consecutive weeks — an unusual achievement in these volatile times. The single, co-written and co-produced by Padley and his colleague Jeremy Godfrey, was Atomic Kitten's 'Whole Again'.

"The last time we were in *SOS*, radio edits were the main thing that we were doing, though we always knew that the years of grounding as radio people and musicians/writers/producers would come to the fore one day. We were writing loads of stuff and said then that people would hear it shortly," explains Bill. "Well, basically me and him have been locked in a room for the last year and a half, just writing. We started off by spending a lot of time making our tracks sound like absolutely finished records, which was a mistake in retrospect, because by the time people got round to wanting to use them, things had moved on a bit — so what was

Number one UK hit 'Whole Again' took Atomic Kitten from the girl-band niche to a universal audience, and made an impressive first single release for co-writers and co-producers Bill Padley and Jeremy Godfrey. **Sam Inglis** hears the story.

a great production when we wrote it was no longer a great production when it got covered by somebody. So we took a conscious decision about six months ago to concentrate more on writing and spend less time on producing the demo, although our demos are still pretty comprehensive.

"We spent a lot of time writing and touting the songs around, and the two people in this country A&R-wise who understood and who got it were Colin Barlow at Polydor and Hugh Goldsmith at Innocent. They would always listen to our stuff and suggest things and give us help and assistance — a rare thing in A&R men! One day we were sitting in Hugh's office at Innocent, and he said 'Oh, I've got this track from Atomic Kitten which isn't quite finished yet.' He played it, and basically it was a half-finished song and a half-finished production, although it had already been put on their Japanese album. All the verses were spoken rather than sung, and the production had the right sort of feel, but it didn't sound like a finished record. And he said 'Can you



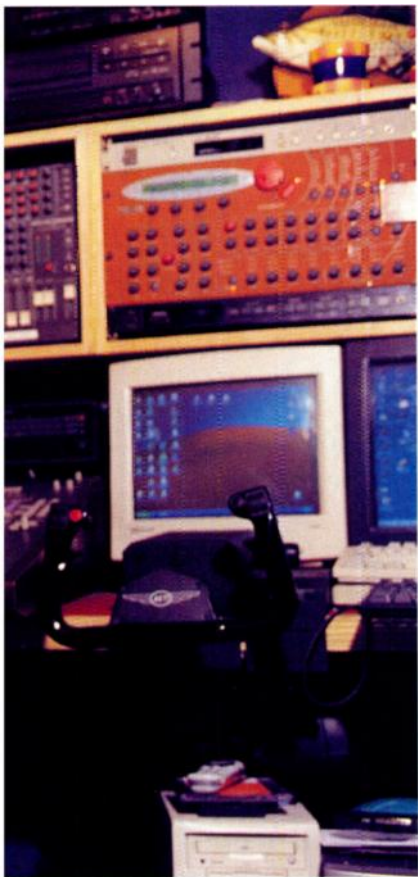


Photo: Ken Aldridge

Bill Padley (right) and Jeremy Godfrey of Wise Buddha Music.

go away and write a melody? You've got a week.'

"We loved it as soon as we heard it. We said 'This is great, but it ain't Atomic Kitten!', but we decided to do it anyway. The original track was done by Stuart Kershaw and Andy McCluskey in Liverpool, who are intrinsically linked with the Kittens. Andy McCluskey of OMD fame, surprisingly, is the man behind Atomic Kitten! And one of the issues was that all the previous Kitten records had all been aimed at 'teenies'. They were quite successful, they had had chart hits, but they weren't actually selling that many records. So our task was to take this track which was nothing like Atomic Kitten, and turn it into a hit song and record.

"We decided to write a melody and change all the chords. It was quite difficult, because the chorus of the song was so hooky that the verse had to lead up to it but not overshadow it, which is why it ended up sounding as low as it does. We very carefully worked out what the vocal range of the Kittens was, because the last thing we wanted was to write a melody that was fantastic but that they wouldn't be able to sing. We couldn't change the key of the song, because the chorus was already there.

"So we wrote this rough thing, and I sang it, so it was me singing the verse and the Kittens singing the chorus, and we did a little bit of tarting up of the track, but not very much. We gave it to Innocent, and Hugh played it to the girls and to Andy and Stuart and to Martin their manager. To start with, they weren't sure at all, because we'd effectively completely changed the song, and they were so used to hearing the previous version. But after a couple of days they came back and thought it was perfect."

Magic Moments

With the new direction for the track agreed, Bill and Jeremy set about making the demo into a record in their West Hampstead music studio. The first stage was to record the Kittens' new vocal for the verses, in place of Padley's own voice on the demo. As Bill explains, however, the girls' hectic schedule made the vocal session a hasty affair: "They were going on stage the same night for the first night of the Steps tour at Wembley. They were on stage at 7.30, and Natasha and Liz were supposed to be with us at 3.30. They eventually turned up at five. So we got Natasha and Liz to sing the whole song all the way through, twice, and I'd say it probably took 15 minutes each."

"In the middle of this, they've brought their wardrobe costumer along, and there are all these dresses in plastic bags being laid out in the living room," laughs Jeremy Godfrey. "So Liz would be trying something on, and then Natasha would come in and do her bit, and then she'd go out and try something else on, and then she'd go out and they'd bring Liz back in. It was like a relay race."

"What we did with them, which is what we generally do when we're working with bands as opposed to solo people, is to get everyone to sing everything, and then see who sings what the best," explains Bill. "They're both great singers. Kerry wasn't there — Kerry's bit was the spoken bit in the middle, which still remained, and she had done the speaking verses which had gone by that point. So Liz and Natasha did the vocals. Our way of doing vocals is just to get them to go through the song four or five times, not worry about stopping, get it all in Pro Tools and worry about it afterwards. You know what you can fix and what you can't. When we do backing vocals, if it's not over in two hours, something is badly wrong, even for 50 vocals. When someone's doing a singing session, we'll say 'Bob The Builder', meaning 'Can we fix it?' And we know what we can move and what we can tune. There is absolutely no point in making a singer go through hell to get a syllable exactly right, or a note that is 0.2 percent over a C sharp back down to a C sharp again. That's just a waste of time. Let the singer sing the song four or five times, and then you worry about it afterwards, that's what you're paid for. Don't make the singer go through agony. I am a singer, and I understand the psychology of singing, and there's no point in getting a singer there for 10 hours going over and over and over the same bit again. There really isn't. You get the performance out of them, get the feel out of them, and then you worry about the inadequacies of it afterwards. And, to be honest, there's pretty much nothing you can't do in Pro Tools when it comes to fixing up vocals."

"Auto-Tune's quite a nice failsafe," explains Jeremy, "but we don't use it excessively. It just catches things and pulls things in a bit, and then for syllabic timing we'll cut the vocals up and move them around."

"It really does happen very quickly, so you're not arsing around for hours doing the same bloody thing," adds Bill. "Jeremy will do stuff like putting 'S's on words where the S wasn't quite right without even thinking about it. It's like an automatic reaction."

"We also don't particularly like vocal booths, because they create a division," says Jeremy. "You're putting someone in a room with glass and they're isolated. We like to be standing around with them when they're singing."

"If we *have* to use a booth, I go in there with the singers," adds Bill.

Bill and Jeremy's secret weapon for recording vocals is an unusual American microphone, the CAD VX2: "We were offered a chance to try the microphone, which I'd never heard of," explains Bill. "It's a double valve mic, a big blue thing. Before it arrived we were using a Neumann U87, which we

Logic versus Pro Tools

Bill and Jeremy have always been firm believers in the merits of Pro Tools. Until about nine months ago, they used Emagic's *Logic Audio* for MIDI and *Pro Tools* for audio, but then switched to doing both on Digi's own *Pro Tools* software. "We have changed our working *modus operandi* quite drastically since *Pro Tools 5*, when they added MIDI sequencing properly," explains Bill. "*Logic* is brilliant at what it does. However, I cannot say that we ever used more than two percent of the features of *Logic*. The way *Pro Tools*

handles MIDI is not elegant, it's not flash — but what do you want to do with MIDI? Record it, quantise it, move it around, change the velocities, transpose it. What else do you want to do with it? People use sequencer features as an excuse for not having any ideas. They'll go 'What are we going to do now? Bollocks! Let's groove-quantise it to a shuffle 32 waltz beat! Let's go into *Cubase* and use whatever that thing is called that generates notes randomly!' For f**k's sake, why not just play something!"

PRODUCING 'WHOLE AGAIN'

► couldn't see past — it's what everyone uses. But we tried this and went 'Hello! This is the vocal sound! This thing sounds amazing. If you track it up 40 times it just sounds glorious. And the Neumann doesn't get used at all, any more.'

Tarting It Up

As well as recording the new vocals, Bill and Jeremy also took over the job of producing the track, although they were careful to preserve the good features of Andy McCluskey and Stuart Kershaw's original version. "What Andy and Stuart did had a real spirit about it, and we didn't want to lose that spirit," insists Bill, "but we had to cut their bits up and move them, so they'd work with the new chords that we'd done. We liked what they'd already got, so the bits they'd already played we just moved around and cut up and made them work."

"In the original, the verse chords were exactly the same all the way through as they were in the chorus," says Jeremy. "It's in E major, but we wanted it to go to C sharp minor for the second chord of the verse, rather than B as it did, so basically we just kept the E chord, doubled it in Pro Tools and added a C sharp in the bass, thus getting a C sharp minor seventh!"

"We tarted the track up, as well," says Bill. "It was quite a job, because we had to take what came from Andy and Stuart — fortunately they're Pro Tools users, so they sent us the Pro Tools files. That's a revolution to us, where instead of having to get a multitrack you get a CD, burnt as Pro Tools files. In the old days when you had to use someone else's multitrack it would be the worst nightmare in the world. You'd get two 24-tracks, and you'd have to figure out what Dolby they had and how were they lined up — whereas with this you get a CD, bung it in, and there the session is."

"We kept the 'underwater' organ sound from the original session, which was part of the song, because we liked that and we couldn't really replicate it," explains Jeremy. "The majority of the bass came off the Roland XV5080. We used the same bass pattern as on the original, but because the chords had changed in the verses we had to replay it. There are two bass sounds — one of them's a sustained bass, just an ordinary drone, which runs in the choruses. In the verse, I hate to say it, but we used General MIDI sounds! I always thought GM sounds were a curse, but they're actually really helpful, because you can just go 'I want a bass sound', click, and it's there. The punctuated bass is a GM pop bass from the XV."

"The piano is from our Kurzweil K2500. We've got the piano board in it, which is a piano sound to die for, a big, lush stereo piano. We kept some of the original drums, and added a couple of additional loops from a sample CD called *Vinylistics 3* — we just took applicable loops and then did the intelligent time-stretching to bars and beats in Pro



Tools. Rather than pitching them in a sampler we just chucked them in and stretched them until they fitted, and then we added a couple of extra kicks from the Emu Phatt."

"When a loop goes in, Jeremy will tend to cut the loop up into bits and move it around in Pro Tools, so the loop becomes something entirely different," explains Bill. "Drums are never played in, we just put kicks, snares, hats and so on into Pro Tools and move them around. They're *built* in Pro Tools, as opposed to played."

Perhaps the most distinctive sound on 'Whole Again' is that of the *tremolando* string chords that punctuate the chorus. "When the track came from Andy and Stuart there was a sort of *tremolando* string thing in there, but it sounded more like some bloke scratching a violin with his arse, and it was out of tune," laughs Jeremy. "So we used Pro Tools to pitch-shift that, and we added our own *tremolando* strings from the Peter Sieclaczek *Advanced Orchestra* sample CD set, which is f***ing expensive, but if you can afford it, worth every penny. There was also a thing that went 'dooo-eee-ooo-eee', which we renamed Doppler Rubbish. That was out of tune as well, so we put that back in tune. By the way, we are just as irreverent when naming our own tracks... we had one recently that we called 'Padley plays the guitar badly!' You may spot a few in the Pro Tools session page!"

The track was rounded off by the addition of an organ sound of venerable origin. "Our only surviving synths from the olden days are a DX7 and a Roland D50," says Bill. "The DX7's never used and the D50 is."

"We have a running joke that the D50 has to appear at some point on everything we do," laughs Jeremy. "Even if it's just a little thing, it appears on everything. On 'Whole Again' it's the organ, patch number 18!"

Gospel Truths

"At this point," says Bill, "We thought 'Well, it's all right, but it's not as good as it could be.' So we

Wise Buddah Music's studio is located in West Hampstead rather than at the main Wise Buddah building in central London. There is no vocal booth, and Bill and Jeremy are quite happy to record vocals without even using headphones, relying on phase-reversing and EQing the backing track to cancel out spill from the monitors.

Disk Housekeeping

"We're using a 9600 Mac, with a Mix Plus system, which is a Mix Farm card and a Mix Core, and one old Farm card," explains Bill Padley. "And we absolutely max out every available bit of DSP space and every available track. Pretty much all of our tracks go up to 64 voices, which is all it'll do. And Digidesign won't believe us, but everything we do comes of one old 9Gb SCSI drive. It's supposed to be split across two, and we started being very good boys by doing everything across two drives, and it became really unmanageable. By accident one day we ended up with 64 tracks on one drive, and it didn't cough. So we don't even touch the second drive."

"We have folders on our Mac called Songs, Edits, Remixes, and so on, and we have *Retrospect* as a backup mechanism, backing up onto DAT. And after every day, it gets backed up to *Retrospect* and things that are no longer in use get cleared off the drive, and it gets defragmented. Disk housekeeping is a boring subject, but it has to be done. Otherwise you end up in all kinds of trouble. Touch wood, we've never lost a thing off *Retrospect*. We can go back to something we did two years ago and there's the Pro Tools session."

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PRODUCING 'WHOLE AGAIN'

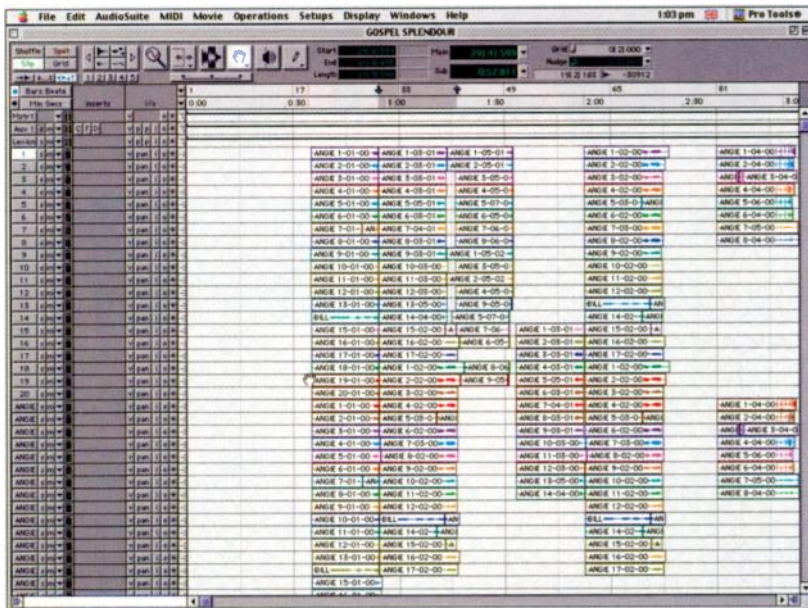
► decided that we wanted a gospel choir. It's an old trick — if in doubt, stick a gospel choir on it. Obviously we weren't going to *get* a gospel choir, so we decided that myself and a fab singer friend of ours called Angie Giles would do the gospel choir. Angie came round, me and her tracked up about 40 vocals, and then we stuffed it all into Pro Tools, arsed around with it, put a couple of delays and a couple of effects on it, and suddenly it sounded like a gospel choir. There was a version that was delayed and shifted using *DPP1* and a version using the *Bruno* plug-in, which was tuned to the notes to give a kind of vocoder effect. That was pretty much an afternoon's work, and it made the track really lift, and made it sound really epic.

"At the end of that, for the first time ever, we used our Focusrite Mixmaster. Before, when we used to finish stuff, we used to put it through every plug-in that was available and hope that it sounded right. But we heard the Mixmaster, and absolutely everything we do now goes through that. It's basically Focusrite's Finalizer, if you like, it's a mastering device, and we put it in an insert in Pro Tools. You put your track through it and it goes 'Hello, I'm now a record.' It was mastered again after us, but we couldn't actually detect the difference. The Mixmaster has been a really good tool for us, and it's not massively expensive. Producers always swan around going 'I've got the Manley this and the Avalon that,' but the Focusrite is aimed at domestic and semi-pro people, and it sounds brilliant. We do our mix, and then we switch it in. There's only two things we come out of Pro Tools for to use other bits of gear. One is that, and one is a Lexicon PCM80 — and to be honest, we don't actually use that properly, it gets used as a pseudo-delay kind of thing."

Round In Circles

Since two sets of writers and producers were involved in the record-making process along with the band, management and record company, it's no surprise that more tweaks were called for at this point. "We gave the track back to Innocent, and they loved it, but weren't sure whether the girls had given their best vocal performance, because they were rushing around so much. So we decided to reconvene and try another vocal. This time we went to Wise Buddah's main studio, and on this day, the girls were not only coming to sing our track, they were also singing another track at the same time in Whitfield Street Studios. So they would come round in shifts. Liz would rush in and do her bit, and then she'd have to rush back to Whitfield Street, and Natasha couldn't speak, because she'd been working her arse off, and her voice was so throaty and low that it didn't sound like her. But anyway, she did her vocal, and Liz did her vocal. We put that vocal on it and sent it back to Innocent, and they said 'Naah, we don't like it as much as the first one.'

"So then the usual thing happens, which is that it goes backwards and forwards with people saying 'Well, I think the third word of the first verse was better on the first vocal than the other one...' So we did a bit of fiddling, sent it back to Liverpool, got it



The fake gospel vocals created by Bill Padley and singer Angie Giles, shown here in Pro Tools.

back down again, and then the girls went into Liverpool and did yet another vocal of 'Whole Again' in an attempt to get this magical verse. And what happened in the end was that we used the original that was recorded in West Hampstead! I'm not sure we told them that... (laughs). We got to the point where it's really about the song working and not about getting into the minutiae of whether that syllable is sung with more emotion, because frankly the song either worked or it didn't work. So we tarted it all up, stuck the gospel vocals on it, gave it back to Innocent, Innocent loved it, management loved it, band loved it, Andy and Stuart loved it, and all was well. And that was in June of last year. So we're thinking 'OK, now what happens?'"

Please Release Me

"Innocent said 'This is going to be the next single, which is going to be out in September,'" continues Bill. "It came to August and everything changed, and there was going to be another single first called 'Follow Me'. So 'Follow Me' was released and did moderately well, but not spectacularly well, and then we heard in November that 'Whole Again' was

The main MIDI modules in Wise Buddah Music's studio: Alesis Quadraverb effects unit, Roland XV5080 sound module, Emagic Unit8 MIDI interface, Emu Planet Phatt, Orbit and Audity 2000 sound modules. To the left is the Focusrite Mixmaster mastering processor.



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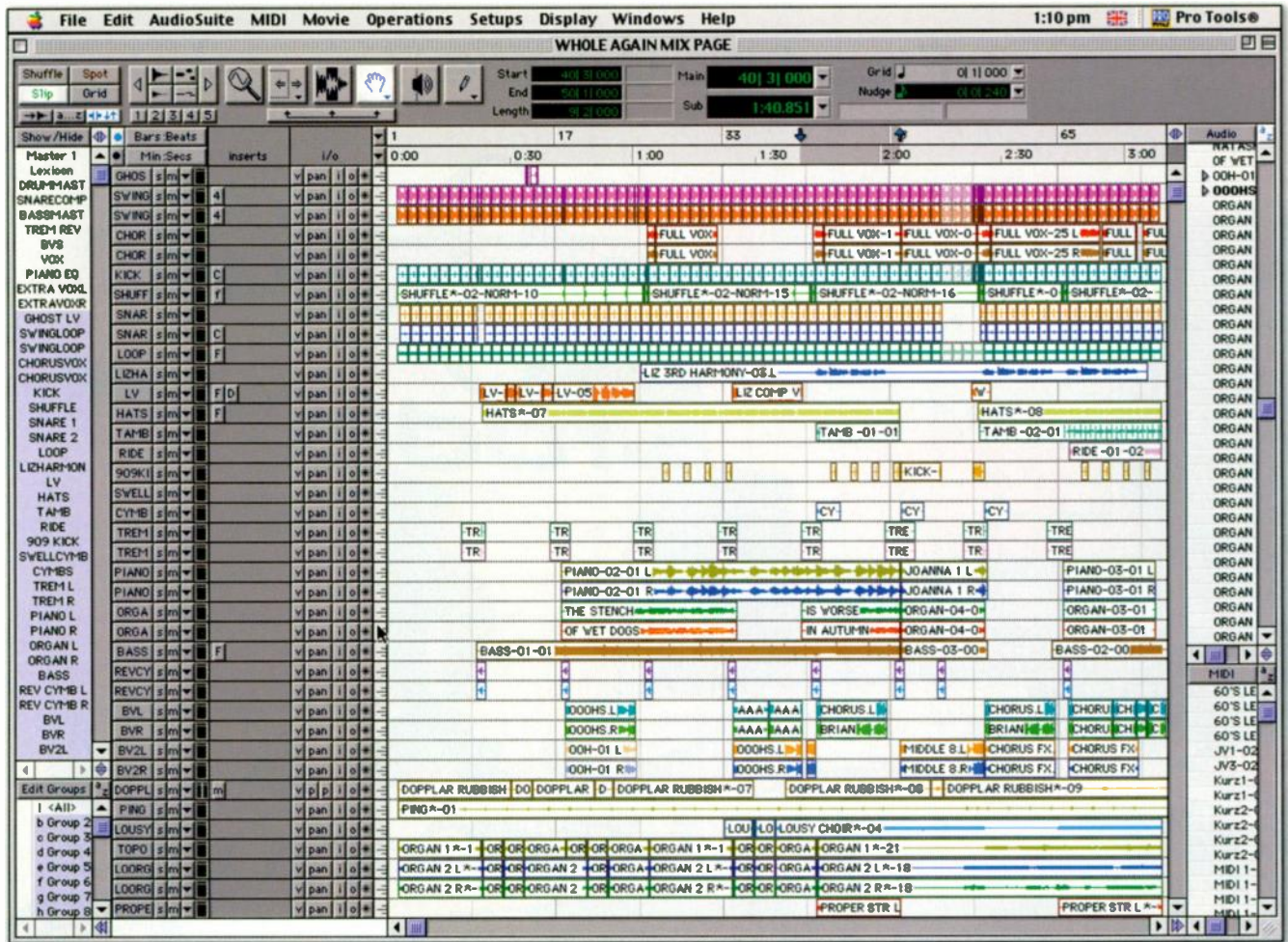
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PRODUCING 'WHOLE AGAIN'



The final Pro Tools session for 'Whole Again'.

► definitely going to be the next single, and it really needed to be a big hit.

"By the time it came out on January 29th 2001, me and Jeremy had done 16,000 other things in between, and had really put it to the backs of our minds. The first midweek chart you get is Tuesday morning at 11 o'clock. Mark Goodier, who's the chairman of Wise Buddah, called me up on Tuesday morning and said 'Have you heard the Kittens' midweek?' I said 'No,' and he said 'Guess.' I started at 18, and he went through the whole chart saying 'Higher!' We went through this laborious process until we got to number one, and I thought he was taking the piss. We were both thinking 'They must have made a big mistake, there's no way this record's going in at number one,' because no-one was playing it. Absolutely no-one, with the exception of Radio Two, which had B-listed it. Independent radio had completely ignored it at this point, although it had been on TV a lot.

"It's become a bit of a phenomenon now, but it was Atomic Kitten against everyone, including radio, which for us was bizarre with our radio backgrounds. Our thing, really, is radio and pop, and that's what was panicking us, because when radio didn't play 'Whole Again', we were thinking 'Bollocks! We've been going round telling everyone how great we are at doing radio records, and these buggers aren't playing it! Even the people that we knew

would play it are not playing it! What the f**k is going on? It turns out that it wasn't the record at all, it was the band. Radio had basically listened to the voices inside their heads telling them they didn't like Atomic Kitten, as opposed to listening to the record.

"So we got to Tuesday morning and it was number one midweek, and the number two record was U2. And we're just going 'There's absolutely no way on God's earth that this record is going to beat U2. Whatever blip this is that's caused by all the Kitten fans rushing out to buy it ain't going to sustain it to the end of the week.' Wednesday midweek — number one. Thursday midweek — number one. Friday midweek — number one."

"By this point," says Jeremy, "it had become the

A Word Of Warning...

You couldn't wish for a more successful debut as a songwriter or producer than 'Whole Again', and Wise Buddah Music are hard at work on a whole range of other projects for new and established artists. Yet Bill Padley has a word of caution for those who think that one hit makes a career: "You would think, if you're a producer and a writer and you've just co-written and co-produced a song that's done nearly a million copies, that the phone would be constantly ringing. Absolutely not true. It's

made more doors open, yes; A&R people will go 'Oh, you're the people who did 'Whole Again'. However, the phone is not ringing constantly. So I would caution people against thinking that after you've had a hit, you swan off to the Bahamas for six weeks and everyone rings you on the mobile going 'Madonna's free if you are'. It doesn't happen! Having said that, if Madonna or Britney can stand our coffee, I'm sure we can squeeze them in."

Import Restrictions Lifted

"In *Pro Tools 5.1* you can import tracks without the associated audio," says Bill Padley. "So if you've got a fantastic guitar sound on a track you've done, you can import the track with all the plug-ins on it that gave you that sound, and then just use it. We have little templates made up — here is a good guitar sound, here is a good vocal sound, here is a good drum sound — which give you good starting points to move on instead of having to recreate them from memory."


longest week ever in the history of weeks!"

"What matters is what happens on the Saturday sales," continues Bill, "and it sold some ridiculously large amount of records on the Saturday. So on Sunday we learn that not only is it still at number one, but it has absolutely slaughtered U2. You could tell that radio stations had been getting really irritated, because by the end of the week they were absolutely hammering the U2 record, and doing anything they could to promote U2. So when it was confirmed at number one on Sunday, we were over the moon. Radio, of course, immediately shat themselves because they had missed this number one record, and started picking up on it the next week. That actually did us a favour, because people who'd never heard it before started to hear it.

"The next week, it was up against Wheatus' 'Teenage Dirtbag'. We thought that was a fantastic record, and thought we had no chance. Wheatus beat us (ha!) for most of the week, and then on the Saturday, again, the Kittens just sold shitloads of records. And the next week it was Outkast's 'Ms Jackson', which once again we really liked. We thought there was absolutely no way it was going to keep it this time. But by this point, it had increased sales in week two, and beat Outkast, and increased sales again. It sold 129,000 at number one, and it's the first record for a long time to increase sales for three weeks while at number one. By the fourth week we were away in Sweden, working, and we'd resigned ourselves to the fact that there was no way it was going to do four — but it did. And now it won't go away!"

Pop Lobster

So what is it about 'Whole Again' that allowed it to overcome the prejudices of radio programmers and remain at the top of the charts for a month? "It's about the song, not the production," insists Bill. "We do demos for Digidesign, we've been to Paris and Amsterdam showing Pro Tools and how to use it, and we've done all these really flash music demos. Then Digi asked us to go and demonstrate 'Whole Again', and we had f**k all to say. It's the most boring session in the world. You bring up the session and say 'Well, there's a bass. And some drums.' It's the least impressive Pro Tools session in the world, but it works, and that's actually a critical point. When you're producing records, you think about the song and what's right for the song, and don't throw in the kitchen sink. If it works, it works, and stop there.

"If you're a producer, you're not doing it to show off. You're doing it to make the best of somebody's song, whether it's yours or somebody else's. If you spend eight quid on a lobster, and you've taken it home, and you've boiled it up, and you've thrown shitloads of tomato sauce on top of it, going 'This'll be lovely!', you have not made the best of the lobster. Right? Identify what it is that makes lobsters nice to eat, and deal with that. So 'Whole Again' is a lobster. And all we've done is grilled it with a bit of cheese. And it's lovely." 

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livin',

It's quite evident from surfing around the *SOS* web forum that many *SOS* readers are making dance music. And a common concern amongst these musicians is that their tracks don't sound as big, loud, and punchy as tracks by their favourite artists. Though many forum participants appear to believe that there is a single reason for this, such as the model of compressor they're using, the real answer is actually a combination of factors. If you're going to get your music sounding as loud and punchy as possible, you have to look at the sound sources themselves, the use of processing and effects, and the way in which the track is mastered.

Fixing It In The Arrangement

Many problems with a track's apparent size can be traced back to the arrangement, and problems such as these aren't easy to solve if you leave them until the mixdown stage. For a start, it's worth realising that creating a 'big' track is about having tonal contrast, so it's no use combining big kick and bass sounds with big snare drums, big pianos, big pads and big vocals. Each instrument you add to a mix will wrest a portion of the available headroom and bandwidth from each of the other instruments, making everything a little smaller. If you feel that you want to add another part to make your track more interesting, why not resist this temptation and concentrate on making your existing parts more interesting instead. Your track will almost certainly sound bigger for it.

It's not just how many parts you put into an arrangement that makes a difference to the perceived size of the track, it's also important where you put them, both in the time and frequency domains. For example, it's no accident that many powerful dance tracks alternate a four-on-the-floor kick drum with an off-beat bass sound. These two parts would have to compete for the low-frequency headroom if they occurred together, so programming them to always happen in different sections of the bar means that they can both be mixed much higher in level.

Similarly, it's worth choosing the individual sounds in your arrangement so that they occupy distinct, and separate, regions of the audible frequency spectrum. If you want a bass sound, a rhythm guitar sample and a lead monosynth part to co-exist within your track, it's worth making sure that they occupy different frequency ranges — if not, then experiment with transposing their parts around until you find a combination which balances better.

Finally, the size of a track is best emphasised by



INCREASING LOUDNESS IN DANCE-MUSIC PRODUCTION

Paul White shows you how to get that massive dance sound. Additional material by Mike Senior.

comparison. In other words, try to allow for some 'drops' in the arrangement, where a number of parts drop out or become more sparsely programmed — when the full arrangement returns, it'll seem much louder by comparison.

Turning The Bass Up To 11

In the context of dance music, the things most commonly associated with sonic size are the bass sounds. The bass sounds are simply those parts within your arrangement which have low fundamental frequencies, typically between 40 and 150Hz.

Obviously, this will normally mean bass synth parts and kick drums within dance music. While it might be tempting to think that simply boosting the low frequencies of a bass or kick drum sound will make it sound big, this isn't necessarily the case — it will all depend on the type of playback system on which your track is heard. For example, a bass sound with a very high-level 40Hz pure tone might



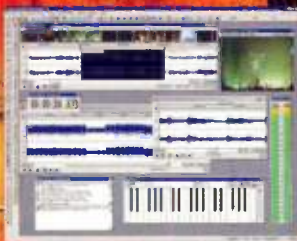
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NEW FEATURES

- 24-bit / 32-bit float / 192 kHz
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▶ threaten to part you from your recently ingested curry when played over a high-power club PA system, but it will be virtually inaudible on most domestic stereo systems, as these roll off quite sharply below 80Hz or so. To make a bass sound seem loud on a system with limited low-frequency response, it will need to contain harmonics above the fundamental frequency that can be reproduced more effectively. It is for this reason that many strong dance bass sounds rely on square and sawtooth waves, both of which have considerable frequency content above the fundamental. Similarly, a kick drum will require some higher-frequency element if its attack is to be discernible on a domestic playback system. On the other hand, if you choose a bass sound that is too harmonically rich, it may take up too much space in the mix unless you keep the bass line very sparse, so filtering some of the top end out of a harmonically rich bass sound at the mixing stage can also help.

Creating a more harmonically rich bass sound from a bland one can simply be a case of firmly applying some EQ, but there are also other ways to give a bass sound more high-frequency clout. Perhaps the best of these is to apply some sort of distortion to it — not only does this make the sound richer in harmonics, it also capitalises on the psychoacoustic effect whereby distorted sounds are interpreted as being louder than undistorted sounds at a similar level.

There are plenty of ways in which you can create distortion. Most multi-effects processors provide distortion algorithms, and there are also numerous software plug-ins available. However, no two types of distortion will be the same, so it's worth really hunting around for the types of distortion which suit you. For a start, don't disregard cheap guitar pedals, or even the more expensive physical modelling preamps that are there on the market. And why restrict yourself to something that's *meant* to distort? A little too much level fed into a recorder, preamp or converter can create unique distortion sounds which might be ideal. Sampling your bass sound at a reduced bit-depth might even do the trick, increasing the level of quantisation distortion, though the resultant grunge won't be nearly as musical as analogue distortion — not that that has ever stopped anyone!

If you're interested in pursuing the subject of controlled distortion further, it's worth realising that distortion can also be applied in a frequency-selective manner by certain processors and plug-ins. One example of such an algorithm is Steinberg's *Quadrafuzz* plug-in. As its name suggests, this virtual gadget splits the audio spectrum into four separate frequency bands and treats each separately before recombining the results. The outcome is a far less messy distortion than you'd expect from a regular fuzz device, and it also has an additional benefit. Because it increases the average signal level, it can make loops, drum sounds, bass sounds or even complete submixes sound very big and exciting.

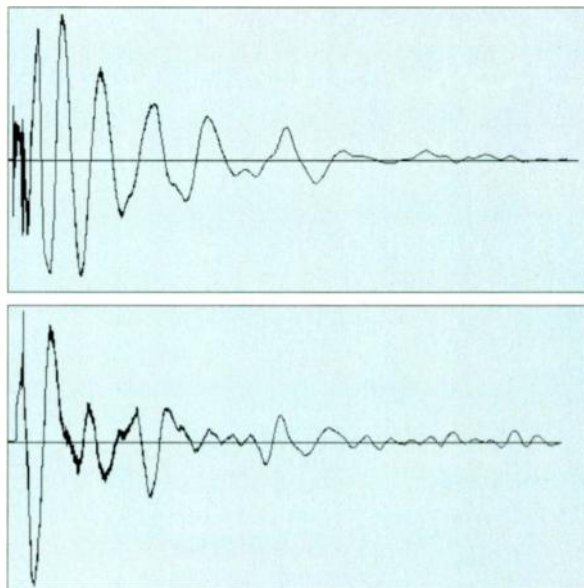
If the distortion you're using is extreme, such as that produced from overloading an A-D converter, the top end can get quite ugly, though this is, admittedly, often useful at an artistic level. By all means wield your high-frequency EQ to sculpt the distortion sound — I find that a variable-frequency 12dB/octave high-frequency shelving filter is usually the most useful here.

Alternatively, a speaker simulator intended for guitar use will usually also be very effective for smoothing things out.

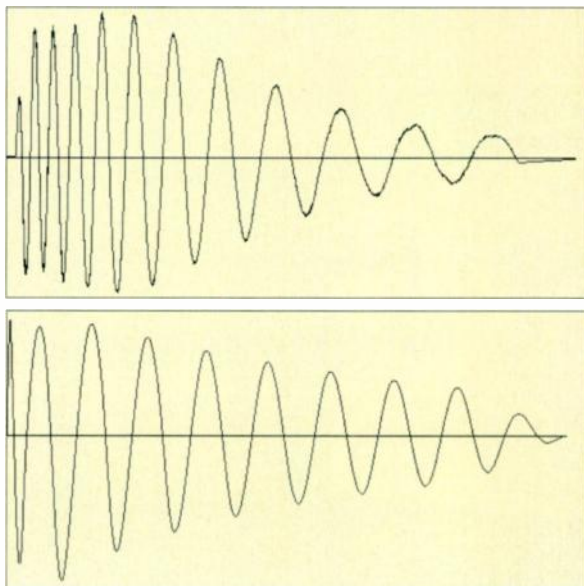
Loud, Strong & Very, Very Long...

In addition to its harmonic content, the subjective loudness of a percussive sound is closely related to its level envelope: how long the sound lasts and how the level decays during that time. In your school physics class you may have learned that energy is simply power multiplied by time. This means that a bass sound with a piano-style envelope is likely to sound subjectively weaker than one that continues at or near full volume for the duration of the note. Changing the envelope of your bass sound, by delving into the envelope menus of your synth or sampler, can therefore help beef up the sound without making the note any longer. This effect can also be achieved within a sampler by moving sample start- and end-points a little further in than might seem natural. In fact, if you edit in the middle of a waveform, the momentary burst of distortion this creates can help the sound become more punchy.

Obviously, in many cases there are no envelope controls available to tweak, and this is where compressors can really help out, once again bringing up low-level detail to create better sustain and therefore a more powerful overall sound. This



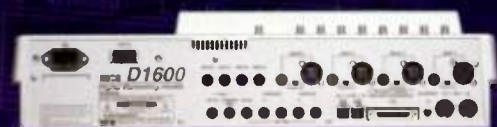
The waveforms of two different real kick-drum sounds are shown above. Notice how their level envelopes decay comparatively quickly.



The level envelopes of the electronic kick-drum waveforms below, by comparison, decay far less rapidly, and this lends them a power which accounts for their popularity in much dance music.

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► is especially applicable with drum sounds, the envelopes of which usually start with a very loud transient before quickly dropping away to silence. If you use a compressor to push down the level of the transient attack, you can then increase the overall level of the sound to make the subsequent decay sound louder relative to the attack. For example, if you were to compress the peak by 10dB, you could bring up the overall level by 10dB without changing the maximum signal level. The result would almost certainly seem louder, as the overall sound would have more energy than before.

Obviously, to make the above technique work effectively, the compressor needs to have a pretty fast release time, in order to allow the gain to bounce back up as soon as the sound's attack transient is over. Though using fast release times can often result in audible gain pumping, the human ear tends to associate this with loudness, so using this effect creatively shouldn't cause problems — as long as you don't overdo it! Some compressors pump more obviously than others, so it's worth experimenting with different ones if you can. However, don't worry if you don't have much choice — most fairly decent compressors should be able to get you close to the sound you're after.

Engineers often seem to swear by particular makes of compressor for bass, particularly when it comes to making things sound larger than life, and there is something to be said for this view. Different gain elements, circuit designs and amplification topologies all have different sonic signatures, some of which are more suitable for bass sounds than others. However, while choosing a 'name' compressor associated with this type of production will often get you better results, spending a lot of money on one will probably make a much smaller difference than you might imagine.

If you're not getting what you're after from a normal compressor, particularly when working with percussive sounds, you might also consider looking at a more specialised dynamics processor, such as SPL's Transient Designer or the envelope compression mode of TC Electronic's Triple•C, both of which are worth a careful look if you're seriously into dance music of any kind. The SPL unit has two control knobs, which allow the levels of the attack and release phases of percussive sounds to be adjusted relative to the overall envelope. The process works independently of level, so there's no threshold to set up, and it works on complete loops as well as on individual hits. The TC Electronic envelope compression is very similar, except that it requires a level

Putting On Layers

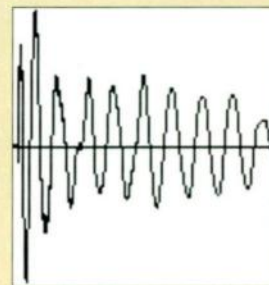
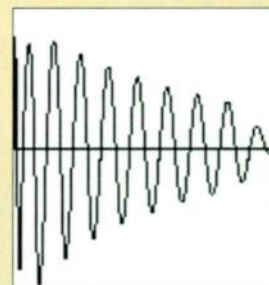
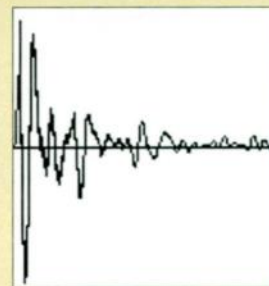
Distortion and dynamics processing are both very powerful tools within dance music styles, but they share one limitation: they both merely respond to the qualities of the raw sound which they are processing. If you find that no amount of processing is proving successful for your mix, it's probably time you reassessed the sound itself. Fortunately, given that most dance musicians run MIDI instruments live, this is not a big problem, because sounds can be layered to produce the desired result, simply by copying the relevant MIDI track and rerouting it.

If your bass sound is lacking something, a good first course of action is to double its part with a synth patch which is very close to being a pure sine wave. While this is playing, experiment with your sequencer's transpose control and with the level of this sine wave part, to see if there are any frequency-response 'holes' which might benefit from being filled in. Don't automatically use such a sine wave as a sub-bass sound, because it can be really useful elsewhere as well, but if you do then make sure also to experiment with the exact timing of the sine wave part for the best results — most sequencers will allow you to do this with a non-destructive delay parameter. If you're just wanting to add sub-bass, you might also consider using one of the sub-harmonic

processes available, such as the Aphex Aural Exciter's Big Bottom function.

Another sound which you might consider layering with you bass parts is a higher-pitched distorted guitar patch — a GM one will often do — but mixed low or reduced to a short duration. In this way you can often beef up the sound without making it seem like it's comprised of two separate layers. Picked guitar sounds can also be useful for increasing the punch of basses, particularly if the guitar sound is quickly muted — in general it is often worth making any high-frequency layer slightly less sustained than the bass sound itself. Why not also experiment with putting such a sound at the end of every bass note, as well as at the beginning? This makes the envelope's release appear more abrupt and can therefore make the sound appear more powerful.

Kick drums can also benefit from a bit of creative layering, particularly if you want to use samples of real drum kits within a dance context. While real drum sounds often have just the character you're after, they rarely have the sheer power that is expected of dance sounds. For this reason, layering more powerful electronic sounds below acoustic ones can provide the best of both worlds. Mixing in the attack phase of, say, a TR808 kick drum sample with your acoustic kick drum can



Acoustic kick drum (top) layered with an electronic kick (middle), compressed to boost its decay, produces the lower waveform.

really help it cut through, for example. On the other hand, if you heavily compress the electronic kick sound before mixing it in, this will boost the decay portion of the combined sound's level envelope, and could therefore make it seem more powerful.

threshold to be set and it allows attack and release times to be specified.

Such devices can also be used to add punch and sustain to bass sounds, especially if individual notes are quite short. In fact, the SPL unit can even be used to create a rather nice subtle distortion on low bass sounds, as it begins to process individual cycles of the sound's waveform, and this can also boost the perceived size of the sound. ►



TC Electronic's Triple•C and SPL's Transient Designer both allow you to alter the attack and decay portions of audio level envelopes, and this can be extremely useful for squeezing the most power out of your dance drum tracks.

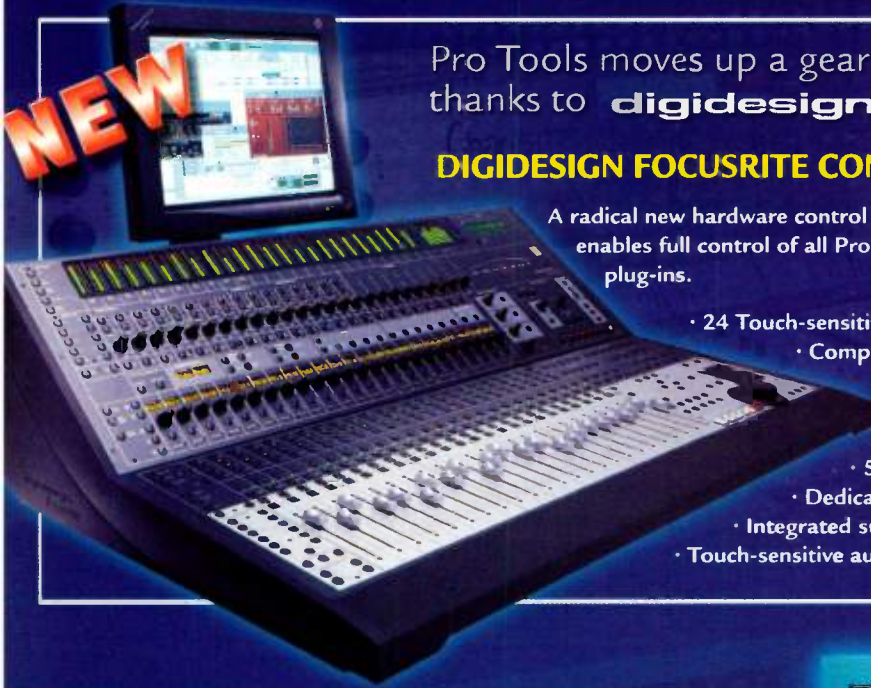
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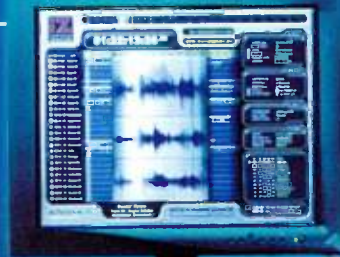
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► Going Large With Effects

Obviously, when adding effects in dance music, anything goes on an artistic level. However, a number of effects also have the potential to increase the apparent size of a track. For example, stereo modulation effects such as chorus, flanging and phasing can help increase the stereo width of sounds, making them appear somehow larger. However, there is also a tendency for such effects to rob a sound of its impact if they are overused. What's more, heavy modulation-effect treatments also introduce pronounced frequency-response notches which are capable of emasculating otherwise beefy bass sounds — if you want to use a modulation effect on your bass sounds, it is therefore a good move to experiment with filtering out the low frequencies from the effect return. Stereo-width treatments, such as those offered by the SPL Stereo Vitalizer series and the Behringer Edison, can also be useful in a similar way for increasing the apparent expanse of sounds.

Static flanging and phasing (effectively just stereo delays with times below a couple of milliseconds) can also be useful for increasing stereo width, particularly if these delays can also be pitch-shifted. Similar stereo width enhancement can also be added using a multitap delay, early reflections, or ambience program, as long as you bear in mind that this might also start to push the sound towards the back of the mix.

Delay lines are extremely popular for making tracks appear more impressive, giving the impression that the sound is filling some cavernous

need to be lowered to remain within the available headroom of the recording medium to which you're mixing down. This can be especially difficult to deal with if the delays are tempo-sync'd, as the delays are often then masked behind the beat — if they are faded up enough to be clearly audible, they can really eat into your available headroom. One way around this problem is to experiment with the more unusual tempo-sync'd delays. If, for example, you use triplet divisions (rather than straight quarters, eighths and sixteenths), this will not only cause the delays to become more audible by avoiding the main beats, it might also make the track more rhythmically interesting — just ask William Orbit...

When working within dance styles, you should be careful with how you use reverb, as using too much of it can really reduce the impact of a track — outside the trance style, at least, where vocals and pads are often treated to cavernous reverbs! If you feel that your mix isn't really knitting together well enough or that the high-frequency elements seem a little dead, then try to solve these problems using delays, early reflections programs and ambience if you can. In fact, you can often shove a whole mix through a good ambience program if it's not working, though this is much less likely to work with a cheapo reverb plug-in.

Processing The Mix Bus

Though the above technique can sometimes work wonders, as a general rule, it's worth avoiding any processing of your complete mix if you can avoid it — such processing is best left until the mastering



venue or massive arena. However, the problem with using delays is that they also appear to distance the track from the listener, which can make individual instruments seem less immediate. This distancing can be made less pronounced, however, if the delays are significantly distinct from the original sound. Band-limiting of the effect return can be particularly useful here, though you could also try feeding the delay line's output to a modulation or reverb effect, to distance the echoes further with relation to the source sound. Naturally, you could also turn down either the delay's feedback level or the fader on the effects return channel — however, heavy delays are characteristic of many dance styles, so this may not be an option for you.

Another potentially problematic side-effect of using delay is that it increases the overall level of the track, and that this overall level will therefore

stage. One notable exception to this is using a full-band compressor on the mix buss to get a particular sound — the subjective balance of a mix can sometimes change quite noticeably, so this is best done during the mixdown, so you hear the effect it produces. However, even in this case, it's best to tread with caution.

Mix buss equalisation in particular is easy to abuse, and enhancement processes (such as those offered in stand-alone units by Aphex, SPL, BBE and Behringer), while often very useful, are easy to get used to and overdo. Just remember that you want to avoid doing anything that will get in the way of the mastering process, especially if you're having your mix mastered commercially.

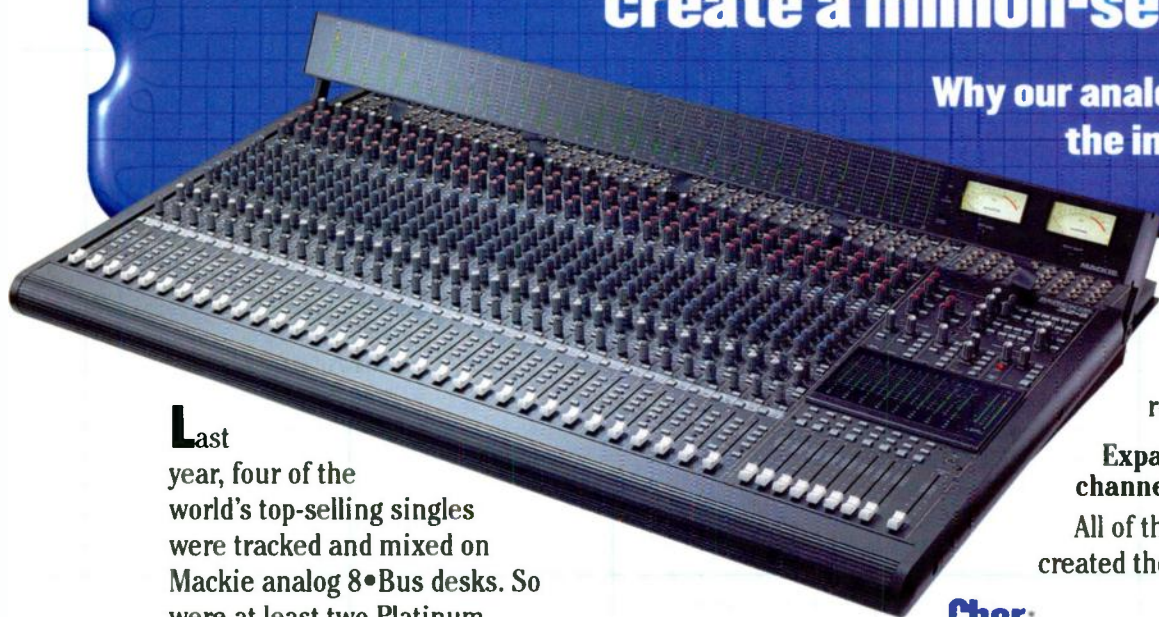
If you prefer to master your own music, then be sure to use the best monitors you can, as well as constantly comparing your mixes with commercial dance tracks in the same style. I would advise

“Most dance tracks should really have their bass sounds panned to the centre of the mix in order to share the load of reproducing the low frequency energy between the two speakers in a stereo system.”

Multi-band compression and limiting, as provided by Drawmer's DC2476 and TC Electronic's Finalizer amongst others, can often increase the apparent size of a track at the mastering stage.

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EQ'ing For Size

A carefully constructed arrangement will usually avoid conflicts between sounds, so there can often be very little left to do at mixdown in terms of equalisation. However, if there are any remaining problems, then it can often be useful to bracket any troublesome sounds with EQ to prevent them trampling on each other.

Even though so many samples and synth sounds seem to sound great straight out of the box, you will still sometimes need to fine tune the tone of individual sounds. Bear in mind while doing this, though, that it's safer to cut than to boost, especially where narrow frequency bands need treating, and too much

boost using a less-than-excellent EQ can make sounds appear unfocused, phasey or disassociated with a mix. While maintaining a natural sound isn't usually a priority with dance music, the last thing you want is to lose impact. If you are not sure which frequency needs treatment, try applying a fair degree of boost and then sweeping the frequency control — once you've found the relevant area, you can return to the cut/boost control and set it to a more suitable position. But above all, whenever you decide to use equalisation, try to do so within the context of your mix, rather than with the sound in question soloed.

keeping tonal changes to a minimum, and when mastering dance music I usually find myself confining these to gentle changes at 80Hz and 15kHz, for balancing the bass end and for adding detail respectively.

Multi-band compression is an excellent tool for increasing the energy of a mix without the side-effects of full-band compression, and it can be particularly useful for applying extra compression to the all-important bass end if you feel you're still short of energy there. When I'm mastering dance music for clients, I'll often use a multi-band compressor to apply very low-ratio compression to all three frequency bands (no more than 1.25:1 usually), but with a threshold of around -30dB. I normally aim for no more than about 6dB of overall gain reduction, and this tightens up the sound considerably without destroying the impression of dynamic range.


Dynamic equalisation can also be useful to add weight to bass sounds without upsetting the rest of the balance. To make this work, I apply a little 80Hz boost (around one octave wide) only when the input signal exceeds the threshold, which I set to trigger only on kick drum beats and bass synth sounds. A boost of two or three decibels is often quite sufficient.

Another process that is worth trying at the mastering stage is valve simulation, which can be used to add even more energy to a mix without making it seem obviously distorted. Not only is this available in some of the digital mastering processors, but there are also numerous plug-ins available offering this. Such processing can be particularly powerful if distortion can be added to individual frequency bands in a similar manner to the way the *Quadrafuzz* plug-in operates — particularly for increasing low-frequency 'bigness'.

Most dance tracks should really have their bass sounds panned to the centre of the mix in order to share the load of reproducing the low frequency energy between the two speakers in a stereo system. However, it can still be worth experimenting at the mastering stage with the stereo spread of different frequency-bands in the mix, if you have the facilities to do this. Not only can the bass be narrowed down for extra power, but the high-end can be widened for a more panoramic and impressive effect.

As a final stage in the mastering signal chain, I generally use a peak limiter to trim off between 3dB and 6dB of peak level, increasing the average mix level accordingly. All that remains then is to listen to your potential master CD on a number of different music systems on which you can imagine your track being played, and at a number of different volumes. For dance music which you want to play in a club, try to persuade someone at your local venue to let you play the track over their PA so that you can hear how it sounds — you could well be very surprised. If you envisage your track appearing both on the radio and in the club, then you might consider doing different versions of your track for these different purposes. You might want masses of sub-bass on a club mix, but this will just be an inaudible waste of headroom on smaller systems. If you filtered out the lowest bass frequencies, you'd be able to increase the perceived volume of the entire track for a radio mix.

Larger Than Life

A lot of the activities involved in music production, and particularly in dance music production, are about creating an illusion. If you've put the above advice into practice, you ought to be well on the way to achieving one element of this subterfuge: the impression of size. 



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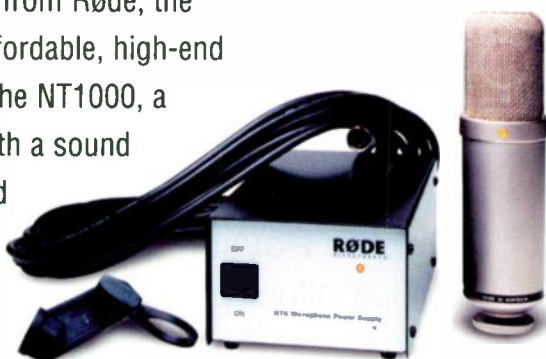
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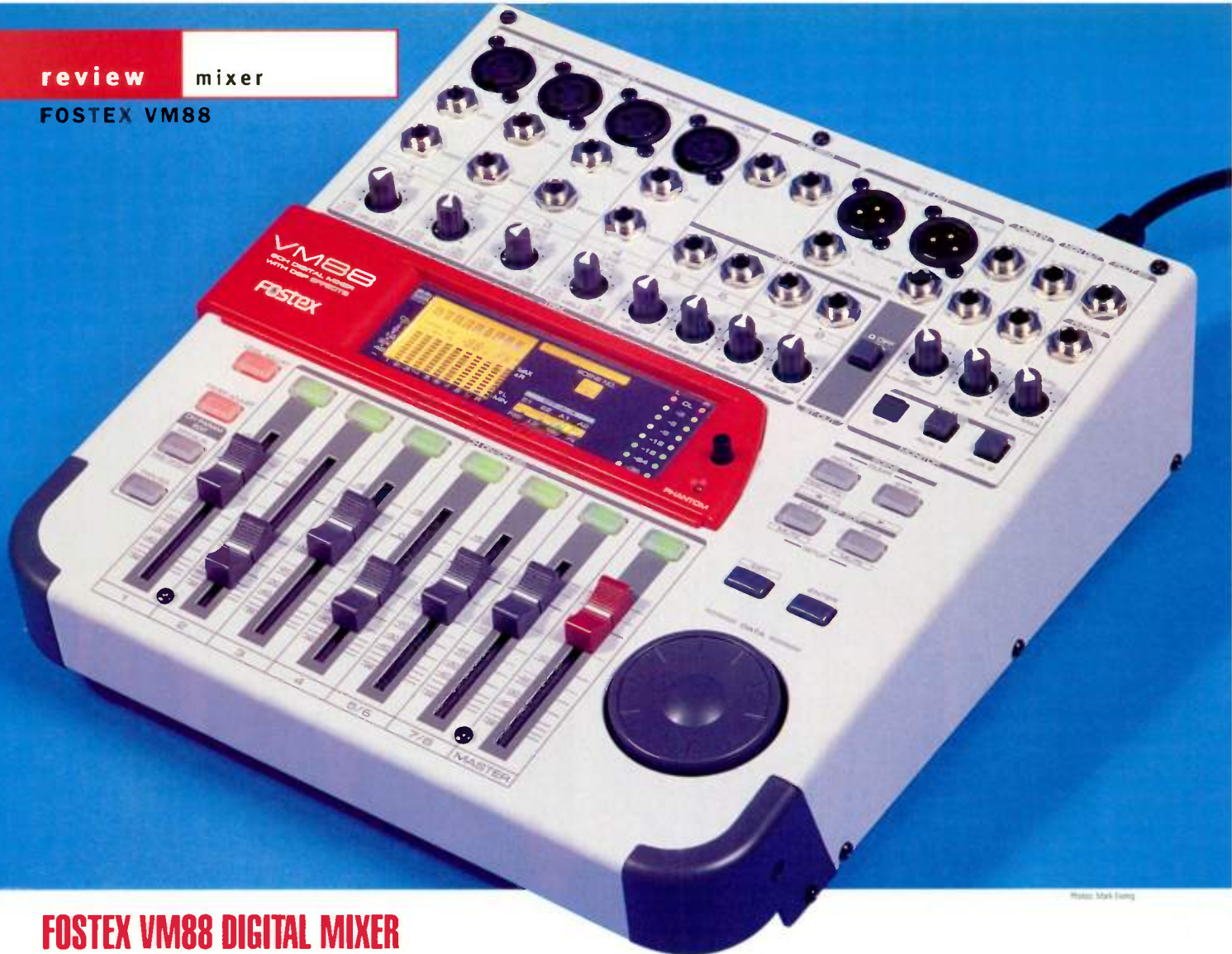


Photo: Mark Young

FOSTEX VM88 DIGITAL MIXER

digit midget

Having built up several years of experience in creating digital recorders, gaining themselves a reputation for solid performance and stability, Fostex have fairly recently turned their attention to digital mixing, releasing their first digital mixer, the VM200, in late 1999 (reviewed *SOS* October 1999) and going on to incorporate a digital mixing section into their VF16 and VF08 hard disk recorders (reviewed *SOS* October 2000 and April 2001 respectively). So far it's probably fair to say that Fostex's digital mixing implementations, though cost-effective and functional, haven't quite lived up to the standards of their recorders. Will their VM88, which we're about to look at, break the mould?

Ins & Outs

Fostex's new baby is an eight-channel, stereo output device offering built-in effects and a basic Scene recall facility, and it has a tiny footprint, little bigger than a closed copy of *Sound On Sound*. Both analogue and digital inputs are available to its eight channels, and they may be used in combination, but only to a maximum of eight at a time. ADAT inputs

are available to the channels in pairs, in groups of four, or all eight simultaneously. Analogue inputs comprise four offering both XLRs (with globally switchable phantom power) and balanced jacks, plus four with balanced jacks only — the former also provide analogue insert points on TRS jack sockets. The latter four inputs are configured as stereo pairs, though there's nothing on the front panel to tell you this — a special mode does allow mono use, but using this effectively disables two of the inputs, making the VM88 a six-channel mixer. The inputs all have a Trim pot, offering a gain range suitable for

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FOSTEX VM88 £549

pros

- Robust metal casing.
- Switchable ADAT or S/PDIF interfacing.
- Four phantom-powered mic inputs with insert points.
- Compact enough for even the most cramped of conditions.
- Suitable for stage and studio applications.

cons

- Input configuration fixed as four mono, two stereo.
- Returning effects uses up precious inputs.
- No dedicated guitar inputs.
- No subgrouping capability.
- No MIDI functionality.

summary

A bit of a jack of all trades that's in danger of being a master of none, the VM88 is nevertheless a cost-effective way of getting various jobs done and has enough strengths to make it worth a look.

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FOSTEX VM88

▶ most mic and line sources, so no doubt people will plug in active guitars, but it would have been nice to see a dedicated high-impedance guitar input.

Digital I/O comes in the shape of an optical connection switchable for the eight-channel ADAT protocol or stereo S/PDIF. It's good to see an ADAT interface, which would indicate that the VM88 can be used for basic multitrack studio recording with a compatible recorder —

certainly while tracking, as each VM88 input has a direct pipeline (bypassing the mixer's channel facilities) to its equivalently numbered ADAT track. Unfortunately, at mixdown the stereo linking of the last four inputs again comes into play, and means that any audio on ADAT channels five to eight is not independently pannable.

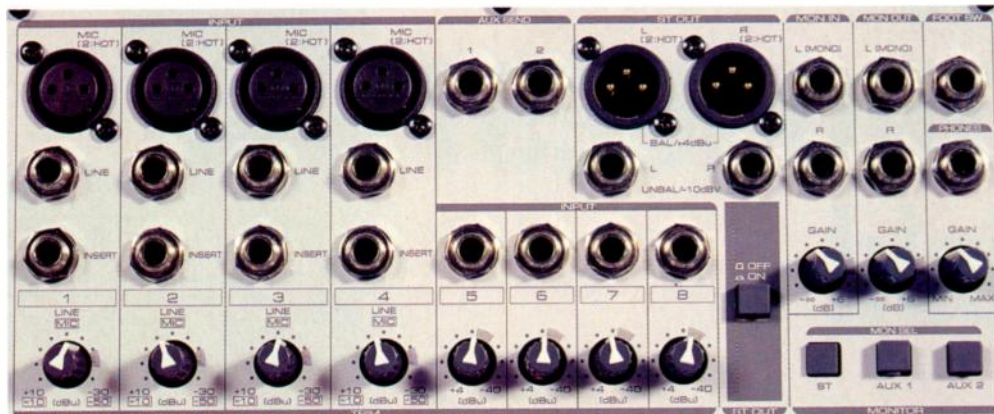
Turning to outputs, we have a pair of XLRs and a pair of unbalanced jacks as choices for sending out an analogue stereo mix, while a digital mix would obviously go out via the S/PDIF port. There's no insert point on the stereo output, though, for patching in external dynamics processing, and the built-in effects lack dynamics. You'd thus have to compress a mix in the analogue domain, connecting the compressor in line between VM88 and the mastering recorder (unless your compressor has digital I/O, that is, in which case the whole chain could be kept digital).

A separate unbalanced stereo Monitor Output is provided, along with a Phones socket. Both monitor and headphone outputs have their own level controls, and the user is offered a choice of what's to be monitored: the main stereo mix, or either of the two aux sends. Fostex have also specified a stereo Monitor Input, with input gain control. This is fed directly to the monitor and headphones output, alongside the main mix: it doesn't mix the audio with the other channels in any way except through the monitor section. In the absence of a dedicated 2-track return facility, this option could be used to audition a mix you've just made, from the analogue outputs of your mastering machine, without having to repatch.

The output complement is concluded by two external Aux Send jacks, which are provided in addition to two sends for the internal effects. No effect returns are provided, though, so returning external effects uses up precious mixer channels — significant when there are only eight to start with!

Controls & Facilities

In by-now-familiar digital style, many of the VM88's channel facilities are accessed via the small backlit display, rather than having physical front-panel controls. There's a real 60mm fader for each of the first four channels, plus one each for 5-6 and 7-8, a master fader, and a mute button above each fader, but all other facilities are virtual. These comprise



pan, three-band EQ, the aforementioned dual sends to the two internal effects processors, and the two external aux send controls. All the sends can be selected for pre- or post-fade operation. The EQ is simple — all bands have fixed frequencies (10kHz, 1kHz and 100Hz), with 18dB cut/boost in each band — but it works fine for basic tone tweaking. It's nice to see that there's the same three-band EQ on the master channel.

Fostex products aren't known for their generous displays, and the VM88's is no departure from this norm. Display contrast in particular is problematic, and you find yourself tweaking the contrast control frequently as you use the VM88 in different lighting conditions and in different seated and standing positions. However, given the display's small size and other limitations, the simple graphic pages for pan, effect sends and EQ are actually quite clever and certainly clear enough. Channel metering, also provided by the display, is in the form of small mono bargraphs, which are not brilliant, but there is a rather better LED stereo output meter on the far right of the display.

Accessing the various display pages is quite straightforward, with the channel mute buttons also doubling as channel select keys (for choosing a channel to edit), and dedicated front-panel buttons to select edit pages for Pan/EQ, Eff/Aux, and the effect processors. Parameter changes are made with a large, slightly wobbly data dial.

The effect editing pages are text-based rather than graphic, but are very easy to use — pretty much inevitable, given that there is a maximum of four editable parameters per effect. There are two processors provided, one a dedicated reverb processor offering 28 algorithms (including a few reverb-delay combinations) and the other offering the same reverbs as the first, plus 10 delay, modulation and pitch-shift algorithms. To take the reverbs as an example, you can edit reverb time (0.1-9.9S), pre-delay (0-100mS), high-frequency damping, and early reflection level. It's nice to see that the second processor offers a tempo-sync'able delay, but since the VM88 doesn't have MIDI you need to either input the desired tempo manually or use a footswitch to tap it in. Effects quality is pretty reasonable, especially with the chorus, flange and delay programs, but the reverbs have a metallic, ringing edge if you're not careful with them.

All the audio socketry of the VM88, with the exception of the digital I/O, is laid out at the top of the front panel for easy access.

“The VM88 could make itself useful providing extra analogue inputs to an ADAT-equipped digital mixer or soundcard.”

VM88 Spec In Brief

- Four balanced mic/line inputs (on XLRs and quarter-inch TRS jacks) with insert points; two stereo balanced line inputs on quarter-inch TRS jacks.
- Balanced stereo analogue output on XLRs and quarter-inch TRS jacks.
- Eight-channel ADAT or stereo S/PDIF digital I/O.
- 20 mixer Scene memories.
- Dual effects processors.
- Internal processing and digital output at 44.1kHz sampling frequency, 16-bit resolution.
- 20-bit A-D and 24-bit D-A converters.
- 273 x 95 x 299mm (whd)
- 2.9kg

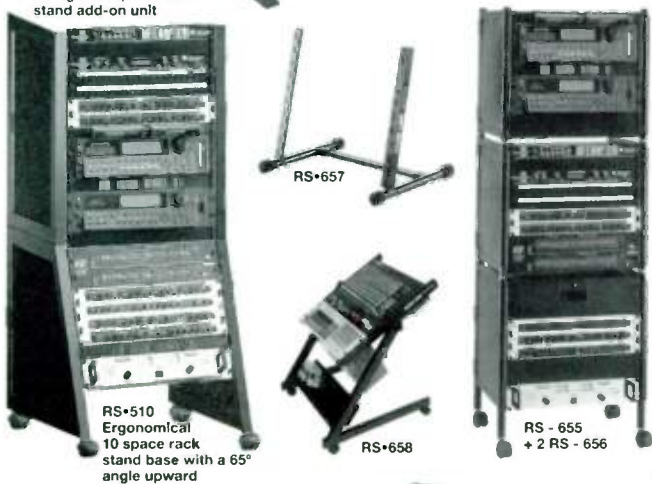
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FOSTEX VM88

Scene That

The VM88 doesn't really offer true automation, even though it will store up to 20 mixer Scenes, each of which captures level, mute, pan, EQ, aux/effect send and effect parameter settings. They have to be selected manually with front-panel controls, or can be stepped through with a connected footswitch. In addition to the user Scenes, there's also a single preset Scene, called Initial Mix, which returns all parameters to their default settings and could be useful as a starting point.

If you're nimble, you can choose and load Scenes on the fly from the front panel, but this is a little awkward, since a Scene has first to be selected with the data wheel and selection then confirmed with a press of the Enter button. Scenes are not chainable in a user-definable order, and since there's no MIDI they're not remotely selectable either. Nevertheless, in the absence of any other form of automation, you could certainly perform a more complex mix with it than you could achieve entirely manually. In live performance too, you could use it to instantaneously make very complex changes of set-up.

In Use

The VM88 has apparently been designed to be put to a number of different uses — if you go by its slim user manual, these include live performance keyboard mixing, small PA mixing, and multitrack recording with an ADAT-compatible recorder. For on-stage use, the mixer can be conveniently clamped to a mic stand, which can be really handy in such a context, though Fostex don't make the clamper assembly themselves, recommending Roland's APC33 as being suitable. Keyboard players might be scratching their heads as to why they'd want to spend over £550 on a digital submixer, the output of which is most likely going to get routed to an analogue front-of-house desk — the only advantages of the digital design would be the effects and the mixer Scenes, but these can't be recalled or archived via MIDI. On the plus side, the VM88's S/PDIF output would allow a live digital recording to be made to DAT or some other digital medium if required, and this would also be a point in the mixer's favour if it were used as a small PA mixer, though you'd have to be sure that you wouldn't need more than four mic inputs. The internal effects processors would be welcomed by any live band on a budget, but of course many dedicated analogue PA consoles, including some powered models, also offer on-board effects. And, as for Fostex's exhortation to "hook your boards and decks up to the new VM88" in at least one of their PDF brochures, the lack of a proper turntable input might restrict this use a little!

The VM88's ADAT interfacing could make it attractive for those engineers doing location recording using an ADAT-compatible recorder, but again the complement of XLR mic inputs might be an issue if more than four condenser mics were required on a job, as extra mic preamps would then be needed. Also bear in mind that the way the VM routes incoming audio to its ADAT output means

that the mixer channel's facilities are bypassed — even though one probably wouldn't want to use channel facilities such as EQ during tracking, the VM88 doesn't even give you the option.

In the studio, the VM88 could be used for digital multitrack recording, but a lack of subgrouping during tracking, no way to bounce audio, and the fact that there's no independent panning of channels 5-8 all get in the way fairly rapidly. In fact, in all applications it's a bit of a disappointment that a mixer that purports to be eight-channel collapses so easily into a six-channel device (if you need independent mono inputs) or even a four-channel one (if you want to return two stereo effects processors). In its favour, the VM88's compact size means that it could be accommodated in the most cramped conditions, and the nice illuminating buttons would be helpful on stage in particular.

Although it's not that aesthetically pleasing to have all the connectors mounted on the top panel, as they are on the VM88, this certainly is the most convenient and useful location for them, and ergonomically the mixer as a whole is well conceived. Neither is the VM88 expensive for a digital mixer with dual built-in effects processors, and it's fairly easy to use. It could also make itself useful providing extra analogue inputs to an ADAT-equipped digital mixer or soundcard — it worked successfully in this way with our Digidesign Digi 001 system.

Verdict

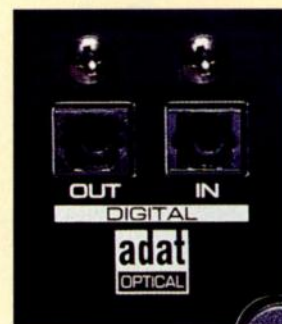
Fostex seem to have intended the VM88 to be a useful digital problem-solver that could be pressed into service in a number of situations. You might take a look at its features and find specific personal applications springing to mind immediately, and if so they've obviously succeeded. Those with simple requirements in the studio or on stage (or both) may see the VM88 as being just what they've been looking for. It's ruggedly built, compact and physically attractive, it sounds just fine, and it offers ADAT interfacing.

There are not many low-cost digital mixers on the market, but anyone who needs more inputs than the VM88 offers could consider the Roland VM3100, which goes for about the same price in the UK at the moment, but has 12 analogue inputs, four of which are presented as two stereo pairs. It lacks multi-channel digital interfacing, but does have dual S/PDIF I/O, and its single effects processor benefits from Roland's effects expertise. The VM3100 offers its own set of compromises, though (such as having no insert points), as seems to be the norm at this end of the digital market!

The fact that the VM88 can be used in various situations means that it's difficult to pin down a single target user group for the unit. We can't help thinking that the lack of a strong vision as to where and how the VM88 will be used means that although it could work in various applications, it won't be perfectly suited to any of them. However, it will be up to the individual consumer to decide whether they see this as the mixer's main weakness, or as something which widens its appeal. **SOS**

Digital Considerations

The VM88's digital input accepts digital audio at 44.1kHz or 48kHz; internally, audio is handled at 44.1kHz, so incoming audio needs to be converted to that rate. With ADAT audio, the incoming rate is selected manually, but the mixer converts incoming 48kHz S/PDIF audio automatically whenever that rate is detected. Audio at 44.1kHz passes straight into the mixer with no conversion. Digital output signals from the VM88 are strictly 16-bit, 44.1kHz.



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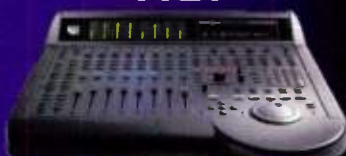
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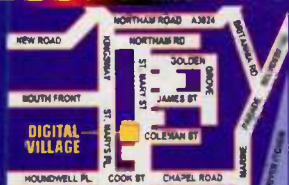
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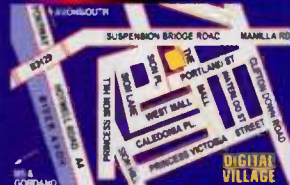
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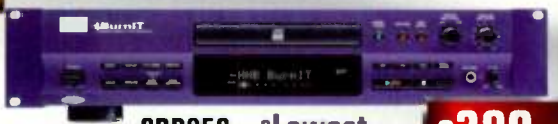


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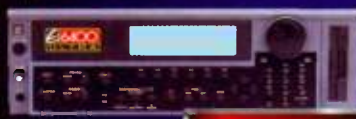
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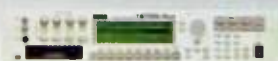
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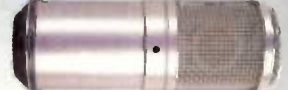
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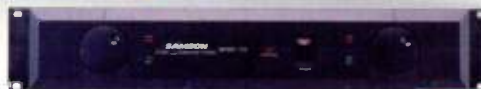
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ECHO MIA PC SOUND CARD

Martin Walker tests an inexpensive, high-quality soundcard which uses virtual outputs to allow multiple PC applications to share its hardware outputs.

Since the introduction of their original 20-bit range of soundcards way back in 1997, Echo have not let the grass grow under their feet. With the arrival of affordable high-quality 24-bit converters they revamped the original Darla, Gina, and Layla range with all-new 24-bit versions, the Darla24, Gina24, and Layla24. In addition, they looked at what musicians were doing with their computers, and spotted a gap for an all-in-one soundcard solution with a front end suitable for recording mics and guitars. Like the rest of the new range, the Mona (reviewed in *SOS* October 2000) looked slick, sounded good, and provided plenty of hardware inputs and outputs.

However, not all musicians need loads of inputs and outputs. In 1997 software plug-in effects were in their infancy, so having eight or more hardware outputs was an ideal way to send individual audio tracks to an external hardware mixer to add EQ and rackmount effects. Even then, though, multiple inputs were required only by those who wanted to record a drum kit or a live band, since layered recordings could be made a track at a time.

Nowadays many musicians create entire songs inside their computers using software synths and plug-in effects alongside their audio tracks. This creates a completely different set of problems, which largely stem from running several music applications simultaneously. One solution is to use a multi-output soundcard, and (drivers permitting) to allocate a separate stereo hardware output to each application. These can then be mixed together using an external hardware mixer.

However, this isn't the only way to do it. With suitable DSP, manufacturers can provide a mixer on the soundcard itself, and then offer several 'virtual' outputs that appear to Windows just like

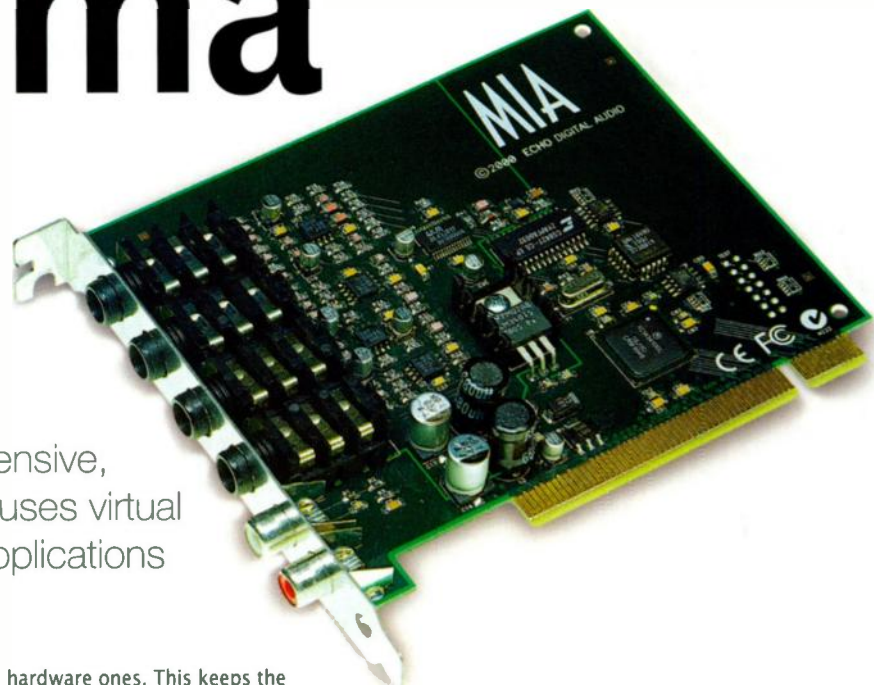
hardware ones. This keeps the cost of the soundcard down, since you only need one set of D-A converters, and has the added benefit that your signals don't have to re-enter the world of analogue before being mixed together. Virtual outputs aren't new (Yamaha's SW1000XG and Terratec's EWS64 series both offer them, for instance), but Echo's latest Mia soundcard provides eight of them along with various other novel features for the very reasonable UK price of £220.

Overview

The Echo Mia provides a single stereo analogue input and output, but with two valuable extras. Not only does its backplate house four full-sized quarter-inch jack sockets (which generally prove far more reliable than 3.5mm jacks or phonos) but both the inputs and outputs are also balanced, which can help a great deal in keeping background noise and hum levels down when connected to other balanced gear. Moreover, as far as software is concerned there are eight virtual outputs arranged as four stereo pairs, which are mixed down using a DSP mixer on the card. Also on the backplate is a pair of phono sockets providing an S/PDIF digital input and output at up to 24-bit resolution. These can also be used to synchronise the Mia to other gear.

It almost goes without saying nowadays that all inputs and outputs are 24-bit/96kHz capable, and the Mia uses the same AK4528 converter chips as found on M Audio's Audiophile 2496, reviewed last month. This is an improved version of AKM's 4524 Codec chip, already used on many other soundcards.

Along with a selection of software demos from the likes of Cakewalk, Native Instruments, Sonic



ECHO MIA £220

pros

- Eight virtual analogue outputs with full multi-client capability.
- Balanced/unbalanced analogue I/O using quarter-inch jack sockets.
- Very good sound quality and low background noise.

cons

- Mac and Windows 2000 drivers not yet available.

summary

With eight virtual outputs that can be freely allocated to different applications, balanced analogue I/O and 24/96 converters, Echo's Mia is an absolute bargain at £220, and should prove ideal for any musician who runs lots of soft synths.

SOUND ON SOUND

“Virtual outputs aren't new... but Echo's latest Mia soundcard provides eight of them along with various other novel features for the very reasonable UK price of £220.”

Foundry, Steinberg and Waves, the Echo Mia (like all of their products) ships with a special version of Syntrillium's *Cool Edit Pro* as well as its driver and utility software. Echo use only two different drivers to support their entire range of soundcards: one for the older Darla, Gina, Layla, and Darla24 range, and the other for the Mona, Gina24, Layla24, and Mia, which they generally refer to as the Echo24 family.

I downloaded the latest Windows 95/98/ME version 5.57 drivers for the Mia direct from the Echo web site. The file size is just 515K, including the Echo console utility. Drivers for Windows NT/2000/WDM along with Mac and even BeOS versions are expected in 'early 2001', but none of these were available in late February when I finished writing my review. As always, you should buy based on what is available now, but of course I'll let you know in PC Notes when these are released.

The Mia is only five inches long and should cause few installation problems, as long as you take a few precautions. Anyone like me with an older 20-bit Echo product such as the Gina already in their PC will need to make sure that this is running at least version 5.04 drivers, since earlier ones will mess up the Mia's install process. I'd already done this, so the Mia went in first time in my PC, was correctly detected by Plug and Play, and the drivers installed themselves alongside

those of my Gina card with no conflicts.

Once back on the desktop, Echo's console utility automatically detects which soundcard in the family is installed, and the 'M' for Mia icon appears (optionally) on the Taskbar. Inside music applications you'll find two new recording options — Mia 1/2 Analog Record and Mia S/PDIF Record — and four stereo playback options: Mia 1/2 Virtual Out, Mia 3/4 Virtual Out, Mia 5/6 Virtual Out, and Mia 7/8 Virtual Out. A key design feature is that these outputs can be multi-client, allowing you to allocate them to different applications simultaneously. Various combinations of MME, ASIO, DirectSound and Nemesys GSIF drivers can be assigned to each virtual output for different applications, the only major restriction being that DirectSound and GSIF are not supported at the same time.

Echo Console

Echo's console utility is described as a 'virtual control surface', and is used to control the audio I/O and clock functions. When used with the Mia it's divided into 11 areas: two rows of five panels one above the other, and a lower strip containing clock and switching functions. At top left is the Analog In section, featuring a pair of peak-reading meters and individual buttons to toggle each input between +4dBu professional and -10dBV consumer sensitivities. To the right of this is the Digital In section, which simply has a pair of level meters.

Immediately beneath these two panels is the Monitor Section. Each input channel pair has a corresponding panel here where you can set up 'zero'-latency input monitoring. Each input has its level fader calibrated from +6dB gain at the top to -100dB at the bottom, with a default position of 0dB, and a text readout box displays the current position. I'd prefer to see some calibration markings on the meters, but at least the moving bars themselves have green, yellow, and red sections to show when levels are approaching clip

Echo Mia: Brief Specifications

- Analogue connectors: stereo quarter-inch jack sockets.
- Analogue inputs: two, balanced/unbalanced, nominal level +4dBu, maximum level +18dBu.
- Analogue outputs: two, balanced/unbalanced, nominal level +4dBu, maximum level +18dBu.
- A-D converters: 24-bit, 64x oversampling (part of AK4528 Codec chip).
- D-A converters: 24-bit, 128x oversampling (part of AK4528 Codec chip).
- Dynamic range: 106dB A-weighted.
- Distortion + noise: <0.001 percent (inputs), <0.002 percent (outputs), 20Hz to 22kHz.
- Frequency response: 10Hz to 22kHz, ±0.5dB.
- Supported bit depths: 8, 16, 20, and 24.

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ECHO MIA

▶ point. Above the faders are mute and solo buttons and beneath them are pan controls (a useful addition not found in the 20-bit console), while a gang button sited between the two pan controls lets you lock the fader positions together when dealing with stereo signals.

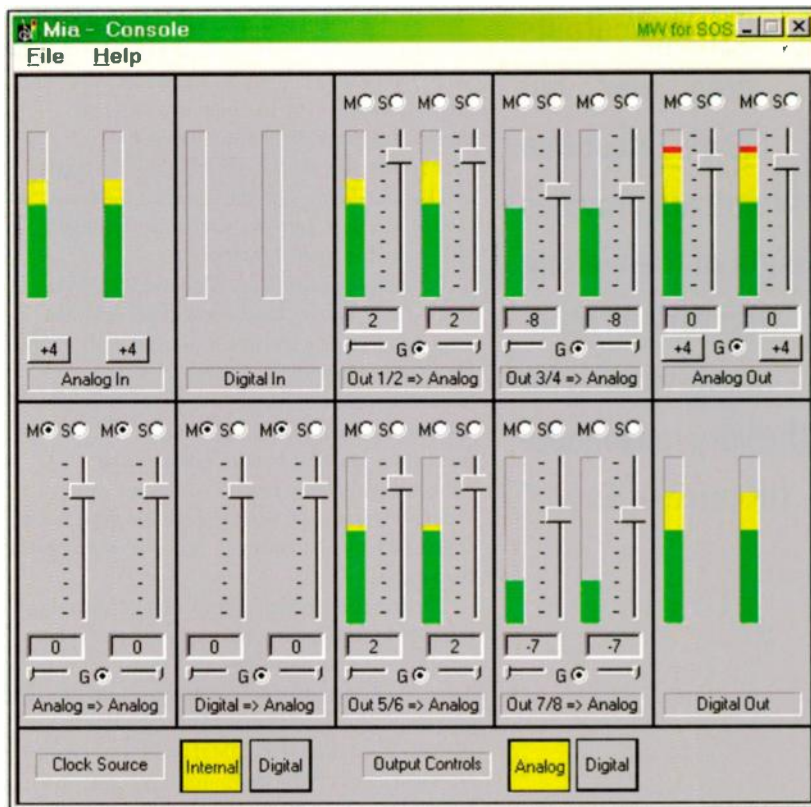
Next along are the controls for the Virtual Outs. Each has a level fader, pan control, mute, solo, and gang buttons, and alongside each fader is a peak-reading meter. The two hardware outputs have panels at the far right of the console: the Analog Out on the top row has controls similar to those of the virtual output panels, but with the pan controls replaced by buttons to toggle between +4dBu and -10dBV output levels, while the Digital Out on the bottom row simply has a pair of peak-reading meters.

There are two pairs of buttons on the bottom strip. Clock Source can be set to Internal when using the on-board Mia clock signal, or Digital, but only if a suitable clock is detected at the digital input. The drivers support multiple Mia cards, so you can use the S/PDIF digital output of the first to daisy-chain additional cards using their S/PDIF inputs, and keep them locked together to sample accuracy.

The second pair of buttons switches between the Analog and Digital output controls. Using these buttons, you suddenly discover that you have a second set of mixer panels for the Monitor Section and Virtual Outs, this time feeding the digital output. When you switch from Analog to Digital, labels at the bottom of each panel section change to show the new destinations. This makes the mixer utility very versatile (if a little confusing at first), since you can set up two completely different mixes — one emerging from the analogue outs and a totally different one from the digital outs. You could, for instance, create a main mix and headphone monitor mix, or perhaps send your audio tracks to one output, and your soft synths to the other.

There is also a Preferences page, accessed from the console's File menu. Here you can change the S/PDIF output format between Professional and Consumer, and choose whether or not to dither the digital input (this should only be enabled when recording 24-bit signals as 16-bit wave files). You can also disable Sync Wave Devices, to make inputs and outputs totally independent, and optionally lock the sample rate to any setting between 11kHz and 96kHz. This could be most useful in multi-client mode (more on this in a moment), to ensure that every output stays at the same rate.

There are also two pages of driver settings to consider inside Device Manager. The Settings page lets you decide whether or not to display the console on the Taskbar, and whether or not the input monitor signals are muted until record is enabled. Some musicians might be disappointed that ASIO 2.0 Direct Monitoring isn't currently available as an option inside applications like *Cubase VST*, but the 'zero'-latency monitoring of



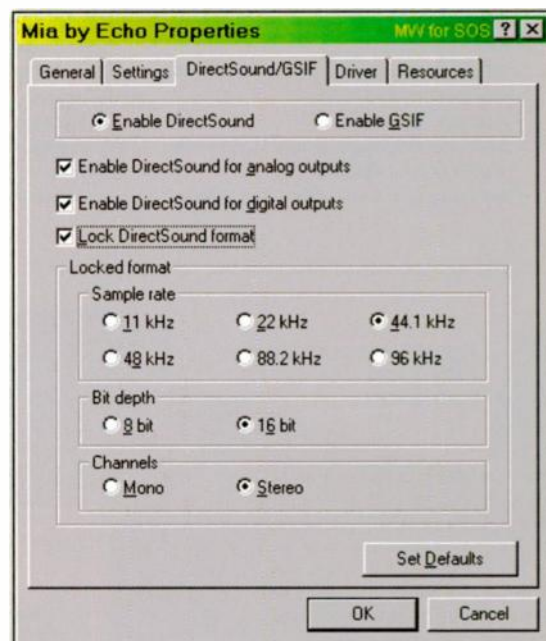
the *Console* should prove perfectly adequate in most situations. An 'SAW compatibility mode' lets earlier versions of this software be used with the Mia, while 'Multi-Client audio' lets you use allocate different virtual outputs to different software applications simultaneously.

The DirectSound/GSIF page lets you switch between these two driver types (only one can be active at a time), and if DirectSound is active you can selectively enable/disable DirectSound for both the analogue and digital outputs. If at least one of these is active then a further set of buttons lets you lock the format to a specific sample rate and bit depth.

Audio Quality

I was particularly interested in comparing the sound quality of the Mia to that of my existing Echo 20-bit Gina card, and I wasn't disappointed. Like most other soundcard manufacturers, Echo have switched from Crystal to the latest generation of AKM converters, and in this case have leapfrogged most of the competition at the entry-level end of the market by fitting the latest ▶

The Echo console utility provides the equivalent of a 24-channel mixer with 'zero'-latency monitoring: 12 channels can be routed to each of the Analog and Digital outputs.



The Mia's drivers provide either GSIF or DirectSound support alongside ASIO and MME, and will allow up to four software applications to be run simultaneously with any combination of ASIO, GSIF/DirectSound, or MME.

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ECHO MIA

► AK4528 chips. As expected, these provide the by-now-familiar improvements of a noticeably more open and natural sound with significantly sharper stereo imaging and sweeter top end, along with a marginally crisper bass. D-A converter noise is also much lower than on the Gina, and more in line with other recent designs.

On the recording side, I made my usual *Wavelab* RMS background noise measurements with the input switched to the lower +4dBu sensitivity. At this setting the A-D converters measured a typical -93dB for 16-bit/44.1kHz, while at 24-bit/44.1kHz this dropped to an excellent -103dB, and was only a fraction of a dB away from this at 24-bit/96kHz. The 24-bit figures are the best I've measured to date with low-cost AKM converters, beating seven other cards by at least 3dB. This is great if you feed the Mia from balanced outputs on your mixer, but you will probably need to use the Mia's more sensitive -10dBV setting to make up for the usual 6dB loss when feeding it from unbalanced gear.

Driver Performance

Anyone buying a standard multi-output card will do so either to provide several outputs in a multitrack audio application, or perhaps to allocate them individually to several software applications simultaneously. The virtual outputs of products like Yamaha's SW1000XG and Terratec's EWS64 series can be used either to add their DSP effects separately to each virtual output, or once again to give simultaneously running applications an output each. However, since the Mia provides no DSP effects, the sole use for its virtual outputs is with simultaneous applications, so it's vital that the drivers are capable of full multi-client support.

Gigasampler users will have to forego DirectSound support, so I started by trying out the performance of the MME drivers, since these are the ones that soft synths will have to use when running alongside any Nemesys products. I got excellent results on my Pentium II 450MHz PC, with 5mS latency using *Vaz Modular*, and the lowest available 10mS setting inside *Reaktor*.

Once I ticked the Mia's 'Multi-Client audio' box I had no problems at all launching several applications simultaneously, each one allocated to a different Mia virtual output pair, and eventually managed to run *Cubase VST 5.0*, *GigaStudio 160*, *Reaktor 2.3*, and *Vaz Modular 2.1* all at the same time! You may find that you have to raise some latency values a little to stay free of glitches with this number of applications running (I had to increase the *Vaz Modular* settings to 15mS), but even so this is a wonderful result!

The DirectSound drivers also worked well, but I got no latency benefits over MME with the soft synths I was using. Having to reboot to switch between DirectSound and GSIF support is annoying, but since Echo's MME drivers seem to work so well with most soft samplers this isn't too much of a disadvantage. Where you will find DirectSound more useful is with MIDI + Audio

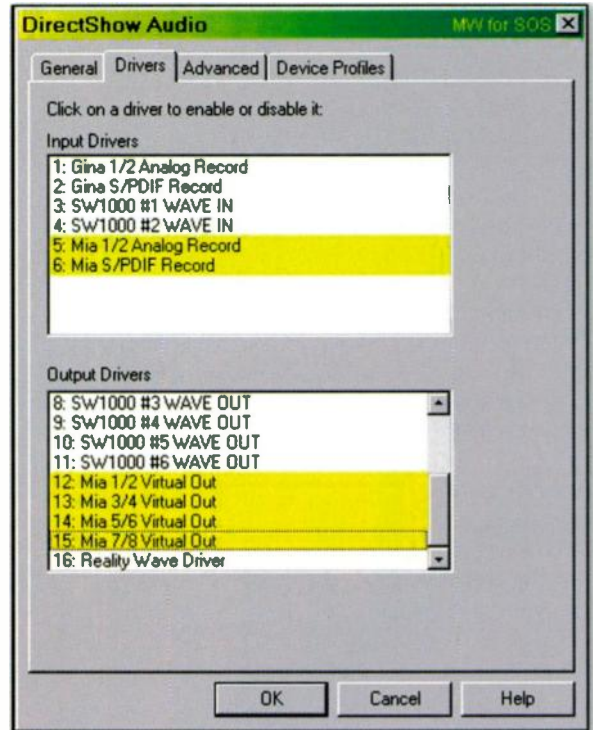
sequencers that don't support ASIO drivers, since for playback you should be able to achieve considerably lower latency.

Talking of which, I managed to run *Cubase VST 5.0* with 256-sample buffers, giving me a very respectable latency of just 7mS, and I suspect faster Pentium III-based machines would manage the lowest 128-sample setting for 4mS latency. Even better is the fact that you can mix and match driver types in any way you wish, so for instance I used virtual Out 1/2 with *Cubase* and ASIO drivers, Out 3/4 with *Gigasampler* and GSIF drivers, and Out 5/6 and Out 7/8 with other applications while using the MME drivers. The S/PDIF I/O also worked perfectly, allowing bit-for-bit copies as long as the Dither Input option is left unticked.

Final Thoughts

There are already several soundcards with 24/96 converters, stereo analogue in and out, and stereo digital I/O available at under £200 in the UK. M Audio's Audiophile 2496 provides co-axial S/PDIF digital I/O and a single MIDI In and Out for just £179, while Terratec's EWX 24/96 at £149 has a choice of optical or co-axial digital I/O (the latter requires a DIY cable), and once again has a MIDI In and Out. Both cards were reviewed in *SOS* April 2001. Marian's Marc 2 (I reviewed the Marc 4 MIDI in *SOS* March 2001) is slightly more expensive at £189, but has both optical and co-axial digital I/O, as well as quarter-inch jack sockets for analogue I/O instead of phonos, and has no MIDI support.

At £220, the Mia is slightly more expensive than these other 'professional entry-level' cards, but has tricks up its sleeve that more than make up for the extra outlay. Its balanced analogue I/O is almost unique at this price, and will help to keep background noise and hum to a minimum for those with compatible gear in their studio. Its audio quality is also extremely good, with lower background noise than any of the immediate competition, but it's the virtual outputs and multi-client driver support that should make it sell and sell. For those who want to run several applications simultaneously, but don't need separate outputs for them, this is the bee's knees, and I've decided to buy the review model. Highly recommended. **SOS**



Well, here they are. The Mia's eight virtual outputs are not unusual in themselves, but with 24/96 capability are previously unheard of in a product at this price.

System Requirements

I'm pleased to see that Echo, along with a few other soundcard manufacturers, are finally making it clear what computer hardware is proven to be compatible with their products. The Mia requires an Intel Pentium II/III or AMD Athlon/Duron system running Windows 98/ME/NT/2000, along with a motherboard housing an Intel or VIA KX133, VIA KT133, or AMD 760 chipset. Provided you also have at least 64Mb of RAM and a fast EIDE or SCSI hard drive, your machine should be compatible.

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packing a punch

**DRAWMER DS501
POWERGATE PROCESSOR**



The Drawmer DS201, the first commercial two-channel gate to feature built-in side-chain filtering, is still an industry standard, so Drawmer have wisely decided to leave this successful design alone. However, they have now made available an enhanced alternative, in the shape of the new DS501 Powergate. This has all the features of a regular DS201, but with the controls nudged up slightly to make room for two more knobs in each channel. These control a new creative feature which started life in the Drawmer MX range — Peak Punch.

The original idea of Peak Punch was to enhance drum sounds by creating a momentary boost in energy as the gate opened. For example, a kick drum exceeding the threshold level would open the gate and, at the same time, have a few dBs of level added over the first few milliseconds to give it more impact. However, in the DS501 this idea has been taken further. While the whole signal can be boosted by a user-adjustable amount (via the Level control) if desired, a second mode also allows this added energy to be passed through a broad tuneable band-pass filter. Above the two extra knobs is a three-way toggle switch which selects between these two modes and a bypass of the Peak Punch facility. The filter's centre frequency is continuously variable from 75Hz to 16kHz using the Tune knob.

All audio connections on the DS501 are via balanced XLRs, though these can be used unbalanced as long as pin three is shorted to ground. The external side-chain Key Inputs are provided on standard quarter-inch jacks.

Rolling With The Punch

The basic gate functions exactly like the DS201, with the same traffic-light metering and variable Hold and Range controls in addition to the more

Paul White evaluates the DS501, which adds a new Peak Punch feature to Drawmer's classic side-chain filter gate design.

obvious Threshold, Attack and Decay knobs. It is fast, it triggers very positively and, best of all, it does what you expect it to do. I've always felt that Drawmer products were reassuringly predictable in operation, and this one is no exception, even when you move into the new Peak Punch section.

The effect of the filter is best appreciated if the Level is turned full up during adjustment, as this applies up to 18dB of gain to the leading edge of the drum sound, allowing the effect of filter tuning to be heard very clearly. Near the low end of the range, the effect is almost like mixing in a big analogue kick drum with the natural drum sound, whereas the filter can exaggerate the click and definition of the drum when tuned high. In the middle of its tuning range, the filter makes the drum sound more boxy or nasal, but in the right circumstances even this effect could still be useful.

Clearly, with the potential to add so much level to the beginnings of your drum sounds, headroom is a consideration, so if you're feeding into a digital recording system then you'll need to keep an eye on those peak levels — in extreme cases, a peak limiter might be useful. Having said that, using the full amount of boost nearly always sounds excessive, so practical settings are likely to produce more manageable results.

Used gently, a low filtered Peak Punch added weight to thin kick drums and depth to toms, while using higher levels of boost threatened to turn that classic Ludwig 20-inch kick drum into a TR909 soundalike. Using high-frequency enhancement, limp snare drums could be made to sound crisper,

DRAWMER DS501 £469

pros

- Easy to set up.
- Positive and predictable in use.
- Includes all the DS201's functions, to which the new Peak Punch features are added at only a modest extra cost.

cons

- Because it is linked to a gating action, Peak Punch can only be effective on single drum sounds, not on whole drum mixes.

summary

The addition of Peak Punch to the tried and tested DS201 is a genuinely useful enhancement both for creative and corrective drum processing.

SOUND ON SOUND

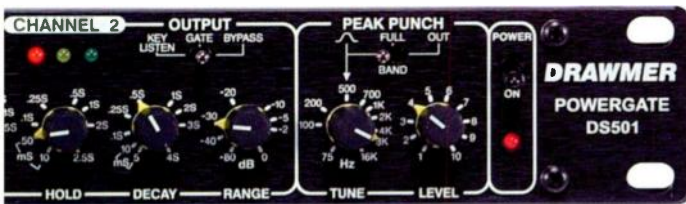
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with enhanced stick impact, and kick drums took on extra snap. In the full-range mode, the enhancement is understandably far less coloured, changing the impression of attack, but not the basic sound.

It is important to note, however, that the Peak Punch only occurs during the first 10ms after the gate triggers (5ms during which the gain is boosted followed by a 5ms decay period), and will hence only work if the gate is set to have a fast attack time. It's also worth remembering that Peak Punch isn't only limited to drums — it can do some interesting things to fast-attack bass synths and other percussive music sounds, but some experimentation is needed to get the best results in these areas.

It seems likely that people will draw comparison between the DS501 and the SPL Transient Designer, but although they



“Using higher levels of boost threatened to turn that classic Ludwig 20-inch kick drum into a TR909 soundalike.”

can both be used to manipulate drum sounds, they are very different pieces of equipment. The SPL unit deals specifically with modifying the attack and decay characteristics of drums whereas the DS501 is essentially a fully-featured DS201 noise gate with the added feature that it can enhance drum-sound attacks in a musically useful way if required. Also, it must be noted that the DS501 only enhances sounds as the gate triggers, so it's only really useful for processing single sounds — the SPL unit is as useful on complete submixes as it is on individual drums.

Defending Champion

Given that the DS501 costs only about 15 percent more than a new DS201 in the UK, I'd say that having the Peak Punch feature is definitely worth the extra. Not only does it allow slightly weak drum sounds to be salvaged, but it can also be used quite creatively to more radically reshape drum sounds where needed. The DS501 may not be revolutionary, but it's certainly a welcome evolution for this studio standard. **SOS**



The DS501 includes all the I/O of the DS201, including the Key Input which helped the DS201 attain its status as a studio standard.

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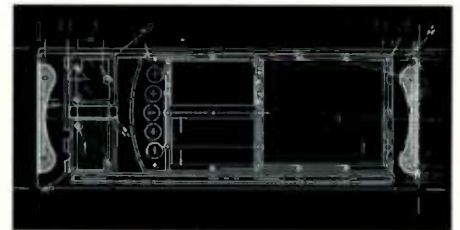
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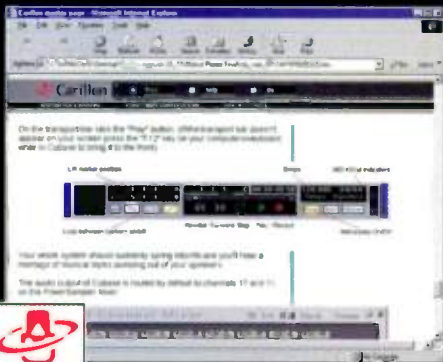
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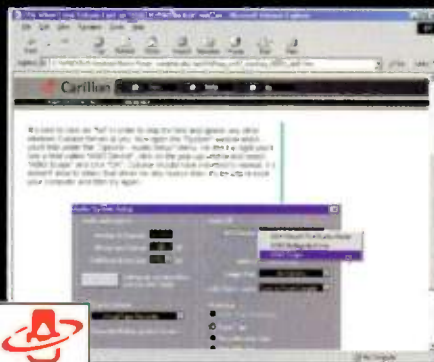
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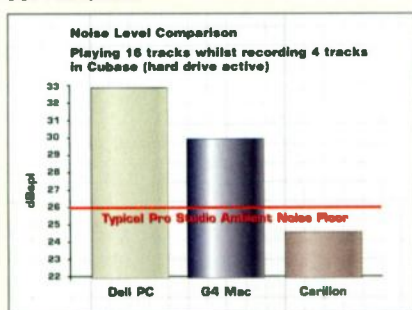
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YAMAHA AN200

► modulator, effects block and a dedicated analogue-style 16-step sequencer track. These synth voices stretch to a respectable maximum polyphony of five notes. The AN200 also offers three sample-based Rhythm voices, each with their own 16-step sequencer tracks. Each Rhythm track has access to 120 onboard instrument samples and these range from acoustic and electronic drum, percussion and bass samples to complex synth tones and special effects loops. There is also a range of basic sample-shaping tools.

I should point out that the AN200's sequencer Pattern and synth Voice arrangement is slightly unconventional in that the two are inextricably linked. You can't have one without the other, and the two parts are always treated as one, although it is possible to copy Voice information from one pattern to another.

• OSCILLATORS

The two VCOs are well specified and can generate a wide variety of waveforms including: Sawtooth, Pulse, Square, Triangle, and Sine types. There's also a noise source, a sub-oscillator for VCO 1, and a few non-standard waveforms with curious titles like Inner and Vari. Yamaha do not provide any information about these, other than pointing out that they change in tone depending on the VCO Sync settings, which is true as far as it goes. To my ears, they sounded as though they were merely combinations or filtered versions of the other more conventional waveforms.

Pitch modulation is well catered for and you can modulate the VCOs with either LFO 1 or 2, pitch-synchronise one to the other (with either oscillator as master or slave), or frequency- and cross-modulate one with the other oscillator or the LFOs, Pitch Envelope Generator (PEG) or the ADSR Filter Envelope Generator (FEG) or Amplitude Envelope Generator (AEG), or various combinations of all the above!

Interestingly, the shape of most of the waveforms is adjustable (not just the Pulse width) and can be modulated by the LFOs or Envelope generators for extra movement and depth. Some presets obviously use waveform modulation, but as with many of the other esoteric synth features, I found it impossible to edit them using the front-panel controls and had to resort to using the supplied editor software.

• LFOs

The LFOs have everything you would expect from analogue versions and more. Modulation waveforms available include: Sine (five types), Triangle (five types), Square (three types), Saw (four types) and Sample & Hold (four types). Using only the front-panel controls it is only possible to route LFO 1 to the VCOs, VCF and VCA. However, using the software Editor you also get the option to add a Delay to the onset of the LFO 1 and use numerous routing and modulation options for both LFO 1 and 2.



• FILTER

Although the VCF looks like any other run-of-the-mill filter with just three controls, it's not that simple. Using just the front-panel controls six filters can be called up (24dB low-pass, 12dB low-pass, and 18dB low-pass, band-pass, band-eliminate and high-pass types). The VCF also has its own ADSR generator (the FEG) and using the Editor software, it's possible to adjust filter Keyboard Tracking, Velocity depth and indeed access a second variable 6dB high-pass filter.

As pseudo-analogue filters go, this one sounds fine, with plenty of range and bite at the more extreme settings and a pleasing mellowness at the lower ends of the spectrum. If you are used to real analogue filters you may not be quite so impressed, as there is occasionally a certain digital quality to the sound. It's hard to pin down but is probably a lack of noise or harmonic distortion. This may concern you if you are fussy about this sort of thing, but I didn't lose any sleep over it!

• EFFECTS

The Effects block includes various types of delay, reverb, flangers, chorus, phasers and overdrive effects. The only physical editing controls available are one marked 'Parameter' and a Wet/Dry knob. The function of the Parameter control varies depending on the selected effect, but it usually controls either the speed of the effect modulation or the length of the reverb or delays. The AN200's selection of effects isn't bad, but I'm not going to pretend that it's terribly inspired either. And given that the software editor gives access to additional parameters in so many other areas of the AN200, it's a shame there aren't any software-editable options available for the main Effects block.

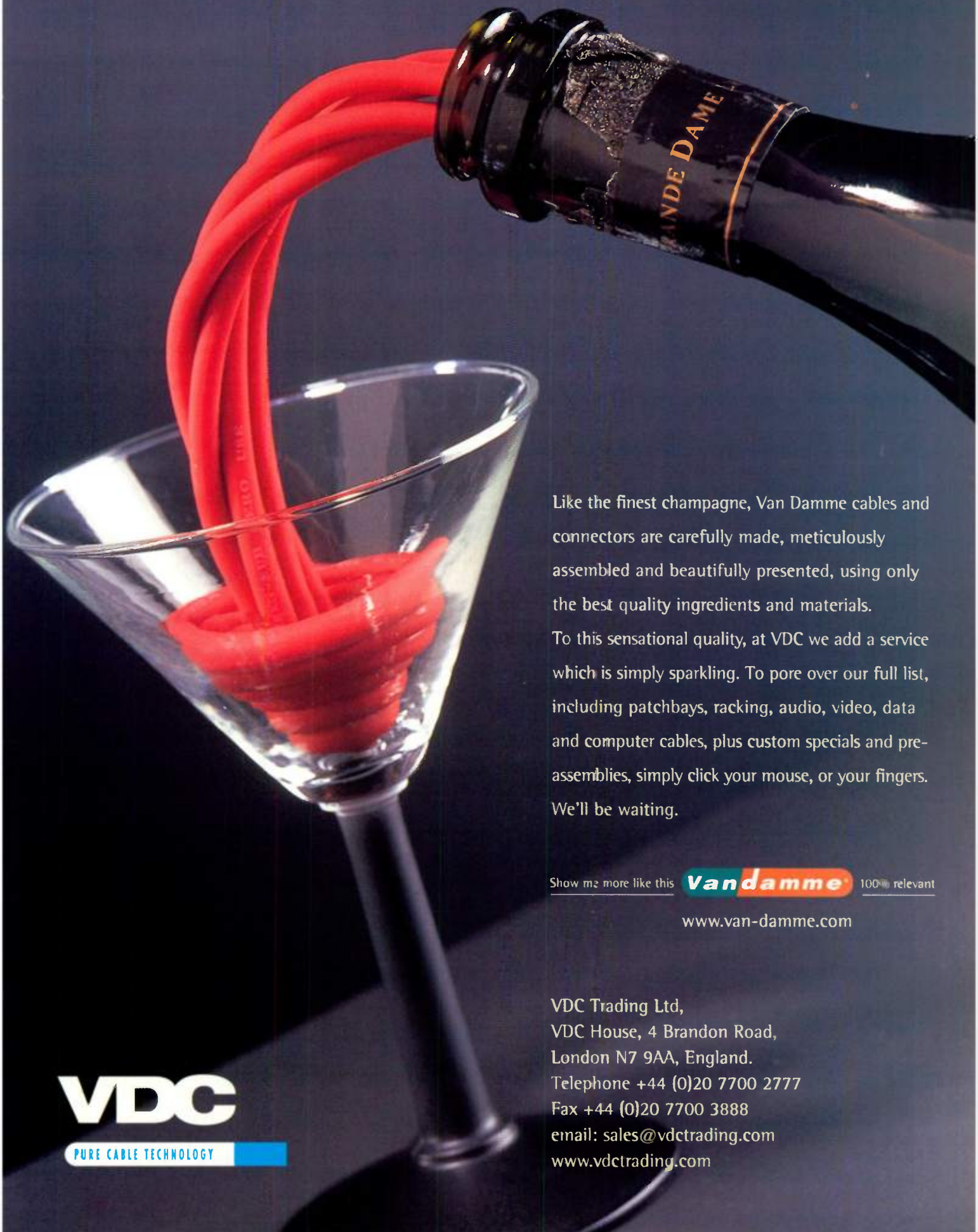
However, there is a separate front-panel-activated Distortion effect which includes further software-editable options. These transform it into a fully fledged Distortion/three-band EQ block. Under software control you then have the choice of various distortion and EQ-based amp simulator processes, as well as variable low, mid and high EQ and a variable low-pass filter. ►

The main AN200 Editor screen, clearly designed to resemble the physical front panel, but with many more software-only options.

AN200 Specification

- Five-note polyphonic AN synth voices: two VCOs (plus sub-oscillator), VCF, VCA, noise, ring modulator, mixer, one pitch envelope generator (PEG), two LFOs, and two ADSR envelope generators (filter envelope generator, or FEG, and amplitude envelope generator, or AEG).
- Three 32-note polyphonic sample-based rhythm voices (120 sounds/samples).
- Effects: Tempo Delay/Reverb, Flanger/Chorus, Phaser, Amp Simulator, Distortion, three-band EQ (AN synth voices only).
- Sequencer: Four tracks, 16 steps, MIDI Sync, MIDI Clock Transmit.
- Free EG: four tracks.
- Scene: two scenes/voices.
- 256 Preset Patterns/Voices.
- 128 User Patterns/Voices.

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YAMAHA AN200

▶ Although this section is no substitute for the lacklustre effects, it is capable of transforming an otherwise dull-sounding patch into something interesting.

• AMPLIFIER & MIXER

The VCA is a simple but effective one with basic ADSR control, though software-editable features also include Velocity and Volume. The VCF and VCA have independent envelope generators, but because of the relative lack of real front-panel controls, both share the same knobs.

The AN200 offers basic onboard mixing which requires the use of multi-function knobs to set the required balance and levels for most of the various VCO, Noise and effects combinations, but a fully featured mixer is available via the editing software. This makes available a decent ring modulator, an interesting Feedback function and individual level controls.

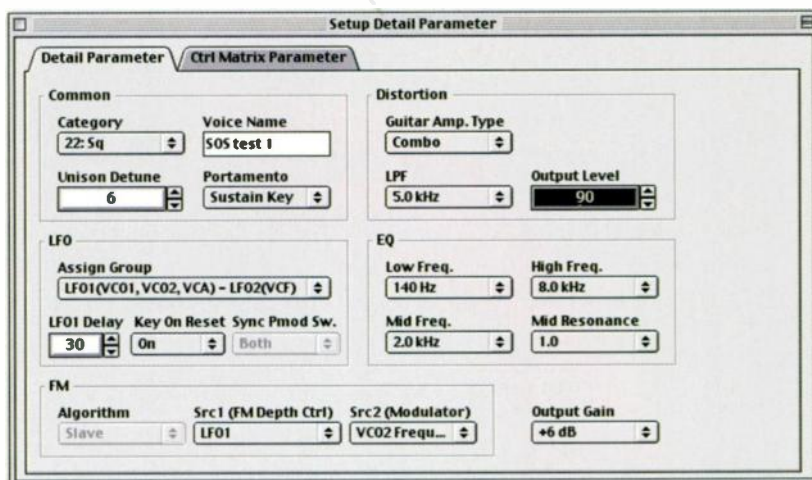
• VOICE ASSIGN

Finally, various MIDI keyboard assign modes are available: Poly (five-note polyphonic), Mono Legato (one note monophonic, no envelope retriggering) and Mono (one note monophonic, with envelope retriggering). There is also a Unison setting; in this monophonic mode, the synth voice is duplicated four times and the tuning interval of the voices can be offset to give a fatter sound — but this is another software-only tweak.

Sequencer

Pattern and Rhythm construction is carried out using a four-track sequencer, one track for the synth and three for the rhythms. This is modelled on the classic analogue 16-step design favoured by Moog, Roland, ARP, and so on, but with a few 21st-century additions. While in Pattern mode the sequencer tracks are always active and can be edited, programmed, and muted using the two rows of 16 illuminated rubberised buttons and the corresponding controller above to adjust individual step pitch, velocity, gate time, and so on. When using the Rhythm tracks, these knobs can also be used to dial up samples for each pattern step from the 120 sounds available. In addition, the three Rhythm tracks each have their own basic low-pass VCF, and although they don't possess any modulation options, the filters can be automated using the Free EG motion recorder (of which more in a moment).

The Sequencer control section includes such performance goodies as forward or reverse play, an option which halves or doubles the playback tempo, track mute and solo, real-time tap tempo adjustment, and pattern retrigger, stutter, roll and swing options. There's also a system-wide gate time control, which I really liked — it allows you to shorten your rhythms to sharp 'tikka tikka' patterns if you wish. My other favourite was the option for real-time Pattern Select via the sequencer pads, which is great for jamming with loops and patterns. The Sequencer is pretty



straightforward to program and use, once you know your way around it.

Performance Controls & MIDI

The main Song/Sequencer control panel includes some unusual (and habit-forming) performance controls. A few useful features have also been borrowed from the AN1x, including a four-track motion control function for recording knob movements (quaintly referred to as the Free EG), and a patch-morphing facility, here referred to as a Scene.

The Free EG feature was first introduced in the Yamaha AN1x, and is included here unchanged. Essentially, it records and plays back any real-time controller movements you make. Most virtual analogue synths have a feature such as this, usually called a Motion Controller or Motion Sequencer. However, this version is slightly more versatile than most, as it can record four separate controllers. Free EG tracks are stored with the Pattern they were recorded in, and playback options include various trigger modes and loop options (forward, alternating, one-shot, and so on) and variable bar lengths (ranging from half a bar to eight). Free EG is like having an extra pair of hands at your disposal; don't underestimate how useful this feature can be at imparting movement and expression into your Patterns and Voices.

Another truly useful performance feature is Scene, which allows you to program two different synth Voices for each Pattern and perform a morph between the two in real time. Despite sounding simple, this can produce some incredibly complex sounds in the transition from one voice to another. You can also use Scene to jump to a completely new sound while still keeping the rhythm pumping ▶

If you thought there were more options available via software from the editor's main screen, how about this? This is the editor's 'Detail Parameter' screen.

“The AN200 is a hugely powerful synth for such a neat and affordable desktop package; if it were sold on a price-per-feature basis it would cost considerably more.”

AN Voice/Rhythm Step Sequencer Parameters

- Step Buttons: On/Mute.
- Note Number: C-2 to G8.
- Velocity: Rest, 1 to 127.
- Gate Time: 1 percent to 1600 percent.
- Pitch Range: -64 to +24.
- Pan: -64 to +63.
- Effect Depth: 0-127.
- Effect Wet/Dry: 0-127.
- Volume: 0-127.
- Instrument Select (rhythm tracks only).
- Filter Cutoff (rhythm tracks only).
- Filter Resonance (rhythm tracks only).

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YAMAHA AN200

AN200 Editing Software

The AN200's software editor is supplied on a dual-format Mac/PC CD-ROM and includes a PDF manual, two Preset banks and a MIDI demo song. The Mac version includes OMS 2.3.8, and the PC version includes *WG Works Lite*. The following features also work between the AN200 and AN1x.

EDITOR FEATURES

- Save/Load Preset and User Data.
- MIDI Bulk Load/Dump.
- MIDI Individual Pattern Load/Dump.
- Store Current Edit (send to AN200).
- Drag-and-drop Pattern Librarian.

FUNCTIONS ONLY AVAILABLE USING THE EDITOR

- **Voice Name Edit:** 10 digits.
- **Category:** 22 types.
- **Unison Detune:** -1 to -32.
- **Portamento Type:** full time, fingered, Sustain key.
- **PEG (Pitch Envelope Generator):** Attack (0-127), Decay (0-127), Depth (-64 to +63), Destination

(VCO 1 or VCO 2).

- **VCO 1 & 2 options:** Pitch (-64 to +63), Fine-tune (-64 to +63), Edge (1-127), PWM Depth (1-127), PWM Width (1-127), PWM Source (Fixed, PEG, FEG, LFO 1, LFO 2, LFO 2 phase, LFO 2 fast, or VCO 2), Multi Saw Detune (VCO 1 only; 1-127), Multi Saw Mix (VCO 1 only; 1-127).
- **X-MOD (Cross Modulation):** VCO 2 (Triangle/Sine), Source (Fixed, PEG, FEG, LFO 1, or LFO 2), Depth (-64 to +63).
- **LFO 1 & 2:** Key On Reset (1-127), Sync Pitch Modulation (Master, Slave, or both), Assign Group (various).
- **FM (Frequency Modulation):** Depth (+63 to -64), Algorithm (Master, Slave, or both), FM Depth Control (Fixed, PEG, FEG, LFO 1, or LFO 2), Modulator (VCO 2 frequency, VCO 2, VCO 1, VCO 1 sub-oscillator, PEG, FEG, LFO 1, or LFO 2).
- **VCO Sync:** Mode (Off, VCO 1 into VCO 2, VCO 2 into VCO 1), Source (Fixed, PEG, FEG, LFO 1, LFO 2), Depth (-64 to +63).
- **VCF:** Velocity (-64 to +63), Key Track (-32 to +63), Second High-pass Filter (0-127).
- **VCA:** Velocity (-64 to +63), VCA Volume (0-127).
- **Mixer:** Ring Modulator (0-127), VCO 1 Level (0-127), VCO 2 Level (0-127), Noise Level (0-127), Feedback Level (0-127).
- **Distortion:** Type (Stack, Combo, or Tube), Low-pass Filter (1kHz-18 kHz, Bypass).
- **EQ:** Low (32Hz to 2kHz, -12dB/+12dB), Mid (100Hz to 10 kHz, -12dB/+12dB), High (500Hz to 16kHz, -12dB/+12dB), Resonance (1.0-12.0), Output gain (+0dB, +6dB, +12dB).
- **Free EG:** Free EG Tempo (20-300bpm), Trigger (MIDI In, Note On, or Seq Start), Loop (Off, Forward, Half, Alt, or Alt Half), Transform (Smooth, Randomise, Scale, or Move).
- **Control Matrix:** Pitch Bend Up (-24 to +24), Pitch Bend Down (-24 to +24), Source (x15; most MIDI controller numbers), Parameter (x15; most AN200 control destinations), Depth (x15; -64 to +63).

▶ along. It's just a shame the Scene function can't be recorded by the Free EG for *really* wild times. The switch functions can't be recorded either; the Free EG records only knob movements.

MIDI is well catered for, although the lack of a Thru socket is frustrating. The AN200 works well as a controller source and almost every function (whether accessible from the front panel or not) can

Conclusions

I'm not the first and I certainly won't be the last to point out that the AN200 is similar in size and layout to the hugely popular Korg Electribes. However, where Korg have two distinct Electribes, one dedicated to synth sounds and another for percussion, Yamaha have produced a hybrid version



The AN200's rear panel. Note that there are only two MIDI sockets, In and Out, with the Out configurable as a 'soft Thru'.

be controlled by external MIDI gear or sequencers. MIDI sources and destinations are set up using the Controller Matrix screen, part of the Editor software, and plenty of MIDI-related information is supplied in the manual.

The Software Editor

When I began using the AN200 I had no idea how much I would come to rely on the Editor software. In day-to-day use I found myself almost exclusively building synth sounds from scratch using the Editor, then performing minor tweaks from the front panel where possible. But funnily enough, I tended to build rhythms and patterns using the front-panel controls and pads. I suppose each user will find their preferred way of working.

On a G3 desktop Mac and a G3 Powerbook, the software Editor was stable and didn't crash once in the time I was using it, although it did exhibit some strange on-screen anomalies where parts of the main editor screen were almost impossible to read. The librarian utility is pretty essential for backing up and naming Patterns. It also doubles as a conversion bridge for loading AN1x Patterns/Voices.

which covers both camps. This approach has both benefits and drawbacks. The AN200 is a hugely powerful synth for such a neat and affordable desktop package; if it were sold on a price-per-feature basis it would cost considerably more. However, I do consider it a drawback that even with the AN200's range of dedicated and multi-function controls, there are so many features of the AN200's synth engine which are only accessible via editing software. If you have a Mac or PC, this isn't going to be a problem, but without one you could be missing out on some invaluable hidden extras and the benefit of fast and relatively intuitive editing, as well as the librarian.

Yamaha are using the catch phrase 'this is not a toy' in their current advertising for the new Loop Factory synths. Well, that may be true but the AN200 is still a lot of fun to play with. After reviewing the Korg Electribes last year I put my hand in my pocket and bought one (contrary to what some people seem to think, we *SOS* reviewers don't get to keep review gear; we have to buy it like everyone else). I'm happy with my little Electribe, but if I were still in the market for a desktop virtual analogue synth-cum-drum machine I would seriously think about paying that bit extra and going for the AN200 instead. *SOS*

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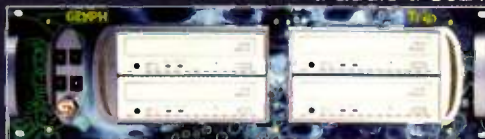
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Since samplers became widely available and more affordable for musicians there has been an ever growing number of sample CD and CD-ROM manufacturers competing to provide new and better quality collections. High quality samples, however, require larger audio files and, in the past, the limited memory of many samplers often rendered extremely large sample files practically unuseable. In recent years though, sampler memory capacity has greatly increased and that has prompted the creators of sample collections to go all out to produce the best possible recordings.

Akai have always worked hand in hand with sample creators to ensure their samplers are supplied with libraries of the highest quality, and many users of Akai samplers swear by the official Akai-endorsed collections. The latest sample collection available for Akai's MPC2000, S3000, S5000 and flagship S6000 sampling instruments is Drums: Hits & Ambience comprising Volume One: The Surrey Sound Room and Volume Two: Pro Percussion. The libraries are the result of many months of meticulous sound design by new sample library CD and CD-ROM creators Perfectionear and have been produced in association with Akai Professional.

This month, AMIC UK have provided us with a bag load of Perfectionear CD-ROMs and CDs worth over £1500 to give away. CD-ROMs of both volume One and Two (worth £150 each) make up the first prize and this will be offered to the first three winning entrants.

Three more readers will win their choice of either Volume One or Volume Two as their prize and lastly, four Audio CDs of Volume One, worth £60 each, will be given out to other winning contestants.

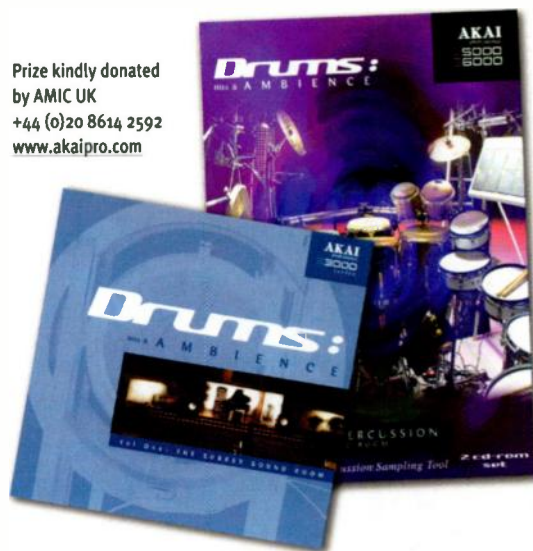
The first package, Drums: Hits & Ambience Volume One: The Surrey Sound Room, is a collection of real ambient drums recorded, as its title suggests, in the Surrey Sound Room studios. The studios were chosen for their well-respected live drum rooms while particular care was taken in the selection of the drum kits and recording equipment; a vintage 1970 Ludwig Big Beat and Yamaha Rock Tour kit were used throughout, recorded through Neve mic preamps and Apogee AD8000 24-bit converters. Traditional mic techniques were also specified as part of the recording brief.

The recordings were done by using close mics on the kit plus a set of ambient mics placed in different positions within the live room. The Ambient mic recordings have been kept separate from the close mic ones on the CD/CD-ROMs, allowing the user to combine and balance the ambient samples with the dry samples to get the desired degree of liveness.

Dry recordings were also made in a drum booth set up in the live area, and these provide various snares, clicks, cymbal swells and other useful drum noises. Most have been multisampled to offer three velocity levels.

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versions of each sample are provided in addition to the normal ones.

Volume Two: Pro Percussion was also recorded at Surrey Sound Room and was seven months in the making. This time emphasis was placed on percussion, and particularly pop-music percussion. Once again, the dry hits are separated from the ambient ones, offering complete control over the ambient feel of each drum sound. Tambourines, wood blocks, cowbells, shakers, congas, bongos, maracas, chimes, bell trees, rainmakers and many others percussive tools are included — each with its own keygroup performance options.

Volume Two also boasts an extensive range of cymbal samples which were created by using sticks and beaters on a variety of cymbal types, including standard crashes, splashes and chinas. All cymbals are supplied as both single hits and swells.

If you want to win this impressive library then simply fill in the entry form provided at the foot of this page. You will need to include your full name and address details along with a daytime phone number. Of course, we require you to answer the questions and complete the tie-breaker too. Once you've satisfied these requirements, simply post your forms to us at the usual *Sound On Sound* address. Entries must arrive by the closing date of **27th July 2001**.

questions

Where was the Perfectionear's collection recorded?

- a. The Surrey Sound Room
- b. The Surrey Sound Bank
- c. The Sorry Sound Band
- d. The Sussex Sound Lab

Which of the following is not a sample included on Volume Two?

- a. Tambourines
- b. Cowbell
- c. Wood Block
- d. Needle Point

What measure has Perfectionear taken to ensure that customers with less sample RAM can still use the sample collections?

- a. Included Feather-weight samples
- b. Included Light-weight samples
- c. Included Lite samples
- d. Included Heavy samples

Tie-breaker Perfectionear's collection aims to provide just about every drum and percussion sample that a musician will ever need. That said, artists and producers are continually coming up with new and novel sounds to use for their rhythms, loops and percussion parts. What obscure and unusual sounds would you like to find in a sample collection for use in a drum/percussion part? Answers in no more than 30 words please.

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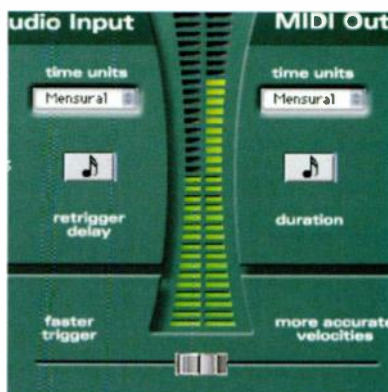
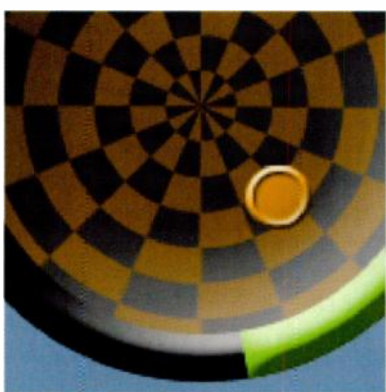
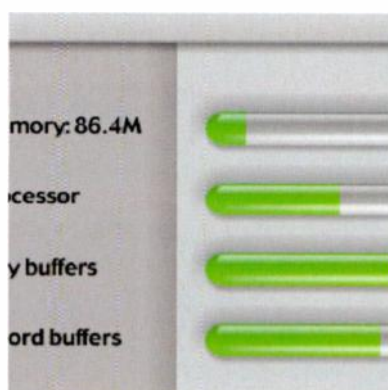
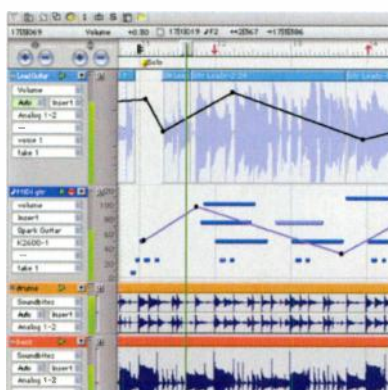
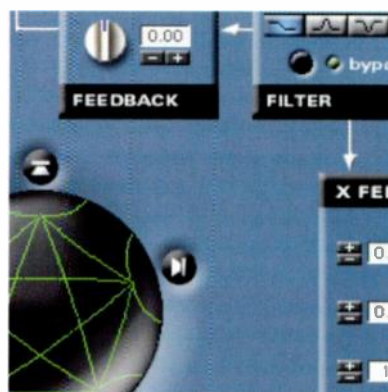
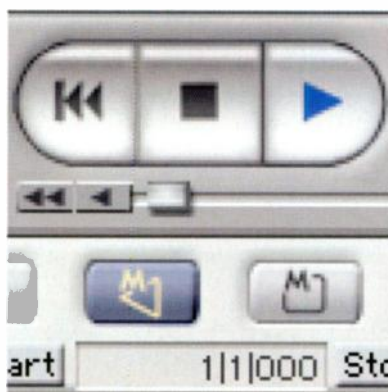
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Post your completed entry to: **Perfectionear Sample Collection Competition** June 2001,
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Would you like to receive more information on AMIC/Perfectionear products? If not, please tick this box.

the small print

1. Only one entry per person is permitted. 2. Employees of SOS Publications Ltd, Perfectionear, AMIC and their immediate families are ineligible for entry. 3. No cash alternative is available in lieu of the stated prize. 4. The competition organisers reserve the right to change the specification of the prize offered. 5. The judges' decision is final and legally binding, and no correspondence will be entered into. 6. No other correspondence is to be included with competition entries. 7. Please ensure that you give your DAYTIME telephone number on your entry form. 8. Prize winners must be prepared to make themselves available in the event that the competition organisers wish to make a personal presentation.



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highly rated?

The 1296 is the latest in MOTU's line of audio interfaces based around their PCI324 PCI card, and the first to offer 88.2 and 96kHz sampling rates in addition to the more familiar 44.1 and 48kHz. In contrast to the other audio interfaces in the range, it has relatively few frills — there's no headphone output, no front-panel controls, and no stand-alone routing or sample-rate conversion facilities. As such, the 1296 is something of a specialist product, and one that will very often, I imagine, be bought to supplement an existing 2408 or 1224 interface. It's certainly a no-nonsense bit of kit, aimed at the upper end of the project-studio market, and it does what it does with

MOTU 1296 HIGH-SAMPLE-RATE AUDIO INTERFACE

MOTU's good-sounding, competitively priced audio hardware has won them a lot of friends in the project-studio and professional arenas. The latest addition to their range is a 12-channel interface that offers 96kHz, 24-bit recording.

Robin Bigwood tests the 1296.



few compromises and a refreshing simplicity.

Essentially, the 1296 offers 12 +4dB analogue inputs and outputs on XLRs, with high-quality 24-bit converters that MOTU claim are capable of delivering a 117dB (A-weighted) dynamic range. In addition, an AES-EBU digital input and output (on XLRs) is equipped with independent sample-rate converters and its own timing clock, allowing it to operate entirely separately from the analogue section. There's also a word clock input and output, and a separate AES digital word input. For those involved in surround-sound mixing, the 12-channel 1296 can, of course, handle two simultaneous 5.1 mixes.

The Unit

The 1296 comes as either a 'core' system, together with a PCI324 card, or as an expansion unit for users who already have the PCI324. The PCI324 is a half-length PCI card, and I can't imagine anyone would experience problems fitting it, especially given the detailed instructions in the manual. MOTU says it's based around a custom VLSI chip which is capable of handling 72 simultaneous inputs and outputs (that's 144 in total!) at 44.1 or 48kHz. At the

higher sample rates 36 simultaneous inputs and outputs can be used at one time, so it's theoretically possible to connect three 1296s to a single PCI324, or to use a single 1296 in conjunction with, say, a couple of 2408 MkII interfaces.

Communication between the 1296 and the PCI324 is via MOTU's proprietary AudioWire protocol, using a standard IEEE1394 FireWire cable. There are three AudioWire sockets on the PCI324's connector panel, as well as a standard nine-pin ADAT Sync connector for sample-accurate transfers with ADAT recorders, and an eight-pin RS422 'Control Track' socket for attaching a MOTU Digital Timepiece synchroniser. Amongst other things this facilitates sample-accurate transfers with Tascam DA-series multitracks, and allows the PCI324's timing clock to resolve to externally supplied SMPTE timecode.

The 1296 itself is a 2U rackmount unit with an elegant and uncluttered front panel consisting of two banks of 12 LED level meters, a smaller section to the left displaying clock and sample-rate information and, on the far right, a rocker-type power switch. It's noticeable, both on the 1296 and ▶

MOTU 1296 £2095

pros

- Fantastic-sounding A-D converters.
- Accurate, clear metering.
- Real-time sample-rate conversion.
- Expandability.

cons

- Annoying software installer!

summary

The 1296 most obviously appeals to those looking for a high-sample-rate interface, but great-sounding converters and crystal-clear metering should ensure a wider following.

SOUND ON SOUND

the TASCAM DM-24. why compromise with a more expensive desk?

The new DM-24 is a digital mixer with ideas way beyond its size and price tag. At just 58 cm wide and 62 cm deep, the fully 24 channel, 8 bus console, boasts professional features and quality with which mixers several times its size and cost cannot compete.

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every channel. Also fully automated on every channel are 2 multi-effects processors, featuring reverb, spatial effects and mic/speaker modelling by TC Works™, Antares™ and TASCAM.

There is enough I/O to connect up to anything; XLR and 1/4 inch jack inputs on every channel, 24 channel TDIF and 8 channel ADAT digital interface, SPDIF and AES/EBU stereo, and two card slots for extra TDIF, ADAT, AES/EBU or 24 bit analogue cards. The large LCD screen, LED ring encoders and 100mm long throw faders provide the most professional user interface on any compact console.



With such powerful features and its highly flexible routing system, the DM-24 is a perfect mix partner for TASCAM's MX-2424 hard disk recording system. Expansion is simple with two DM-24s operating as a single console in Cascade Mode; which at this price is not going to break the budget.



TASCAM

a whole world of recording

MOTU 1296

▶ on the new Firewire-based 828 interface, that MOTU seem to have dropped their silhouetted unicorn logo. This is much lamented amongst MOTU diehards, but shouldn't adversely affect other users too much!

The 1296's metering is very nice indeed, with each of the 12 inputs and outputs getting its own 19-segment stack of LEDs, calibrated in 3dB steps from -42 to -6dB and in single-decibel steps from -5 to -1dB. There are two 'over' LEDs, one which lights only momentarily, and one which latches on when the signal reaches full scale even for a single sample. Settings for peak hold and 'over' hold time are made from within the PCI324 console software (of which more later).

The small sample-rate information section on the front panel, labelled 'Clock', presents its information in a very clear and unambiguous way, with separate indicators for the sample rates in use for the A-D and D-A converters, and the AES-EBU digital section. Again, settings can only be changed from within the PCI324 console application.

Around the back of the 1296 is where it's all happening. Dominating the rear panel are 12 analogue inputs on female XLR connectors and, below them, 12 outputs on male XLRs. To the right of these are the AES-EBU digital connectors, on a further pair of XLRs, one male and one female. Below them a pair of BNC connectors handles 'System Word' in and out, and close by there's the separate 'AES Word In' BNC. At the extreme lower left there's a standard IEC three-pin power inlet, and at the other end, an IEEE1394 AudioWire socket. Everything is clearly marked and all the XLR sockets have strong metal retaining clips. The 1296 does have a fan, which vents on its right-hand side, but it's quite quiet in operation — in fact, I only noticed it after a couple of days of use.

The 1296 I received for review came as a core system, so as well as the 1296 interface itself the box contained a bubble-wrapped PCI324 card, a 15-foot AudioWire cable, a power lead, and a bundle of documentation. There's a dual-purpose Windows/Mac manual, a manual for *AudioDesk* (a bundled multitrack audio recorder and editor for Mac), a cross-platform installer CD, and the obligatory product registration card.

MOTU specifies minimum computer requirements of a 200MHz Pentium processor with at least 32Mb RAM running Windows 95 or 98, or for Mac, a 200MHz 604e with at least 32Mb RAM and OS 7.6.1. I imagine these are absolute minimum requirements, though, and to get the best out of the 1296 you should really try to partner it with something much more powerful and up-to-date. It worked a treat on my 350MHz blue and white G3, with 256Mb RAM. It goes without saying that you also need a free PCI slot in your computer, and a decent size high-spec SCSI or IDE hard drive, preferably one dedicated to audio storage.

Setting Up

With the PCI324 card in your computer and the 1296 connected to it, you then need to install

drivers and accompanying software from the provided CD. There are ASIO drivers for Mac and PC, a PC Wave driver, and a direct PCI324 driver for Macs running MOTU software. It was here that I ran into a problem, though. The 1296 ships with *AudioDesk* multitrack recording and editing software for Mac, which is like a MIDI-less version of *Digital Performer*. I had no need for this because I already have *Digital Performer*, but there was no way to install the essential PCI324 software without getting *AudioDesk* along with it. It was particularly annoying to find that the *AudioDesk* installation had written lots of extra plug-ins into the MOTU folder in my Extensions folder. These plug-ins, whilst perfectly usable, are older versions of the ones that come with *Digital Performer*, and I can only hope that, had I not previously arranged my existing *DP* plug-ins into subfolders, the *AudioDesk* installer wouldn't have trashed them, necessitating a reinstallation of *Digital Performer*. MOTU really ought to provide an option to not install *AudioDesk* for existing users of their software.

MOTU make quite a noise about how easy it is to get up and running with the PCI324 and 1296 once the drivers are installed, and to this end provide a Setup Wizard for Windows and Mac which promises to painlessly set up the PCI324 console ready for use with your audio software of choice. For those unfamiliar with the concept of configuring and using audio interfaces the Setup Wizard can only be a good thing, but whilst using it I experienced another glitch. The Wizard correctly identified the connected 1296 at the beginning of the configuration process, but by the end it had mysteriously changed its wizardly mind, and suggested I'd connected a MOTU 24i instead. Even when I'd managed to overrule this the PCI324 console ended up being configured incorrectly, and I had to manually enable the 1296's single analogue I/O bank.

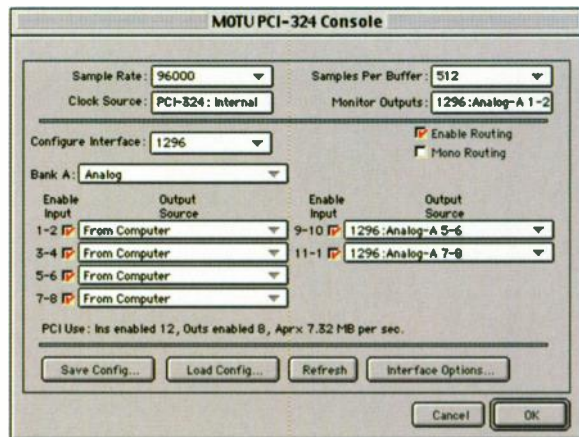
Worse still, I tried installing the PCI324 in a 400MHz G4 (running System 8.6) and the wizard couldn't recognize what interface was connected to the PCI324, although it did know that something was connected. In fact, it was impossible to use the 1296 until I'd located a newer version of the PCI324 driver on my *Digital Performer* installer CD, at which point everything ran flawlessly.

Latency

Whilst the 1296 doesn't achieve the holy grail that is zero latency, it does get pretty close. With a Samples Per Buffer setting of 512 I was able to achieve a virtually unnoticeable latency of around 5mS using *CueMix*, and a slightly sluggish but quite workable 25mS going through effects in *Digital Performer*. I did notice a few clicks and pops using lower Samples Per Buffer settings, though they occurred only whilst monitoring during recording, and never on playback. The bottom line is that, for the majority of people, latency will be unlikely to be a major problem whilst using the 1296.



MOTU's Setup Wizard is designed to help you get your chosen interface up and running quickly.



Non-*Digital Performer* users will need to use MOTU's console application to control the 1296.



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Software

The PCI324 console is really provided for Windows users, and for Mac owners not running MOTU software, as it's effectively built into *AudioDesk* and *Digital Performer*. Every aspect of the PCI324 card and the 1296 is controllable from it, as are the functions of any two additional MOTU interfaces connected to the PCI324 card. Several levels of complexity on offer, from simple enabling/disabling of banks of inputs and outputs, through to complex routing and pseudo-patchbay options.

The upper part of the PCI324 console window controls parameters related not to the 1296 but to the PCI324 card itself. They include system Sample Rate, Clock Source and Monitor Outputs selection, although perhaps the most crucial is the Samples Per Buffer pop-up menu, which effectively controls the monitoring latency of the PCI324/1296 system. Smaller buffer sizes mean lower latency but higher processor load, and whilst usable settings may be found, much lower latencies can be achieved by using the *CueMix* console software.

The role of *CueMix*, whose user interface looks a little like a very simple mixing desk, is to directly patch selected 1296 inputs to the monitor outputs, taking the relatively short trip to the PCI324 card and back. Without *CueMix* your audio input passes



through the PCI324, its software driver, the computer's processor and your host application, before going back out the same way to the 1296's

CueMix provides a simple virtual mixer, allowing you to set up your monitor routing appropriately.

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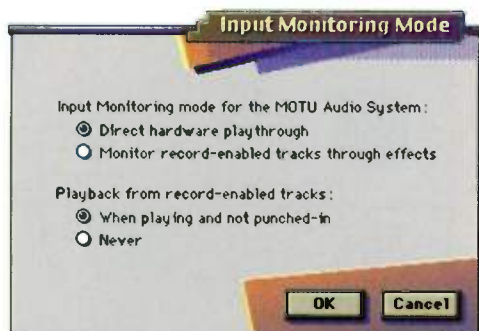


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monitor outputs, with increased latency the inevitable result. The downside of using *CueMix*, of course, is that you won't be able to process your input with any of your host application's plug-in effects, but at least it gives you the option to choose between very low latency or using the effects architecture of your software. *Digital Performer* and *AudioDesk* users don't need to use *CueMix* at all, as all its functions are taken care of by the Input Monitoring Mode dialogue box in conjunction with the input and output



'Zero'-latency monitoring is available to users of the 1296, but you have the option to route inputs through your audio application instead so that you can hear them with effects, if necessary.

routing currently in use.

Digital Connections

An important aspect of the 1296 is its AES-EBU digital input and output, which, like the rest of the interface, are 24-bit 96kHz capable. There are independent sample-rate converters on both input and output, and in addition, the 1296's digital section has its own clock source which can operate completely independently of the analogue section. The digital input and output are configured in the PCI324 console, under the 1296's 'Interface Options'. Setting them up is pretty straightforward, and any

rate conversion that comes into play is indicated on the 1296's front panel, as is the presence of an external timing clock for the digital output. When active, the digital input does, however, 'steal' two of the 1296's analogue inputs (also selectable in the 'Interface Options'). Because I'm not exactly falling over equipment with AES-EBU digital connections in my studio, I used an M Audio CO3 S/PDIF to AES-EBU converter to connect a range of external equipment with both co-axial and optical digital outputs, and it fulfilled its role admirably.

Given that the 1296's sample-rate conversion occurs in real time, it's amazingly good, and I found it hard to distinguish between original and converted signals when, for example a 44.1kHz output from a CD player was brought into *Digital Performer* at 48kHz. Conversion of 44.1kHz signals to higher sampling rates worked equally well, as did the conversion of a 48kHz DAT recording down to 44.1kHz. High frequencies remained clear and well defined, and stereo image hardly suffered at all. Very impressive.

Sound Quality

Ultimately, the *raison d'être* for the 1296, aside from the claimed high quality of its A-D converters, is its ability to record at 88.2 and 96kHz sampling rates, and I was keen to make some recordings at a variety

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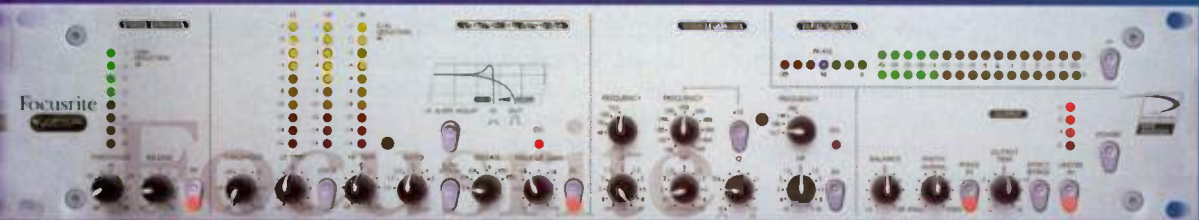
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... TO FINISH

MOTU 1296

of sampling rates and bit depths and compare the results. Supporters of high-sample-rate recording argue that higher frequencies can be recorded more accurately, without the inherent quantisation errors that occur with 44.1 and 48kHz systems. A higher sample rate, they say, also places any undesirable effects of anti-aliasing filters in use at the A-D conversion stage well outside of the human hearing range. The trade-off, however, comes in the form of increased data storage requirements — a 24-bit 96kHz recording takes up about three times the disk space of one made at 16 bits and 44.1kHz — and greater processor demands.

There are those, of course, who argue that any perceived advantages of higher sample rates are purely imaginary. A more pragmatic but equally valid line is that the majority of the music-consuming public don't have access to replay systems that could reveal the differences anyway, and that most wouldn't hear or care about the differences even if they did.

Technical, musical and social arguments aside, digital recording theory suggests that it's high frequencies in particular that should benefit from a higher sampling rate, so I started off by recording a very lively-sounding reproduction harpsichord with the 1296 configured for 96kHz 24-bit operation. I then immediately made a recording at 48kHz 24-bit so I could compare the two side-by-side. I used a variety of microphones to make the recordings, including Rode NT1s, an Audio Technica AT4033 and Sennheiser MKH20 omnis, all running through Mackie VLZ preamps. Monitoring was via Alesis M1As patched directly to two of the 1296's outputs.

The 96kHz take sounded every bit as good as I'd expected — a big, confident, colourful sound, with excellent stereo imaging, superb detail, and a tangible sense of involvement. I then switched sampling rate and listened to the recording made at 48kHz. To say the difference was subtle would be an understatement, but there certainly was one, although it's hard to define or describe without seeming to exaggerate the issue. Of the two the 48kHz recording sounded very slightly fuller and more rounded, albeit with a hint of constriction at the top end. The 96kHz recording was more 'airy', maybe, but it also sounded leaner and somewhat more clinical.

I then moved on to record acoustic piano in a pretty lively, resonant room. The sampling rates were 44.1 and 88.2kHz, and this time there was a more marked difference, with the 88.2 recording providing a greater sense of depth and space. The 44.1 take was again more rounded, although rather less 'roomy'. Interestingly, though, I'd find it hard to say which of these recordings I'd prefer to listen to — both were extremely good in their own right.


To put things in a slightly different perspective I then made recordings of a number of instruments, including recorders, concertina, percussion and voice, using first the 1296 then my 2408 MkII (running at the same sample rates). I'm a big fan of the 2408, but I'll readily admit that, without exception, the 1296 sounded sweeter, clearer, and

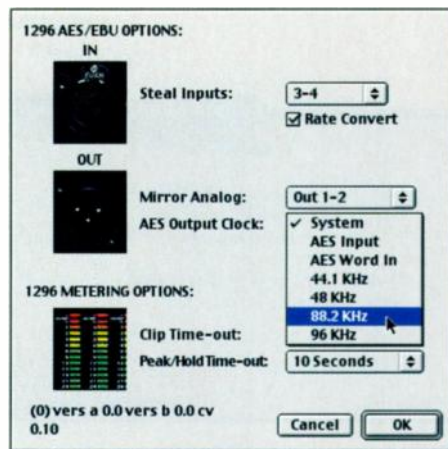
had better focus. In fact, the difference between the 1296 and 2408 was much more pronounced than anything I heard when comparing recordings made using different sample rates on the 1296 alone, which tended to confirm my suspicions about the claims made for high-sample-rate recording — whilst differences are audible with extremely critical listening, it's always other aspects of the signal chain that have a greater impact. I can understand that sample rates of 88.2 and 96kHz (and even 192kHz and higher) appeal to purists of the recording world, but I personally find it harder to see how they really benefit the vast majority of music consumers, either at home, in the car, or in the cinema. I would be very interested, though, to hear a large scale orchestral work recorded at 96kHz and with 24-bit resolution, as there is much to suggest that any benefits gained from using high sample rates become more pronounced in line with the complexity of the recorded material.

Conclusion

I would certainly agree with the often-heard statement that high-sample-rate recording is something you take seriously only when the rest of your signal chain and recording process is beyond reproach. But that's not to say that what the 1296 offers is superfluous or excessive — far from it. Its A-D conversion is excellent, and I personally would be tempted to invest in one for this aspect of its performance alone, using the higher sample rates for projects and clients that demanded them. The digital sample-rate conversion is good, too, and for a working studio, having to quickly deal with material at a range of rates and formats, could be worth its weight in gold.

As far as the competition goes, the much cheaper M Audio Delta 1010 is renowned for its sound quality, but has no metering or sample-rate conversion facilities. The FireWire-based Metric Halo Mobile I/O 2882 has onboard mic preamps and phantom power and is capable of 96kHz 24-bit recording, but has only eight channels of input and output, while the Crest FB88 has a similar specification without the preamps.

What none of these alternatives offer is the ability to be mixed and matched with other interfaces, as is the case with the 1296 and other interfaces in the MOTU range. This counts for a lot, as it means you can add 96kHz capability to, say, an existing ADAT- or Tascam-based digital system with ease. The build quality of the 1296 is excellent, the software and drivers are well written and dependable, and the front-panel metering is clear, informative and accurate. And given that the 1296 is a fine-sounding 12-channel system, it represents excellent value for money. It's going to be hard to give it back. 



The 1296 provides a single stereo AES-EBU-format digital input and output. Using the digital input means that you lose a pair of analogue inputs.

Can Your Computer Keep Up?

Just because MOTU's AudioWire can handle lots of simultaneous inputs and outputs it doesn't mean that your computer can too. For the hell of it I record-enabled all 12 channels on the 1296, and a further 24 channels on a 2408 MkII. Sample rate was 48kHz and resolution 24 bits. My G3 did manage to record — for about 10 seconds, after which a processor spike crashed *Digital Performer*. From what I could observe, though, the demands made of my audio drive, a 45Gb 7,200rpm Maxtor IDE internal, were not unduly large, so it seems that processor power is an important factor in handling large numbers of inputs and outputs. I was not able to ascertain what sort of system would need to be used to handle 72 simultaneous channels of 96kHz 24-bit audio.

information

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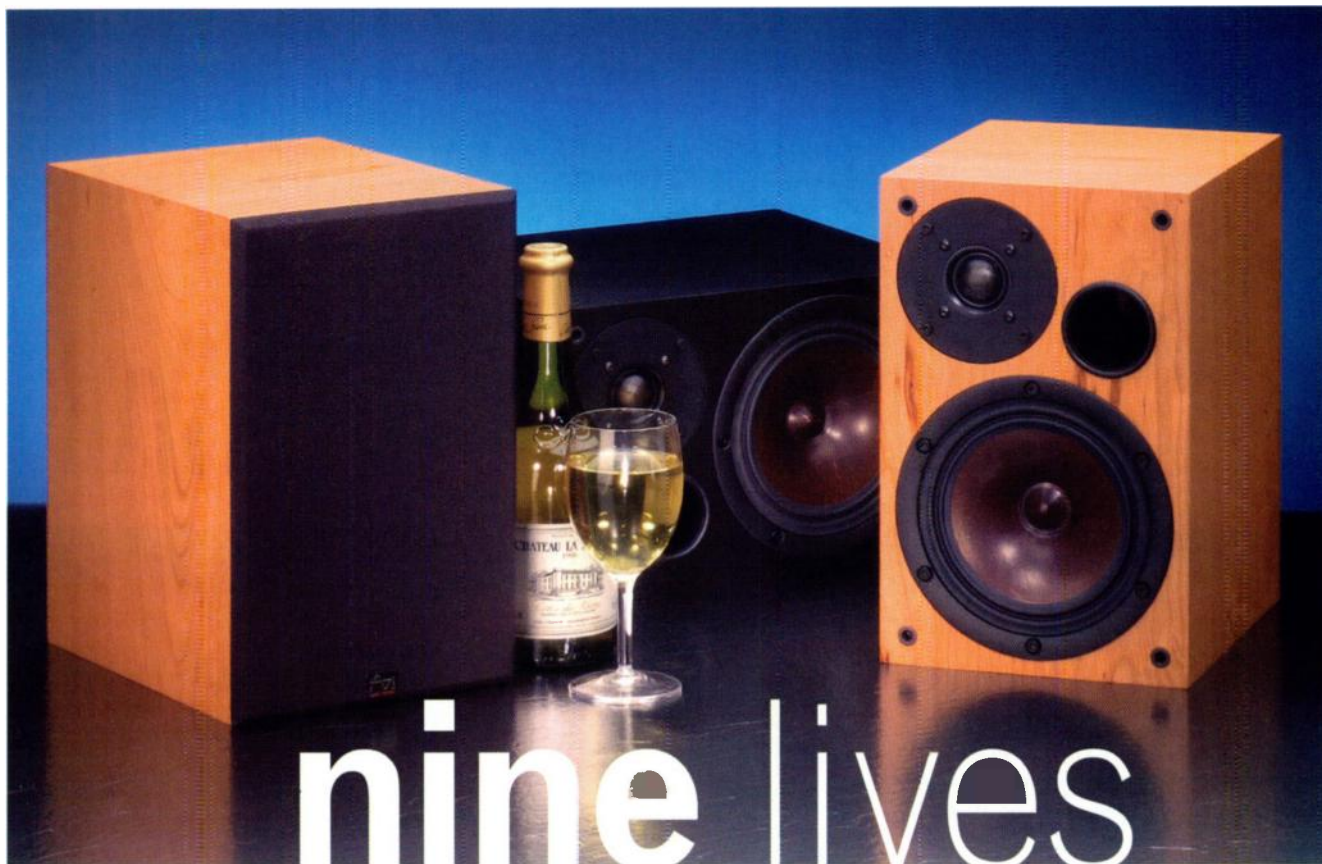
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AVI PRO NINE



nine lives

In addition to their prestigious range of hi-fi products, AVI also make a number of loudspeaker and amplifier products that cross over into the professional and project studio markets, the latest of which is their new Pro Nine nearfield monitor. The Pro Nine measures just 310 x 195 x 250mm yet its frequency response is only 6dB down at 55Hz and remains flat within ± 2 dB up to 27kHz. With an 89.5dB sensitivity (1W at one metre), the speaker is remarkably efficient and can produce a maximum SPL of 111dB per speaker. However, it still needs an amplifier of between 100W and 150W per channel to make sure that transients are handled cleanly.

The Pro Nine uses a ported two-way design in a box made from 15mm-thick MDF, available in textured black or cherry-wood veneer finishes, with a removable cosmetic grill fitted to the front panel. The cabinet is completely filled with a precise mass of long-fibre wool for damping and tuning, and the drivers mount in recesses machined into the baffle. Two conventionally colour-coded binding posts connect the speaker to its cable (the designers have deliberately omitted a bi-wiring option).

Woofers & Tweeters

The Pro Nine is the first commercial loudspeaker to feature a new and specialised 6.5-inch bass/mid unit from the Scandinavian company Vifa. This beautifully made, and comparatively expensive, little speaker features a very long, 25mm-diameter voice coil suspended in a symmetrical spider assembly fixed to a separate platform some

AVI PRO NINE MONITORS

A new high-specification VIFA speaker cone makes its debut in AVI's latest compact monitors. **Paul White** puts them to the test.

distance away from the magnet, allowing plenty of ventilation to the coil assembly. Given the physical size of the driver, the magnetic assembly is quite substantial, with a central vent passing through the axis of the magnet.

A newly profiled, low-resonance double-roll suspension system supports the edges of the cone while the cone material itself is unusual in that it is made from randomly sized wood pulp fibres coated with a brown plasticised damping material. The curvilinear diaphragm's mass and stiffness are, according to Vifa, balanced to produce minimum distortion over the driver's operating range. Vifa also claim this is the best drive unit of its size that they have ever built, though many of its features are refinements of established principles used in other classic drivers, rather than anything radically new.

Partnering the Vifa bass/mid driver is the same high-end, ferrofluid-cooled Scanspeak tweeter used in all the other AVI monitors, another quite expensive component. This is a one-inch, soft-dome unit mounted off the centre line of the cabinet in such a way that the driver alignment is similar whether the speaker is stood on end or laid

AVI PRO NINE £699

pros

- Compact format that works equally well horizontally and vertically.
- Detailed mid-range with adequate bass extension for mixing in small rooms.
- High standard of build quality.

cons

- Can sound less impressive when used with cheap or underpowered amplifiers.
- No magnetic shielding.

summary

The Pro Nine is a very high-quality, small monitor, well suited to discerning nearfield or small studio mid-field monitoring applications.

SOUND ON SOUND

on its side — this may be an important factor for those users who like side-mounted monitors, as the stereo imaging won't suffer in the same way as it would for systems with symmetrically mounted drivers. The drivers are not magnetically shielded, as it isn't practical to shield magnetic assemblies of

“It was no surprise that the Pro Nines delivered a very tight, solid performance... Particularly noticeable was the level of detail that the monitors revealed.”

this size without compromising the driver performance. However, unless the speakers are almost physically touching a TV or computer screen, the degaussing circuits found on most monitors should be able sort out any problems.

During the development of the Pro Nine, AVI made a number of discoveries that were fed back into their existing monitor line, culminating in enhanced crossovers throughout their range. The new design achieves an improvement in the behaviour of the speaker at and around the crossover frequency, as the contributions from the tweeter and bass/mid units remain in phase with each other in the region where they overlap. The crossover operates at around 2.5kHz and has a second-order, Linkwitz Riley response with a claimed phase accuracy of better than one degree. As with other AVI monitors, the crossover is hand-built using premium-grade components on a heavy glass-fibre PCB.

Apparently there are plans to introduce an active version of the Pro Nine later in the year, where the amp packs and electronic crossover are mounted outside the enclosure, on the rear panel.

Owners of the passive Pro Nine should be able to have their speakers upgraded relatively easily when the amp packs become available.

Performance

AVI's general approach with monitors has always been to put money into high-quality drive units and crossovers, rather than into fancy boxes, and to apply solid engineering principles to the system design in as scientific a way as possible. As such, it was no surprise that the Pro Nines delivered a very tight, solid performance when used with a suitable, high-quality amplifier. Particularly noticeable was the level of detail that the monitors revealed, which seemingly extended well back into the mix, as well as from left to right. Voices were reproduced with a very open, natural character while the bass end handled kick drums confidently with no evident time smearing.

Some small monitors might seem more bassy, but this will often be because over-zealous cabinet tuning causes bass notes to ring on, making them appear misleadingly more powerful. This AVI design uses a fairly low-Q tuning system so that bass overhang is very tightly controlled, yet even then the speakers don't sound unduly bass-light unless driven from a woefully inadequate amplifier — certainly the increase in bass extension compared with the smaller AVI Biggatrons is quite noticeable. Obviously, no physically compact speaker can equal the bass extension of some of the larger studio monitors, but in most project studio control rooms I'd say that the Pro Nines will get the balance just about right.

Although you can buy cheaper monitors that sound impressive, I feel it's worth paying the extra for this degree of accuracy, especially if you're working with acoustic instruments, voices or final mixes. **SOS**

information

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blue tones

BEHRINGER V-AMP PHYSICAL MODELLING GUITAR PREAMP



Behringer's take on the desktop amp modeller adds a new twist — rotary shaft encoders with LED displays. **Paul White** approves...

Behringer's V-Amp is a modelling guitar preamp, complete with speaker simulator, effects and an optional Emagic *Sound Diver* patch editor. If this sounds in any way familiar, it's because Behringer are clearly after a share of the market niche carved out by the groundbreaking Line 6 Pod. But although the V-Amp tips a cheeky nod in the direction of that product, and offers very similar facilities, you'd never mistake one for the other. For a start, the V-Amp is bright blue rather than red, and instead of the Pod's distinct kidney shape its outline is a caricature of an electric

guitar. The construction looks similar, but closer inspection reveals that the V-Amp is made from tough ABS plastic, rather than from cast metal, and that the knobs are not regular pots but continuous encoders surrounded by rings of LEDs.

The Hardware

The V-Amp comes packed in a neat padded gig bag, with an AC adaptor and a surprisingly solid dual footswitch. The lead from the footswitch connects to a quarter-inch jack socket and can then be used for navigating through the internal patches.

The high-impedance Input socket matches any type of electric guitar pickup, while the stereo line output can be used with balanced or unbalanced connectors. A headphone socket is also provided, and it puts out plenty of level for personal practice. Oversampling 24-bit converters are used for the guitar input, providing plenty of dynamic range without the user having to mess around with sensitivity controls. The sample rate is 31.25kHz, ▶

BEHRINGER V-AMP

£210

pros

- Good user interface using continuous rotary encoders rather than normal pots.
- Footswitch and gig bag included.
- Attractive price.
- Good range of usable sounds.

cons

- Compressor use restricted with certain other effects.
- Output stage slightly noisy.

summary

Though Behringer are developing an already familiar theme, the V-Amp also incorporates some genuine innovations. Given that you get the carry bag and footswitch thrown in, it provides exceptionally good value.

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BEHRINGER V-AMP



The V-Amp's comprehensive MIDI implementation allows remote editing and full real-time control of all parameters.

► which equates to an audio bandwidth of around 15kHz. Given that most guitar speakers take a dive above 3kHz, this should be more than adequate.

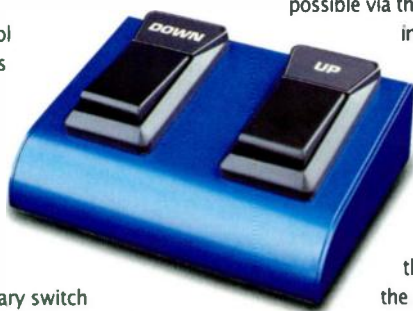
A rather neat Aux Input, on a stereo quarter-inch jack with its own thumbwheel level control, allows any stereo line-level signal to be monitored along with the guitar sound — ideal for jamming along to CDs or drum machines. MIDI In and Out sockets are provided for remote parameter control, patch changing and patch dumping — the special version of Emagic's *Sound Diver* software, available as an optional extra, uses the MIDI interfacing to allow editing from a computer. However, if you aren't able to use *Sound Diver*, you can still edit the V-Amp from your sequencer by referring to the full MIDI implementation chart provided. Alternatively, you could use Behringer's forthcoming heavy-duty FCB1010 MIDI pedalboard for live control.

The general control layout of the V-Amp is unarguably Pod-like, comprising Volume, Bass, Mid, Treble and Gain controls for the preamp section, as well as a Master output level control. A 16-way rotary switch selects from a range of guitar amplifier types and a second 16-way rotary switch selects an effect or dual-effect combination based on delay, modulation (phase, chorus, flange), auto-wah, rotary speaker and compression. The reverb is separate from the other effects so it can be added to any patch. There are eight different reverb types varying from small room to cavern, with two ambience and two spring settings. When using the V-Amp for recording, the two outputs allow stereo effects. There are separate controls for the Effects Mix and the amount of Reverb, as

well as a Tap button for quick and easy setting of delay times and modulation rates. All the pots, with the exception of the Master output control, show their current value on the LED ring around them.

Five buttons lettered A to E provide direct access to the five patches in the currently active bank. Up/down cursors move through the 25 banks of patches (with the current bank shown in the two-digit luminous display) and over half the patches come ready primed with sounds contributed by various players and session musicians including the UK's Geoff Whitehorn. These can be modified or replaced by the user and saved to any location, simply by holding down the patch select button for two seconds or more. Factory patches can be restored one at a time or globally.

A reasonable degree of editing is possible via the front-panel display,



including selecting from one of 15 different speaker-cab emulations to go with the current patch, and choosing between reverb types. Finally, the Tuner button mutes the audio outputs while LEDs under the main numeric display give 'up-a bit, down-a-

bit, OK' indications of intonation. The 'A' which the tuning references can be set to various standards between 425Hz and 455Hz, with 440Hz as the default setting.

The Sounds

The V-Amp's selection of main amp sounds is similar to that offered by the Line 6 Pod or the Johnson J Station — the complete listing is given in the 'Modelled Amps & Cabs' box. Extra gain can be added to each patch and a noise gate with user-variable

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BEHRINGER V-AMP

▶ threshold keeps out the worst of the hash when using the high-gain settings. If anything, the amp models provide a greater range of overdrive than the originals, particularly with the high-gain models, so if you want something approaching subtle, you need to keep the gain control in its first quarter — I particularly like the mildly overdriven end of the American Blues amp. Switching the speaker models produces quite dramatic changes in tonality, from the small and boxy practice amp to that big 4 x 12 sound.

The Fender amp models have that characteristic ringy, on-the-edge sound and the break-up tends to be musical and well-controlled at higher overdrive levels with a reasonably good response to playing dynamics. If you want to do a cover version of Hendrix's 'Little Wing', use this patch with the rotary effect set to very slow and add a dash of reverb — very convincing. I don't know whether the original was done using a Fender or Marshall amp, but that's the combination that works for me in the V-Amp. The models based on the Boogie and Soldano amps have that distinctive tonal coloration that helps them cut through the mix, and at higher gain levels you're well into hooligan territory!

I feel that the Brit models, which are evidently based on the Marshall sound, are slightly lacking in the heavy-bass/scooped-middle tonality that goes with these amps, but the sound is still very playable. By comparison, the Brit Class A sounds rather more musically useful than the Vox amps that I used to own before they became unreasonably fashionable. You know how it feels to drive a car when the power steering has failed? Well I always felt Vox amps played like that unless they were absolutely flat out, and the V-Amp is more controlled in this respect.

On the whole, the models make a fair stab at emulating the amps they're supposed to. However, I think it's fair to say that the V-Amp's overdrive presets are a little grittier than the sounds I get from my Pod, whereas the clean tones are actually more lively, in a 'Pod meets Rockman' kind of way. As with the Pod, the V-Amp has a set of models named after itself, where the designers have combined what they thought were the best elements of several models and then tweaked them until they got something

they liked. In short, if there was a Euro standard for guitar sounds, these would come pretty close to it.

The effect combinations are simple and sensible, with maximum delay times of just under two seconds. Though there are no real surprises here, everything delivers the kind of sound and quality you'd expect from a pedal equivalent.

One slight letdown is that the rotary effect is definitely less convincing than that on the Pod. It's musical enough, but to me it sounds more like a Univibe than a Leslie. The auto-wah function fares rather better and delivers an effortless 'Voodoo Chile' impression — if you have a MIDI pedal this can be used to control the wah-wah effect using MIDI Continuous Controller 7. Another part of the effects section which works well is the compressor, which seems nicely tailored to guitar sounds, but this can only be used on its own or with chorus — there's no compressor/delay option.

In Use

The V-Amp is designed to be extremely easy to use — just pick an amp type, set the preamp controls, then decide what effects you want to add, and how much. The rings of LEDs around the encoders are a great improvement on the conventional pots found on most other low-cost guitar preamps of this kind, and as soon as you select a patch you can see exactly what settings were used to create it.

An appropriate speaker cab is loaded in for each amp type, but if you need to change it, it's very simple to do so. The V-Amp can also be used with a regular guitar amp, though some adjustment of the tone control and speaker simulator settings may be necessary to fine tune the result. Having an Aux Input for playing along with an external source is a nice touch.

Though there's a noise gate to cut out pickup buzz and suchlike, there's still a small but noticeable amount of background hiss when the gate is closed, no doubt due to the output stage. This is something I also noticed with the Pod, though the Johnson J Station seems to be much better than either in this respect.

Carry On Vamping

Behringer have applied their usual strategy of hanging back to see what the other guys do, then trying to improve on it while offering a lower price. The user interface of the V-Amp is certainly a step up from what we've come to expect on a product of this type, and the sounds, while not uncompromisingly accurate, are responsive and very usable. I particularly liked some of the clean and gently overdriven sounds, though anyone who gets off on chainsaw guitar sounds should also be able to find something to their liking. Finally, the V-Amp costs less than its competitors in the UK, yet comes with a nice footswitch and a bag, which means that a lot more people will now be able to afford a modelling guitar preamp for recording or rehearsal. **SOS**



“The rings of LEDs around the encoders are a great improvement on the conventional pots found on most other low-cost guitar preamps of this kind, and as soon as you select a patch you can see exactly what settings were used to create it.”

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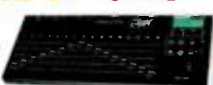
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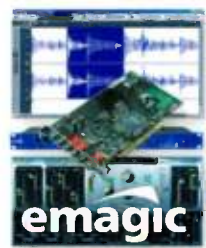
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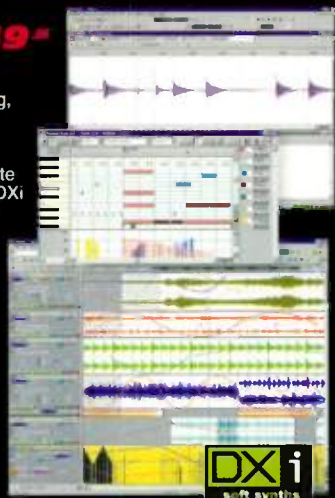
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ROLAND MC307



ROLAND MC307 GROOVEBOX

play mc for me

Roland followed their first MC303 Groovebox with the well-specified MC505. Now there's the MC307, with a spec more like the 505, a price closer to that of the 303, and more DJ-friendly features. Mr **Paul Nagle** puts a record on.

It should not be forgotten that Roland's first forays into programmable accompaniment in the early '80s gave the world the TB303 Bassline and the TR series of drum machines. Of course, these machines only achieved worldwide desirability when used in a way never anticipated by their creators, and only after the original machines had passed out of Roland's product line. Musicians pleaded with Roland for many years to recommence production, but they refused to simply remake the old analogue machines. Eventually, in 1996, Roland turned to digital technology and designed something new:

the MC303. They bestowed upon it the title 'Groovebox' and crammed into it samples of the classic instruments that dance-music producers (in particular) had been asking for. Everything was housed in a robust metal box complete with internal effects, a pattern-oriented sequencer, and some knobs to tweak during playback. But the MC303 was not without its limitations; not least that its timing could be quite shaky once you asked it to do too much. Its single stereo output, cryptic display and lack of a user area for patches all caused frustration if you tried to push its boundaries. Thankfully, Roland addressed most of its shortcomings with the excellent MC505, whose list of improvements included multiple outputs, additional controls, an improved tone generator, LCD, better effects and user patch locations. All those enhancements didn't come cheaply, at just under £1000 in the UK, and it was only to be expected that Roland would seek a 'middle way'; a means to offer MC505 functionality at a lower cost. The resulting spin-off is the MC307, and if its name seems to have been created by a random number generator, at least its function is clear: to make dance music more accessible than ever.

Sibling Rivalry

Internally, the MC307 has much in common with the MC505, reviewed extensively in *SOS* April 1998

ROLAND MC307 £699

pros

- Bags of good sounds, rhythms and riffs instantly available.
- Plenty of user patch locations.
- 64-note polyphony.
- Flexible synthesizer engine.

cons

- Single stereo output.
- External power supply.
- No Low Boost feature.
- Poor timing in Song Mode if individual patterns are (moderately) complex.

summary

The MC307 is a slimmed-down MC505 with an even greater selection of presets on board. With its large collection of dance patterns and 'hands-on' interface, you can get down to track construction with the minimum of fuss, although that single pair of outputs means you need to be satisfied with onboard effects processing. If you plan on using Song Mode, keep your musical data simple or be prepared to experience timing instability.

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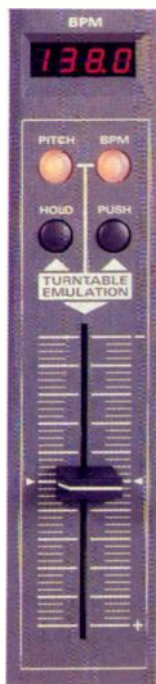
ROLAND MC307

► (see www.sospubs.co.uk/sos/apr98/articles/roland_mc505.html). It features the same impressive synthesis engine consisting of four 'Tones' per sound, each with a multi-mode digital filter, twin LFOs, and envelopes for pitch, filter and output stages. Polyphony is a healthy 64 notes maximum, the unit is up to eight-part multitimbral (seven 'Instruments' and one 'Rhythm Track') and many of the programming options have their source in that studio standard, the Roland JV1080. Ten 'structure' algorithms control the routing of tones through filters, the booster section, ring modulator and amplifier. As on Roland's JV and XP series of instruments, these structures offer deep programming potential, so it's great to see them on the MC307. It is externally that the differences between models are most apparent. At just over two kilograms, the MC307 feels lighter than its size (422 x 277 x 98mm) suggests. All the knobs and switches feel positive enough to be used for on-the-fly tweaks, even in a demanding live context.

The back panel reveals several obvious cost savings in comparison to the MC505. Most significantly there is just a single stereo output (the MC505 has six outputs in total) and the power supply is via an external adaptor. As on the MC505, there is no dedicated MIDI Thru; instead the MIDI Out is configurable for either duty. Even Korg's Electribes have three MIDI sockets, so I don't see a good excuse for this. A pedal input, on/off switch and Phones output are the remaining items of interest.

The black wedge design surrounding the backlit LCD and multi-function knob matrix gives the MC307 its distinctive appearance. A silver metal panel upon a black plastic base contains the bulk of the user controls, with the now-familiar 16-key mini-keyboard (B to D) running along the bottom. To the right of the unit, a long-throw slider provides 'Turntable Emulation', something new to a Groovebox — we'll return to this in a moment. For the time being, I was pleased to note a dedicated tempo display above the 'turntable' slider and also that the transport controls were a step up in quality from the MC505, resembling those used on the VS series of workstations. If you have seen earlier Grooveboxes, the front panel should hold few surprises. The design is intended to encourage instant gratification and, although this version has less dedicated controls than the previous models, its user interface is still quite intuitive.

Several features that I liked on the MC505 didn't make it into the 307. These include the dedicated mixer and envelope sliders, the 'Low Boost' function (with its speaker-warping 'Octave' switch), and the D-Beam controller. This latter offers plenty of pose value and some genuinely cool performance tricks so, for me, it is sadly missed. Roland did add some facilities not present in the MC505, though, which perhaps suggest that a more specialised role is intended for the MC307.



Don't dismiss the Turntable Emulation slider as a DJ-only function; it provides a great means of real-time tempo and/or pitch control.

Of these, the Turntable Emulation slider (see left) is new to the Groovebox range, and was surely added with the gigging DJ in mind. It consists of a large center-detented slider, Hold and Push buttons, and two backlit buttons enabling slider control of pitch, tempo or both at once. If you activate both, and set a Pattern playing, the slider can then be used to mimic the effect of transposing a sample loop in real time. By setting tempo in this way, you can sync up to an external source by ear. Actually this was no problem on the MC505 either, using tap tempo and then tweaking with the alpha dial. The MC307 retains the tap-tempo method too, so you can choose which way best suits you.

Another new feature is the Grab switch. This was previously seen on the Roland DJ2000 mixer, and activates effects in a user-configurable way, determined via an assignment screen in Pattern Edit mode (more on Pattern creation later). Once set up, you could use the Grab switch to activate, say, a delay on some of your multitimbral instrument parts while a multi-effect such as a flanger is routed to others, and yet others remain completely unprocessed. The switch has three states: On, Off and 'Grab', which remains on while you hold it, but springs back to off when released. Grab may not sound radical, but it's fun, and can even be quite dramatic, depending on your choice of effects and the parts you process.

In Use

For live performance, it's great to have a one-knob-per-function interface, but the MC307 takes a more minimalist approach, trimming down physical controls to those deemed essential. Thus there are knobs for filter cutoff and resonance, LFO depth and overall volume, and there are switches for filter type and LFO waveform. The LFO switch has a second function: if held down, an Assign menu appears in the display, allowing you to direct LFO output to pitch, filter or amplifier. However, if you want to alter modulation frequency, you need to delve into the (very detailed) Patch Edit menus. If scrolling through menu options doesn't get your juices flowing, there is an alternative that might just provide enough tweakability. Below the LCD are four knobs whose functions vary according to the setting of a small button. Four small arrow-shaped indicators show which row of options is currently active; the rows are labelled with the function each knob will perform. They include Reverb time, Pan, multi-effects parameters, Arpeggiator Range and the attack/release components of the envelopes. If this isn't enough, the knobs may also be programmed with user functions: 10 fully assignable configurations into which you can store the parameters you need to hand. Although these don't cover anywhere near all the options that Patch Edit

Spec At A Glance

- Polyphony: 64 voices.
- Patches: 800 Preset, 256 User.
- Rhythm Sets: 40 Preset, 20 User.
- Patterns: 240 Preset, 200 User.
- RPS Patterns: 470.
- Songs: 50.
- Effects: Reverb (six types), Delay (two types) and Multi-effects (25 types).
- Multitimbrality: eight Parts (one rhythm track, seven 'instrument' tracks).
- Arpeggiator: 43 Preset patterns, 10 user.
- Extras: Turntable emulation, Grab switch.
- Resolution: 96ppqn.

MC Sounds

With no less than 800 preset patches and a further 256 user locations, Roland have tried to ensure that they provide something for every possible taste. A glance through the Reference Manual shows many of the base waveforms to be variations of TB-this and Bass-that, along with many, many percussion sounds, and effects. There are plenty of 'standard' waveforms too, so if you're in need of bagpipes, pan flutes or some really cheesy saxophones, you're in luck. I felt that many of the instrument samples paled in comparison with the more synthetic ones; the former sounded lifeless and lacking in presence. For example, the piano, with its short samples, works well in the context of a dance track, but is obviously not designed for Chopin. This doesn't necessarily conflict with the Groovebox philosophy, and many of the preset synth patches are great.

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ROLAND MC307

► offers, they may be sufficient for most live performance needs. As they are named simply U01-U10, though, you must remember which configuration contains which definitions! The MC307 arrives already programmed with the most useful elements pre-assigned; select one definition and the knobs become an ADSR envelope for the filter. With another definition, the knobs take over four of the arpeggiator parameters. I particularly enjoyed setting one of the knobs to control key shift and then applying this to the currently selected part during playback. Key-shifting an entire drumkit in this way was an impressive effect, one that I have yet to tire of. You can select new assignment configurations during playback, and even reassign individual knobs without stopping the music.

To go still deeper into a patch, the 136 x 32-pixel graphical LCD may seem small, but it's actually an improvement over the one on the MC505. Navigation is performed by a hierarchical menu system with soft buttons and the four assignable knobs for parameter edits. Initially I could find no way to display the name of the onboard waveforms until I stumbled across the 'Rhythm Part View' button which translates a waveform's cryptic reference into a name (eg. A068 into 'Ac Piano'). I did eventually find mention of this in the manual, despite an index designed to confound Sherlock Holmes.

Tempo-aware Effects

The MC307 offers three separate effects blocks: reverb, delay and multi-effects. You can set effect levels independently for delay and reverb, whilst the multi-effect acts as an insert: either on or off for each part. Rhythm parts may have separate delay or reverb levels for individual instruments, although I found the setup procedure for this rather involved.

There are six types of reverb and two delays, one short and one long. For a full list of effects, see the box on the right. The Isolator, by the way, is another DJ-friendly effect new to the MC307, whose function is to cut volume in three specific frequency ranges (Low, Mid and High).

Many of the effects allow tempo-aware settings to be made so, for example, you can set delay times, or tremelo, chorus, flanger, or auto-pan effects to sync with the current tempo at various intervals. The overall quality is good; I particularly enjoyed the Radio Tuning effect, which introduces a tuneable high-pitched whine while processing your part to sound as if it's been through a low-quality speaker.

The MC505's 'Low Boost' feature has not made it across to the 307, so you have to use the multi-effects to beef up a drum pattern or bass line. If you do, you're limited to those effects that feature a built-in 'Low Gain' parameter — and not all of them do. Of course you can boost the entire output at your mixing desk, but as there are no individual assignable outputs, separate EQing of even the bass drum is sadly impossible. Even one assignable output would have been very welcome.

Patterns & Songs

As with all the MC Grooveboxes, the MC307 is a



The main part of the MC307's front panel. There are fewer physical controls than on the top-of-the-range MC505, but Roland get around this by offering four soft buttons and four knobs with three different function sets, accessed by the black button to the left of the first knob. It's a neat, flexible control system.

pattern-based device at heart. An MC307 Pattern can consist of between 1 and 32 measures and feature up to seven 'Instrument' tracks and one rhythm track. Of course, an 'Instrument' can be a percussion part too, so it doesn't take much effort to turn this Groovebox into a mega-powerful drum machine. For its rhythm part, the MC307 has 40 preset kits, and a further 20 user kits can also be created and stored.

Pattern creation may be in real time or step time, taking input from the onboard mini-keyboard or via an external MIDI source. Sadly, you can't just pop into real-time record mode during playback — you need to stop first — but other than that, everything you'd need is here, plus a few more esoteric features. For example, during real-time record, the Erase Menu option lets you clear data by type and, if it's notes you want to chop, you select the range of notes to delete by simply holding down keys.

Step-time recording (known as TR-REC) is very simple: you input notes spaced according to the setting of the Scale button, activating steps by pressing the appropriate key on the mini keyboard. There is even a TR808-style Rhythm Grid, accessed using the Rhythm Part View button, although you can't use this during playback.

With 40,000 notes available, there should be sufficient space to record lots of dance patterns. Of course, this is less than half the capacity of the MC505 and, at this stage, I should reveal that the MC307 also lacks its predecessor's SmartMedia card slot, so if you want to offload your patches and patterns, you'll need an external MIDI sequencer.

Once you have created some Patterns, up to 50 of them may be chained into an original Song; the MC307 can hold up to 50 Songs internally. Each Song can draw from a pool of 240 preset and 200 user Patterns, and creating one is a simple matter of choosing the playback order of the Patterns. You can make temporary overrides, perhaps muting parts or altering effects settings, and these overrides are then stored in the song. As with most pattern-based sequencers, if you alter the musical data in an MC307 Pattern, this will affect any Song that refers to it.

While trying out Song mode, I discovered some rather alarming timing glitches that occurred when I chained several patterns together. The MC307 clearly struggled to cue up the next pattern during playback, resulting in a slight delay before the new

MC307 Multi-effects

- Four-Band EQ.
- Spectrum.
- Enhancer.
- Overdrive.
- Distortion.
- Lo-Fi.
- Noise Generator.
- Radio Tuning.
- Phonograph.
- Compressor.
- Limiter.
- Slicer.
- Tremolo.
- Phaser.
- Chorus.
- Space-D.
- Tetra Chorus.
- Flanger.
- Step Flanger.
- Short Delay.
- Auto-Pan.
- Feedback Pitch-shifter.
- Reverb.
- Gated Reverb.
- Isolator.

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ROLAND MC307

▶ pattern started or even (occasionally), an irregular burst of notes. True, my patterns contained a few pitch bends and moderately fast hi-hat patterns, but they all looped smoothly in Pattern mode. If you intend to use Song mode, be aware that you might need to simplify some of your patterns, unless Roland have found a fix by the time this review is published.

Arpeggiator & RPS

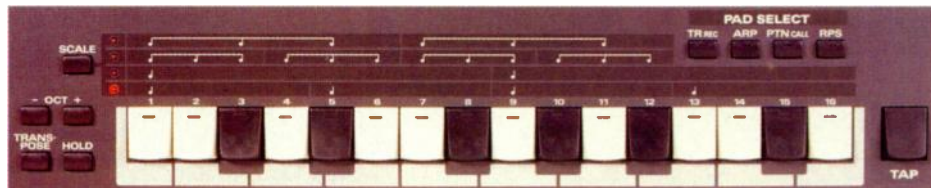
The arpeggiator is very comprehensive, offering 43 preset patterns and space for 10 user configurations. There is an impressive number of parameters to control arpeggiation, including style, motif, beat pattern, shuffle rate, accent rate and octave range. Some unexpected styles are included too, such as waltz, *bossa nova*, *salsa*, *mambo* and *samba*. Fortunately, the more everyday arpeggio modes and patterns are all present, including our old friend Random, and since the MC307 has a dedicated Hold button, its arpeggiator is even more useful than the one in my Roland XP80 workstation.

If the arpeggiator is marvellous, the RPS (Real-time Phrase Sequencing) mode remains an oddity. Although Roland add this to many of their instruments, it seems to be largely ignored by many users. With around 470 preset RPS patterns available, Roland clearly think we should get into them. The RPS mode is intended to add extra riffs in time with the current pattern, perhaps a drum roll, bass line or set of effects — and very effective it is too. Once activated (by a dedicated switch), up to 16 phrases can be called up at once in an 'RPS Set', the phrases corresponding to each key of the mini-keyboard. You can then trigger them by holding down one of the mini-keys or from an external keyboard. To make phrases continue playing, you depress the Hold key at the same time as the relevant phrase key (or keys), at which point it/they will loop. Phrases even play when the pattern is not active, so you can use them as intro sections before bringing in the main pattern with the transport play key. It's a bit of a shame that RPS and the arpeggiator are mutually exclusive: switching on one of them deactivates the other. There are 60 user locations for RPS sets.

If you activate RPS patterns during playback, you can exceed the usual limit of eight multitimbral parts. However, the manual does warn that phrases containing a large amount of data can adversely affect your playback timing. A phrase is available for triggering from each of the 16 keys in addition to your normal parts, so you really can cause mayhem if you put your mind to it.

Conclusions

I briefly owned the first Groovebox, the MC303, several years ago, so I can attest to the desire for an interactive 'one-box' gigging machine for drums, bass, arpeggios, and so on. If anything, with this latest model, Roland have narrowed their definition of what a Groovebox should be, and made it more dance-specific. Yet if you choose to ignore the



marketing, style and feel of the MC307, you could bend it to your will and push it beyond the dance genre. Of course, if you're not that way inclined, you will find a lot of preset sounds and patches on board that may not appeal to you. You could also argue that new features such as Turntable Emulation are unashamedly dance-oriented and therefore appeal, say, to DJs, to the exclusion of anyone else.

However, I think the MC307 still has plenty to offer the non-dance musician. I found Turntable Emulation a valid means of tempo control and the Grab Switch was useful for instant effects variations. Nevertheless, I would still hand back these new features in return for a couple of assignable outputs and/or better timing stability — and moreover,

The mini-keyboard allows both real-time and step-time note input. The four buttons on the right determine the exact function of the mini-keys: Step-time record, Arpeggiator editing, Pattern call-up for on-the-fly chaining, and real-time phrase selection (RPS) respectively.



I can't imagine that any dance-music *aficionado* could feel differently. The timing problems I experienced in Song Mode felt pretty fundamental and the lengthy time it takes to save a patch makes me wonder if the MC307 is already working as hard as its technology allows. I hope Roland provide a solution for tighter note-on playback, otherwise Song Mode will be a source of great frustration.

Ultimately, of course, it will be price that determines whether a punter chooses the MC307 or stretches a little further for the MC505. You may disagree, but personally, I'd save up the extra and go for the latter, with its individual outputs, D-Beam, Low Boost function, internal power supply, SmartMedia slot and dedicated controls. **EOS**

The MC307 has fewer audio outputs than the MC505, offering just a single stereo pair.

information

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System Settings

It will come as no surprise to seasoned *Sound On Sound* readers that System Settings is the area where you may alter the global behaviour of the instrument. Many pages of options lurk beneath four sub-menus, including master effects on/off, master tune, pedal assignment, memory status, grab switch mode, data transfer, synchronisation settings, and so on. It is here that you can specify whether incoming MIDI will affect each part and whether the internal sequencer controls internal or external MIDI instruments, or both. I was surprised to see that the MIDI channels used by each part cannot be changed. If you want to play the arpeggiator, RPS patterns or the currently selected part from an external

keyboard, set the Remote Keyboard option to On. Or, if you wish to use the 307 as a multitimbral module, set Remote Keyboard to Off. If you locate System: MIDI and set the MC307 to MIDI Mode 2, the most important parameters are given specific MIDI controller numbers which are both transmitted and received. Patch, pattern and song write commands are located here too.

The MC307's write operations are very sluggish — it takes over 10 seconds to write a user patch! Finally, perhaps because Roland realise how skull-splitting their filter's resonance can be, there is an option to restrict its range in both Rhythm and Normal parts, which is handy.

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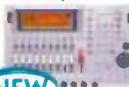
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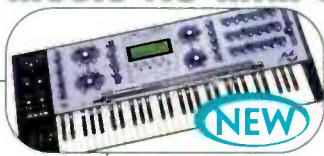
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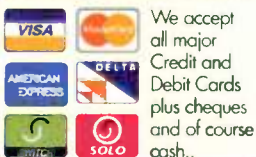
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UNIVERSAL AUDIO 1176LN



universal appeal

It was in 1966, when even I was still too young to know or care, that Bill Putnam first started work designing his 1176 limiting amplifier. Evolved from the popular Universal Audio 175 and 176 valve limiters, the 1176 retained many of their proven qualities, whilst combining it with the latest solid-state amplification derived from the company's successful 1108 preamplifier.

Inside A Classic Design

The Field Effect Transistor (FET) had only recently become available and Putnam found a way of using this new device as a voltage-controlled variable resistor, and thus as the gain-controlling element of a compressor. The fundamental problem facing Putnam was how to keep the device operating within its linear region, in order to keep distortion sufficiently low. After much experimentation he eventually hit upon the simple and elegant idea of using the FET as the bottom half of a voltage divider circuit, across which the audio signal was applied. This voltage-controlled attenuator he then placed ahead of a solid-state preamplifier stage and line driver, and derived its control voltage from a relatively conventional level-sensing circuit monitoring the output.

During this period, professional audio equipment employed 600Ω input impedances and consequently demanded a lot of signal current. As a result, output stages had to be pretty beefy and Putnam addressed this with a Class A amplifier based around a special custom-wound output transformer, the performance of which became crucial to the sound of the 1176. This transformer performed two functions simultaneously: it converted between the unbalanced internal circuitry of the limiting amplifier and the balanced external connections; and it also provided the correct impedance-matching for the 600Ω line.

However, Putnam knew that transformers are notorious for introducing distortion, so he used additional sets of secondary and tertiary windings to provide feedback signals — a practice already commonly employed in valve amplifiers. In this way

UNIVERSAL AUDIO 1176LN LIMITING AMPLIFIER

More than 30 years after the original 1176 was introduced, it has been put back into production by the designer's sons. **Hugh Robjohns** investigates the latest and most authentic reproduction of this classic 1960s compressor.

the transformer was enclosed within the negative feedback of the output amplifier and its non-linearities were compensated and corrected for automatically, producing very low output distortion.

Putnam's original design of the Universal Audio (later Urei) 1176 Limiting Amplifier was launched in 1967 and did very well for itself, but in 1970 it received a significant update largely designed by an engineer called Brad Plunkett. His modifications improved the noise performance tremendously and resulted in the 1176LN ('Low Noise'). There have been numerous revisions and updates since (see 'Design History' box), but the D and E 'black-face' LN versions are widely believed to be the best-sounding models, and it's these that have been incorporated into the 1176LN which is under review here.

The pages of *Sound On Sound* have already seen one reincarnation of the 1176, the Purple Audio MC76 which was reviewed back in November 1999. However, the thing that makes this Universal Audio model so special is that every effort has been made to ensure that it is an exact, authentic replica in every possible detail. With the exception of changes made to comply with CE legislation, no attempt has been made to modernise the design of the Universal

UNIVERSAL AUDIO
1176LN £2344

pros

- An authentic replica.
- The classic becomes easy to get hold of, at last.
- Sounds great on almost everything.

cons

- Expensive.
- Requires a slightly different working approach than with modern compressors.
- Setting up stereo linking is *Elm Street* territory, and is best avoided!

summary

By far the most authentic replica of this classic limiting amplifier to date, built by the sons of the original inventor. Every rack should have at least one of these fabulous processors, which seem able to impart a special magic to almost everything passing through them.

SOUND ON SOUND

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Featured band: Cosmic Rough Riders

UNIVERSAL AUDIO 1176LN

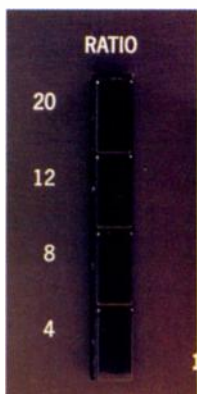
▶ Audio 1176LN. Universal Audio claim that their 1176LN re-issue is as faithful to the original, in terms of components and construction, as you can get. Internal construction is, as might be expected, on a par with the originals, showing the same hand-wiring and classic 1970's approach to circuit board layout: most of the critical active devices are mounted in sockets, all components are identified, and both the top and bottom casing panels can be removed for easy maintenance.

Guided Tour

The front panel of the strong 2U steel chassis contains a pair of large input and output level controls, both scaled from infinity up to zero. Between these is an unlabelled hole which provides access to a calibration trimmer for the meter zero position (when in gain-reduction mode). Next, a smaller pair of knobs determine the Attack and Release time constants — both are scaled from one to seven, though the faster settings are obtained at the higher numbers, the opposite of what you'd normally expect. The attack times range from 800 μ s to a very fast 20 μ s, and the release times span 1.1s to 50ms. A back-stop switch on the Attack control provides a bypass condition.



Two columns of four interlocking buttons are arranged either side of the illuminated VU meter. The left column determines the compression ratio with options for 4:1, 8:1, 12:1, or 20:1. An unintended, but popular, aspect of the 1176 is that pressing combinations of buttons simultaneously, you can create a number of not entirely predictable compression effects. Although there is no physical threshold control on the 1176LN, the threshold setting is varied internally depending on the selected ratio — the higher the ratio, the higher the threshold — and this is very logical and practical. For example, the specifications suggest the internal threshold is -25dBm for a 20:1 ratio, falling to -32dBm at a 4:1 ratio. (Incidentally, the use of the 'dBm' for the relative



levels here is correct, as the unit is intended to interface with 600 Ω impedances. In practical terms, the dBm value equates directly with modern dBu terminology.)

The column of switches to the right of the meter provide a variety of house-keeping functions. Any of the top three of these will switch the unit on, while



While the 1176LN's metering can be switched to show either the amount of gain reduction or the output level, the latter increases the level of noise and so would not normally be used after levels have been set.

the bottom one powers it down. The top button switches the meter to show the amount of gain reduction while the central two buttons display the output level referenced either to +8dBm or +4dBm levels. Since the latter two modes can introduce a little more distortion, they are not normally used except when setting up.

The rear panel is a replica of the original 1176, complete with terminal-strip connections. The only concession to modern technology is the inclusion of an IEC mains inlet, with integral fuse holder and mains voltage selector. XLR sockets are provided for the main audio input and output — there's only one of each, as this is a strictly mono unit. The seven-way terminal strip can be used to make hard-wired audio connections (in parallel with the XLRs) with solder-tags or bare wires, and the metering signal is also available to allow a remote meter to be connected, if required.

Finally, there is a phono socket labelled 1176SA, which is used to link 1176LNs for stereo operation and this has always been the weakest aspect of the 1176 design, to my mind. No simple cable connection between two units here, but a special 1176SA adaptor module, and battery-powered at that! What's more, you have to manually align the FET bias voltages using a trimmer on the adaptor, if you want to get a pair of units working reliably together in stereo.

“The 1176LN is judged by many to be unsurpassed as a vocal compressor...”

Design History

Following its introduction in 1967, the 1176 limiting amplifier has seen many revisions and updates through its long life. The original version was denoted the 1176A, but was revised to the model AB only a few months later, with improvements in stability and slightly reduced noise. The following year saw the model B, with further minor changes to the preamplifier circuit. These models all featured a brushed aluminium faceplate with blue control legends.

The 1176 first adopted the black faceplate in September 1970 for the 1176LN model C, with new low-noise circuitry designed by Brad Plunkett. This circuitry was originally encased within an epoxy module, but a subsequent redesign fully integrated these improvements with the main PCB, producing the model D. The model E was introduced in the early 1970s and was the

first to accommodate European 220V mains power with a voltage selector on the rear panel.

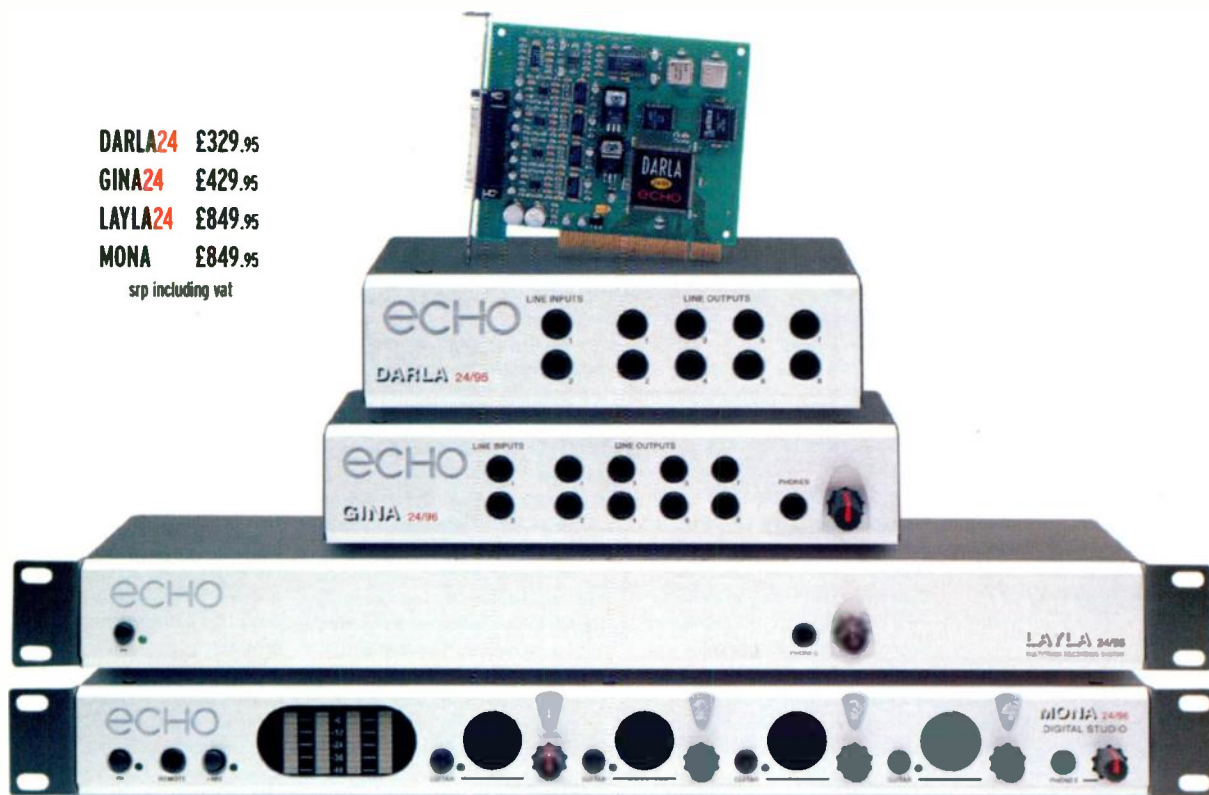
Of all the revisions, model D or model E variants are most often favoured. However, another significant redesign occurred in 1973. The model F output stage was modified to provide higher output current capability by using a push-pull circuit design borrowed from Universal Audio's new 1109 preamplifier. This new output stage replaced the original Class A circuit borrowed from the 1108 preamp. The meter drive circuit was also updated, with an operational amplifier instead of the previous discrete circuit.

The classic transformer front end of the 1176 met its demise with the model G, in which an electronically balanced input stage replaced it. The final update, the model H, simply marked a return to a silver faceplate.

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Echo Comparison Chart

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Analog outputs	8	8	8	6	2
Digital outputs	0	2 or 8	2 or 8	2 or 8	2 (8 virtual)
Analog inputs	2	2	8	4	2
Digital inputs	0	2 or 8	2 or 8	2 or 8	2
Nominal output levels	yes	yes	yes	yes*	yes
Nominal input levels	yes	yes	yes	no*	yes
Default nominal level	+4	+4	+4	See below	+4
Analog input gain	no	no	no	yes*	no
Input clocks	Esync	S/PDIF, ADAT, Esync	S/PDIF, ADAT, Word	S/PDIF, ADAT, Word	S/PDIF
Output Clocks	Esync	Esync	Word, Esync	Word, Esync	Esync
Midi	no	no	Yes	no	no
Sample rates	8, 11, 16, 22, 32, 44, 48, 88, 96	8, 11, 16, 22, 32, 44, 48, 88, 96	8, 11, 16, 22, 32, 44, 48, 88, 96	8, 11, 16, 22, 32, 44, 48, 88, 96	8, 11, 16, 22, 32, 44, 48, 88, 96
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*Mona handles nominal levels differently from the other cards. For analog outputs, the XLR connectors are +4 and the RCA connectors are for -18, so there's no software switch to change between the two. The analog inputs are controlled by knobs on the front panel, not in software by the console. Mona can handle +4 and -10 just by turning the knob on the box. There is no software switch for analog input nominal levels.

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UNIVERSAL AUDIO 1176LN

The Designer: Bill Putnam

Born in 1920 in Illinois, Putnam grew up in an era of early radio broadcasting and crude home-built electronics, and by the age of 16 was already constructing his own audio equipment. During the War he served with the US Army as a radio engineer and immediately afterwards started his own recording studio back in Illinois, the Universal Recording Corporation. At that time, recording studios had to build most of their own equipment and Putnam created the Universal Audio manufacturing company to build and market his designs.

The company relocated to Chicago in 1947, and it was here that Putnam used artificial reverberation for the first time on a pop record. The reverb in question was created using the tiled toilets at the studio, and graced The Harmonicats 'Peg-O-My-Heart', which sold over 1.4m copies. However, this was by no means Putnam's only recording innovation: he also made the first use of tape echoes, he made the first vocal booth, and performed some of the earliest experiments in eight-track recording.

His studio became much sought after, recording the likes of Muddy Waters, Bo Diddley, Chuck Berry, Tommy Dorsey, Count Basie, Dizzy Gillespie, Ella Fitzgerald, Sarah Vaughan, Nat King Cole and Duke Ellington, amongst many others. Needless to say, Putnam had a hand

in the engineering and production of many of these records, and even wrote some of the songs and lyrics as well!

By 1955 Universal Recording was probably the largest and most advanced independent recording facility in America, but Putnam sold his interest in it in 1957 to set up the new United Recording Corporation on Sunset Boulevard in Hollywood, a facility which eventually expanded to three studios, a mixdown room, three mastering rooms, and a small manufacturing plant. Once again, the list of both staff and clients quickly grew to read like a Who's Who of the music industry: Ray Charles' classic 'I Can't Stop Loving You' was recorded there, as well as Sinatra's 'It Was A Very Good Year' and The Mamas & The Papas' 'California Dreaming'. These studio facilities still exist today — as Cello Studios and Ocean Way Recording — and are considered to be some of the best-sounding rooms ever built.

The Universal Audio equipment manufacturing business continued to thrive, changing its name to Urei. The patent rights were acquired for the LA2A leveling amplifier, which was marketed under the Teletronix



Bill Putnam (front): audio designer, engineer and entrepreneur.

division of Urei, and the 1108 FET preamp and the 813 range of monitor speakers were designed and built. Putnam continued to innovate in California, building the first modern-style control rooms, introducing the first console design with equalisers in every channel and developing the feedback equaliser.

In the late 1950s Putnam could see the potential for stereo even though the record companies were not yet interested. He decided to record everything in both stereo and mono simultaneously, using separate control rooms, partly to gain experience in this new format and partly for shrewd business reasons. Inevitably, when stereo became a big hit in America in around 1961, none of the record companies had any

stereo material in their catalogue, but Putnam had amassed an enormous collection of already successful material over a period of about two and a half years. However, rather than simply selling the tapes, Putnam struck a fantastic deal where the record companies repaid all the studio time for the entire two and a half year period when he had been tying up two control rooms — this being at a time when the studio was phenomenally busy and was doing about \$200,000 worth of work a month (roughly equivalent to \$1 million a month at today's prices)!

The sixties saw yet more experimentation from Putnam, who custom-made his own 30ips tape machines in order to make recordings for some of the super hi-fi labels of the time, such as the Mercury Living Presence series. Moreover, realising that retaining the quality of these recordings when cutting to disc was impossible, he also designed his own half-speed disc mastering system in order to get the high frequencies onto his records.

Bill Putnam died in 1989, but his company Universal Audio lives on, under the careful management of his two sons, marketing re-issues of his classic designs as well as developing software plug-ins including digital versions of the celebrated LA2A and 1176LN processors.

Blast From The Past

Connecting the 1176LN is straightforward enough, though the approach to setting up the controls is a little unusual when compared to modern devices, albeit perfectly logical, simple and, above all, fast. The procedure is to set the input and output controls to somewhere around their mid-positions and then punch in the required compression ratio. The output level control can then be set to bring the music peaks to the required level, and the amount of 'squash' can be determined by adjusting the input level control — turning it up forces more input signal above the fixed threshold and into the

compression region. Finally, the attack and release times can be set to suit the material being processed.

The 1176LN is judged by many to be unsurpassed as a vocal compressor, and I would certainly agree that it can be extremely effective. It can be surprisingly transparent when used fairly gently on a 4:1 ratio, a setting whose warm, valve-like quality can be sublime on softer voices. Yet it can also accommodate the raunchiest hard compression demands too, which can be fantastic on strong, belted-out rock vocals.

The original was often also celebrated as a compressor for bass, and I certainly found the





The 1176LN's Input control pushes the signal level up against the unit's fixed compression threshold, while the Output control provides make-up gain.

re-issue's compression to cope wonderfully with the wildest excesses of electric or acoustic string basses, without changing the inherent sound or losing the essence of the player's dynamics. In fact, this unit is versatile enough to be used in a variety of applications, and can even work wonders to tighten up individual drum tracks, especially as it is fast enough to be able to control peak levels well.

The 1176LN always had a slightly bright character — more of a subtle spectral tilt than an obvious high-frequency lift — which is reproduced faithfully here and which generally helps tracks to cut through in the mix without you needing to reach for the EQ. This element of the unit's sound is one of the more significant reasons why it has enjoyed the success it has over the last thirty years.

I was only supplied with a single unit for this review, so I can't specifically comment on how easy (or otherwise) it is to link two of the reissued models for stereo operation. However, most engineers generally steer clear of this kind of application with the 1176LN, preferring to use it only on mono sources. It will be reassuring to some, though, that the option is there if they have the tenacity to pursue it.

Perhaps because of the pioneering era from which this product descends, the new 1176LN immediately seems to impart a classiness and 'rightness' to any sound which passes through it. What exactly this 'rightness' is proves hard to quantify, but few current dynamics processors have this same character while being so quick and easy to control. No wonder then that so many original units are still in everyday use after so long. Anyone who has used an 1176LN will probably have fallen in love with it, and will also be glad to hear that this Universal Audio reincarnation is every bit as good as the original — hardly a surprise given that its design is almost exactly the same as the original, in every critical way.

The only real down side with the 1176LN is its price, which seems rather steep, in the UK, at about a thousand pounds over that of the Purple Audio MC76 replica. Without having the two side by side, I wouldn't like to say which sounds the best, but the MC76 certainly received a lot of praise when it was launched a couple of years ago. Clearly, the most significant element in making a decision here is whether you would be happy with the slightly updated purple copy, or would rather have the (admittedly) classier looking 'authentic replica'. Check them out side by side if you can — but be prepared to part with your money one way or the other! **SCS**

Information

£ 1176LN, £2344.13; 1176SA stereo-coupling adaptor, £92.83. Prices include VAT.
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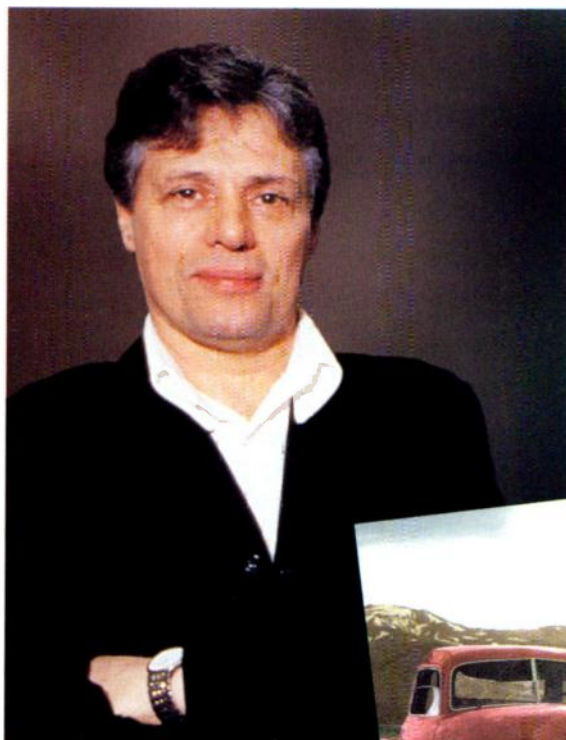
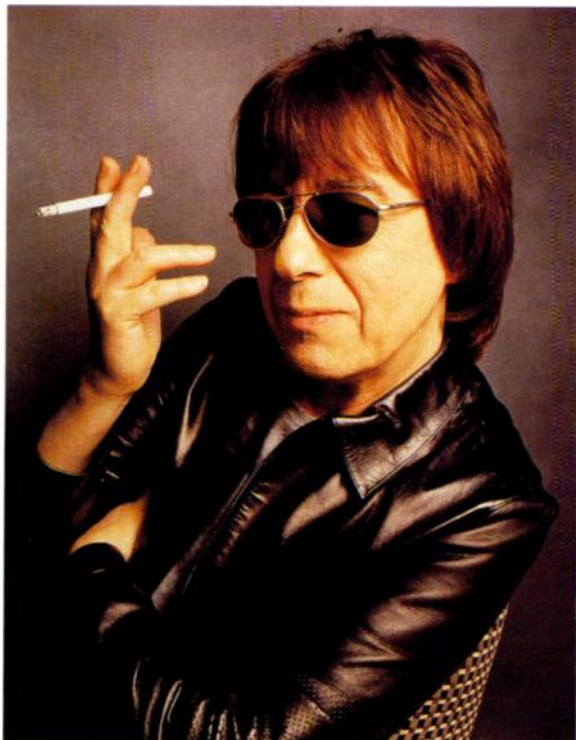
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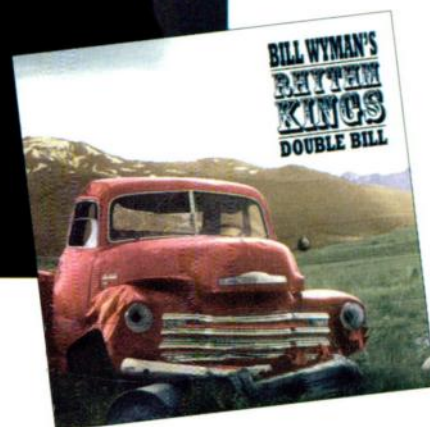
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Bill Wyman (left) and Terry Taylor.



fascinating rhythm

**BILL WYMAN, TERRY TAYLOR & STUART EPPS:
PRODUCING THE RHYTHM KINGS**

“When we did the first album, a lot of people were saying ‘Yeah, it’s great — who played the bass?’” laughs Bill Wyman. “That’s nice, innit? They just didn’t think it was my bass guitar sound, I suppose, but I’m playing it like an upright bass, with a different technique, and flat-wound strings, so it sounds more like an upright than an electric. It fools a lot of people. Of course, you can never really achieve the perfect sound of a double bass on a bass guitar. But I can’t play a double bass, because my hands are too small!”

Some people are evidently finding out that the man who’s spent more than 30 years thumping a four-string for the Rolling Stones is a more versatile musician than they thought. Bill Wyman’s post-Stones project boasts an all-star lineup that includes Georgie Fame on organ and vocals, Gary Brooker (of Procol Harum) on piano and vocals, well-known guitarists Albert Lee and Martin Taylor, along with singer Beverley Skeete, backing vocalists, a brass section and a rhythm section led by Wyman. The Rhythm Kings is a supergroup, devoted to playing the music Wyman has loved all his life. “When I left the Stones in ‘93 I didn’t want

to do any music,” he says. “I’d just had enough, I’d been playing music for almost 35 years. I just wanted to get away from it and do other things. So I did that for two years, and then I wanted to do something musically, but I wanted to do something different, so I decided to just do anything that came to mind, no matter how out-of-date it was, whether it was a music-hall song, a Fats Waller song, a Creedence Clearwater Revival song, or Donovan, or early Bob Dylan, or Louis Armstrong, or ragtime, or country, just anything that came to mind. I thought ‘Why not just do all those songs that I like, all those songs I wish I could have been part of?’”

The first person Wyman brought into his new project was guitarist and long-term collaborator Terry Taylor. Bill and Terry had known each other since the late ‘60s, and Terry had contributed to a number of Bill’s previous solo projects. “We originally thought we were going to do it as a duo,” explains Bill. “We were going to call ourselves the Dirt Boys, and we were going to do it like the Everly Brothers, with guitars and perhaps a drummer, and just sing country, early blues, and jazz. Then we got a drummer, and

After three decades powering the rhythm section of the Rolling Stones, Bill Wyman has gone back to the music he grew up with, with help from the impressive array of talent that is his Rhythm Kings. **Sam Inglis** hears how their new album *Double Bill* was made.

Bill Wyman:
**“I remember times
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 while we're running
 through the song!”**

found Dave Hartley the piano player, and that just changed the whole thing, because he's an absolutely stunning player, and he can take the simplest melody and turn it into something wonderful. So then we thought 'Mmm, it'd be nice to have a really great jazz guitarist,' and it just built — then we thought 'Oh, we've got a rockabilly song, we really need Albert Lee...”

“And then once we'd done it we thought 'Are our voices good enough?’” says Terry. “And then we thought 'It'd be nice to have a horn section', and 'Oh, it'd be great if we could have a couple of girls doing backing vocals.' We were going to try several different girls, but once we'd heard Beverley, we thought 'There's no point in looking at the rest, let's use her.' And then Georgie obviously was keen to sing a couple, and Gary Brooker wanted to sing, and Albert Lee's a good singer as well. So now we've got four top singers on each album, and five major players.”

“A lot of the songs we do were done in the '40s and '50s when it was just changing from the big band era and going into the rock & roll era, and in-between there were those eight or 10-piece combos with people like Cab Calloway and Louis Jordan,” explains Bill. “The Rhythm Kings is that kind of band — horns, piano, and a brass section, there's only two brass players but they double up, and two backing girl vocals. There was no organ on those old records, but I think that's one thing that really fits, it always works with these early songs, as the bass does.”

While putting the band together, Wyman and Taylor were also amassing a vast amount of potential material. “Bill has a *large* record collection,” explains Terry. “So we just went through it for about six months. We had six or eight C90 cassettes filled with odd songs from like Etta James and Aretha Franklin to Carl Perkins, to Little Hat Jones to Scott Joplin to Elvis. From the '30s right up to the late '70s, we just picked anything that took our fancy.”

Old-Time Music

Although they favour tried and tested recording technology, and although most of their material dates back to the middle of the last century, the

Rhythm Kings are not slavishly attempting to sound like the old records from which they take their inspiration. “If we do a song from the '30s, it won't sound like that song if you compare the two tracks,” insists Bill. “The piano playing is totally different, the quality of the sound of the piano is totally different, the guitar sounds are different. They never used an organ, and on most of them there was never a bass. Before the '50s it was very rare that there'd be a bass on anything, and then it would be an upright. Sometimes if you're doing a blues track from the '30s, sometimes there was just a bass player and a violin or something, and then on the next song there'd be a piano and a trumpet, or sometimes it'd just be a harmonica and a singer. They used really weird mixtures of two or three instruments, it was whoever could play anything on that plantation or in that small community that wanted to have a go at doing something, and they'd just get together, two or three of them.

“We do those songs, but we don't try to do them exactly the same as they were done before. What we try to do is capture the feel and the atmosphere of the song. We usually follow the same general arrangement, although we do change things a bit sometimes, but mostly we stick to the same chord structure if it's a good one, and the same melody lines, although we change them if they sound too old-fashioned. But generally, we just try to capture the magic of that moment when they recorded it, the atmosphere and the mood that they did it in. That's much more important than what everybody plays. If we're doing an old Ray Charles song, we don't sit down and analyse it and try to play it note for note exactly like he and his band did, because there's no point.”

“In fact, we don't even rehearse it,” laughs Terry. “We listen to it, and then we just run through it in the studio a couple of times and then take it.”

Kings Of The Studio

Bill Wyman's Rhythm Kings have now been a popular live attraction for several years, and when I met Bill and Terry they had just shared production ▶

Writing New Old Songs

As well as the eclectic selection of old songs chosen by Bill and Terry, the Rhythm Kings also perform new songs written by the duo in the style of the '40s or '50s. I asked them how they go about writing songs to fit in with the classic material that makes up the bulk of their sets.

“We usually mess around on an acoustic guitar, or a keyboard, get a chord sequence and a tune going, and Bill will usually write the lyrics in the style of '30s and '40s songs,” says Terry. “When we take a song in to the band, obviously they put their

bits in, which is the nice thing about it. I'll play the guitar, Bill will sing it and sometimes put a guide vocal on a rough track, but once the pianist puts his chords in in his style of playing, and Georgie Fame does his thing, it all works.”

“I always noticed when I tried to write soft rock stuff, I had some successes and some failures, as I suppose everybody does, but I never felt comfortable with it,” admits Bill. “It would sometimes take me a long time to write songs. The songs that were successful were

done really quickly — ‘Je Suis Un Rock Star’ was done in half an hour on a four-track in France, like ‘In Fashion’ and ‘White Lightning’ and all those early things I did in the '70s on solo albums — but sometimes I'd have a track and it used to take me three weeks to do a lyric, and then when the record came out, I'd think ‘I don't really like that lyric, it's too vague.’ I find writing songs in the style of a certain era, whether it's a blues from the late '20s, or a jazzy-souly kind of song from the '40s, or even an uptempo rockabilly-style

track like ‘Hole In The Wall’ — all you do is do the same thing. If you use the slang of that time in the lyrics, and the kind of chord structures they used then, it doesn't matter if you stick precisely to what notes they would have played in the '30s or '40s. You can do it more modern, but it'll still have that feel, because it's got the right changes. So it becomes much more simple for me to do a '40s song, or a rockabilly song, or an early blues, than it ever was trying to write pop. I feel more comfortable in it.”

RECORDING *DOUBLE BILL*

► duties on the band's third album *Double Bill*. As Bill explains, the Rhythm Kings' approach to recording is based around preserving the freshness and spontaneity of the band's live performances: "I remember times in the '70s when bands like Yes or Genesis or Pink Floyd spent three days getting a drum sound — three whole days getting a drum sound! We get our drum sound while we're running through the song! You don't need all that crap. I think that's well over the top, it's not necessary. In three days, we'd cut nine songs. You run through each song two or three times, make sure everybody knows it, and then you cut it. And while we're doing that, the engineer's getting sounds and the teaboy's getting the tea."

"We try to get three done a day, at least," agrees Terry. "Sometimes we do more. There's no rehearsal. We just play the band the song we want to do, they all have a listen to it two or three times, and then we go into the studio and start playing it."

"We do everything live and it's all done in three takes," continues Bill. "Every track we've ever recorded has been done in three takes maximum, mostly one or two. If it gets past that, you kind of feel that it ain't happening, so you just move on to the next song. If you're going to do traditional music like this, you have to get a bit of an atmosphere on it, like there was on the originals, and the only way to get that is to grab it while people are enthusiastic about playing, and having fun doing it. It's mostly up-tempo, good-time stuff. So if you dither about on it, and you do 10, 12, 15 takes, it becomes better played but it loses atmosphere. It's important to have most of it done live, and then you might just drop in a couple of piano notes or something. Sometimes we redo vocals because there's bleed-over of sound, and we do the horns as overdubs and the backing vocals as overdubs. And, of course, if Albert Lee's in America when we cut the tracks, then Albert will overdub; if Martin Taylor's on tour, travelling, he'll come in and overdub, so some guitar things are overdubbed here and there, but we try not to do too much overdubbing."

So what do the Rhythm Kings look for in a studio? Terry's answer is succinct: "Tape, an old desk, and some good old mics. We also like a big recording area where we can sit around, so we'd have Georgie on the organ, we've got the piano, and we've got the drums in a booth. Beverley does some live vocals, and we like to record like that, you get a better feel."

"We use a lot of old microphones, stuff that was in the Stones' mobile studio from the late '60s onwards," adds Bill. "We use valve mics for the vocals, because they're the best vocal sounds you can get really. Every vocalist that ever works with us always says to us that they're pleased with the vocal sound, and it's because of the mic. We just put them straight into the desk, and I go straight into the desk with the bass."

"We don't use a lot of computers," laughs Terry.

"There's no typewriters on our albums!" agrees ►

Engineering The Rhythm Kings

The engineering role on all the Rhythm Kings albums has been filled by the vastly experienced Stuart Epps, known for his work with Led Zeppelin, Eric Clapton, George Harrison, Cliff Richard and many others. Stuart explained in more detail the engineering approach he uses with the Rhythm Kings: "The album was recorded on two-inch tape at 30ips, non-Dolby. It was recorded on the DDA desk at the Snake Ranch. Up until now, most of Bill's albums were recorded at my studio, which started off at the Mill and then moved to Wheeler End. We used to record on an MCI desk that I had, and I found that the DDA desk at the Snake Ranch was very similar. It's got a very warm sound, similar to a Neve I suppose. It's a brilliant desk, I've never really used a DDA before, but it definitely enhances the sound."

"There was actually one particular microphone we used for all the vocals, which is an AKG C12-414. It came from the Rolling Stones mobile, and it must have been in there 20 or 25 years. We've actually used that particular mic for all the vocals, for every single vocal we've done on every single album, which is a bit weird, but it seems to work no matter whether it's Georgie Fame, Gary Brooker, Beverley Skeete or Bill singing. It's not the big long cylindrical flash C12 which costs about six or eight grand, it's a 414 in shape, but it has got a power supply so I guess there's some sort of valve in there. It's definitely got some sort of quality to it over the years."

"We always DI the bass. I've been recording Bill for 20 years, and the Rhythm Kings for four or five, and particularly on the Rhythm Kings I spent a long time with Bill trying to get the right bass sound that he wanted, which was generally as close to a double bass as possible. We tried all sorts of different bass guitars, from the very first bass that used with the Stones he built himself. I'd never even seen this bass guitar, but it was a pretty weird fretless bass that he made himself, which I think is now hanging up in Sticky Fingers in a glass case. It did sound close, because he has a very light touch, so it sounded close to a double-bass, but it still wasn't quite right, so we kept trying different things. I think it's mainly down to the way Bill plays really. He's got a very light but very precise touch, and as long as the monitoring is set the right way, somehow it tends to sound like a double bass, although he's actually playing a Steinberger. He's a very under-rated player, Bill, and if you listen to what he's playing it's kind of complex and very accurate. Maybe not many people listen that closely!"

"I always use Neumann U87s on guitar amps. I definitely prefer 87s, to get as much warmth and as much of the sound of the instrument as possible. The drums were always close-miked with fairly regular mics — some Calrecs on the tom-toms, otherwise it was an AKG 'egg' [D12] on the bass drum and a Shure SM57 on the snare. There's a drum booth in the studio we used, which tends to give the sound we want. Generally, there were a lot of other people playing — there'd be piano, bass and a couple of guitars as well as the drums, so for



Stuart Epps.

separation, the drums tended to go in the booth. But it seems to be the best way to record the sound, with it being very dry, even though traditionally the drums might have been done in a large room.

"We had a fair amount of separating to do, and we'd build barriers in the traditional way. When you haven't got an EMI or an Olympic or something, you have to build little booths with blankets and curtains and whatever you need to put over everything, and then hopefully you get the separation so you're not getting leakage all over the place. No-one's particularly blastingly loud, it's not a heavy metal band, so everyone's levels are fairly under control."

"Georgie Fame plays a Hammond. He has one that we use on the road, I think it's an M100, whereas in the studio we tend to rent in a B3 or C3. There's always a question about whether a good sound comes from the instrument or the player, and I think it's definitely the player in Georgie's case. There are settings in the instruments that he knows all about, because he's been playing them for 40 years or something, and he takes the back off, and he fiddles about with it to make it sound the way he wants, and away he goes. If it doesn't come up to the technical specification that he's used to, sound-wise, he'll mess with it a bit until it's right, and I'll mic it up in the traditional way and away we go. For the Leslies I used a pair of Calrecs on the top: you tend to have to use them with a pop shield, because they're a bit like Neumann KM84s, quite high-powered, and then something like an Electro-Voice RE20 for the low end, although I tend not to get a lot of low end with Georgie really. He gets quite a mellow tone, and you don't need a lot of low end."

"For the grand piano, I generally use two AKG C414s of the ordinary type. They have got a beautiful piano at the Snake Ranch, it's a nine-foot Yamaha and it really is a superb instrument. I know everyone is interested in what mics people use, but it wouldn't matter what mics you used on a crap piano, really, it would still sound like a crap piano, and admittedly you don't want to use crap mics on a great piano, but it is the instrument that makes all the difference, and obviously the player. Not all of the album was done at the Snake Ranch, so some of the pianos on the album were recorded at other studios — a lot of the rhythm tracks were done at Maison Rouge, and they didn't have a very good piano at all."



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RECORDING *DOUBLE BILL*

► Bill. "It isn't that we've got anything against modern technology, it's just that for what we do, it's better to use old stuff and tape, because we get a much warmer sound. If we were doing rap tracks or something, obviously we wouldn't use an old desk and old mics and all that, we'd go and use a bleeding computer like everyone else does and save ourselves some money."

"That way you spend longer doing it, though," warns Terry. "You can spend a week on a track messing around, but we've been through all that and we don't like it. Obviously it ends up digital, but we keep it in analogue right until the very last minute. And that is in the mixing process, because what we like to do is give it to someone to mix without us being there... on digital, so you've got recall. And we need recall, because he'll bring it back to us and we'll go 'No, we can't hear Martin's guitar, the vocal's not loud enough, there's too much echo on everything.' And then he can just recall it all instead of starting from day one again, like if you were doing it normally on tape. So we need that digital mixing so we can do the recall and adjust things. We used Brian Tench to do the mix, but we've got another engineer that we record with, Stuart Epps [see *Engineering The Rhythm Kings* box]. He's an excellent engineer, he gets some of the best drum and vocal sounds."

"Stuart's a great engineer, but he's not a very good mixer!" laughs Bill. "People are very good at what they do, and if you try to give them something else, they don't make it for some reason. But I couldn't mix either. I could go into a studio and spend all day on a track, and I might play it to Terry in the evening and he'll say 'Horrible'. I know I'm not a mixer, so I'll give it to someone who I think can mix it, and then listen to

the results, and then we'll make changes."

"It's just little adjustments we make really, they're very minor," explains Terry. "He gets it nearly right. He was hoping to get one track right this time, and he did, he got one out of 24. The others we had to send back!"

"Sometimes it was just a little bit more vocal, volume-wise, and a little less echo. It was just odd little things, he did pretty well," says Bill.

"We don't like too many effects, either," insists Terry. "We don't like too much reverb and stuff. We used Soul II Soul for the mix, which I think has a Neve desk, and they've got digital effects, but he hired in some old compressors and stuff as well."

"Most of the recording for this album was done in this little studio called Snake Ranch, up near the 606 Club," adds Bill. "A couple of tracks were done on a farm that used to be Alvin Lee's studio, out past Maidenhead."

"We also used Soul Studios out in Cookham, which are now owned by Chris Rea but used to be owned by Jimmy Page — a couple of the tracks on the album were recorded there," adds Terry. ►

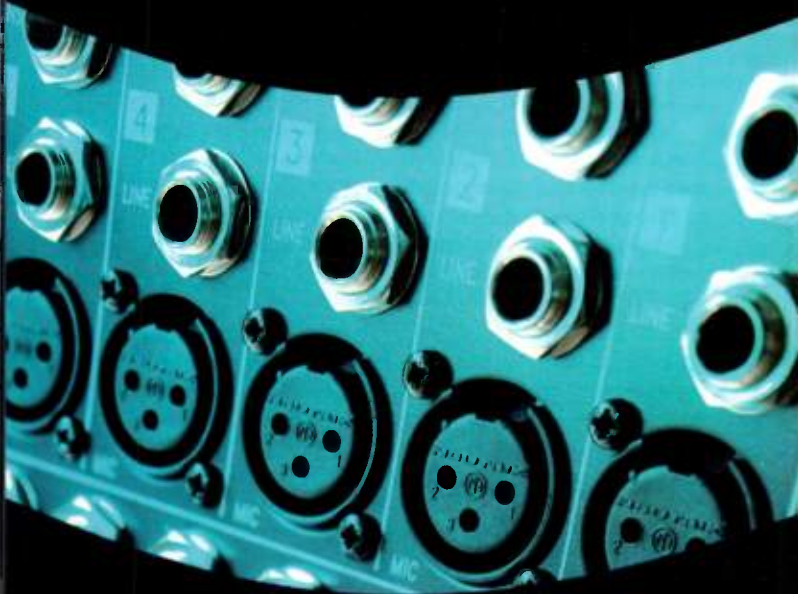
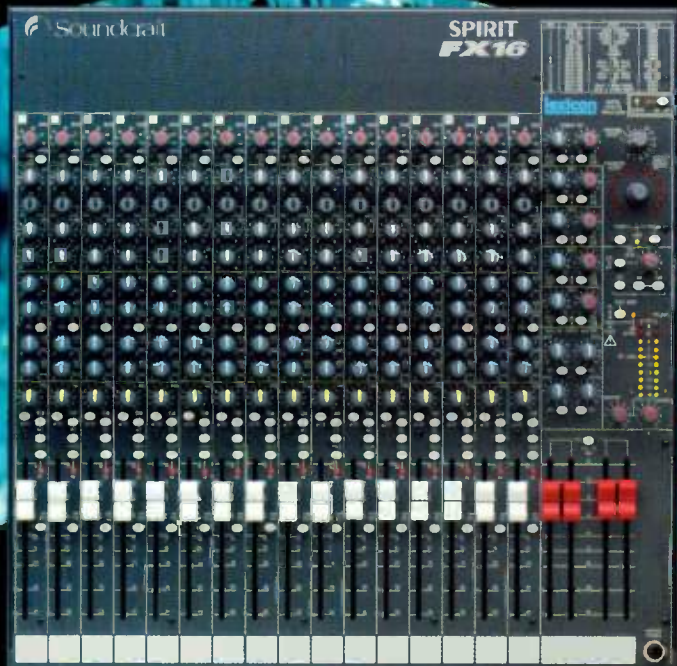
Some of the members of Bill Wyman's Rhythm Kings (from left to right), Terry Taylor, Gary Brooker, Beverley Skeete, Frank Mead, Bill Wyman, Graham Broad, Martin Taylor.

Professionalism & Headphones

Stuart Epps clearly loves working with the Rhythm Kings, and appreciates above all the sheer professionalism of all involved, which makes life easier for a recording engineer. "What you tend to find with these musicians who are all incredibly professional, is that they don't harp on about 'Oh, I can't perform, can I have a bit more of this in the headphones,'" he says. "It's important, and I like to give them a good headphone balance, but because they're thinking more about what they're

doing, and they're incredibly professional, as long as it's kind of happening in the cans, that'll be enough. You find that only it tends to be young bands or people that haven't been doing it very long that need 500 headphone mixes, it's because of their lack of musicianship really. More experienced singers don't ever comment on headphones, because they don't rely on them. It's very important that singers don't rely on headphones, they should rely on themselves."

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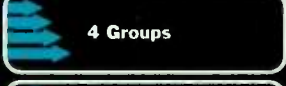
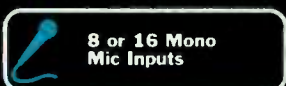
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RECORDING *DOUBLE BILL*

▶ Making Arrangements

So when you have an unrehearsed band composed of top-flight musicians playing largely for fun, what exactly is the role of the producer? Unsurprisingly, Bill and Terry see their job as largely corrective — keeping the sessions running smoothly, picking up mistakes, and occasionally suggesting alternative arrangements. “We give the musicians a free rein,” explains Terry, “because then you get the best out of them. Rather than telling them ‘You’ve got to play that,’ you just say ‘Play what you feel’. And if it isn’t right, we’ll tell them.”

“Our job starts with either choosing or writing songs, and how we’re going to do those songs, then deciding who’s going to sing it, are we going to have an organ on it...”

“Who’s going to be the main guitarist — is it an Albert song or is it a Martin Taylor type song?” continues Bill. “Is it going to be a vocal by Georgie, Gary, Albert, or Beverly? Or me?”

“When it comes down to it, I do have to say ‘Yes, that is going to work’, or ‘No, I don’t like that’,” says Bill. “Sometimes we cut a whole track and it all sounds good, but I’ll think ‘Something’s not right there’, and we’ll talk about it, and I’ll say ‘Take the organ out’. And you take the organ out, and it sounds fantastic, because you suddenly realise that what he’s playing on the organ is filling up all the inside of the song, and when you take it out, it’s all clear, and it all fits perfectly — or it might be the piano or one of the guitars, it could be anything. It just makes a complete change to the track, so I do have to have those final says all the time, and sometimes it can be a bit difficult when you’re talking to Gary or Georgie or Albert or Martin. They’re all top-class people who’ve got their own careers and their very highly acclaimed — to tell Albert Lee that his guitar don’t fit can be a bit difficult sometimes, but someone has to do it! Jeff Beck tried to play on one track, but his sound just didn’t suit any of the tracks. He’d begged me to get him on the album, he’d said ‘I’ve heard about this stuff you’re doing, I want to be on it,’ and he came down and we tried and tried but it just did not gel. He’s an extraordinary guitar player, but he’s got a certain sound, and that sound just didn’t sit on any of these tracks. But there’s no prima donnas in this band. They’re like ‘Oh, all right, I’ll try something else.’ And they do, and suddenly it all gels.”

“I think I’m more creative than Terry, but Terry’s much more musically clever than I am. He knows every chord there is. I play an E, and he says ‘No, that’s a 10th diminished with a bottom G’, or something. He knows all that shit and he’s got a very good ear, so he can hear where one of the vocals is singing the wrong note on a certain chord, or if Georgie or Gary does something wrong, he’ll correct them. It doesn’t happen very often because they’re all great musicians. Once in a while, though, it’ll sound good to me, but Terry will say ‘No, there’s something wrong on that change into the middle section,’ and then we’ll listen back slowly and he’ll say ‘It’s the girl, she’s singing the

wrong note,’ or ‘It’s Gary on the piano, he’s hit the wrong note,’ or whatever. So we work really well together because he’s got his parts that he’s really good at, which I’m not good at at all, and I think I’m a bit more creative melodically than he is, so I’ll work out the horn arrangements with one of the players, and the backing vocals, that’s where my strengths lie.”

One problem that arises when trying to record a supergroup such as the Rhythm Kings is simply getting all the musicians in the right place at the right time, as Bill explains. “They’ve all got their own working careers, they’re all gigging. Georgie Fame’s in Hong Kong at the moment, Albert’s in Nashville I expect. Where’s Gary — the Bahamas? They’re all over the bloody place. We’ll ring up and say ‘Where’s Martin? We need Martin to overdub two tracks,’ and it’s like ‘He’s in New Zealand, but he flies to New York on Thursday, and he might be back on Friday morning.’ It’s like that all the time. Or you’ll get in touch with Georgie Fame and it’s like ‘Well, he’s in Norway, he’s got to fly to Holland tomorrow, and then he’s



down to Spain for three days, and then he’s back in England overnight and then he’s off to New York. It’s a nightmare.”

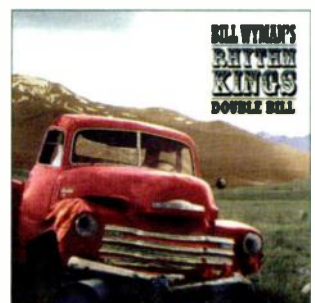
Love Letters

The Rhythm Kings are the sort of musical project that only someone with Bill Wyman’s public profile, contacts, resources and sheer enthusiasm could carry off. It’s a chance for some of the world’s most highly respected musicians to have fun playing music they enjoy, and both live and on *Double Bill*, the band demonstrates exactly what ‘good-time music’ should be all about. “We don’t make much money doing this kind of stuff,” laughs Bill. “It ain’t a money earner, it ain’t a career move or anything. We don’t sell very many copies of our albums, and it costs us quite a lot to do it, because we’ve got 12 pieces and everybody gets session fees, and then you’ve got 24 tracks to mix, so it becomes quite an expensive project. When you go on the road, you’re playing places that hold 700 to 2000, with a 12-piece band, with 12 hotel rooms and travel and so on, so on the road you don’t make much money either. Everybody ends up doing it for the same reason we do it. It’s a labour of love.” **SOS**

The Double Bill album was released on April 23rd.

Bill Wyman:

“To tell Albert Lee that his guitar don’t fit can be a bit difficult sometimes, but someone has to do it!”



DAWSONS



GREAT SOUNDS, SOUND PEOPLE

Fostex 8 Track Digital Recording System for under £370!!!

8 Tracks of Digital Uncompressed Recording along with Digital cut, copy and Paste. The Fostex VR800 has ADAT lightpipe in/out so you can use it with any digital desk that has these, or combine it with the Fostex VCB to give you 8 Analogue in/out if you already have a desk.

Fostex VR800 (with built in 100 Meg Zip Drive) only	£199
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or including the Fostex VM88 Digital Mixer	£499
Fostex VR800 (with built in 10 Gig) only	£269
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or including the Fostex VM88 Digital Mixer	£599

Very limited supplies. Please call soon on 1925 245422

Sale for the Century!!!

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Akai SO1 Sampler†	£699	£239
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Beyer M560 Mic/Headphones	£199	£145
Beyer MC740 Studio Microphone	£1199	£799
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DBX DDP1 Digital Dynamics Processor	£599	£389
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Korg I212 PCI ADAT Recording Card†	£599	£169
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LA Audio PS1 Pro (MicPre/Dess/Comp/EQ)	£599	£299
LA Audio TCX2 Tube Compressor	£299	£199
LA Audio TCX20 Tube Compressor	£299	£199
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Media One USB Audio I/O & Digital I/O	£199	£129
MUSICATOR GS Software	£299	£1
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Roland SC88 Sound Module	£399	£199
Roland U220 Classic Sound Module	£699	£229
Roland U8ST USB Recorder with Cubasis	£499	£299
Seasound SOLO EX PC/Mac Recording System†	£599	£299
SekD ProDiF Gold Lightpipe i/o Card	£399	£299
SekD ProDiF Plus PCI Card	£349	£269
SekD ARC88 Bin and Bout Analogue Card	£399	£299
SKB 4214 Keyboard Case	£199	£140
SPL Classic Vitaliser	£563	£329
SPL Transient Designer 4 Channel	£699	£429
Spirit FX8 Mixer c/w Lexicon FX†	£499	£299
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Tascam TDif to ADAT Converter Box	£175	£129
Terratec MP3PO MP3 Player (New)	£349	£299
TC Gold Channel NEW 1 only	£1761	£1199
Yamaha A3000 Sampler	£1199	£399
Yamaha CD8AE AES i/o for 02R/O3D	£299	£199
Yamaha PLGDx Board etc	£225	£179
Yamaha Promix 01 Digital Mixer†	£999	£399
Yamaha QY8 Walkman sized Sequencer†	£399	£99
Yamaha RK01 rack Ears for Promix 01	£35	£22
Yamaha S30 Synth	£999	£649
Yamaha SU200 Sampling Workstation†	£449	£229
Yamaha SU700 Sampling Workstation	£849	£559
Yamaha SY77 Workstation†	£1199	£399
Yamaha VL70M Modelling Synth Module	£599	£315

† Denotes 2nd Hand. All other equipment will be ex-demo or brand new, both with full warranty. Please call for more details on 01925 245422
This list is compiled more than a month before you see it. We apologise if an item has been sold. However we may have an even better deal for you.

Trading since 1898
Trading Securely On-Line for over 3 Years

1. By Telephone

Simply dial 01925 245422 anytime and we will be delighted to take your order. All our sales guys use the gear we sell and can offer advice and suggestions to help you buy the right equipment.

2. By Mail

Please send your order to **Dawsons/DPA 65 Sankey Street, WARRINGTON WA1 1SU, England**, with either a cheque, postal order or credit card details.

3. By Fax

You may fax your order through anytime on **01925 574495** with your credit/debit card details. Please include a daytime telephone number in case of difficulties.

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24 hour ordering service now on-line using our secure server. Also interest free credit form for electronic submission.
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You may email your purchase order to us but please include a contact number for confirmation and security checking
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6. Next Day Delivery

Provided Goods are in stock with us, or our suppliers, we can offer next day, pre-noon pre-10.30am, pre-9am, or even Saturday delivery. Please ask us for prices and details.

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If you are not completely satisfied with your purchase, simply return it in its original condition within 15 days, we'll gladly exchange it, offer you a different product of equal value, or give you a full refund. Certain restrictions apply to some products.

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Within the first 2 months of your new purchase, the product should fail for any reason, we will replace it with a brand new one, carriage paid! No other store can offer this level of service.
• Certain conditions apply

9. Price Pledge

Within 30 days of making your purchase at Dawsons/DPA, you can show us the same product(s) advertised at a lower price at another store in the UK, we will refund the difference. That way you cannot go wrong.

10. Which? Web Traders



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We also welcome Solo & Diners Club Cards



£199
Fostex VR800 inc. Built in 100 Meg Zip Drive

Electrix Filter Queen "Killer Queen!"

Both units can be racked together with the supplied Rack Adaptors into a standard 19u space

£149
Electrix Filter Queen Was £199 Now £149

Also available the EQ Killer at £149.

Combine both the EQ Killer and the Filter Queen for a **KILLER QUEEN™** Package at just £279

Fostex VF16 inc. Yamaha YSTM30 Monitors

Save a PACKET!

Limited Stocks

£869
Usually sells for £1099. Save £230 for a limited time

Fostex VM04 Digital Mixer

Ideal for use as a keyboard sub mixer, small PA Mixer. Also can be used for digital recording direct to DAT, CDR or MiniDisk due to the S/P-Dif Digital Output. This mixer usually sells for £299. You could even use the desk as a front end to the Fostex VR800 above for "on-location" recording

Buy it with a **Fostex VR800 (10 Gig) for just £335!!!**

£99.95
Fostex VM04 Digital Mixer was £299 Now £99.95

Behringer Outboard & Effects Processors

If you can't see the one you want Call us for more!

- UltraDyne** £389
A Best Stereo Dynamic Compressor. 24 Bit AD and DA converters make this unit ideal for mastering applications. Massive LCD Display allows complete control. The UltraDyne even has Tube Simulation algorithms.
- UltraFex** £99
Processes High and Low Frequencies and has a Stereo Spatializer to give your recordings a polished rich sound with crystal clear highs, and tight powerful bass end. Provides that "Professional" sound!
- Ultramizer** £149
Have you ever wanted a device which creates incredible musical and cutting power and doubles the loudness of your recordings or PA system without clipping? This unit has multiband arrangement with noise reduction.
- Composer Pro** £99
The industry standard and now improved. Can be used both on the initial recording, and on the final mixdown. Don't be put off by the price. This unit saves quality and has a built in Stereo gate XLR and Jack in/Outs.
- Tube Composer** £269
All the above features combined with 11AX7 tubes to precisely add the desired amount of tube sound to your audio. Looks and sounds superb! We only have a small number of these at this very low price. Call now!

Mixing Consoles

Soundcraft M4	£499
Soundcraft M8	£625
Soundcraft M16	£749

SPIRIT M SERIES

- 8 Analogue Ins with 3 Band EQ with swept Mid, featuring the same Mic Preamps as the Soundcraft Ghost for superb clarity (M8).
- 4 Stereo Ins - Ideal for Synths/Expanders
- 4 Aux Sends (2 pre, 2 post fade)
- 4 Dedicated Stereo Aux Returns
- +48V Phantom Power
- Can be easily rackmounted at no extra cost by sliding off the sides!
- Features a unique S/PDIF Digital Output to interface directly with your Computer's soundcard or your DAT CD-Recorder or Mini Disk for perfect clarity.

Prices start from just £499 for the Spirit M4

Call 01925 245422 or visit www.dawsonsmusic.com



Midi Control Keyboard with Synth Controllers NEW!!!

49 Keys with a built in Realtime Controller that can be used with Yamaha Sw1000XG, Soundblaster Live etc

Also Includes Steinberg Cubase

£149⁹⁵

Korg KARMA Synth NEW!!!

KARMA!

£62.50 per month

WALDORF MICRO Q NEW!!!

Polyphonic Virtual Analogue Synthesiser
*Up to 25 voices (with expansion board up to 75)
*300 sounds 100 multis 20 drum maps
*16-part multi-timbral * MIDI in / out / thru
*20 x 2 characters display *2 inputs (1 x stereo)
*6 rotary encoders
*6 outputs (3 x stereo) + headphone out on the front
*95% sound compatible with Waldorf Q

£44 per month

Reason Software for Mac or PC NEW!!!

Reason comes in the shape of a classic studio rack, packed with all the gear you could possibly need. Samplers, Analog synths, Mixers, Step time drum machines, Effects, and a realtime multi-track sequencer for fast and intuitive music making. Everything is there except the drawbacks: no tripping over cables or locating ground hum. All of Reason's 16 devices have the look and feel of the real thing. But more importantly, they have the sound, the performance and the attitude to rival any hardware out there. And you can use each device as many times as your CPU can handle. Units include: NN19 - Sampler, SubTractor - Polyphonic 2 oscillator synth, and loads more -

CALL US FOR A DEMO CD ON 01925 245422

£289

Studio Monitoring

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Spirit Absolute 4Ps (Powered)	£499
Yamaha MSP1a (Half Powered - replaces NS10a)	£249
HMB Circle 3 Passives	£239
HMB Circle 3 Passives	£315
HMB Circle 3 Active	£529
HMB Circle 5 Active	£749
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Event PS6 Active Monitors	£449
JBL 4208 Passive (Ideal for Dance - 8" Driver)	£225
Genelec 1023A Active	£499
Genelec 1030A Active	£919
Genelec 1031A Active	£1679
Genelec 1032A Active	£1600
Roland D1120A (inc. Digital Input)	£549
Roland D1100A (inc. Digital Input)	£775
Miloco HRK24 Active	£1089
Behringer Truth Active	£539
Tinnoy Reveal Passive	£189
Tinnoy Reveal Active	£199
Samson Servo 170 Amp (85+85 into 4 ohms)	£129
Samson Servo 260 Amp (130+130 into 4 ohms)	£189

£499 Event 2020 Pair

£315 Circle 5 Passives

£299 inc. Leads & UK

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AKG D880 Dynamic Microphone	£39
AKG C1000 Condenser (Works on Batteries)	£125
AKG C2000 Condenser inc. Suspension Mount	£149
AKG C4000 Large Diaphragm Condenser	£299
Audio-Technica ATR97 Boudry Mic	£79
Audio-Technica AT4033 inc. Suspension Mount	£239
Audio-Technica AT4035 inc. Suspension Mount	£199
Audio-Technica AT4047SV Condenser	£399
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AT 4033 & Focusrite VoiceMaster	£559
AT 4033 & TL Audio 5051 Voice Processor	£619

£275 NT1 Condenser

£239 NT2 Condenser

£125 NT3 Condenser

£149 NT3 Condenser

£79 ATR97 Boudry

£559 AT4033 & Focusrite

£319 AT4033 & TL Audio

Korg D16 16-Track with FX

16 Track recording onto its built in Drive. Built in effects and microphone. Direct to CD Burning to Master your recordings. Touch Screen for easy Navigation. Last few units - Hurry!

£869

Yamaha AW4416 Digital Recording Studio

Dynamics Processing on each channel for total control. 12 Gig Internal Drive gives you ample recording time. A built in Yamaha CDR Drive lets you archive your songs or burn them to a CD which can be played back in any Hi-Fi system with a CD Player

£100 per month

Synths & Expanders

Aleiss Andromeda (on demo at Warrington)	£2399
Emu XL1 Multi-Timbral Lead Module	£83 Dep + 18 x £27 0% £599
Emu Proteus 2000	£99 Dep + 12 x £39 0% £547
Emu Planet Earth (World Module)	£79 Dep + 12 x £47 50% £649
Emu Virtuos	£95 Dep + 18 x £43 0% £869
Korg Triton (inc. GigBag & Stand)	£299 Dep + 24 x £59 0% £1715
Korg Triton Pro (7 Keys with above)	£349 Dep + 24 x £70 0% £2029
Korg Triton ProX (88 Keys Fully weighted)	£2439 Call for finance deal
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Korg MS2000R (inc. AKG D880 Mic)	£79 Dep + 12 x £39 0% £547
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Supernova II Rack (36 Voice)	£139 Dep + 24 x £50 0% £1339
Supernova II Rack (48 Voice)	£159 Dep + 24 x £55 0% £1479
Supernova II Keyboard (24 Voice)	£119 Dep + 24 x £57 0% £1467
Supernova II PRO Keyboard (36)	£189 Dep + 24 x £61 0% £1633
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Nord Lead II	£119 Dep + 18 x £48 0% £983
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Nord 3 Synth	£1699 (Available on Low Rate Finance)
Nord Micro Modular	£49 Dep + 10 x £35 0% £399
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Roland XV5080 inc. SRX Board	£1699 (also includes cables to connect)
Yamaha CS1X	£49 Dep + 12 x £29 0% £397
Yamaha CS2X	£69 Dep + 12 x £44 0% £557
Yamaha CS6X	£149 Dep + 24 x £47 0% £1217
Yamaha CS6R	£99 Dep + 18 x £43 0% £873

£59 per month

£45 per month

Korg Triton Rack

£1199

- All the sounds of the Korg Triton. 32Meg Sound Rom installed
 - Up to 8 PCM expansion boards can be fitted
 - Full feature sampler with 48 KHz 16 bit mono/stereo sampling
 - Time stretch, Time Slice, Crossfade Loop.
 - Dual Polyphonic Arpeggiator. Create Drum Patterns, Guitar Strums
 - Plays back Midi Files and Triton Songs.
 - Sampler inputs can be used to provide Vocoder effects.
- Save £500**

AKAI

AKAI S2000 & 18 Meg Memory (END OF LINE)
24 Months at £22.99/month. Total 0% Credit Price £551.76

AKAI S3000XL inc. CD-Rom Player & 18 meg Memory
24 Months at £40.00/month. Total 0% Credit Price £960

AKAI S5000 inc. CD-Rom Player £59. Dep + 24 x £49
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AKAI S6000 inc. CD-Rom Player £299 Dep + 24 x £72 = £1807 0%

£49 per month

£159 Akai S2000

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AKAI DPS16 Studio

16 Tracks of uncompressed CD Quality Recording with superb built in effects and the ability to Master your own Audio CDs using an optional external SCSI CD Recorder

- True 24 Bit Recording - No Destructive Data Compression
- Sampling Rates up to 96kHz for Crystal Clear Recording
- Large 6 inch Flip Up Graphic Display
- Equipped with 10 Gigabyte 3.5" Drive as Standard
- Phantom Power allows condenser mics to be used
- Graphic Waveform Editing for accurate control of your recordings
- Complete with 4 Bus 56 Bit Effects Card Fitted

£62.45 per month

0% Deal includes a Set of Yamaha YSTM30 Monitors

Groove Zone

Ever wanted to synchronise all your Midi Gear with your Audio Gear?

The Red Sound Voyager does exactly that. Put any audio source into either of its two inputs and it will detect and display tempo. It will then send it out as Midi Clock to control your Sequencer or GrooveBox. It really is that simple! If all you have is One Audio source then pick the Red Sound MicroSync

£199

Direct Drive Turntable Kit

Complete with 2 Direct Drive Turntables, Mixer, Headphones, Carts & Speakers - Ideal for scratching. Alternatively we can supply a Belt Drive version called "DJ in a Box" for £329. All you need to experience the DJ Revolution from a Company you can trust!

For loads more deals on DJ Gear, Call us on 01925 245422 for a DJ Flyer

£479

Call 01925 245422 or visit www.dawsonsmusic.com

Roland

MC-80 Midi Sequencer



Full Stackable Mid Sequencer with the option of expansion by adding a 2.5" IDE Drive to store your songs on or by adding the VG-SP16 Voice Expansion Board to turn the MC80 into the MC80EX with high quality GM/GS sounds.

- 2 Midi Out's to control up to 32 Midi Channels
- 120,000 note memory with QuickPlay & 480TPQN resolution
- Inc. the XP-80 Arpeggiator Fully MMC & MTC compatible
- Backlit 2-Line LCD Display for easy control on stage
- 8 Footswitch ports allow remote control of play/stop, punch in/out, mark/jump or even fade out.

MC80 **£39** per month
£39 Dep. plus 12 x £39 Total 0% Credit Price £399

MC80EX Includes the GM/GS Sound Board **£45** per month
£45 Dep. plus 12 x £45 Total 0% Credit Price £599

Lexicon

Lexicon Core2 & MP100 Effects



24 Bit Resolution with 400 Sample Rate, 120dB knee limiting on every input channel, to 4 state space compression and provide 4 dB of improved headroom. The Core2 has Four High Quality Analogue Inputs, Eight Channels of Analogue Out, Eight Channels of ADAT™ Lightpipe Digital I/O and a stereo S/PDIF Pair. The supplied MP100 Effects daughterboard includes all of the effects of the Lexicon MPX100 Dual Channel Effects Processor with Chorus, Flange, Pitch, Delay plus the legendary Lexicon Reverb and Ambience. All processing is done on the card so no power is taken away from your computer.

Due to a special deal Dawsons have done with Lexicon, we are now able to offer both of these cards for just £349.95 whilst stocks last!

Only while stocks last! **£349.95**
Lexicon Core2 & MP100 Was £599 Now £349.95

LIMITED STOCKS - CALL SOON!

Macintosh Packages



Apple Mac Systems are all available on a low rate finance scheme. Please call us for details. Units will have software and hardware installed and tested prior to us sending them out. All peripherals are 100% Mac compatible and we do not use Grey Imports.

Media 2000
G4 466MHz
128 meg Ram
30 Gig Drive
CDRW Drive
56K Modem
17 inch Monitor
Yamaha SW1000XG
Steinberg Cubase VST
£2349

Media 3000
G4 466MHz
128 meg Ram/30 Gig Drive
CDRW Drive
56K Modem
17 inch Monitor
Midiman Delta 44
Emagic Logic Gold
Midiman USB MidSport
£2359

Media 4000
G4 466MHz
192 meg Ram
30 Gig Drive
CDRW Drive
56K Modem
17 inch Monitor
Design 001
£2479



PC Packages Viper 3000 & 4000

Buy a PC Package from Dawsons Music and all software and hardware will be configured and installed. All you need to do is Switch on & Go. They also include separate Graphics Cards and separate Soundcards unlike High Street PCs to make future upgrades easy.

Viper 3000
Genuine Intel PIII 800
128 Meg Fast Ram
56K Internal Modem
20.5 Gig H-Drive/52x CD
17 inch XGA Monitor
Richtek8832 CDRW
Yamaha SW1000XG
Steinberg Cubase VST 5
£1899

Viper 4000
Genuine Intel PIII 866
128 Meg Fast Ram
56K Internal Modem
20 Gig H-Drive/52x CD
17 inch XGA Monitor
Yamaha 161040 CDRW
Emagic Logic Gold
Midisport 2x2
Terratec EWS88MT
£2199

"The Hunt for Red October..."

Creamware Power Sampler

Power Sampler integrates a complete studio sampler right into your PC or Mac. Sophisticated Sampling software and the latest DSP hardware. 32 Stereo Voices - no matter what host processor you use. In fact the DSP power on this card means that virtually none of the host PC's computing capacity is affected allowing you to go ahead using VST or Logic etc. In addition the card can also be used as a highly expandable I/O package. The unit is compatible with Akai, WAV, AIFF and soundfont libraries. It also has 2 Analogue I/O, Digital I/O and can be optionally expanded up to 36 I/Os. Mid input is supported and the card comes with ASIO2 Drivers.

£30 per month
£30 Dep. plus 12 x £30 Total 0% Credit Price £399



compatible with **emagic Steinberg**

Other Creamware products available. Please call!

Emagic Audiowerk 8 Surround



2 Analogue and 8 Audio Outs. Along with Digital optical S/PDIF. Fully compatible with Windows 98/ME and Mac OS. The Audiowerk 8 Surround comes with a special version of Logic Audio. This software features 16 Stereo Tracks, real-time DSP an integrated stereo sampler editor. In addition there's a virtual mixing console, linked real-time editors, high timing resolution, real-time quantisation and AVI or QuickTime movie support to allow you to add to your home movies. The software can also support Emagic's EXS24 software.

£299 Inc. Delivery
Emagic A1W 8 Surround Inc. Emagic Surround Software

BR-8 Hard Disk Recorder with FX

An 8 Track Hard Disk Recorder with a wide range of diverse effects to suit every type of recording source including some of the best guitar effects about. Built in On Board rhythm track that doesn't use up hard drive space. Backlit display with icon selection for easy editing. Built in 100 Meg Zip Drives uses the industry standard cartridges.



£45 per month
£45 Dep. plus 12 x £45 Total 0% Credit Price £599



JS-5 Jam Station

4 Part Jamming machine with Digital Recording capability. The JS-5 can provide a variety of effects with superb sounding drums, bass and chords derived from the JS-5 sound chip including Reverb, Chorus. The JS-5 also has an audio track that time-stretches any audio depending on the Temp of the backing you use. Want to speed up a track - simple, just turn the dial!

£22 per month
£22 Dep. plus 12 x £22 Total 0% Credit Price £299

Does it Look Innocent...?

If you own a Roland VS1680/VS1880 or any of the VM7000 mixer range then you will have experienced the power and quality of Roland built in effects. Did you know that you can expand them (VM7000 range -2 more VS range -1 more)? The VS-8F2 will fit into all of the above and provide you will double the effects processing power. It features 24 bit operation with either 2 independent stereo effects processors, or 4 mono effects (compressors/gates etc). All signals and routing remain in the digital domain and the board has 210 preset patches and 200 user FX patches. It's even User Installable! If you own one of the above - Treat Yourself!



£139 Inc. Carriage
Roland VS-8F2 Normally sells for £249

Limited Deal that only applies to existing stock - Please hurry!!!

Roland SPD6 NEW!!!

Six individual rubber pads, hand and drum stick compatibility, 113 onboard percussion and instrument sounds and MIDI output.

Two footswitch inputs (for creating a compact drum set), optional battery power using six AA batteries.

£20 per month
£20 Dep. plus 12 x £20 Total 0% Credit Price £299



Mobile Computing - FIREWIRE Solutions

The MOTU 888 connects directly to the FireWire bus on your computer. No PCI or PC Card required. 8 Channels of TRS Analogue I/O. 2 Multigular Preamps with Phantom Power. 8 Channels of 24-Bit ADAT™ Optical I/O. Cuelix Plus™ provides zero latency monitoring of live inputs. Includes AudioDesk™ software for Mac OS plus ASIO drivers for all major MacOS and Windows 2000NT audio software.

- Sony VAIO Pentium III/650 Mhz 128Meg Ram/12Gig Drive 14.1" 8xDVD 56K
- MOTU 888 Firewire Interface
- AudioDesk software
- Midiman USB MidSport 2x2

Please call for details on the G4 Powerbook system



£2699 Inc. Delivery
MOTU 888 FireWire Interface

Inc.. VAT

Egosys WAMI Box Midi & Audio for Laptops



If you use a Lap top for work then you might have found it difficult to locate a decent good priced Midi and Audio interface. The Egosys Wami Box is just that. It has Optical and Co-Axial S/PDIF 2in 2out Analogue, a Midi interface, 84 Voice Programmable Multi-Timbral Synth, Mic Preamp. It even includes professional quality digital signal processors which you can use on audio input channels and Midi sounds. It also comes with ASIO2 drivers. The Wami Box even has 16 Meg of Sample Ram so that you can even use it as a sampler. You need a PC/Mac slot on your Laptop but it doesn't have to be superfast machine.

£35 per month
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Over the last couple of months we have looked at what features to consider when buying hardware for phrase sampling, where to find usable sounds and how to get them into your sampler. Well, what now? In this final part, I'll be looking at the techniques you'll need for constructing tracks using sampled phrases and, in particular, breakbeats.

Breakbeat Basics

Possibly the most frequently used type of sampled phrase in modern music is the breakbeat. Breakbeats (often shortened to just breaks) are sections of one or two bars, often taken from funk and soul records, where the music breaks down such that only the drummer or rhythm section is playing. Such sections of records were often used to give the listener a pause in the groove and to provide some musical variety.

DJs such as Kool Herc and Grandmaster Flash, who played New York block parties in the late seventies, noticed that the dancers went wild when this part of the record played. So, using two copies of the same record, they repeated such sections indefinitely, recuing each record while the other was playing and crossfading between them as necessary. Of course, with a sampler it is much easier to extract and loop breaks, allowing you to use them as the basis of a new track.

If you decide that you want to use a breakbeat (or any looped phrase, for that matter) as the basis of your track, then the first thing to do is make sure that the sample is topped and tailed correctly. But, before you even think of doing any editing, save a copy of the original sample! Believe me, getting into the habit of making regular backups will save you a lot of hair pulling.

Firstly, make sure that the beginning of the sample is trimmed as close as possible to the start of the phrase — in the case of a breakbeat this will usually be just before the kick drum at the beginning of the first bar. If your sampler has graphic editing, use the zoom function to get the start point of the sample in nice and close. Even when you've got graphical editing, though, you should still be sure to keep listening to the sample as you're editing — your ears should be the final judges of any edit, so use them.

If you are trimming solely by ear, however, it can be difficult to tell if you've trimmed all the dead space from the beginning of the sample. In this case, I always suggest pitching the sample right down (by one or even two octaves) while editing, as any empty space before the first beat will be much easier to identify in this way.

When you've sorted out the beginning of the sample, flip to the end and remove any redundant audio. It's a good idea to leave an extra beat at the end, often the first beat of the bar after the section you wish to use — this allows you a little freedom when attempting to get the sample looping

catch phrase

In the final part of this series, **Oli Bell** gives you some practical tips and tricks on looping, re-grooving and time-stretching.

PRACTICAL PHRASE SAMPLING FOR MODERN MUSIC PRODUCTION: PART 3

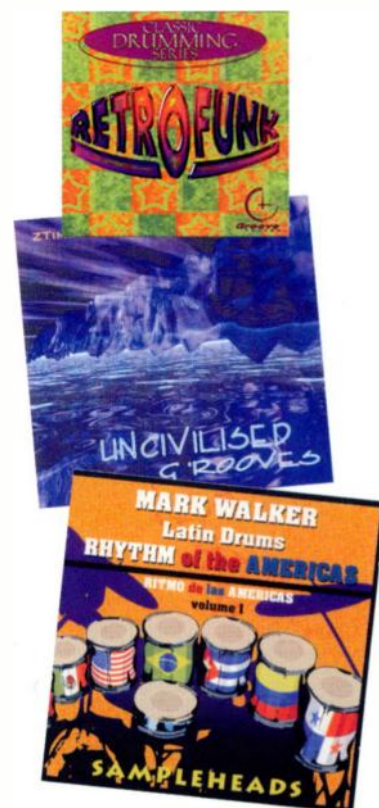
smoothly. While you're trimming the end point, keep retriggering the sample by hand to check that you are left with the correct sample data.

Looping The Loop

When the sample is topped and tailed, it's time to set it looping. While it is possible to use the loop function built into your sampler, this type of looping is designed mostly for use when multisampling, extending the sustain portion of a sample for as long as the respective triggering note is held. However, when looping breakbeats or phrases, this on-board looping has drawbacks which render it pretty much useless for creating the basis of a whole track. For a start, if you're working on a track and decide that you want to play it from the middle, then the sample wouldn't sound, as it would have been triggered earlier in the song. Also, the speed of the loop running freely will inevitably drift in timing against any parts triggering from the sequencer, and will do so in a slightly different way every time you play the track.

In short, the only sensible way to loop a breakbeat is by retriggering it every time it is needed. With most sequencers it is a simple matter to copy the trigger note however many times it is required throughout the track. If you've left a little bit of a longer tail on the sample than you need, then be sure to end each sequenced trigger note just before the next begins, and check that your sampler is set to receive MIDI Note Off as well as MIDI Note On messages.

The next thing to do is to match your sequencer's tempo to that of the loop, in order that your sequenced notes will retrigger the sample at just the right point to get it looping smoothly. If you know the tempo of the loop you are using, then you can simply enter this into your sequencer and you'll be most of the way there, but if you don't, then



While many drum sample CDs give nominal bpm's, these are often not accurate enough to use for looping the samples in your track.

you'll just have to set the sequence going and match the tempo manually, gauging the effectiveness of each tempo adjustment by ear. In fact, even if you know the nominal tempo of the loop beforehand, you should still experiment with slight adjustments to this to check that you definitely have the best match — many bpm values given on sample CDs are rounded to the nearest

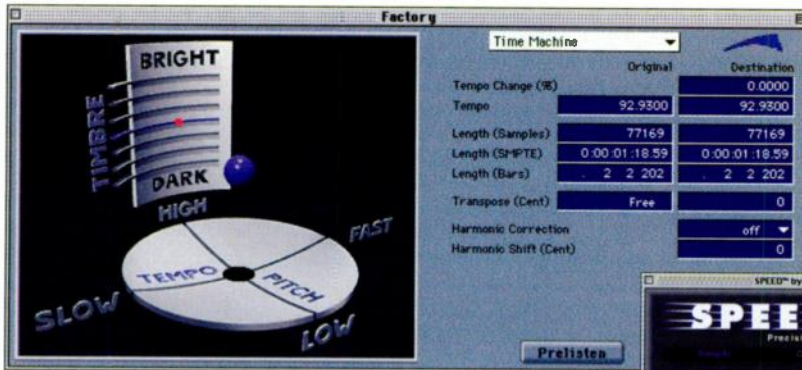
often beyond the reach of the musician on a budget. Without such a program, the simplest way to achieve tempo-matching is to change the pitch setting of the new sample, until its playback speed is in line with the track. The catch, of course, is that the required shift in pitch will not always sound appropriate.

Many modern samplers and audio editing programs now provide time-stretching algorithms which can lengthen samples without pitch-shifting. These usually work by replicating or deleting blocks of sample data, and crossfading at the edit points to make them as seamless as possible. Even though the quality of time-stretching algorithms can vary considerably, they can often work brilliantly if the amount of time-stretch is modest and can be particularly successful with samples which have few sharp transients — bass lines, for example.

Drum loops tend to not fare so well, however, especially when stretching the length of a sample beyond 10 percent or so, as you get flammings starting to creep in. With large stretches, the sampler has to work harder to fill in the gaps opening up in the sample data, and the sound begins to get quite grainy, though not without

potential for some good sonic experimentation! Try stretching a loop, recording the result, resampling, then time-stretching the resultant sample back to its original length — the digital colouring and rubbish that is introduced might be just the inspiration you need.

Another way in which you might attempt to keep the pitch of a sample constant while changing the length, would be to pitch it down within the sampler and then correct this pitch-change with a real-time pitch-shifting processor. Pitch-shifting technology has been available for many years now, so there are some good algorithms about — even if



If you use a computer for music, there are many pitch-shifting and time-stretching processors available with which you can match your sampled phrase to the key and tempo of a track.

whole number, for example.

If the sample has been trimmed correctly, and the tempo matched satisfactorily, the loop should repeat smoothly. If you have any problems getting the looping smooth, then try tweaking the envelope parameters for the sample's amplifier to make the transition a little more gradual.

Speeding Up & Slowing Down

Up to this point, I've assumed that you're wanting to use the loop at its natural tempo, but that's often not the case. Many people find themselves wishing to incorporate a loop at one tempo into a track at another, for example. There is software available which caters for this need — Sonic Foundry's *Acid* and Bitheadz's *Phrazer*, for instance — but this is

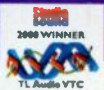
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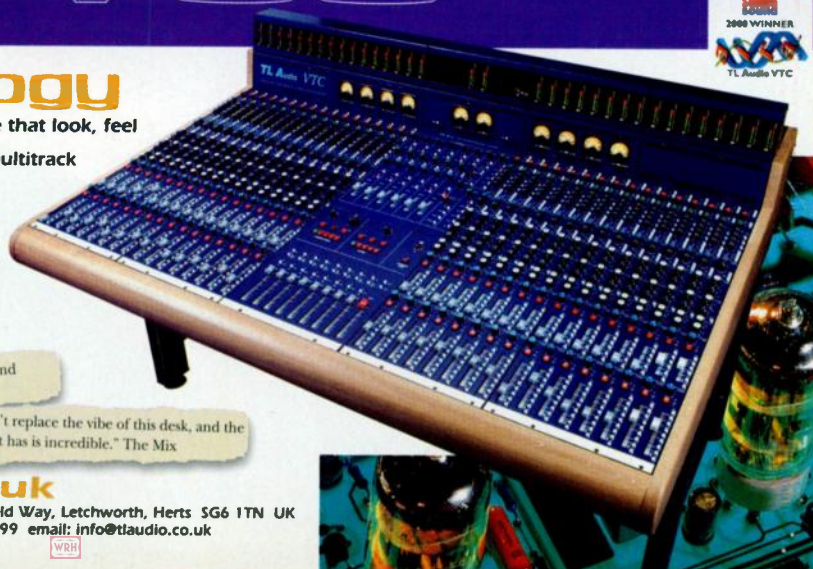
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► your pitch-shifter is a bit dodgy, the graininess which it produces may be more desirable than that of your time-stretching algorithm, so it's worth a try.

Breaking It Down

If you're working with drum loops, there is another way to match them to different tempos and grooves. The sampled phrase can be cut up into sections, each triggered from a different MIDI note, which can then be used to re-assemble the pattern at the new tempo.

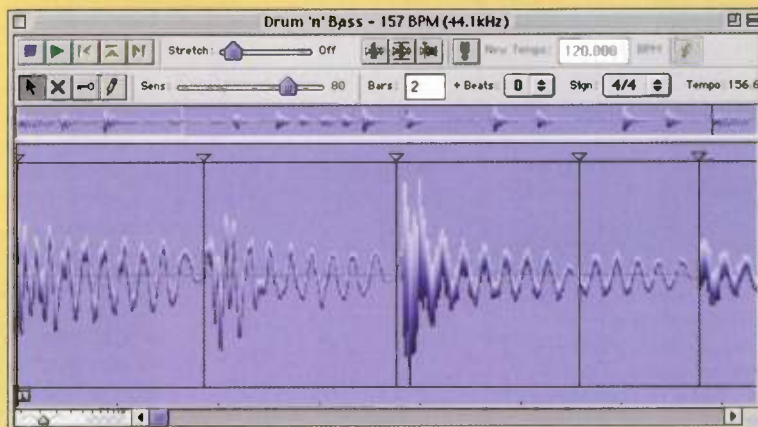
This process can be very effective, but it can also be time-consuming. Many musicians use Steinberg's popular *Recycle* software to ease this chore (see the box on this page for details), but that doesn't mean that you can't cope quite adequately using your sampler's own editing facilities, if you have sufficient patience. My first step when doing this is always to make as many copies of my original sample as I plan to have final slices of it. An average one-bar drum loop might need as many as sixteen or more copies, for example. Rename each one with a number, for example Drumloop 1, Drumloop 2, Drumloop 3, and so on. Next, edit the beginning and end points of each of the copies so that each successive element is isolated — as this is a drum loop you might trim Drumloop 1 to keep

Loop Processing With Steinberg's *Recycle*

Steinberg's loop-processing package *Recycle* came as a bit of a godsend to sample freaks and quickly found itself a welcome home in the dance producer's arsenal. It provides an easy, hassle-free way to automatically chop up loops into their component parts.

You simply import the sample in question — a number of common sample formats are supported — and then let the program find where it thinks the individual elements are. Though it's usually pretty accurate at defining the slices you want, you are given the tools

to tweak its automatically generated slice points, and also to add points of your own. Once this has been done to your satisfaction, the slices are transmitted back to your sampler via MIDI or SCSI as individual samples mapped chromatically. Finally, the program creates a MIDI file that plays back the slices in the correct order and timing, allowing you to edit or change the loop's sequence or tempo. For further details of the software's operation, refer to Paul Farrer's review in SOS May 1995.



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just the first bass drum hit, while Drumloop 2 might be trimmed to keep the hi-hat hit immediately after it, and so on. Carry on until the end of the original sample and you should have one short, trimmed sample for each of the individual elements.

Now, you need to recreate the phrasing of your original loop. For this, set up your sampler such that you can play any of the original chopped sections alongside the original complete version, but with each sample triggered from a different MIDI note. Different samplers achieve this in different ways, but there are a couple of general setup

considerations to bear in mind. Firstly, you'll have to make sure that each of the edited samples plays at its original pitch, even though they are all triggered from different notes. Also, it's usually best to set the sample-triggering of the slices to 'one-shot' mode, where samples are triggered in full regardless of the length of their MIDI trigger notes.

The first task will be to set up the original sample to loop smoothly, using the techniques I've already described, to ensure that your MIDI trigger notes are placed correctly relative to your song's measures. Once you've got the loop going, try playing along

Adventures In Pitch & Time

Because pitch-shifting and time-stretching have been used so much for making sampled loops and phrases sit together, the sounds that these processes produce have now become characteristic of many modern music styles. This means that pitch-shifting and time-stretching are now freely usable as creative effects.

Comparatively subtle shifts in pitch — a few semitones either way — can be very effective in bringing about tonal changes, especially with

percussion. For example, pitching snares up slightly sharpens their impact, whilst pitching down whole drum loops can give a fatter, dirtier feel. If your sampler responds to pitch-bend information, then try wiggling the pitch-bend wheel of your controller keyboard while different samples are playing. Some samplers even let you route an LFO or envelope generator to the pitch of the sample, so that you can program pitch manipulations to happen automatically.

Large shifts and stretches are harder to pull off without sonic side effects, but that could well be an advantage if you're into creative processing. Large upward pitch-shifts create a 'munchkinisation' which can be useful, while large downward pitch-shifts or extreme time-stretches create grainy results which have endeared themselves to many dance producers — perhaps the most notable example being Fatboy Slim in the breakdown of 'The Rockafeller Skank'.

One particularly useful technique is combining a time-stretched or pitch-shifted version of a sample with the unprocessed audio. Pitch-shifting a vocal phrase through a perfect fifth, without time-stretching it, can create a lovely harmonised effect with the original sample, for example. On the other hand, playing a drum loop at half or double speed against an unprocessed version of the same loop can add a whole range of atmospheric grunge or odd percussive effects.



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▶ with it by triggering the slices from your keyboard. Do a few trial runs to get the feel of the timing, and then record your performance onto a new sequencer track. Quantizing to sixteenth or thirty-second notes may help to tidy things up here if you don't trust your own timing. When the trigger pattern is recorded, shunt individual notes back and forth a few ticks at a time until the loop replays how you expect it to. If you wish to keep the exact dynamics of the original loop, make sure that all your MIDI notes are at maximum velocity, and that any velocity sensitivity in the sampler is at its minimum setting.

When you have managed to get the fragments triggering in pretty much the right places, try modifying the original sample. Hopefully, your programmed version should now be at least a passable imitation of its forebear. Now try adjusting the tempo of your sequencer — it can be very liberating to be able to increase or decrease the tempo of the loop without the pitch changing. If you decrease the tempo, you may find that the gaps between the samples will seem unnatural, but you can partly overcome this by adding sampled 'air' underneath the new loop. I find that the light crackles of the run in (or out) of LPs, or quiet breaks in live recordings (classical LPs being a personal favourite) are good for this use. Furthermore, ambience of any type can help to unify bunches of sliced samples into a complete loop.

Shuffling The Pack

Of course, there are other reasons for slicing up a drum loop, besides wanting to use it at a different tempo. Why not change the programming of the loop or add a fill? If you use extra beats or hits from the same loop, then they'll often work with it in spite of sounding a bit rough-edged on their own. You can even reprogram the parts into a new sequence.

Though reordering of sampled slices is perhaps most commonly done with drum loops, many other samples can also be processed in the same way. If the result is interesting to listen to then it doesn't matter whether it sounds natural or not. In fact, the sound of instrumental or vocal samples chopped about unnaturally is normal in many modern styles. Any sampled riff or phrase — bass, guitar, sound effects, and particularly vocals — can be subjected to the editing scalpel and creatively reordered.

Try lifting a vocal phrase from a sample CD or other source — in most good dance music shops it's quite easy to find 12-inches filled with a *capella* tracks specifically pressed for remixing, for instance. Cut the vocal phrase into its component words, in exactly the same way as we treated the drum loop earlier. Once again, you can now spread out the words to fit a different tempo, should you wish, possibly applying a slight timestretch to some of the chopped words to create a more convincing result. However, you can also now rearrange the slices to form a new sequence, which will not only create a whole new feel to the vocal but often new meaning as well. And why restrict the slicing resolution to just words? Cut each word into its component syllables, and try adding a change in

pitch to individual syllables, or use different effects for each syllable. Or stretch, move and repeat them to create a new rhythm or strange delivery — need I say "re-ee-wind"?

Bass lines also lend themselves well to slicing: try cutting up a favourite bass line into one- or two-note sections and making up a

completely new loop of your own. A good tip is to pull out the little phrases that are unique to the bass — slides, pats or funky bits of finger and string noise — as these sounds can be difficult to program convincingly. They can be looped into new riffs or just added to your programming for extra realism or atmosphere.

Chopping individual chords or riffs out of piano, keyboard or vibes parts is equally effective. Try to remove a couple of different kinds of chord — one major and one minor, for instance — and use the resulting samples both straight and pitch-shifted to create new sequences and changes. You could even try slicing the part at random intervals to see what results come up. You might just come up with a really great hook for your track.

An Ear To The Future

This short series should have you well on the way to successful phrase sampling. But remember, there are no hard and fast rules for sampling, so never be afraid to experiment. If something sounds good then it usually *is* good, so why not use it? While a great sampler, great samples and great technique can be really useful, none of these will make up for not using those things attached to the side of your head, for if you really do use your ears then even the most lo-fi kit is unlikely to stand in your way. **ES**

Filter Fondling

Filtering of one type or another is all over modern productions, which is hardly a surprise given how many samplers provide separate filters for every sample. Every type of sample seems to have been filtered to within an inch of its life at one time or another, so there's little risk of overdoing this particular type of processing — just make sure you don't blow your monitors!

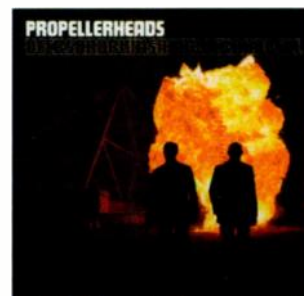
Filters really get creative when you start to modulate them in real time, and modern samplers offer a large number of options for doing this. Often there will be on-board envelope generators which can be routed to control filter cutoff, and these alone offer a great deal of sonic manipulation. Using a quick high-resonance sweep at the start of a sample can help to give it extra attack, for example —

via a high-frequency pulse for downwards sweeps and a low-frequency pulse for upward ones. LFOs are also handy when routed to filter frequency, and at their maximum speed setting they can create FM synth-like effects.

However, the most flexible control for your filtering will usually come courtesy of MIDI. A couple of extra tracks of controller data recorded to your sequencer can really transform an otherwise stale-sounding sample or loop, so give it a go. For example, you could sample a sawtooth wave from a synth or sample CD, turn up the resonance on its low-pass filter, and modulate its cutoff frequency over MIDI for instant TB303-style burbling. Alternatively, you can increase the momentum into your choruses by gradually opening or closing filters as you approach that part of the track.



Both Akai's MPC2000XL and Yamaha's A5000 have specific editing options for dividing up loops into shorter segments.



The Propellerheads' *Decks And Drums And Rock And Roll* contains many good examples of creatively sampled vocals.



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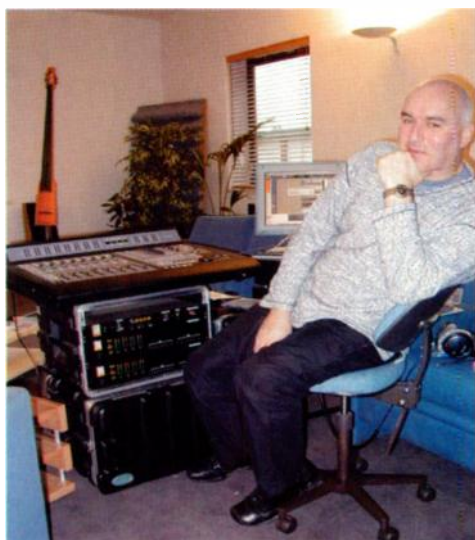
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a naim of note

It's remarkable that there is so little cross-fertilisation and cooperation between the hi-fi and recording industries, especially when you consider how badly they need each other in these days of ubiquitous lossy compression and on-line audio delivery. But then the relationship between the two industries has always been a touch frosty. Each side has historically seemed to view the other as a tolerable bunch of well-meaning amateurs at best and at worst as a hoard of dangerous loonies to be vilified at every opportunity. So it's a brave hi-fi company which becomes directly involved in the music recording process, thus deliberately putting itself in a position where it no longer has the excuse of "poor recording quality" to blame for any less-than-wonderful sounds which might emanate from its gear. It's particularly risky if the company has based its brand and business on a philosophy

RECORDING FOR THE NAIM LABEL

You may know Naim as a UK-based hi-fi manufacturer, but they also own a record label, and apply the same esoteric standards to the records they release as they do to their audio equipment. **Phil Ward** investigates the label's obsession with sound and explains their recording and mastering techniques.



Regular Naim label engineer Peter Williams at work on guide tracking and trial mixes in the big listening room at Naim.



The audio purist at work; engineer Ken Christianson making a direct-to-stereo classical recording for the Naim label on his Nagra 4S.

of putting the highest-possible sound quality first, second, and third.

Of course, many high-quality hi-fi companies have lent their logos to the odd CD over the years for hi-fi marketing purposes. But only two, Linn Products and Naim Audio, have kept at it and reached a stage where they can justifiably claim to be independent, artist-signing, music-recording and CD-producing labels in their own right. That doesn't mean they've lost sight of the value of the CD as a marketing tool for high-end hi-fi — they can't afford to — but rather that the recording, production and selling of music has become a self-sustaining, semi-detached business.

What's In A Naim?

The Naim Label didn't start as a marketing man's clever ploy. It began as a hobby and went on to be driven by discontent with commercial CDs. The company's founder, Julian Vereker MBE (1945-2000), was an enthusiastic recorder of friends' musical efforts in his youth, and it was dissatisfaction with commercially available equipment that convinced him to try his hand at amplifiers. So, once Naim Audio was well established and successful, the label represented to some extent a return to Vereker's first love. But it takes more than just revisiting a hobby to make a successful CD label, and it was Naim's then-Sales Manager (now joint Managing Director)



Janvier Jones' *Soul Searching*, recorded direct to stereo for Naim by Ken Christianson.

Paul Stephenson who convinced Vereker that the Naim Label could be commercially viable, profitable and be a fun thing to do for real. Vereker took on the technical issues, while Stephenson handled A&R, distribution and sales.

Soon after the first Naim CD player was designed and launched in the early '90s, the company found itself as arguably the leading advocate for the format among the seriously analogue, 'flat-earth' die-hards. A problem in those early days, however, was finding CDs technically and musically good enough for Naim to demonstrate to the doubters that the silver disc really could satisfy the vinyl disciples. So, in the same way that Vereker had begun making his own amplifiers when he was unhappy with the existing commercial products, he now set about producing CDs. To begin with, he focused on mastering issues. Even to those convinced from the start by CD, it was obvious that early discs often lost something in the transfer, compared to vinyl. To Vereker, this pointed inescapably to things going wrong in CD mastering, so he set about identifying the problems and trying to put them right. To accomplish this, he got hold of the original two-track masters of one of the company's favourite vinyl demo records: *Electric Glide* by Gary Boyle, a little-known '70's jazz-rock workout. Using mechanical isolation, digital signal handling and analogue filtering techniques developed for the original Naim CD player, and with the help of London mastering house Finesplice, *Electric Glide* was remastered for CD. Nearly everybody that heard it wanted a copy (despite its fairly un-hip content), and the Naim Label was, well, half-born.

Direct-To-Stereo Recording

The other factor in the birth of the label was serendipity. Ken Christianson is a partner at one of Naim's most successful

US dealers, and just happens to count some distinguished US jazz musicians among his friends, for example accomplished double bass player Charlie Haden. Ken is also a recording engineer, and a single-minded and enthusiastic practitioner of the art of 'purist' direct-to-stereo recording.

Christianson's approach is founded on the philosophy that recording is utterly subordinate to music and has only one purpose — to capture a performance as accurately and transparently as possible. Although editing and mastering is carried out digitally on the Sonic Solutions system at Finesplice, Christianson remains convinced that analogue tape without noise reduction still provides an engineer's best shot at capturing good raw material. A typical Christianson recording setup for anything up to a small acoustic jazz or classical group consists only of a venerable matched pair of AKG 414EBs and an ageing Nagra 4S stereo reel-to-reel recorder running at 7.5 inches-per-second (ips). Recording takes place onto seven-inch reels of 3M 966 tape, which is no longer manufactured, but Christianson has a good few years' worth hidden away. For quick replay and review during sessions and for easier identification of takes, he runs a Philips consumer CD-R or Sony DAT machine in parallel with the Nagra.

Running the Nagra at 7.5ips means that low-frequency accuracy is maximised and it may be that the consequently slightly shy top end compensates for the relatively bright nature of the AKG mics — although Christianson is unconvinced by this theory. The only mic preamps used are the Nagra's own and Christianson's only concession to making life a little easier is to use the Nagra's record level limiters (although he does apparently prefer the sound with limiters rather than without). Microphone placement and format tends to be modified to suit the ►

Classical Production Values

Naim generally record classical sessions without a producer, leaving the musicians on a session to fall back on their instincts and self-produce. The role of a producer on a classical session traditionally carries with it much better-defined and more rigorous responsibilities than on a pop or perhaps a jazz session. With classical instruments and material, especially in small ensembles, and even with the finest players, there are always going to be issues of dynamics, timing, intonation, interpretation and performance that require fine judgements to be made. The producer's role is to follow the score as

recording takes place, make note of the points at which problems arise, arbitrate between musicians, advise on interpretation and style and generally to help make the tough artistic decisions ("is that take with the slightly flat 'B' in bar 18 better than the technically perfect one that felt a little too sterile...?"). With musicians self-producing, although there are usually fewer and longer takes of various sections, more of the difficult decisions are likely to be revisited at the mastering stage. A classically trained mastering engineer with the ability to read notation is then invaluable.

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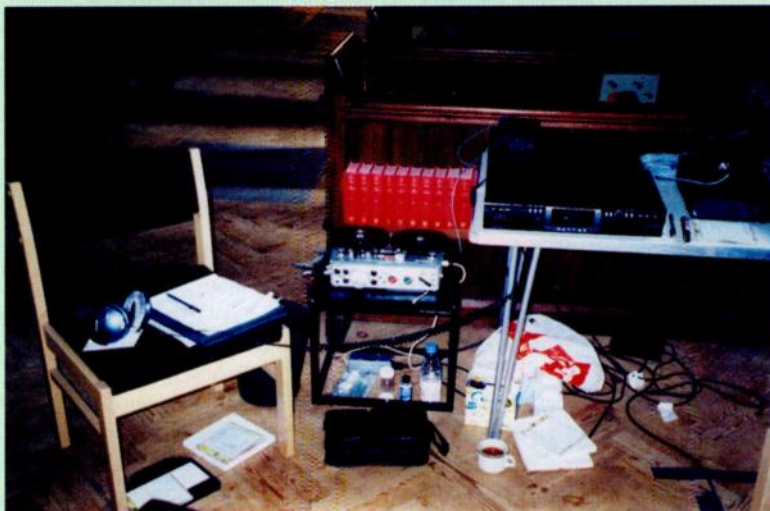
► particular project and recording space, but generally, for a small group, the AKGs are likely to be around two and a half metres from the floor, spaced about 250mm apart, angled downwards towards the group and outwards around 110 degrees.

With the option of 'fixing it in the mix' absolutely non-existent (to say nothing of Christianson's distaste for such practices — he considers even gentle EQ to be the Devil's work), the sound of the band, room and in particular how the band, mics and room integrate are the vital factors in capturing a good result. Christianson will take enormous care in selecting the acoustic space, setting up musicians and listening — not to the output of the mics, but to the band itself. He works tirelessly with the layout of the musicians and orientation of their instruments to get the right instrumental and tonal balance. It seems obvious to him that if the sound of the band in the room is good, he stands the best chance of capturing it on tape. In his opinion, tiny shifts in the position of an instrument can produce startling changes in sound and he so he behaves almost like a photographer composing and framing his shot, with the mics and recorder as his acoustic camera. Only once he is happy with the sound and balance of the music in the room will he listen to the mic output and make a few balance test recordings on DAT or CD-R. He then makes small adjustments to mic positions, primarily to fine-tune the overall tonal balance and level of room ambience. According to Ken, changes of just 100mm in the height or distance of the microphones can radically influence the perspective and ambient feel of a recording.

Christianson's unconventional approach to recording doesn't end with a tape full of music. Mastering from the Nagra to a production-ready Exabyte tape is a similarly idiosyncratic process. With a few refinements, it's the same process developed by Julian Vereker for the Gary Boyle CD. The first step is the production of a transfer CD-R of the complete session tapes minus any definitely fluffed or unsuitable takes. The CD-R is produced on a Naim-modified Philips recorder — one of the first CD-R machines, and in Naim's view, never bettered. The transfer CD is then replayed at Finesplice on a modified Naim CDS player stripped of its analogue stages and fitted with a digital output. The resultant S/PDIF signal is then fed directly into Sonic Solutions for editing, level optimisation, ambience matching (ie. picking sections of background noise to insert between tracks and edits), compiling and finally mastering to a Exabyte tape. The relationship between Naim and Finesplice goes all the way back to the Gary Boyle project, when Vereker was searching for a professional mastering studio that was both utterly committed to sound quality and yet open-minded enough to accept some unconventional working methods. Finesplice had (and has) an industry-wide reputation for musical sensitivity in editing and mastering, and so fitted Vereker's requirements exactly. It's not surprising

Ken Christianson Equipment List

- Nagra 4S running at 7.5ips with 3M 996 tape.
- Matched pair of 1978 vintage AKG 4414EBs.
- Philips consumer CD recorder.
- Sony portable DAT.
- Naim HI-Cap power supply.
- Naim Headline headphone amplifiers (several).
- Beyer DT931 headphones (several).



The sketch of Ken Christianson's recording methods was derived both from interviewing him and observing him at a three-day recording session of a baroque trio for the Naim Label at a church near Newbury. Pictured is his standard tracking setup for the session, with gear as detailed above.

the relationship has endured.

From Fairlights To Finesplice

A glance through the Naim Label catalogue reveals many discs that very obviously were not recorded by Ken Christianson with only two microphones — such as those featuring Italian guitarist Antonio Forcione. These CDs were recorded by Peter Williams, a Dublin-born engineer whose 20-year career in music goes right back to growing up in the same village as U2's Edge and Adam Clayton.

However, Williams decided to seek fame and fortune in London, where he could indulge his passion for the use of computers in music production. Thus his route into the music business and recording was not through playing but through programming a Fairlight CMI. Expertise with the Fairlight brought a flood of work in the early '80s and, at the age of 23, a co-directorship at Dublin's Windmill Lane Studios [home, unsurprisingly, to many U2 recording sessions — Ed] where he put together one of the first dedicated computer/synth studios. Around that time, while visiting a Dublin hi-fi exhibition, Williams remembers getting involved in a heated argument with two opinionated exhibitors over the sound of CD. They were Naim's Julian Vereker and Ivor Tiefenbrun of Linn. Moving on from Windmill Lane, Williams founded Rope Walk, Dublin's first 32-track digital studio. Since 1997, he has worked freelance with his Pro Tools and exotic analogue studio setup, known as The Zerosphere (see gear

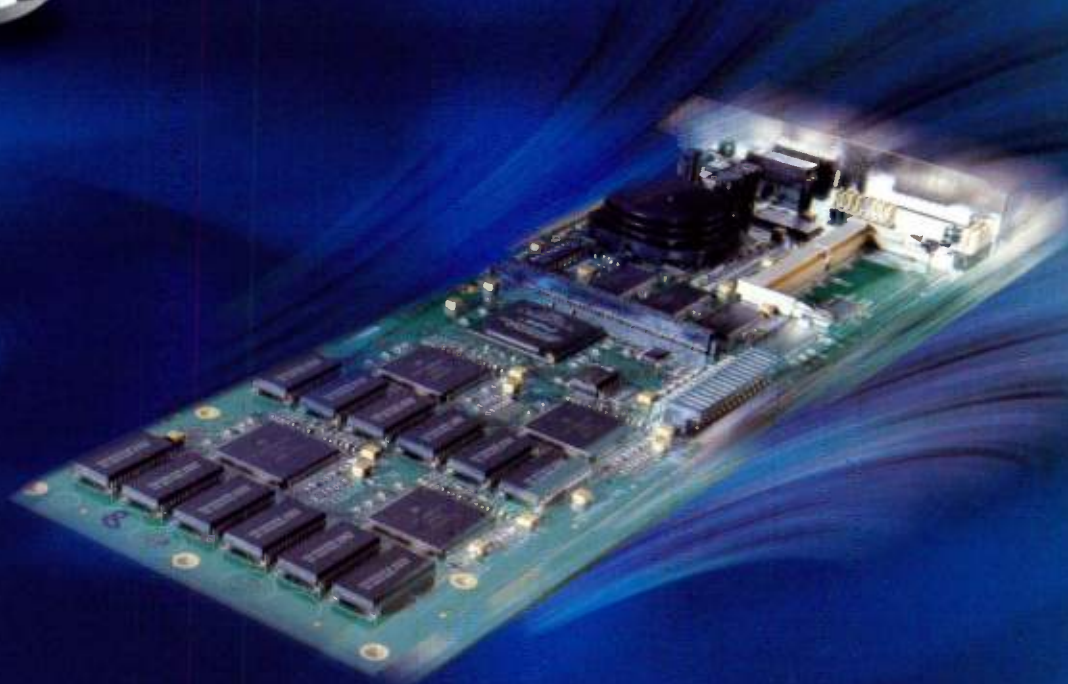


Antonio Forcione's *Live* album, recorded and mixed for Naim by Peter Williams.



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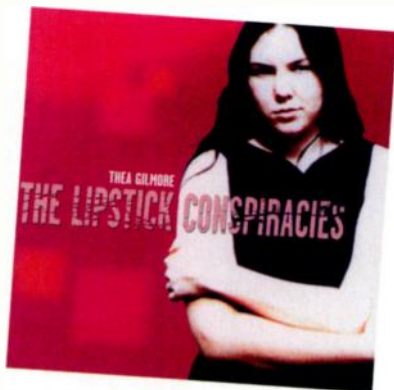
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► list elsewhere in this article).

The argument with Vereker and Tiefenbrun at that Dublin exhibition was a classic example of the gulf that sometimes exists between the recording engineer's approach to recorded music, and that of hi-fi enthusiasts or designers. Where recording engineers hear clarity, precision and accuracy, hi-fi enthusiasts sometimes hear cold sterility. And where hi-fi enthusiasts hear an emotional, involving warts-and-all performance, recording engineers sometimes hear an amateurish muddle. With hindsight, it's obvious that the arrival of CD was going to do nothing but polarise opinions still further. But rather than remaining entrenched in their opposing positions, some 15 years later Julian Vereker and Peter Williams found themselves brought together through Naim's first Antonio Forcione CD. Forcione himself had suggested that Williams engineer the sessions, and so the non-traditionally trained recording engineer and the arch hi-fi radical found themselves working together with a common goal. And as Williams himself explains, there's nothing like a shared goal to break down suspicion and enable former protagonists to cooperate and learn. And they did. According to Peter, he learned that while hi-fi has its share of misguided amateurs (and pro-audio 'doesn't?'), it also boasts many well-grounded, talented engineers with valid and surprising points to make about the reproduction of music. He admits to being astonished at the differences in sound that can result from, for example, alternative CD-mastering



Thea Gilmore's *Lipstick Conspiracies* album, used by Naim to run a series of comparative CD mastering tests.

processes. Tracks from a recent Naim release, Thea Gilmore's *Lipstick Conspiracies* (a project taken over by Naim at the mix stage) were used recently to trial different mastering processes. The following different procedures were followed with the same material all the way from the 24-bit Pro Tools mix through to the production-pressed CD:

- Pro Tools 16-bit recording, dithered via the TC Works *MasterX* plug-in to CD-R, then to Sonic Solutions;
- Pro Tools to Tascam DA45HR 24-bit DAT, then to Sonic Solutions;
- Pro Tools to Sonic Solutions via Philips CD-R recorder and Naim CDS digital playback.

Naim Label Highlights

• CHARLIE HADEN & CHRIS ANDERSON — *NONE BUT THE LONELY HEART*

An archetypal Ken Christianson recording of a jazz duo in a large, sumptuous environment — Cami Hall in New York. It was Haden's request to do a CD of standards with blind, disabled pianist Chris Anderson. Anderson, 71 years old when the recording took place, is one of those secretive, hidden greats of American jazz — revered by his fellow jazz musicians, but destined through the vagaries and injustices of the music business never to have made it into the public consciousness.

• CHRIS ANDERSON & SABINA SCIUBBA — *YOU DON'T KNOW WHAT LOVE IS*

Recorded at Avatar (previously The Power Station) in New York by Ken Christianson and Peter Williams. Originally intended to be a live, two-microphone recording of piano, double bass, drums and voice, with the balance between band and singer determined entirely by the physical layout of each instrument with respect to the mics. In the end, however, the recording employed overdubs on an analogue multitrack as well as direct-to-stereo recording, because the acoustic layout needed for the two-mic balance made communication and sight-lines between musicians impossible.

• JANVIER JONES — *SOUL SEARCHING*

One of the largest direct-to-stereo projects for Naim, recorded by Ken Christianson. The drums and percussion were recorded by a pair of AKG C414 mics, while the bass, guitar, and Rhodes piano were recorded in a booth by a further pair of 414s. There was a DI for an ancient Minimoog, and a booth with one singer each side of an AKG414. Everything was mixed live to Christianson's Nagra 4S with just a touch of analogue plate reverb on the vocals.

Trial CDs were made of the various sources and the unanimous winner, judged by listeners with no knowledge of which CD was which, was the 24-bit DAT based transfer. This was then mastered using Sonic Solutions, Prism and HDCD dithering, together with the original TC *MasterX* version, and all four taken to finished production CD. The surprising and clear winner at the end was the 24-bit DAT and Sonic Solutions dithered version. But even more surprising to Williams was the magnitude of the audible differences between the discs. He now uses the CDs

none but the lonely heart



Charlie Haden - Chris Anderson

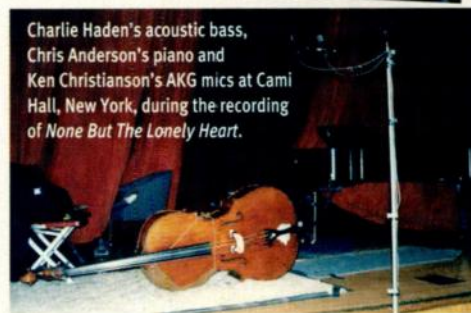
Chris Anderson.



Charlie Haden.



Charlie Haden's acoustic bass, Chris Anderson's piano and Ken Christianson's AKG mics at Cami Hall, New York, during the recording of *None But The Lonely Heart*.



Below: Ken Christianson and Peter Williams' mic setup for the *You Don't Know What Love Is* session at Avatar, New York.



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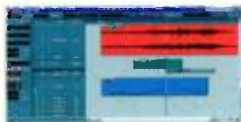


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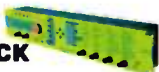
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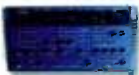
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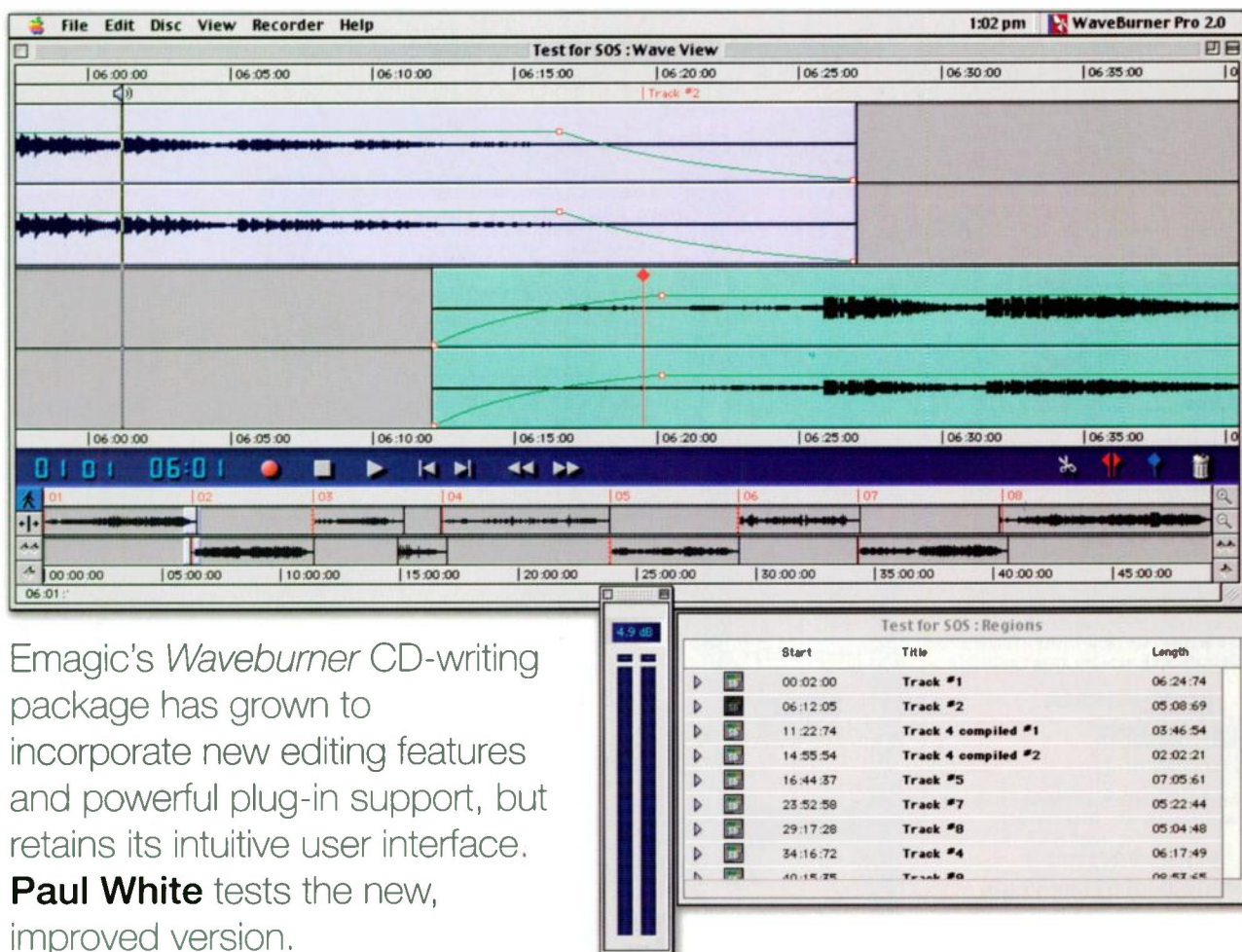
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EMAGIC WAVEBURNER PRO



Emagic's *Waveburner* CD-writing package has grown to incorporate new editing features and powerful plug-in support, but retains its intuitive user interface.

Paul White tests the new, improved version.

Emagic's Audiowerk 2 Production Kit, reviewed in *SOS* in July 1999, introduced both the Audiowerk 2 audio card and *Waveburner*, a newly developed application for compiling and burning audio CDs. They've now launched a new and improved version of the latter as a separately available application. *Waveburner Pro* is a Mac-only audio CD-burning application designed for compiling individual songs into a finished album, and is capable of producing Red Book CDs complete with copy prohibit, UPC/EAN and track ISRC codes where required. CDs burned using *Waveburner Pro* can be used as production masters by many CD duplicating houses. *Waveburner Pro* also supports CD Text for adding album names, track names, performer/artist names, composer, arranger and messages.

The editing side of *Waveburner Pro* is still in many ways less comprehensive than that of other programs as it's mainly designed to deal with completed songs rather than to 'assemble edit' songs from bits of alternative takes (though this is possible with care). However, it does provide an intuitive audio manipulation environment, the ability to create level changes, fades and crossfades, and now has support for VST plug-ins. Furthermore, a bundled suite of mastering plug-ins now provides multi-band compression, limiting, EQ and denoising.

Installation is from a CD-ROM and the copy protection requires the CD-ROM to be placed in the

burning desire

EMAGIC WAVEBURNER PRO AUDIO CD-WRITING SOFTWARE FOR MAC

drive when prompted, every three months or so. To use *Waveburner Pro* you'll need a Power Macintosh computer running Mac OS 8.6 or higher and at least 16Mb of free RAM. For any serious real-time plug-in use, a G3 should be considered the practical minimum. Stereo audio files at the CD sample rate of 44.1kHz will also take up between 700Mb and 1Gb of drive space per album project — and you'll require twice that if you need to create a disk image prior to CD burning. You'll also need a CD burner (a list of supported drives is available on the Emagic web site at www.emagic.de) and, although you can record

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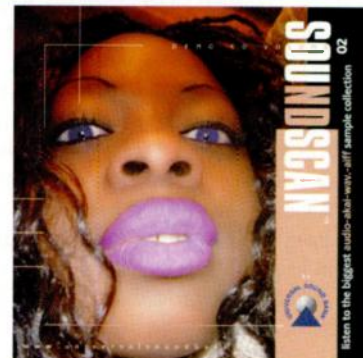
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“It’s possible to have several CD tracks within one audio region or several regions comprising one audio track — you can even put track starts in the middle of a crossfade if you need to.”

and play back via the Mac’s own audio I/O, you’ll need a soundcard (ideally with a digital input) for any serious work. Direct support is included for the Emagic Audiowerk 2 and Audiowerk 8 cards, and support has now been added for ASIO- and EASI-compatible hardware; there’s also an included EASI driver that allows Digidesign hardware to be used via Direct I/O. I used this in conjunction with a Digidesign Pro Tools Mix 24 system for my tests.

Chop And Change

Audio may be recorded directly into *Waveburner Pro* at 44.1 kHz only, or it may be imported from other applications in *SDII* (mono, interleaved or split), *AIFF* or *WAV* formats at bit depths from 8 to 24 and sample rates of up to 96kHz. *Waveburner Pro* can also convert MP3 files to 16-bit, 44.1 kHz files. Existing files may be added via an Add File menu or you can drag and drop directly from the finder to the List window, and any material not at 44.1 kHz is automatically sample-rate converted by the program. *Waveburner* can be used at 16-bit or 24-bit resolution — at the end of the process, 24-bit files are reduced to 16-bit using dither to maintain low-level linearity.

Once audio is in *Waveburner Pro*, it may be viewed graphically as a waveform and can be chopped into regions using a scissors tool. Material from DAT or similar sources initially appears as a single region within the Waveform and List windows, whereas imported *SDII*-format audio files that already have *SDII* regions within them are automatically separated into *Waveburner Pro* regions unless this function is disabled in the Preferences menu. Region start and end points may be trimmed, regions may be moved in time relative to each other and crossfades between overlapping regions can be created. Region levels may be changed (per channel if necessary) and CD Track Start Markers can be added at any position. By default, track start IDs are automatically created at the start of each newly created region, though it’s possible to have several CD tracks within one audio region or several regions comprising one audio track — you can even put track starts in the middle of a crossfade if you need to. You just add or remove track start ID markers as necessary.

The main work area of *Waveburner Pro* is the Waveform display, where audio is viewed as two parallel sets of stereo tracks. The reason there are two sets of tracks is to allow region overlaps to be viewed in a meaningful manner. When a continuous file is sliced up into regions, the regions appear alternatively in the upper and lower sections of the window as shown in the screenshot, above left. A transport control bar resides below the main waveform displays, and below this is a smaller overview waveform for the entire CD project. Pressing the Record button brings up the record window.

Time scales are marked along the top and bottom of the window and the main waveform display may be zoomed in both time and amplitude dimensions via the Zoom icons in the toolbars. Time may be

EMAGIC WAVEBURNER PRO £229

pros

- Very easy to install and use.
- Handles fades and level changes very well.
- Good handling of track spacing and track start IDs.
- VST plug-ins supported as well as the included mastering plug-ins.

cons

- No waveform-level editing.
- Not ideal for compiling songs from multiple sections.
- Noise-reduction plug-in is disappointing.

summary

Waveburner Pro is less than a full-blown audio editor but far more than just an audio CD burning program. Most of the time it’ll do everything you need, but occasionally you may need help from a dedicated audio editor.

SOUND ON SOUND

EMAGIC WAVEBURNER PRO

► displayed as frames (SMPTE-style), time or samples, and track IDs and indices are shown directly below the upper time scale bar. Indices, which are supported only by some CD players, are shown as diamonds and may be named. Track start and pause markers are shown as triangles and both types of marker have a line below them that extends across the waveform display. A CD player-style display at the left of the screen shows the track numbers, indices and real time location.

Where tracks are dragged so that they overlap, the track start marker is placed at the centre of the crossfade region, though it can of course be moved or deleted. Where regions don't overlap, the pause marker is located at the end of the first region and the start marker at the beginning of the second region. Double-clicking on a region opens a dialogue box that shows all the region data numerically, including its start and stop trim values, the fade-in and out times, and any left and right gain changes that have been made. Regions may also be trimmed in the Waveform window by dragging the start and end markers.

Most operations are non-destructive, so that even when files are cut into regions and the regions moved around, the original audio file remains unchanged. However, audio can be normalised to bring its loudest peak up to digital full scale, and if several regions are selected at once, they will all be scaled by the same amount so that the loudest peak in whatever region it happens to reside is at digital full scale.

During audio playback, a stereo level meter shows the signal level along with a numerical readout of the remaining headroom. Peak level data is stored along with the overview file, which means that *Waveburner Pro* always knows where the loudest peak in a region or sound file occurs. An audio level envelope line may be dragged to change levels or to adjust fade lengths and shapes, but if the level is increased to the point where clipping will occur somewhere in the file, it turns red as a warning, while if the audio is normalised, it shows purple. A blue line indicates that the peak value of the region has not yet been read while a green line shows that the audio levels have been read and are below 0dB peak. Note that clipping that occurs within a chain of plug-ins (due to boosting within individual plug-ins) won't necessarily be detected, but a plug-in level meter can be inserted anywhere into a plug-in chain if you need to check this.

Playback from the current cursor position can be started and stopped using the space bar, and as soon as a new region is created (by cutting an existing region), it displays grab handles for length, level and fade adjustment. Track start markers may be dragged to new positions by simply grabbing the 'head' of the marker; alternatively, if the line below the marker is dragged instead, the track pause and start markers are moved together. If you change a gap length near the beginning of an album, all the tracks ahead of the one you're working on move up, so you don't have to worry about changing edits or track spacings you fixed up earlier. Moving the

Bundled Plug-ins

In *Waveburner Pro*, plug-in processing is accessed via a dedicated plug-in window which provides a choice of where the plug-ins are placed in the signal path. The choices are Mix or any individual region, and plug-ins (or combinations of plug-ins) may be copied from one region's plug-in window to another along with their settings where necessary. A practical example of the separate mix and region processing facilities might be the use of a single limiter over the whole mix, but different EQ and multi-band compressor settings for individual regions.

Though the bundled plug-ins function like VST plug-ins, they are actually part of the program so can't be used in other applications — even *Logic* — which is a shame. My feeling is that *bona fide* owners of both *Waveburner Pro* and *Logic Audio* should be able to use either set of plug-ins in either application. As standard VST plug-ins may also be employed, the user potentially has access to some excellent dedicated mastering plug-ins from third-party companies such as Waves, DUY and TC Works.

Because plug-ins use a significant amount of processing power, when used in real time they can slow down the disc-writing procedure to the point where write errors occur. This is one reason why *Waveburner Pro* has the ability to create a disk image file of the entire CD with all edits, fades and effects made permanent. However, on slower computers, it may be impossible to run all the real-time plug-ins you need even if you're not burning a disc, hence the facility to bounce regions or files to disk, again making any plug-in processing permanent. Using the bounce feature, processing using plug-ins can be successfully completed in stages, even on relatively slow computers.

Waveburner's bundled plug-ins are a multi-band compressor, an equaliser based on the *Fat EQ* found in *Logic Audio*, a de-noising device, a stereo width expander, a limiter and an additional level meter that can be inserted amongst the plug-ins to diagnose clipping problems. The basic compressor is much the same as the one supplied with *Logic Audio*, but the multi-band compressor is a brand new plug-in that can provide separately adjustable compression in up to four frequency bands. The levels of the bands can be individually adjusted, and downwards expansion is included for cleaning up low-level noise during

pauses. Pretty much everything is adjustable including the crossover frequencies, compression ratios, thresholds and time constants, and there also some more advanced features such as a continuously adjustable Peak/RMS control, look-ahead, and a sophisticated graphical display.

The de-noising device is another newcomer that works on multiple frequency bands, much like Digidesign's *DNR*. The main difference is that it can't learn noise prints, so you need to experiment with the settings on a section of audio file that contains only noise before applying it to an entire album or region. Use this plug-in with care, as anything other than expert setting up will result in the dreaded 'chirping' or 'glass noise' as the expanders in the various frequency bands open and close. Whereas the multi-band compression, EQ and limiting plug-ins perform very well, the noise reduction tends to introduce quite audible side effects unless set up very carefully, and even then you can only reduce the noise by a few dBs before the 'chirpies' return. TC *Spark XL's* noise reduction is infinitely better and makes *Waveburner Pro's* denoiser sound very sad indeed!

The stereo width expander provides a new slant on an old trick. Effectively, this plug-in splits the audio into numerous frequency bands, then pans these alternatively left and right to provide a psychoacoustic increase in perceived width. Not only does this work for widening existing stereo, but it can also be used to fake stereo from mono. However, while the feeling of width increases, the stereo localisation doesn't generally improve so it works better with some material than others. Various controls enable the user to determine how the high and low ends of the spectrum are affected, how many frequency bands are created, and how much widening is applied.

Perhaps one of the most important types of plug-in for mastering is the limiter, and the one supplied here is both simple to set up and very effective. As with Waves' *L1*, you set the maximum level you want the audio to reach before limiting takes place, then increase the input gain to force the signal up against the threshold. A high-resolution gain-reduction meter shows how much level the limiter is lopping off signal peaks, and for applications where more subtle limiting is required, there's a soft-knee option to make the onset of limiting more progressive.

cursor through the overview waveform makes it easy to start playback at any point within a file, and Emagic's familiar 'running man' catch button can be used to ensure that the displayed waveform is always at the cursor position. With catch active, the screen scrolls each time the cursor reaches the right-hand side of the screen.

Track List

Though pretty much everything can be done in the Waveform window, *Waveburner Pro* also features a Track List window which displays the numerical and ►

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► text information associated with the various tracks in a more familiar playlist form. Key commands may be used to play back individual tracks and new additions can be made to the playlist by dragging and dropping files from the Mac's Finder or by creating new regions in the Waveform editor window. Edits may also be viewed and adjusted numerically in this view, but in most instances, working in the Waveform view is easier and more intuitive for everything other than text entry.

Processing

Once the audio has been assembled in the desired order, it may be processed using the included plug-ins (see box on previous page) and/or any suitable third-party VST plug-ins. An excellent feature is that you can choose to apply plug-in processing to specific regions as well as to entire album projects, so if you need different settings or even completely different processing for each song, you can have it provided that your CPU can power all the plug-ins you need to use. If you don't have enough CPU power to do everything in one go, there's a 'bounce' facility that lets you save regions, or even whole projects with all the processing made permanent. Once plug-ins have been set up, the completed album may be saved as a disk image file complete with all processing. It is possible to burn CDs directly without first creating a disk image, but this can sometimes lead to problems, especially with slower computers.

Using Waveburner Pro

Waveburner Pro is extremely easy to use, and effective provided that your songs need no waveform-level editing such as click removal, surgical cutting and pasting or other destructive processes — if you need editing of this kind, it must be carried out in another program first.

Both recording and importing audio is trivially easy, and dragging existing files from the desktop to the List window is one of the most straightforward ways to work if you've already recorded your audio using another program. Should a song need patching up (for example, by combining sections from two or more different mixes), it can be done, but getting the timing of the section transitions spot on requires a certain amount of trial and error. For example, there are no 'loop and nudge' windows of the kind you find in *Sound Designer II*, *BIAS Peak* or *TC Spark*. Where you do need to make such an edit, a short crossfade usually works best.

However, *Waveburner Pro* makes simple cut-and-drag editing very intuitive — most jobs get done by simply grabbing something and dragging it somewhere else! In a typical album project, the main jobs are creating and trimming regions, applying fades to the ends of regions, getting the right gaps between songs and, occasionally, crossfading songs, after which you might want to tweak the levels or stereo balance of individual tracks before applying



A selection of Waveburner Pro's bundled plug-ins: the multi-band compressor, Fat EQ and limiter.

processing such as compression, limiting and EQ. A test session involving all these processes took around 20 minutes from importing my audio to getting ready to burn a trial album of eight tracks, including some crossfades.

Playing safe, I created a disk image file before attempting to burn a CD, but when I reopened this in *Waveburner* and entered the CD-burning dialogue window, there was a pre-ticked check box that said 'Create Disk Image First?' As it was a disk image I was using, I felt the program should have recognised this fact and unticked the box for me, but it's not a problem once you know about it. After that, I had the choice of changing the burn speed and of making a test burn in simulation mode. I did both, and a 2x speed simulation run confirmed everything was OK. After that, burning the CD was a one-button operation.

Verdict

Waveburner Pro is one of those 'Does what it says on the tin' programs, and is a lot more straightforward to use than most CD-burning programs of its type. It isn't a full-blown audio editor, but for creating a mastered album from one or more audio files of ready-mixed songs, it's a doddle. I particularly like the sensible way in which track start IDs can be placed where you want them by dragging, and the system for creating crossfades between tracks would be difficult to improve upon. Having the ability to use VST plug-ins both on individual tracks is something I've wanted for a long time, and being able to use other plug-ins on the complete album at the same time also makes a lot of sense. The included plug-ins are pretty good, aside from the slightly disappointing noise-reduction, and the program supports more up-to-date CD burners than the majority of its competitors. *Waveburner Pro* would be a good choice for burning audio CDs on any Mac-based system. **SOS**

information

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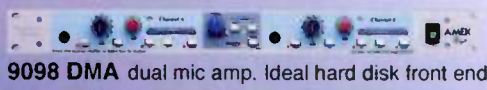


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super sonar

Cakewalk's *Pro Audio* range is one of the most widely used sequencers in the PC world, but their latest package has a new name and a new image, as well as lots of new features.

Martin Walker tries out *Sonar*.

Cakewalk have been developing music software for many years, and are unusual in having started their product line on the PC rather than the Atari or Mac platforms. The Windows platform is still their main area of operation, and over the last few years their *Cakewalk Pro Audio* range has gone from strength to strength, gaining a huge following in the US, and a smaller but committed one in Europe. Widespread acceptance over here was arguably hindered by its lack of ASIO or EASI soundcard driver support, which for a long time gave it substantially higher latency values than competitors such as Steinberg's *Cubase VST* and Emagic's *Logic Audio*.

All this has changed, however, with the launch of Cakewalk's new flagship product. *Sonar* isn't *Pro Audio 10*, and seems designed to replace the *Pro Audio* line, but given its huge number of new features I expect the majority of existing users to upgrade. *Sonar* supports an unlimited number of audio and MIDI tracks, has new audio loop construction and editing tools, fully automatable DirectX 8 audio plug-ins, new real-time MIDI effect plug-ins, completely new DXi-format soft synths, a new ergonomic user interface, and greatly enhanced vector-based automation. *Sonar* also uses an advanced audio data storage system that allows multiple projects to access the same clips. If you edit any portion of a shared clip, only the edited portion is saved, and the same part of the original file is marked as no longer shared. If you tend to create different arrangements of the same song this could prevent you from unnecessarily duplicating a lot of data, and it does avoid the nightmare scenario of accidentally altering a file that you still need to play back an older song.

Although it will run on the first version of Windows 98, this isn't advised, since *Sonar* is optimised for use with Windows 98 SE, ME, and 2000, which all support WDM audio driver

CAKEWALK SONAR DIGITAL MULTITRACK RECORDING SYSTEM FOR PC

technology. Using these platforms, low latency is now available to all, especially if your soundcard has suitable WDM drivers available, enabling you to play soft synths in real time and monitor live inputs with real-time plug-in effects.

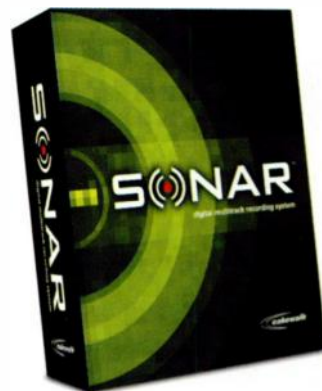
Installation

Sonar ships on a single CD-ROM, while the bigger *Sonar XL* (see box) includes a second CD-ROM with considerably more audio loops. Like the rest of the Cakewalk range it employs no fancy copy-protection, relying on a CD key number and a serial number on the registration card. I had no problems during installation, except that *Sonar* requires Microsoft's DirectX 8.0, and offers to install it if you haven't already done so on your PC. This shouldn't bother most musicians apart from those who also want to use *Cubase VST*, since Steinberg advise against using DirectX 8 at the moment.

Existing *Cakewalk* users should find their preferences transferred to *Sonar*, but don't try to install it in the same folder to save space, since this may cause problems. The recommended procedure is to install *Sonar* in its own separate directory, and since *Sonar* will open existing WRK, BUN, and MID files created using other Cakewalk products, you can then later uninstall *Pro Audio* if you wish.

When you first run your new installation of *Sonar* it runs the Wave Profiler to determine the safest DMA and buffer settings for your soundcard(s), just like *Pro Audio*, although settings are now displayed in samples rather than bytes. Cakewalk recommend trying the Profiler's settings first before attempting any tweaks. If your soundcard already has WDM drivers installed, *Sonar* will detect them and make adjustments. However, if you have a mixture of cards, some with WDM drivers and others without, you may wish to force all of them to use MME drivers instead, since *Sonar* doesn't support the use of WDM and MME simultaneously.

Sonar supports both 16-bit and 24-bit recording and playback, and with my Echo Mia and Yamaha SW1000XG soundcards, the Wave Profiler suggested a buffer size that gave me a 300mS latency with MME drivers and its proprietary WavePipe acceleration enabled. Suitable WDM drivers were sadly still not available for either of my cards running under Windows 98 SE (see box). I decided to try manually tweaking the settings, and managed to achieve a reliable 15mS latency with my Echo Mia and Pentium II 450MHz PC when playing both



CAKEWALK SONAR

£249

pros

- Excellent low-latency performance even with MME drivers, and users with WDM drivers may achieve even lower latency figures.
- DX Instruments provide real-time Cakewalk soft synths for the first time.
- Track View and its vector-based automation is very easy and flexible to use.
- Groove Clips offer real-time loop sequencing complete with *Acid* import facility.
- Very stable for such a new product.
- A bargain at the price!

cons

- WDM soundcard drivers are still in short supply.
- There are few DX8 plug-ins and DXi soft synths available so far.
- Some parameters cannot be changed during playback.

summary

Sonar is a quantum leap forward for Cakewalk, and will undoubtedly make many musicians think long and hard about abandoning their current MIDI + Audio sequencer.

SOUND ON SOUND



Above: With a new ergonomic Track View, automated DX8 plug-ins effects, new low-latency DXi soft synths, and loop-based Groove Clips, Cakewalk's new *Sonar* should appeal to many who are not existing *Cakewalk Pro Audio* users.

Below: This close up of the Track View, shows all the parameters in the Track pane to the left, some of the new vector-based automation in the Clips pane to the right, and one of the new DX Instruments in action. This is Edirol's *Virtual Sound Canvas*, and all five of the current MIDI tracks on this Project have been linked to it via the empty audio track at the bottom.



CAKEWALK SONAR

▶ audio tracks and DX Instruments before I got any problems at all — this suggests that although WDM drivers are preferred, they are not mandatory.

Overview

Existing *Cakewalk Pro Audio* users won't be fazed by *Sonar* in the slightest. Although there are many new features, much of the main interface survives, from the set of largely familiar tools arranged by default in three rows across the top of the display to many of the setup and editing windows. New users, however, will find the set of eight tutorials extremely useful. These cover the basics of recording and editing both MIDI and audio tracks, using Groove Clips (more on these later), mixing, effects, automation, and using soft synths, and are discussed in both the electronic help file and the printed manual.

I've always found Cakewalk printed manuals easier to use than those of most other manufacturers, and this one is no exception. Over an inch thick, and with tabbed sections to make things easy to find, it's organised in just the way most musicians will want to find information. As far as I can see the electronic help file is identical, but of course has the advantage of a keyword index for rapid navigation to the desired topic.

In Cakewalk-speak, the Project is the centre of your work, and is stored as a work file (with a WRK extender). Each track contains a number of Clips (which other manufacturers such as Steinberg call Parts), and each of these contains MIDI or audio events. The main Track View is divided into three main sections: the Track pane, showing initial settings for each track, the Clips pane where the data itself appears, and the Buss pane (of which more shortly).

The Track pane displays settings such as volume and pan, source, output, and effect routing, and this is where new features are initially most obvious. Gone are the text-based columns of *Pro Audio's* Track pane, to be replaced by a much more manageable tabular arrangement. Cakewalk have modelled the new Track Pane on the Windows OS; both audio and MIDI tracks have a title bar across the top displaying the track number and name, Mute, Solo, and Record Arm buttons, and then maximise, minimise, and restore buttons. These make altering the view very quick: you can instantly zoom individual tracks to full track pane height, or collapse others to a minuscule height defined by the

System Requirements

Like nearly all music software, *Sonar* is happy running on Windows 98 alongside any soundcard equipped with MME drivers. Other than that, the box states that a 400MHz processor is required, along with 64Mb of RAM and 100Mb of free hard disk space. However, just as in the *Cakewalk Pro Audio* range, MME drivers will give relatively high levels of latency when compared with the ASIO or EASI drivers used by other sequencers. DXi soft synths will still play back with sample-accurate timing, but playing them 'live' may feel quite sluggish, and you will be pushed to use DirectX audio effects live on an external input signal.

Where *Sonar* really comes into its own is when running Windows 98 SE, ME, or 2000, all of which support WDM soundcard drivers that should provide much lower latency and kernel-level audio streaming. Cakewalk have, for instance, managed latency figures of just 3mS with soundcards such as M Audio's Delta 1010 and WDM drivers. However, although Cakewalk do print a list of audio hardware manufacturers supporting WDM on the *Sonar*

packaging, not all of these actually have drivers available yet, and some have only "announced plans to support WDM drivers".

I was running Windows 98 SE, so I paid a visit to both the Echo and Yamaha web sites to find out if WDM drivers were yet available for my Mia and SW1000XG to get a feel for the current situation. Echo had released a beta driver version for their 24-bit cards running under Windows 2000, but unfortunately this didn't yet support Mia. More importantly, however, it was a 'true NT' driver, and not based on the WDM model. Yamaha had also released a WDM driver suitable for Windows 2000, but with the warning "do not attempt to use it under Windows 98 SE", so sadly neither of my soundcards were yet able to run *Sonar* with WDM drivers unless I upgraded to Windows 2000. Long-term, this could be the best OS for *Sonar*, as long as the remainder of your hardware and software is compatible, but my experience proves that it's wise to check carefully where WDM is concerned if you want to achieve the lowest possible *Sonar* latency.

titlebar itself, while you can also zoom individual tracks to any size by dragging the horizontal dividers between each one.

As you zoom in, further horizontal strips appear in the Track pane containing lots more parameters. For MIDI tracks these comprise MIDI channel, patch number, Bank, Volume, Pan, Velocity Trim, Key Transpose, Time, Fx, Chorus, Reverb, Input source (for recording), and MIDI Output. Most are self-explanatory, but Fx lets you patch in a chain of Cakewalk's MIDI effects, which makes child's play of adding real-time arpeggios, echos, delay, and the like. Audio tracks have Volume, Pan, and Trim, Input and Output routing, Fx (this time to choose both real-time plug-ins and whatever DX Instruments you have installed), and a set of Aux busses with Send and Pan controls, Pre or Post-fader switching, and even Phase controls.

You can selectively view All of these parameters, or just the Mix options, effects or I/O routing, by clicking on one of the four named tabs at the bottom of the Track View (see screenshots). When you drag the vertical divider between the Track and Clip panes, the various parameters resize and rearrange themselves to suit the new available width.

Across the top of the Track Pane is a new toolbar, ▶

Feature Comparison: *Sonar* vs *Pro Audio 9*

To help existing users of *Cakewalk Pro Audio 9* decide whether to upgrade, here is a brief list of *Sonar's* new features:

- Supports Windows 98, 98 SE, ME, and 2000 (*Pro Audio 9* supported Windows 95, 98, 98 SE, and NT 4.0).
- Unlimited simultaneous audio tracks (128 in *Pro Audio 9*).
- Unlimited total MIDI and audio

- tracks (256 in *Pro Audio 9*).
- Unlimited real-time audio effects (256 in *Pro Audio 9*).
- Unlimited real-time MIDI effects (256 in *Pro Audio 9*).
- 960ppqn MIDI resolution (480ppqn in *Pro Audio 9*).
- Support for optional low-latency WDM Driver Kernel Streaming.
- Support for dual processors and dual monitors.

- Audio loop construction and editing.
- Enhanced Track View with individually resizable tracks, multiple view tabs, and enhanced record and playback meters.
- Non-destructive slip editing, click-and-drag audio fades, and automatic crossfades.
- Vector-based mixing for Aux sends, MIDI velocity and controllers, DirectX 8 audio plug-in automation,

- and DXi soft synth automation (*Pro Audio 9* only supported vector-based mixing for audio volume and pan).
- Integrated Loop Explorer window with file and loop preview functions.
- Up to 64 Virtual Main busses to access multiple soundcard outputs.
- Import of MP3, ACID, AIFF, ASF, AU, MP2, MPG, MPEG, and SND files.
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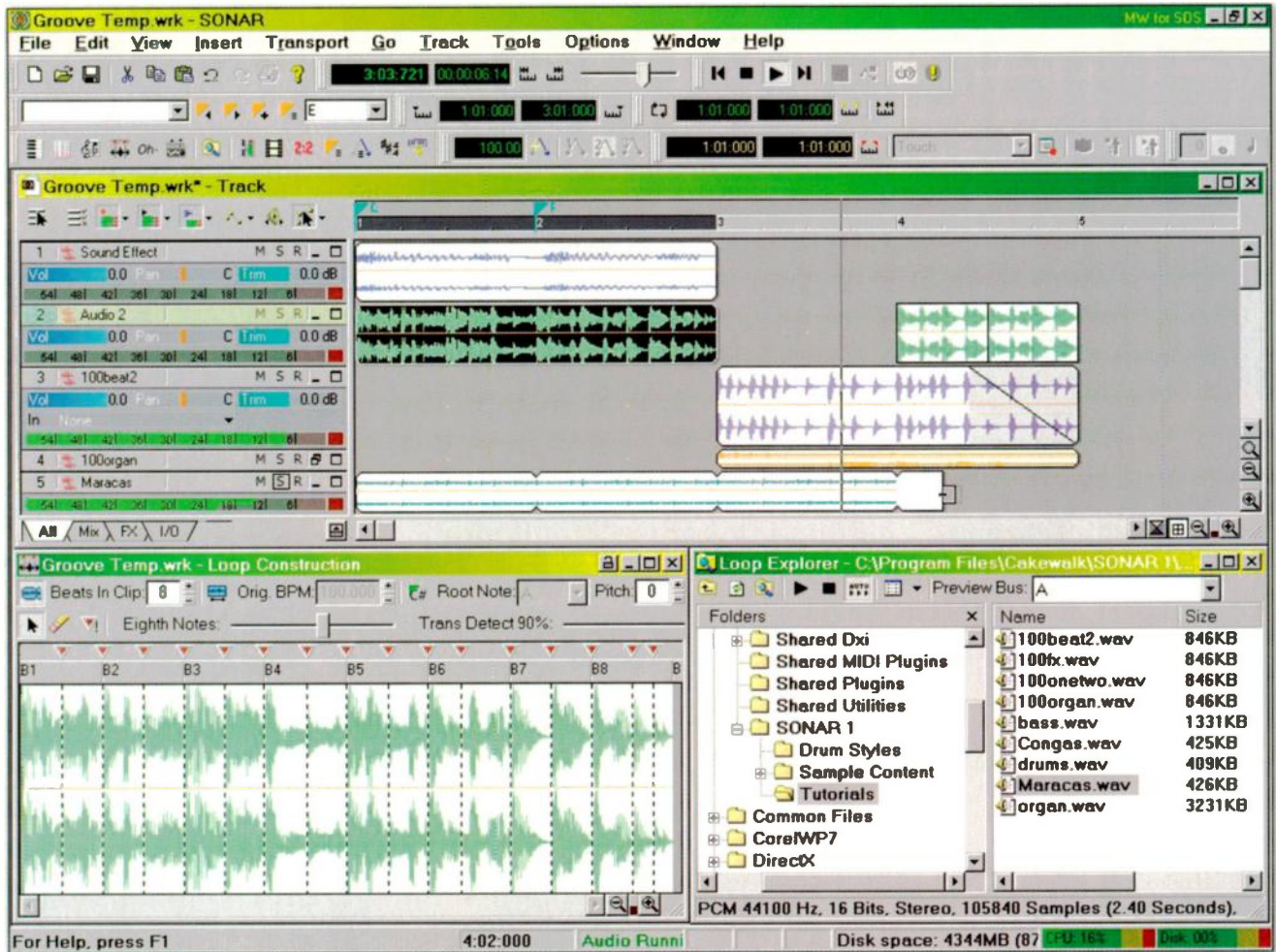
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CAKEWALK SONAR



▶ with buttons to Select All Tracks, a Module Manager to decide which tracks are displayed, options to toggle the display of user-definable record and playback metering for each individual audio track, as well as tools for audio Scrubbing and Envelopes (these are part of the vector-based automation, first introduced in Cakewalk's *Pro Audio 8*). The meters are displayed at the bottom of each channel strip, and can be configured to display peak levels, RMS, or both, over a user-definable range varying from 12dB to 90dB, and have clipping indicators, hold, and lock peak functions. A choice of decay time (ballistics) would have been useful, but overall Cakewalk have made it very easy to view record and playback levels.

Optionally displayed across the bottom of the Track View is the Buss pane. Here you will find all the virtual main and auxiliary busses (you can create as many of these as you need), and can name them, route them to individual soundcard outputs, and meter their current levels. Overall, you will spend a considerable amount of time using the Track View, so ease of use is of paramount importance, and here I feel that *Sonar's* Track Pane is a huge improvement on its predecessor's interface.

New Editing Features

The editing facilities are largely the same as those of *Pro Audio*, apart from a few graphic tweaks, but

there are a few notable new features. Slip Editing has three modes, and can be used on both MIDI and audio clips. Trimming is the default mode: if you place the cursor over the start or end of a clip it changes to show that slip editing is available, whereupon you can drag the clip start point to the left or its end point to the right, to temporarily mute playback of the now-hidden data. Steinberg's *Nuendo* has a similar facility, and it's very handy when assembling a song from sections of various takes, so you can either use a shorter part of a longer take, or mute extraneous noise before or after the take, without bothering to edit it.

Loop-based composition is easy using Groove Clips. Here you can see how they appear in the Clip pane with bevelled corners; the bottom *Maracas* track is being Slip edited to add loops. Across the bottom are the Loop Construction and Loop Explorer windows.

Sonar XL

Cakewalk also offer a deluxe bundle named *Sonar XL* which includes lots of tasty extras — although, in contrast to other manufacturers' product ranges, you get the full *Sonar* feature set in both versions. The highlight of the bundle is the full version of *Tassman 2.0* by AAS. When I reviewed this back in *SOS* July 2000 I was very impressed by its combination of physical and analogue modelling, tempered only by its (at the time) high latency and stand-alone-only operation. Version 2.0 now offers both VSTi and DXi options for much lower latency, and this full retail version normally retails at £270, making *Sonar XL* a

bargain for the inclusion of this alone.

Also included is *ReValver SE*, an impressive-looking virtual guitar amp plug-in that emulates a rack full of preamps, power amps, effects, and speakers, every parameter being automatable. There are 47Mb of extra SoundFonts courtesy of Sonic Implants, while the remaining extras are all loops. These comprise a huge collection of 545Mb of Expanded loops from PowerFX (there are only 222Mb in the basic bundle), 104Mb of *Percussion Wall* loops from Numerical Sound, and 48Mb of *Essential Rock Volume 1* loops from SquareWAV.

Scroll-trimming lets you move the clip contents in time while leaving its start and end positions intact, while Slide-trimming moves the end you have selected along with the data.

Also new in *Sonar* are Automatic Crossfades, which let you drop one clip on top of another that ends sooner in such a way that during the overlap the shorter one will fade out while the longer one fades in. You can also add real-time fades to either end of a clip by moving the cursor to its top left- or right-hand corner, where it changes to a ramp symbol that can be dragged in the appropriate direction to create any length of fade. If you subsequently apply a Slip edit then you can either move the entire fade with it, or simply alter the position of the quietest point of the fade, so that the fade length alters.

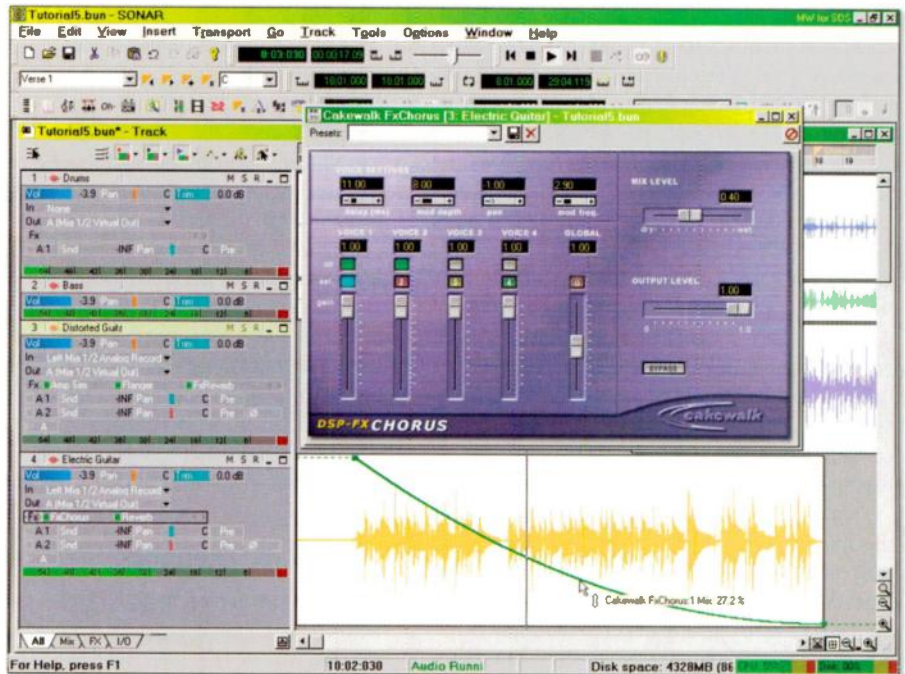
Looping The Loop

Creating music from loops using samplers has been a mainstay of modern track production for some years, but it wasn't until the arrival of applications like Sonic Foundry's *Acid* that it became easy to create multitrack compositions using loops that could have their pitch shifted or their duration time-stretched 'on the fly'.

Sonar provides this functionality in the form of Groove Clips, which are audio clips that 'know' their tempo and root pitch, so that they can be stretched to match changes in tempo or key changes in the song. The Loop Explorer lets you audition loops in a two-pane window very like Windows Explorer, and from here you can drag them directly into your Clips pane. Predefined Groove Clips appear inside *Sonar* with bevelled corners to distinguish them from normal ones, and can be looped by Slip editing their start or end points, when multiple instances of the groove appear to fill the length of the edited Clip.

If you double-click on a Groove Clip, the Loop Construction window opens. Here you can make the Clip follow the pitch of the project (set via a drop-down box in the Marker Toolbar). Markers inserted on the Time Ruler then let you change key during the course of track, by entering a suitable Groove Clip Pitch. Creating your own Groove Clips is also very simple: you just drag and drop a suitable audio file onto a track, double-click on it to open the Loop Construction window once more, and then use Slip editing to mark the section of the file that you want to use as a groove. When you click on the Enable Looping icon, *Sonar* automatically slices the clip into a number of beats defined by slicing markers, and you can fine-tune these by dragging them.

Groove Clips work well, sound good, are easy to create, and what's more there are loads of predefined ones included on the CD-ROM, including 222Mb of loops from PowerFX divided into Beats, Construction Kits, and Instrument phrases, and 72Mb of organic-sounding Smart Loops including drums, percussion, bass, and guitar. You can also



import *Acid* loops into *Sonar*, which will be a boon to many.

DirectX Effects And Automation

Sonar supports all DirectX plug-in effects, but if you use those compatible with the new DirectX 8.0 format you can automate their parameters as well. FXpansion have also been beavering away to upgrade their *VST-DX Adaptor* to version 3.0, which allows both VST plug-ins and VST Instruments to be used with DX8 automation inside *Sonar*.

You add an effect by right-clicking the Fx box in the Track View. This opens nested menus containing not only your Audio Effects sorted by manufacturer, but also whatever DX Instruments are installed (more on these shortly). Exactly the same technique can be used in the Console View, by right-clicking the Fx field for a channel or buss. Once you select an audio effect from the list, its front panel automatically

Here's one of the new DirectX 8 effects, showing how you can automate any of its settings (in this case chorus mix). Notice that I've created chains of effects for the two guitar tracks in their Fx boxes.

New Bundled Plug-ins

Apart from the CFX effects previously seen in the *Pro Audio* range, the *Sonar* bundle includes various new audio plug-ins. *Amp Sim* provides a variety of guitar sounds with a choice of amp models and speaker enclosures, while *Tape Sim* models the effect of saturated analogue tape. Both were previously available separately as the *Audio FX2* pack. The *Compressor/Gate*, *Expander/Gate*, and *Dynamics Processor* are all designed on very similar lines, with graphical readout of transfer function, peak or RMS detection, and optional soft-knee characteristic, while the *Limitter* is altogether simpler.

However, the highlight for me is the five plug-ins from Power Technologies, especially since you can automate any of their parameters. There's a rich *FxChorus* with up to four voices, *FxFlange* with two, the comprehensive *FXDelay*, again with four voices,

and *FxEq*, which offers up to eight parametric bands and two shelving ones. *FxReverb* provides an extremely comprehensive set of parameters and sounds relatively smooth.

Sonar also offers various MIDI effects in addition to those previously available in *Pro Audio*. *Style Enhancer Micro* from Ntonyx has been upgraded from version 1.28 to version 2.0, and there are four completely new effects from MusicLab. *Fixed Length* lets you alter note lengths from *staccato* to *legato* in real time, while *Looper* lets you select and loop preset MIDI clips in a song (rather like Groove Clips except for MIDI). *Rhythm 'n' Chords 2.0 Lite* is designed to create professional-sounding guitar accompaniments including strums and picking from predefined rhythm patterns, while *Velomaster Lite* is an effective compressor/limiter for MIDI, but with some features of the full version greyed out.

CAKEWALK SONAR

► opens so that you can choose a suitable preset or set up an effect from scratch. You can chain any number of effects in the Fx box and drag them into different orders, while double-clicking on their name launches the front panel again for further edits.

The *Sonar* bundle includes quite a few new effects (see box), although only five of these are DirectX 8-compatible. These are Power Technologies' *FxChorus*, *FxDelay*, *FxEq*, *FxFlange*, and *FxReverb*. Once you select one of these, or a DirectX 8 plug-in from another developer, you can create an automation Envelope for any or all of its parameters, add nodes at any point and drag them to another value, or change the resulting linear ramps to a selection of curves. The positions of the relevant controls in the effect window are also updated in real time by the automation data.

You can also group controls in the Track View together for automation purposes, and once armed their movements can be recorded either by dragging them directly during playback, or from the more traditional environment of the Console. Both approaches create envelopes in the Clips pane that can be manually edited.

DirectX Instruments

DXi is a new open standard for Windows-based soft synths that was developed by Cakewalk, based on Microsoft's existing DirectX technology. To *Cakewalk Pro Audio* users, DXi soft synths must be one of the most exciting new features to be included in *Sonar*, since they completely remove the hassles associated with using stand-alone soft synths. DXi is also being embraced by third-party developers in applications such as the popular *Fruity Loops 3.0* loop creation and drum sequencing tool.

It's important to point out that you don't need WDM soundcard drivers to use DX Instruments on playback, since this will always happen with sample-accurate timing. You do need low-latency drivers to play instruments in 'real time', just as you will to use DirectX plug-ins on a live input, but judging by the 15ms latency I managed with the MME drivers of my Echo Mia, this is achievable with non-WDM drivers.

To use a DXi you need to create a new audio track, and then insert the desired instrument in its Fx slot. To link it to MIDI data you just change the Output of a suitable MIDI track to point to this synth. DX Instruments can accept patch and bank change commands as desired, and playing them in real time rather than while a song is playing is also no problem as long as the Audio Engine button on *Sonar's* Transport Bar is on. Effects are often included as part of DX Instruments, but you can chain further audio plug-ins as you wish.

Included in the basic bundle are four DXi-format soft synths. The first is the basic edition of Applied Acoustic Systems' *Tassman SE*, capable of a wide range of physical and analogue modelling sounds. Unlike the full version bundled in *Sonar XL* (see box) you can only play back existing instruments, because the *TassBuilder* application is missing. Audio Simulations' *DreamStation* DXi is an analogue

modelled polyphonic synth with three oscillators, rich-sounding filter, several ADSR envelopes, LFO, portamento, and distortion. It certainly sounded the business to me, although some of the controls were minuscule and difficult to read on my 17-inch monitor screen. Edirol's *Virtual Sound Canvas* is, as its name suggests, a GM-compatible synth, and although the complete sound set only occupies 4Mb is a useful source of bread-and-butter instruments. Finally, Live Update's *LiveSynth Pro* is a SoundFont player which sounds very good, although the bundled version is a demo limited to 30 days.

Final Thoughts

In many ways, *Sonar* reminds me of both Sonic Foundry's *Vegas Pro* and Steinberg's *Nuendo*, especially in the flexibility and ease of use of its main Track View window, and the way you can zoom all the way in to view individual samples. However, *Vegas Pro* has no MIDI facilities at all, while *Nuendo's* are only a subset of those provided by *Cubase VST*. Here *Sonar* scores highly, since its MIDI facilities surpass even those of its *Cakewalk Pro Audio* predecessors. The addition of looping functions to rival those of Sonic Foundry's *Acid* will also endear *Sonar* to many musicians. The new DX Instrument engine is also a boon.

During the entire review period the only problems I experienced with *Sonar* were the help file locking up on various occasions when I clicked on a link — in which case closing and reopening it let me carry on regardless — and a few crashes caused by my manually tweaking the latency too low or exceeding my available processing power. I did find a couple of minor points frustrating, such as having to stop *Sonar* playback before record-arming a track, but this is hardly a major niggle. I also know a few musicians have grumbled that *Sonar* provides no support for surround sound (at the moment anyway), but then neither does *Cubase VST*, and most of us are still producing stereo audio anyway.

Overall, *Sonar* is very impressive, and a huge improvement over *Pro Audio 9*. It takes the Cakewalk range into far more direct competition with other products like *Cubase VST* and *Logic Audio*, and in many ways I found it easier to use than either of these programs. I suspect that many musicians will now consider using *Sonar* in preference to other products, especially once existing VST plug-ins and VST Instruments become available in DXi versions. However, the most remarkable feature of *Sonar* is its price. It's a steal at just £249, and existing *Pro Audio* users can upgrade for just £89.95! Get your credit cards ready for a smaller dent than usual. **SOS**

“*Sonar* is very impressive, and a huge improvement over *Pro Audio 9*. It takes the Cakewalk range into far more direct competition with other products like *Cubase VST* and *Logic Audio*, and in many ways I found it easier to use than either of these programs.”



Prices & Upgrades

- *Sonar* £249.
 - *Sonar XL* bundle £399.
 - Upgrade to *Sonar* from *Pro Audio Deluxe* £74.95.
 - Upgrade to *Sonar* from *Pro Audio* £89.95.
 - Upgrade to *Sonar XL* from *Pro Audio Deluxe* £149.95.
 - Upgrade to *Sonar XL* from *Pro Audio* £169.95.
- All prices include VAT.

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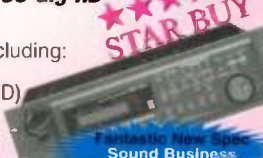
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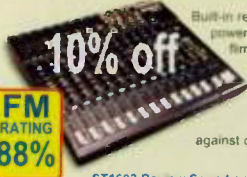
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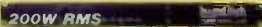
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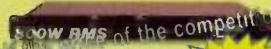
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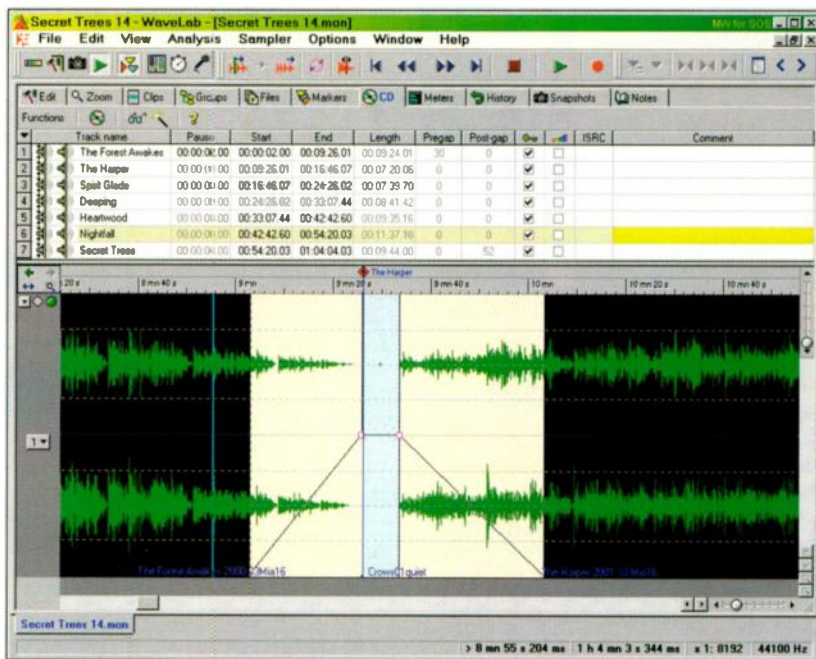
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CD MASTERING ON THE PC

The final stage of production — turning your mixes into a finished CD — requires some specialised tools.

Martin Walker runs through the options and considers how best to set up and use the necessary PC software.

Lots of *SOS* readers have been asking me over the last few months if they can master their albums using a computer, rather than relying on external rackmount hardware to do the job. Mastering basically involves taking the individual songs, placing them in a suitable order (which not always as easy as it sounds), adjusting their relative levels and EQ to make them sit more



With suitable software (such as Steinberg's *Wavelab 3.0* shown here), you can assemble your album tracks in any order in both list and graphic form, hear the joins, add fades in and out on the fly, and crossfade two tracks.

mastering masters

comfortably together, and adding any final 'fairy dust' if and when needed. Well, of course, this is possible using a computer, and once you have your recordings on a hard drive you could leave them there at every stage right up to CD burning of the final product if you wish.

However, the hot debate among traditional studio owners concerns software plug-ins, and whether or not their quality matches up to that of external rackmount outboard effects. This question is particularly important during mastering, since each make and model of the types of processor that get used, tends to have its own unique sound.

As I discussed in *PC Musician SOS* November 2000, there is no inherent reason why a software solution should be inferior for most types of effect, subject to it being given sufficient processing power. Indeed, some existing rackmount effects are nothing more than powerful computers in a box with additional I/O. Most modern studios seem to be using at least some plug-ins, and some have embraced them wholeheartedly as another way forward, if not the only way forward.

So, the answer is yes — you can master an album without ever leaving the comfort of your computer, and get results that are good enough to release commercially. However, mixing and mastering are very different skills, and it's important to know how to make the most of the available software tools.

Suitable Software

If all you want to do is assemble a set of already perfectly formed audio files into a chosen order and

CD MASTERING ON YOUR PC: TOOLS & TECHNIQUES

then burn an audio CD you won't need a mastering application, since you can do this with almost any CD-burning utility. However, this can be a frustrating approach, since unless you can listen to the tracks in sequence before the burn, you won't be able to hear how they sound one after the other until you put the finished CD-R in your hi-fi. The latest versions of products like Adaptec's *Easy CD Creator*, Ahead Software's *Nero*, and CeQuadrat's *WinOnCD* all provide more facilities for those creating audio CDs, but there's no substitute for being able to audition and make changes to the WAV files in context.

The next step up is a list-based stereo audio editor that lets you assemble your audio files, add fades in and out where required, and audition the 'joins'. Nowadays most of these have a graphic environment that makes the process far more intuitive, as well as the ability to drag and drop each track relative to each other to adjust spacing, and in some cases even drag one across another to automatically create crossfades between tracks.

Since modern multitrack audio software is capable of running plug-ins suitable for mastering

Professional Mastering

While mastering on your PC can give good results, I certainly wouldn't claim that it gives results as good as those achieved by a professional mastering engineer. For a start, you're unlikely to have a state-of-the-art monitoring system that's flat down to 30Hz or less to accurately judge the bass end. You won't have tens of thousands of pounds worth of esoteric EQ, compression, reverb, and other goodies to tweak your sound to perfection.

Most of all, however, you're unlikely to have the same level of expertise, objectivity, and impartiality. Good mastering engineers are renowned for their 'golden ears', and their skills are acquired through years of training and experience.

purposes, it's also perfectly possible to master in the same environment in which you record and mix. However, a dedicated mastering application may still prove easier to use in the long run, for various reasons. First, it's vital to be able to zoom in to view waveforms at single-sample level to be able to spot and remove clicks and pops, and not all multitrack applications let you do this without accessing an external audio editor. In addition, it's often easier to assemble a set of stereo mixdowns into the final order and adjust the spacing between them using a list-based approach, even if you can also view them as graphics, since dragging and dropping text in a list is far easier to deal with.

Finally, using a dedicated mastering application into which the CD-burning process is fully integrated can make the overall process even easier, especially where the final CD audio file is being calculated 'on the fly'. This is because the individual tracks always remain separate, so that you're not having to deal with single 600Mb image files for an hour-long album. In many cases the fades can also be applied 'on the fly' during the burn, which makes it easier to change things at the last moment if required, and some packages even let you apply plug-in effects to individual tracks as well.

I have come across one multitrack application that provides all these facilities — *Samplitude 2496*

(formerly marketed by SEKD, but now under the banner of Magix, who also offer a dedicated stereo version called *Samplitude Master* devoted to mastering). On the PC there are several other software applications that are specifically intended for detailed work on final mono or stereo tracks. The most famous is Steinberg's *Wavelab*, now at version 3.0, which now incorporates the multitrack Montage function to assemble more complex tracks, add fades and effects 'on the fly', and has integrated CD-burning facilities.

Sonic Foundry's *CD Architect* is another elegant application, and comes bundled with their *Sound Forge Lite* editor, although most musicians will prefer the more comprehensive *Sound Forge* if it's within their budget. Sample rates of up to 96kHz have been supported for some time, but only after a wait of several years for the recent version 5.0 have 24-bit files been supported as well. Syntrillium's *Cool Edit Pro* is also an excellent stereo and multitrack editing package, but doesn't have integrated CD-burning facilities. IK Multimedia's *T-Racks* provides virtual valve EQ, compression, and multi-band limiting, as well as fade options, and has recently been updated to accept 24-bit files, but unlike the others mentioned here doesn't provide graphic editing — in fact, it's more like a rackmount processor such as TC's Finalizer in approach. ►

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CD MASTERING ON THE PC

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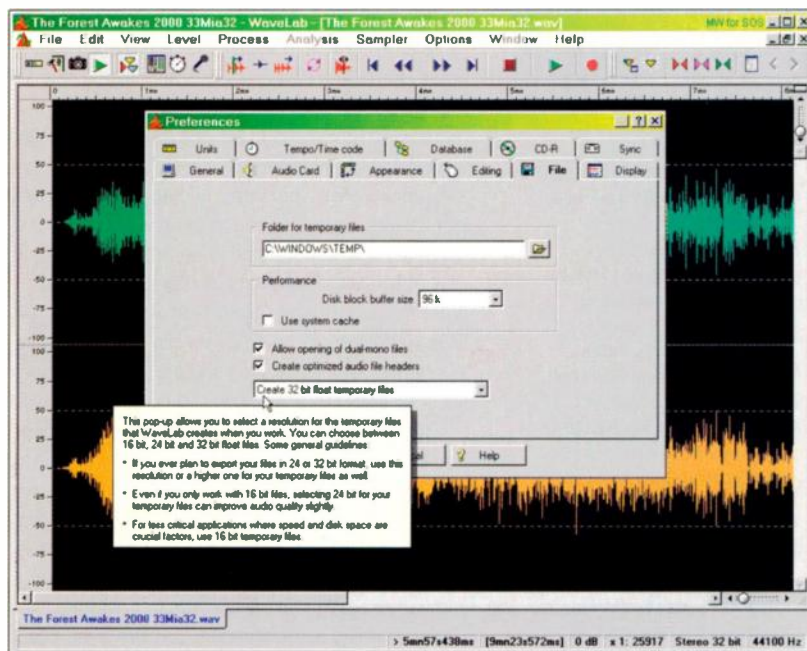
For the best final results when mastering, the stereo audio files of each track should be at 24-bit or higher resolution. This doesn't necessarily mean that you have to record every track in your audio sequencer at 24-bit resolution, since most multitrack applications will let you mix 16-bit and 24-bit tracks at will: the important part is to make the final stereo mixdown at 24-bit, or even 32-bit if you have a suitable application like *Cubase VST/32*. You will benefit from this even when using 16-bit converters or samples on the original recordings, since as soon as multiple tracks are mixed together there will be more than 16 bits' worth of resolution anyway.

Choice of sample rate is a more thorny issue. I still use 44.1kHz since this is my target rate for burning audio CDs and although some people maintain that modern sample-rate converters are now so good that you can start at 96kHz and then down-convert at the end, I prefer not to put my audio through an extra stage of conversion. However, if you're convinced of the audible benefits of high-sample-rate recording for your type of music and gear, and your system can cope with the increased processor and hard disk requirements, go ahead, though bear in mind that 88.2kHz may be a more benign choice than 96kHz, since the down-sampling process to 44.1kHz is so much simpler.

If you're transferring a 48kHz DAT tape into your PC for mastering, you will obviously have to convert this to 44.1kHz. Since this will change the overall sound slightly, I would be inclined to do this as the first process, so that you can add further tonal tweaks to the final 44.1kHz version as required. If you have several applications capable of this conversion, try them all and compare the results, and if there are any quality options make sure that you always use the highest one — it may take considerably longer to process the whole track, but you want to lose as little quality as possible.

Whatever sample rate you choose, you should leave recordings at as high a bit depth as you can until the last moment, and then convert to the final format (normally 16-bit for audio CD burning) as the last stage, with suitable dithering. This is because any alterations you make to the audio files — including gain changes, compression, EQ, and fades — will produce rounding errors in the calculations. If they are already at 16-bit then the accumulating errors will gradually make your tracks sound coarse and grainy, and you'll lose fine transient detail and stereo localisation.

If your software lets you choose a resolution for temporary files, make sure this is also at a suitably high setting. In *Wavelab*, for instance, choose 'Create 32-bit float temporary files' in the File page of Preferences. While you're there, if you have separate Windows and audio drives make sure that you set the Folder for Temporary Files to the Windows one, since keeping them on a different drive from your audio ones will greatly speed up most Undo operations. You can also do this for *Sound Forge* in



the Perform page of its Preferences. If you're using *Cool Edit Pro*, ticking the 'Auto-Convert all data to 32-bit upon opening' box will ensure that all subsequent editing is also carried out at 32-bit resolution.

Neat And Tidy

Once you have all your tracks as final stereo files, the first thing to do is to listen to them carefully for any basic imperfections such as clicks, pops, hums, and so on. These should really have been dealt with at the multitrack recording stage, but sometimes they slip through unnoticed. If you hear any such problems, and you still have the multitrack files, you will nearly always get better results removing the offending sounds there than on the final mix, but even with a final stereo mix there's a lot that can be done. Restoration is a complex subject, but here are a few pointers that may help.

Very short clicks and pops a few samples long can usually be neatly removed using a waveform Draw tool, while longer ones are better dealt with by a dedicated algorithm that has been designed to recognise and eradicate them. *Wavelab* has a variety of these built in to its Waveform Restorer, *Cool Edit Pro* also provides a variety of Noise Reduction options in its Transform menu, and *Sound Forge* has glitch detection available in its Find tool. The beauty of these functions is that they only alter the waveform for the duration of the click, which nearly always gives an inaudible result in the final track.

Hums are more problematic. A narrow notch filter set to 50Hz or 60Hz, depending on your local mains frequency, will get rid of the fundamental, but you will nearly always need to filter out the 100Hz and 150Hz (or 120Hz and 180Hz) harmonics as well, and this can start to compromise the overall track quality if you're not very careful. Several plug-ins, such as TC Works' *Native EQ Parametric*, Waves' *Q10-Paragrophic* and *Renaissance EQ* have suitable presets, and again, treating individual tracks rather

Making the most appropriate settings in your mastering application can have noticeable effects on final sound quality. Most software provides guidelines that will help you make the best decision.

Visual Information

Many musicians find that using analytical tools helps during mastering, and I discussed many of the options in some detail in *SOS* September 2000. A spectrum analyser is useful to examine frequency response against other recordings, and can also be invaluable in spotting low-end problems that may not be audible on nearfield monitors. Most audio editors, including *Cool Edit Pro*, *Sound Forge*, and *Wavelab* now incorporate them, and shareware plug-ins are also available from Nick Whitehurst (see Contacts box). Steinberg's *FreeFilter* also has one built in, and can learn the frequency response of another track and apply it to one of yours.

A phase display can help check for mono compatibility (which is still vital if you expect radio play). Steinberg has one in its *Mastering Edition*, Nick Whitehurst incorporates one in his shareware *C_SuperStereo*, and PSP provide a *Stereo Analyser* in their *StereoPack*.

A sonogram display can help you make decisions about high-frequency enhancement, as well as spotting low-level hums, whistle and DC offset problems. Again, *Cool Edit Pro* and *Sound Forge* have one built in, while Steinberg's *Mastering Edition* has one in plug-in form.

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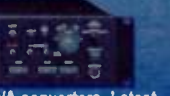
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CD MASTERING ON THE PC

▶ than the final stereo mix will probably produce the best results.

The only really effective way to remove hiss is to use a specialised real-time plug-in like Steinberg's *DeNoiser*, or one that analyses a noiseprint, such as Sonic Foundry's *Noise Reduction* or Arboretum's *Restoration-NR*. The latter type will remove any continuous background noise, and can therefore be effective for hums and air-conditioning noises as well. In many cases you may get away with treating only the first and last few seconds of the track, where background noise may be more noticeable. This avoids having to pass your entire track through the plug-in, but watch out for clicks when you drop the process in and out. Many low-cost CD-burning applications have restoration tools built-in, but few of these are suitable for professional work — use your ears before you decide whether or not to entrust your tracks to them.

Having dealt with any imperfections in the recording, it's time to top and tail your tracks, removing any extraneous material before the first note and after the final one. I normally leave a few milliseconds before the first note and apply a very short fade-in, so that there's no possibility of a click. However, be very wary of chopping off the end of reverb tails at the end of the track.

The next stage is to assemble the tracks into a suitable order — which, contrary to many people's perceptions, isn't as easy as it might sound!

Equalisation

Hopefully, your tracks will already sound fairly close to the desired result in terms of EQ. If not, then perhaps you need to spend a bit more time at the multitrack stage, since you are likely to get better results overall by equalising each instrumental track separately. Mastering EQ should be a matter of making subtle changes such that different tracks on an album fit better with one another. For this you don't normally tend to need a multi-band graphic EQ, or a complex parametric EQ (or at least not using high 'Q' settings). What you need are gentle slopes allowing you to apply moderate, wide-ranging boost or cut. These not only sound more natural to the ear, but will be far more effective at warming up or cooling down a track than lopping off or boosting isolated chunks of the frequency response.

There are loads of EQ plug-ins on the market, and they all sound different, so if you already have several to choose from you should use your ears to decide which are best for mastering. Try setting up similar settings on each and switch between them to see which sounds the most musical. Personally, I like Steinberg's *TL Audio EQ1*, since it has a warm, open sound based on TL Audio's valve equaliser and is extremely easy to use, and the 7-band parametric and switchable slope design of Steinberg's *Q-Metric*, which can process at double the normal sampling rate for a smooth, open 'analogue' sound. Another great candidate for mastering is the Waves *Renaissance EQ* (part of the *Renaissance* bundle), which has great-sounding 48-bit processing and unusual 'parametric shelf' options. The TC Works

Parametric EQ (either the *Native* version or the cheaper *Native Essentials* one) is good for mastering as well, since it provides the option of shallow slopes right down to 3dB/octave.

Fairy Dust

Even tracks recorded in the best studios can sometimes benefit from a little enhancement. Normally this concentrates on the two extremes of the frequency spectrum, to hone and polish the bass end and add some missing sparkle at the top. There is a difference between these techniques and EQ, since they often work dynamically rather than simply raising or lowering the frequencies in question, and in some cases actually generate missing harmonics based on what's already there. However, the different types have already been covered in some depth in the pages of *SOS*, so let's concentrate on what's available in plug-in form for the PC.

At the high-frequency end, one of the first enhancers was Steinberg's *Spectralizer*, now available as part of their *Mastering Edition* bundle. This adds second- and third-harmonics above a chosen frequency, and like most other such plug-ins can also help enhance transient detail and stereo imaging. Arboretum's *Harmonic Exciter*, from the *Hyperprism DX* pack, works in a similar way, while PSP's *MixTreble* also offers high-frequency stereo widening and companding to further enhance the mix.

You may also want to try adding a subtle amount of virtual 'tape and tube' modelling. I discussed suitable plug-ins in depth in *PC Musician* October 2000: some to try include Steinberg's *TrueTape* and *Magneto*, PSP's *MixSaturator*, and AIPL's *WarmTone*. If you want to widen or otherwise alter the stereo image, Waves' *S1 StereoImager* and PSP's *StereoEnhancer* work very well, as does the freeware *C_SuperStereo*. It's very tempting to add too much enhancement and stereo treatment, so make sure you A/B with commercial mixes so that you don't overdo things.

The bottom end is probably the most difficult to tweak unless you have good acoustics in your studio, and even then you still won't know what's going on below the cutoff point of your monitors. Again, referring to known commercial



There are plenty of high-quality plug-ins available that are suitable for mastering, including exotic 'analogue' and 'tube' EQs, multi-band compressors, and visual aids.

Hints & Tips

- Make sure you regularly switch between the track you're working on and other reference tracks as a comparison, preferably including some commercial ones that have had the benefits of no-expense-spared mastering expertise.
- Every audio process costs something in sound quality, so don't put your tracks through any unnecessary stages.
- Wait at least a day after mixdown before starting to master — the two processes are

- very different, and mastering needs a clear head.
- Don't use a noise gate plug-in to remove low-level sounds between tracks — after all, you've got a large-screen editing environment and can add suitable fades and digital silence wherever you need it.
- Play back the final tracks to friends, be they musicians or otherwise, and try to keep quiet when they make comments — you'll learn more that way.

“The only really effective way to remove hiss is to use a specialised real-time plug-in like Steinberg’s DeNoiser, or one that analyses a noiseprint, such as Sonic Foundry’s Noise Reduction or Arboretum’s Restoration-NR.”

mixes will help keep your bottom in perspective, and in many cases you could roll off everything below about 30Hz with a suitable filter to prevent unnecessary cone flap while leaving the bass almost unchanged. Suitable plug-ins to try for bass tweaks include Waves’ *MaxBass*, Arboretum’s *Bass Maximiser*, and PSP’s *MixBass*, all of which generate harmonics based on the original bass end to reinforce it, while offering bass compression to increase the impression of bass without unduly increasing overall level.

A Question Of Balance

A lot of musicians normalise all their final stereo mix files, raising the level so that the loudest peaks are all exactly at 0dBFS (full scale). Now I can see the attraction of immediately making them louder, but

this is totally the wrong thing to do at this stage. First of all, you make it extremely difficult to add any further treatment such as EQ or top-end enhancement, since these will both tend to raise peak levels even further. Since you’re likely to want to change the overall level later on, it’s also an unnecessary set of calculations to put your audio through, but most important, it won’t adjust the levels so that your tracks sit well together.

Perceived loudness is a function of average (RMS) level rather than peak level, and is far better measured by a VU (Volume Unit) meter than the peak meters found on most small hardware mixers and in nearly all software. Of course, making sure that the peak level of your recordings never reaches clipping point is vital during the recording process, but this isn’t what you need for the mastering stage.

Monitor Levels

Although it’s extremely important to reference your own music to the cream of commercial releases in a similar style, it’s also important to try to stick to a similar listening level whenever you are mastering, to avoid the Fletcher-Munson effect. The frequency response of the human ear varies with level, so if you play music louder it will sound more bassy and topky. If you listen at different levels each time you work you run the risk of adding too much or too little bass and high end. This is why most mastering engineers use a pink noise test signal to set up a specific sound pressure level of about 80dB SPL through their monitors at the listening position using a C-weighted level meter — Studiospares and Tandy (Radio Shack) have cheap models — and then leaving the monitor amplifier controls well alone.

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CD MASTERING ON THE PC

► If your software can measure the average RMS level of a track then you can use this to provide an indication of relative levels between them. *Sound Forge* and *Wavelab* both provide this function, but remember that unless your music is all at the same tempo and in the same mood, some tracks will probably need to be quieter than others anyway, so use your ears as well. A ballad won't sit properly in the middle of a rock album if it's at the same level as the rockier tracks, for instance.

There are many ways to start levelling, but one of the easiest is to take the track that you feel should be the loudest, and start with that. Unless you've already compressed the life out of it, you'll probably need to increase its average level slightly to compare with most other CDs on the market. At the mastering stage, the majority of tracks can simply be treated with a look-ahead limiter like Waves' *L1 Ultramaximizer*, Steinberg's *Loudness Maximizer*, or the *L* limiter/maximiser of TC Works' *Native Bundle 2*. These can raise levels by four or five dB above normalisation levels in a virtually transparent way, by limiting only those peaks that would otherwise be clipped.

A discussion of compression options during mastering would need a dedicated article in itself, and on many tracks I'm unconvinced that that mastering compression is needed unless there's something basically wrong with the track dynamics or de-essing is required. Even then, if you've already got your multitrack sequencer sitting in the same PC then it will probably be easier to deal with there than at the mastering stage. If you do use mastering compression, a soft-knee algorithm generally sounds better, and there are many plug-in options such as PSP's *MixPressor*, TC's *Native DeX*, and Waves' *C1* and *RCL*.

Multi-band compression can help where a particular part of the spectrum needs treatment, and generally results in less audible side-effects for a given amount of gain reduction. You can use it to tweak the level of specific frequency bands without unduly altering the rest of the mix. Two plug-ins of note here are Steinberg's *ME Compressor* and Waves' *C4*, both of which offer extremely flexible click-and-drag control over band crossover frequencies.

All Of A Dither

The final stage in the mastering process is to reduce the bit depth from 24-bit or 32-bit down to the 16-bit required for an audio CD. At the same time you need to add dither noise during the process to retain as much as possible of the low-level detail from the original files. Most musicians understand the reason for dither in principle, but here's a way to make the benefits more obvious so that you can hear the results for yourself. Those who have a choice of several dithering algorithms can also use this technique to compare them.

Start by taking one of your 24-bit or 32-bit tracks and apply a fade-out with no dither to the last 30 seconds or so, leaving you with a 24-bit or 32-bit file. Now select the final few seconds of this fade,



The FFT display, bottom right, shows the high-frequency dither noise added by the popular Apogee UV22 algorithm.

starting at a level of about -50dB or so (check the peak level in your software meters), set it to loop, and then play it back. You will have to turn up your mixer or amplifier level considerably to hear the result, and to prevent nasty damage to either your ears, amplifier, headphones, or speakers, the safest thing is to cut and paste this section into a new file to avoid accidents.

First of all, play the fade back with its normal bit resolution, and hear how it fades smoothly to silence. Now try playing back the file with simple truncation to 16-bit resolution. Plug-ins like Waves' *L1 Ultramaximizer* let you set the Quantise value to 16-bit (with all other dither options set to None) or if you're using *Wavelab* you can change the Preferred Playback Resolution to 16-bit in the Audio Card page of its Preferences section and restart playback. You will hear that the final part of the fade will have lots of distortion as the lowest bit flips on and off.

Now you can try adding various flavours of dither noise, either using the facilities of your mastering application or using a plug-in. Set the dither to 16 bits while still playing back with 16-bit resolution. With basic dither noise added you will hear a steady hiss, but with the music now clearly audible all the way to the end of the fade. If you change to noise-shaped dither, the hiss will be less audible (since this technique locates as much of the noise as possible above 15kHz, where it is less audible to human ears).

Effectively, you are trading off a few dB of extra noise for the complete absence of low-level distortion, giving an apparent resolution of up to 19 bits in the final 16-bit file. The only thing to beware of is that some 'ultra' shape settings should only be used at the very final stage of mastering, since they add such a high peak of high-frequency noise that any subsequent editing followed by further dithering may theoretically cause distortion. However, once you understand dithering you'll retain the best possible sound quality when you finally burn your tracks onto audio CD. **SOS**

Contacts

AIPL (*Warmtone*)

W www.aipl.com

Arboretum (*Hyperprism DX bundle, Restoration-NR*)

W www.arboretum.com

IK Multimedia (*T-Racks 24*)

W www.t-racks.com

Magix (*Samplitude*)

W www.magix.com

PSP (*StereoPack, MixBass, MixTreble, MixSaturator*)

W www.psp-audioware.com

Sonic Foundry (*Sound Forge, Noise Reduction 2, Vegas Pro*)

W www.sonicfoundry.com

Steinberg (*DeNoiser, Magneto, Mastering Edition, Q-Metric EQ, TL Audio EQ1, Wavelab*)

W www.steinberg.net

Syntrillium (*Cool Edit Pro*)

W www.syntrillium.com

TC Works (*Native Essentials, Native Bundle*)

W www.tcworks.de

Waves (*Native Power Pack, Renaissance Collection*)

W www.waves.com

Nick Whitehurst (*C_FFT, C_SuperStereo, FFT*)

W <http://ourworld.compuserve.com/homepages/NickWhitehurst/>

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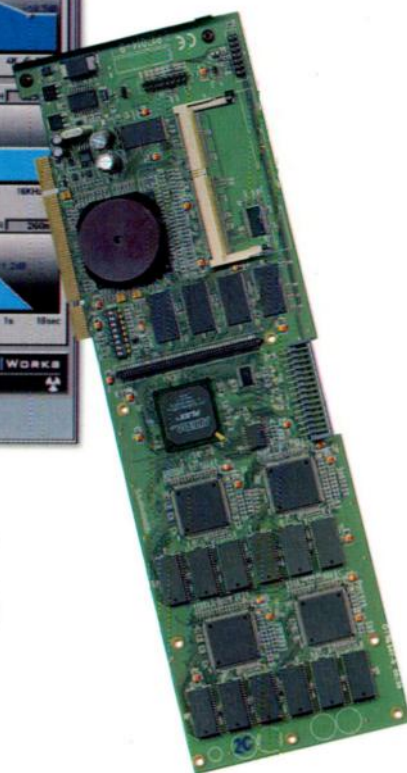
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Paul White turbocharges his Mac in the never-ending battle to load up bigger and better plug-ins.

core concepts



TC WORKS POWERCORE DSP PLUG-IN BOARD FOR MAC

The Steinberg-conceived VST plug-in standard is perhaps one of the most significant computer music developments since MIDI itself. However, as VST plug-ins depend for their processing on the host computer, there will always come a point where the computer throw up its hands and says 'No more!' Current alternatives include high-power, DSP-based plug-ins that run in completely different environments, which provide more power and expandability, but there's a lot to be said for sticking with just one standard environment where you know with a reasonable degree of certainty that all your plug-ins will run side by side without introducing restrictions or extra complexity. Because of the excellent support for VST within current music software, I believe that for most people VST is the plug-in environment that makes most sense, although Digidesign's TDM system has advantages for the professional user.

A few months back, we announced that TC Works had developed a DSP card designed to provide a lot of extra power for running plug-ins within any VST- or MAS (MOTU's own plug-in system)-compatible Macintosh music program. PowerCore is now available, though currently on the Mac platform only — PC support is planned for the end of the year.

At The Core Of The Apple?

Although it runs within a VST/MAS environment, it must be made clear from the start that it doesn't actually run ordinary VST plug-ins. PowerCore uses fixed-point Motorola DSP processing, which requires completely different code from host-based VST plug-ins. The big difference between PowerCore and other DSP-powered systems is that both PowerCore plug-ins and conventional VST/MAS plug-ins can be

accessed from within the same menus and used within the same environments, making the difference largely transparent to the user. Furthermore, PowerCore has come at a good time, because even though G4 computers are immensely powerful, the wealth of VST effects, processors and instruments available, combined with the demand for higher sample rates, greater bit depths, and inevitably surround capability, means that the available native processing power can get eaten up surprisingly quickly. There's also a trend towards better quality and more powerful plug-ins, which also places a lot of demands on processor overheads.

It's important to underline the fact that sequencer software manufacturers don't need to do anything to support PowerCore beyond implementing the VST or MAS protocols, because it works in these environments. PowerCore also supports 24-bit/96kHz and beyond if the host program supports that, albeit by reducing the number of plug-ins that can be run at once. Furthermore, the effects use 48-bit double-precision processing on the DSPs for optimum resolution. It's never easy to define exactly how much extra processing power you get with a card like PowerCore but in terms of plug-ins, it's claimed to be equivalent to a G4 computer with a clock speed of over 2.8GHz.

The next obvious question to ask is where these specially written plug-ins are going to come from. Some plug-in designers have made it clear that they don't think it's worth the effort to totally rewrite their code to run on a DSP platform, while others, who either use DSPs in their hardware already or who write plug-ins for other DSP-based systems, have shown more enthusiasm. Of course, TC Works

The biggest attraction of PowerCore for most would-be buyers will be the ability to run up to eight instances of the high-quality TC MegaVerb reverb plug-in (top-left) without loading the host computer's CPU at all.

TC WORKS POWERCORE £999

pros

- Puts heavy-duty DSP effects in a VST or MAS environment.
- Good power-per-pound/dollar ratio.
- Very respectable bundled plug-ins, especially the reverb.

cons

- At the time of review, there were no third-party plug-ins available.
- No bundled dynamics processing.

summary

PowerCore offers the best of both the DSP and VST worlds in a conceptually simple package which is compatible with all VST and MAS audio software. Currently, only Mac systems are supported, but PC support is expected at the end of the year.

SOUND ON SOUND

Spark LE

The bundled version of *Spark LE 2.0* is a 'light' but still very powerful version of TC's *Spark 2.0* editing program, offering stereo waveform editing, playlist editing, comprehensive plug-in processing, CD burning and audio format conversion. *Spark LE 2.0* offers real-time processing with 32-bit floating point accuracy and supports 8-, 16-, 20-, 24- and 32-bit audio files at sample rates up to 192kHz. It can work with WAV, AIFF, SDII and all formats supported by QuickTime, and handles MP3 decoding via QuickTime. As with

the full version, there's drag-and-drop Region-to-File export and real-time sample-rate conversion.

However, unlike the full version with its expandable effects matrix, the Master section of *Spark LE 2.0* can accommodate up to a maximum of four VST or *Spark LE* plug-ins at one time. The provided plug-ins are a single-band parametric EQ, *MaxIt* maximiser, and a *Delay Line* with tempo matching facility. Third-party VST plug-ins may also be used in *Spark LE*'s Master section.

themselves will be providing new PowerCore VST plug-ins, and as they're already a strong name in the plug-in world, you can bet that their offerings won't be too shoddy! To date, Antares have announced a PowerCore version of *Auto-Tune* due to ship in July and, as expected, TC Works' sister company TC Helicon are pitching in (sorry) with a new plug-in based on their human voice modelling technology. TC are also in discussion with several other companies and at the Frankfurt Musik Messe, Steinberg announced that they are considering developing products for PowerCore. The Motorola 56K DSP used in PowerCore is standard issue in many high-end processing applications from

Pro Tools to boxes by TC Electronic as well as a number of digital synths, so it should be relatively easy for many developers to offer versions of their products that will run on PowerCore!

Ultimately, it won't matter if not everyone supports PowerCore because, unlike other systems, you can run host-based VST or MAS plug-ins at the same time as PowerCore ones, with the advantage that transferring some of the load to PowerCore frees up more processing power on the host computer. To get the ball rolling, TC Works provide a bundle of pretty serious plug-ins with the card, including a very respectable reverb in the shape of *TC Megaverb*. As reverb is one of those processes that really drains CPU power, this in itself is a good reason to consider PowerCore.

Also in the bundle are *TC Chorus/Delay* and *TC EQSat*, the latter combining five-band parametric EQ with tube-saturation emulation. These plug-ins are based on the *TC Tools* package previously available only to Digidesign TDM users, and the chorus/delay is actually modelled on the respected TC Electronics 1210 Spatial Expander. TC Works' *MasterX* is also planned to be available at or shortly after the time the card hits the market, with *Voice Tools* following on later in the year. Buyers also get a free copy of *Spark LE v2.0*, a cut-down version of TC's *Spark* editing and mastering software. None of the bundled

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TC WORKS POWERCORE

► plug-ins currently offer any surround processing, but TC may develop this in the future.

Using PowerCore

Installing PowerCore drivers from the CD-ROM is pretty straightforward. The card itself goes into any free full-length PCI slot and has no I/O or other connectors to complicate matters. Because the bundled software is specially adapted to work only with PowerCore, no copy-protection schemes are needed. For optional plug-ins (either from TC Works or third-party developers), there will be a one-off challenge and response system that will authorise the plug-in to run only on one particular PowerCore card.

Once the software has been installed, the PowerCore VST plug-ins (which reside in your standard VST plug-in folder) appear and behave like any other VST plug-ins, but of course they draw their power from the DSP card, not from the computer. Because the card doesn't deal with I/O, it doesn't care what I/O protocol your sequencing software uses. I checked it out using Pro Tools hardware via Direct I/O, an Emagic Audiowerk 8 using its own *Logic* driver, and the Mac's built-in I/O via an AV ASIO driver, and once my early beta software was replaced with the production version it worked smoothly with them all.

The Bundle

You should always buy a product based on what it offers at the time of purchase rather than what it promises for the future (even when the future looks good!) so the quality of the bundled effects, especially the reverb, is a paramount concern. All three plug-ins feature a streamlined and intuitive user interface that provides a sensible amount of user control without getting too bogged down in obscure parameters, and a number of the controls elements have strong graphical elements. For example, the reverb depicts room sizes and shapes along with a graph of the reverb early reflection position and the late reverb decay. Separate decay times can be dialled in (or dragged) for three adjustable frequency bands, again with a neat bar-graph-style display, while the reverb characteristics can be adjusted by room shape, room size, surface material diffusion and overall high-frequency absorption.

From the various shaped 'rooms', it's possible to create all the usual plates, rooms, chambers, halls and so on that appear as presets on most hardware reverb boxes, but there doesn't appear to be any provision for setting up gated or reverse effects and there's no means of modulating the delays within the delay matrix (for those Lexicon-style 'Spin' and 'Wander' effects). Nevertheless, the reverb engine is surprisingly flexible and it's possible to produce some very classy treatments that are smoother and more dense than those achievable using typical native plug-ins. A range of presets is included to get you started, and designing your own patches is very simple. *MegaVerb* is also capable of turning in some quite passable room ambiances, which I feel is

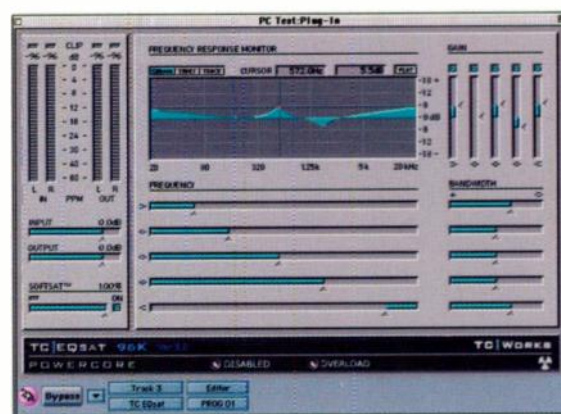
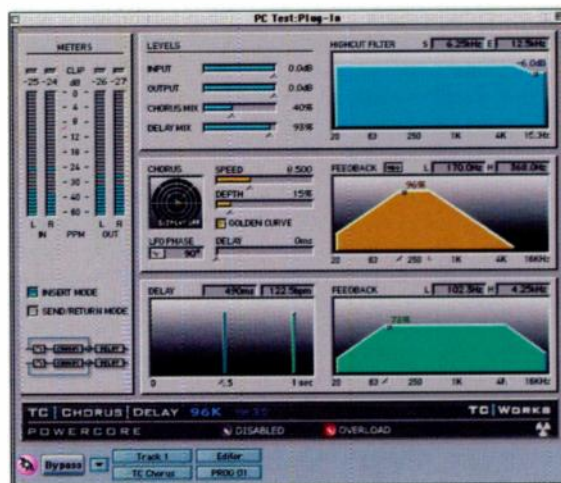
important in today's production environment. It's hard to be exact about something as subjective as reverb, but I'd say *MegaVerb* stacks up pretty well against hardware boxes costing around the £500 mark, and PowerCore can run up to eight of them at the same time if need be.

EQSat includes variable tube-style saturation followed by a five-band equaliser with fader control and is based on the EQ stage from the TC Finalizer. The tube saturation only comes into effect for loud signal levels and seems to be intended to provide more headroom by applying soft clipping to signal peaks. The equaliser itself, which is configured as a three-band parametric bounded by two shelving high- and low-pass filters, is smoother and more musical than many digital equalisers I've tried, but you still seem to have to add rather more of it to produce the desired effect than would be the case with analogue EQ. *EQSat* is the most processor-efficient of the plug-ins, and PowerCore will support up to 12 at once (or 16 in mono).

Finally, the *Chorus/Delay* plug-in combines delays with a separate chorus/flanger. The delay can be set by time or tempo, and although there's no specific tape emulation facility, the feedback path can be high- and low-pass filtered at any frequency to suit the user. Like TC's hardware units, this effect sounds classy and musical, though I would have liked a multi-tapped stereo delay facility.

Conclusions

The great thing about PowerCore is that once it's installed, you just forget it and call up the associated plug-ins just as you would your standard VST (or MAS) plug-ins. Because the included reverb is rather better than typical native offerings (at least those that leave you any free DSP power to do anything else!), PowerCore is a very practical way of expanding a Mac-based music studio for around the price of a couple of modest hardware reverb boxes. Perhaps my only gripe is that there really should have been some dynamics plug-ins included in the bundle because everyone needs compressors. No doubt more plug-ins will turn up soon, hopefully priced closer to VST prices than TDM, but even as it stands, PowerCore makes a lot of sense. **EOS**



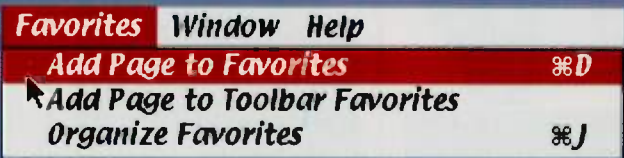
As well as *MegaVerb*, PowerCore ships with two other high-quality plug-ins: *TC Chorus/Delay* (top) and *TC EQSat*.

information

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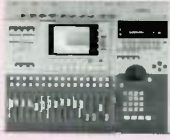
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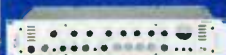
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synth secrets

I promised last time that we'd look next at how the brass synthesis theory I've been explaining over the last two months translates into real sounds on simple subtractive synthesizers. I'm going to start by taking as an example a single, rather basic monosynth, one with very few controls, very few control routings, and just a single signal path. This may not sound very encouraging, until I tell you that the synth is the Minimoog: very simple, very basic, and yet glorious. Since a decent treatment of brass sounds on the Minimoog takes up more than enough space for one instalment of this series, I'll be continuing next month with the Roland SH101 and the ARP Axxe.

Let's start by taking a peek at Figure 1 (see below), which represents the complete synthesis structure of the Minimoog, controls and routing. At first glance, it may look a little daunting, but you'll soon notice how limiting it is... perhaps the most limited of any multi-oscillator monosynth ever produced. If you want to prove this to yourself, try to draw the equivalent block diagram for the contemporaneous ARP Odyssey or ARP 2600!

Now, if you compare Figure 1 to the theoretical

PART 26: BRASS SYNTHESIS ON A MINIMOOG

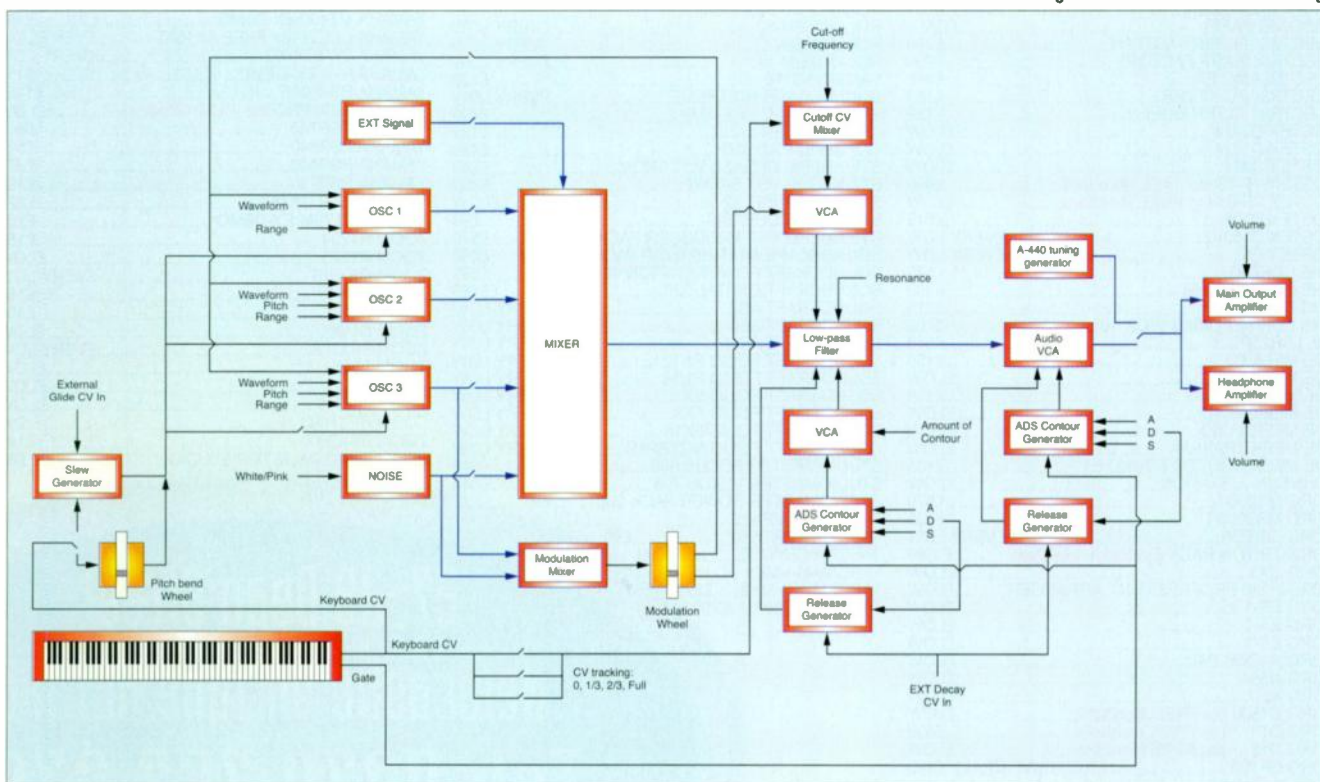
Last month we looked at how analogue modules can reproduce the sound of a real trumpet. All very well if you own a wall-sized modular system — but what if your means are more limited?

Gordon Reid adapts theory to practice with a Minimoog.

brass patch shown at the end of last month's Synth Secrets (shown again in Figure 2, on the right above), you'll see that the idealised patch requires numerous modules and CV routings unavailable on the Minimoog. This, in turn, suggests that the Moog is incapable of creating a good brass patch. However, experience tells us that the Minimoog is one of the



Figure 1: The structure of the Minimoog.



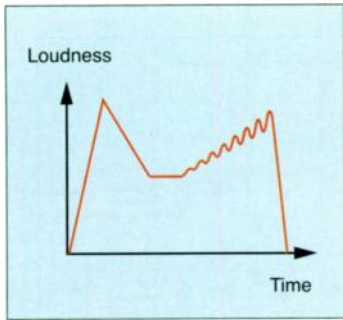


Figure 5: The loudness envelope of a note defined by a five-stage contour plus LFO.

Unfortunately, the Minimoog does not have a five-stage loudness contour, nor does it offer any form of loudness sensor, nor does it have an LFO that can add tremolo! Before describing the best that the Minimoog can do, I'm going to jump down to the control panel immediately to the left of the keyboard to determine whether the Decay switch is on or off (see Figure 6, right).

The reason for this is obvious if you know the Minimoog. Far from offering the desired five-stage contours, the Minimoog has only three-stage Attack/Decay/Sustain controls in its contour generators; it cannot even produce a four-stage ADSR contour, as found on most other synths. The best that it can do, when the Decay switch is set to On, is re-apply the Decay time as a Release stage when you lift your finger from a key. Because I know that a real brass sound ends very rapidly once you stop blowing the instrument, I want the synthesized sound to do likewise, so I set the Decay switch to Off.

The only two important parameters in the Loudness Contour section (see Figure 7, above right) are Attack, which should be set to 100 milliseconds, and Sustain Level, which should be set to 10 on a scale of zero to 10. Because the Sustain is at its maximum level, the Decay Time is irrelevant, and the Release Time, as discussed in the previous paragraph, is effectively instantaneous, no matter what the setting for the Decay knob may be. The resulting contour is as shown in Figure 8 (above right). Yikes! It's not much like Figure 5 — but it will have to do.

Shaping The Waveform: Tone

At this point, you may be wondering how on earth the Minimoog can produce a passable imitation of a brass instrument. If it can, surely it must be because the filter section can produce a close approximation to the ideal? Well, let's see...

You'll recall from the last two months that louder notes have more harmonics than quieter ones. Furthermore, you know that louder notes have higher proportions of higher harmonics than do quieter notes. But there's nothing we can do about this on the Minimoog, because it has no performance controls — velocity or pressure sensitivity, for example — to allow you to introduce this sort of expression. Indeed, there's *no* way to make the intensity of your playing affect the harmonic content of the sound. Fortunately, there are four things that can be done to approximate the tone of a brass instrument.

• FILTER CONTOUR

We can use the Minimoog's Filter contour generator to allow the higher harmonics to enter the sound in a reasonably realistic fashion. Figure 9 (below) shows the Minimoog's Filter section set up for a brass sound. As you can see, the cutoff frequency is set to -5 (on a scale of -5 to +5) so this is equivalent to 0 percent on most other synths. In other words, the low-pass filter is completely closed unless modulated by some external device. At the same time, the Amount Of Contour control is set to 6.5 (on a scale of 0 to 10) so the associated Contour Generator will sweep the cutoff frequency when you press a note. Remembering that the Decay switch in the performance control panel is set to Off, you can say that the filter contour has an Attack of 600 milliseconds, a Decay of 800ms, a Sustain Level of 5, and an instantaneous Release. I've drawn the resulting contour in Figure 10 below. It's exactly what we want, as shown in Figure 13 last month.

• RESONANCE

You will see in Figure 9 that the Resonance is set to 2 (out of 10). This suggests that there is a slight bump in the filter cutoff profile, as shown in Figure 11 on the next page. Again, this is very close to the response that the theory and measurement of real brass instruments says we require.

• FILTER TRACKING

In part 24 of this series, I discussed how the harmonic content of a brass note changes with pitch and concluded that, to reproduce a brass instrument accurately, the filter cutoff frequency must track the keyboard CV at slightly less than a 1:1 ratio. For example, if one note is an octave higher than another (ie. the frequency doubles), the filter should open by a factor slightly less than two... say, to 190 percent of its previous value.

The Minimoog does not offer a variable filter tracking, but instead has four options, selected using the Keyboard Control 1 and Keyboard Control 2 switches in the Filter section. If both switches are set to Off, the filter cutoff frequency does not track the keyboard. If switch 1 alone is on, the filter tracks at 33.3 percent of the keyboard CV. If switch 2 alone is on, the filter tracks at 66.7 percent of the keyboard CV. Finally, if both switches are on, the filter cutoff frequency follows the keyboard CV at exactly 100 percent. The closest approximation to the theoretical ideal is 100 percent, so I have set both switches to On. This means that the resonant 'hump' in the filter profile always lies in the same position relative to the note being played, and that is — by and large — as it should be.

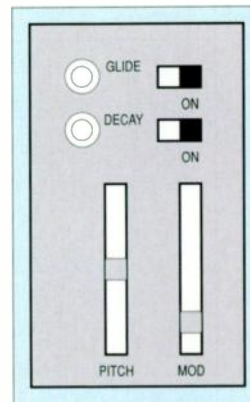


Figure 6: The Minimoog's performance control panel.

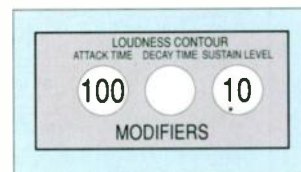


Figure 7: The Loudness Contour settings.

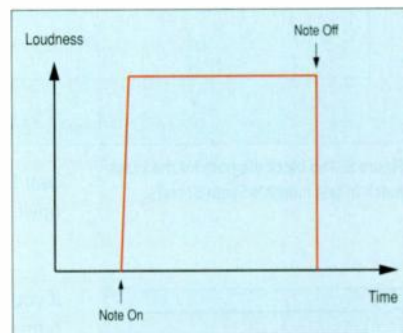


Figure 8: The loudness contour.

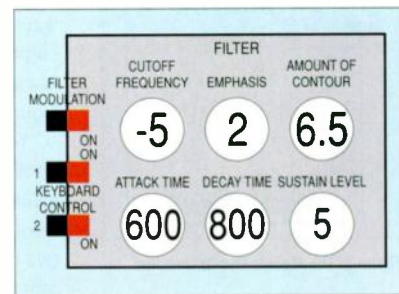


Figure 9: The Minimoog filter section.

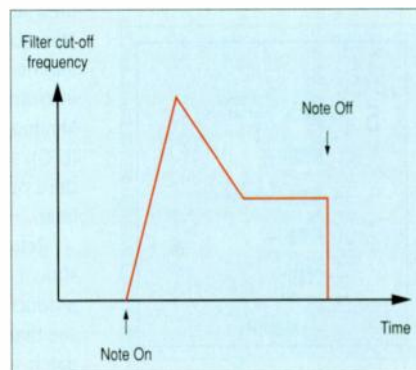


Figure 10: The filter cutoff frequency contour.

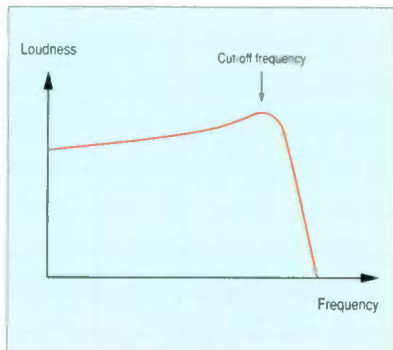


Figure 11: The filter's resonant cutoff profile.

• FILTER MODULATION

Last month, I described how a 'settling time' is required at the start of every note played on a brass instrument, and showed how a rapid modulation applied to the filter cutoff frequency could imitate this. I also used a contour generator and a VCA to ensure that this 'rasp' lasted just a fraction of a second.

On the Minimoog, Osc3 can provide the necessary signal to modulate the filter. The bad news is that there is no electronic way to contour its output; it looks as though the filter is either modulated, or not. But don't give up yet...



Figure 12: Defining the modulating signal.



Figure 13: Using Osc3 as an audio-rate LFO.

The filter may be modulated by the output from the Controllers section (shown in Figure 12, above) if the Filter Modulation switch (seen in the Filter section back in Figure 9) is on. The important knob in Figure 12 is the one marked Modulation Mix, which determines whether the modulating signal comprises Osc3's output, the output from the noise generator, or a mixture of the two. I have set the control to 0, giving us just the output of Osc3.

I now need to revisit the Oscillator Bank to set up Osc3 for modulation duties (see Figure 13, above). There are four controls to consider. Firstly, the Osc3 Control switch is off, so the frequency of the oscillator does not track the keyboard CV. This means that the modulation is consistent, no matter what notes we play

on the keyboard. Next, the 32' frequency range and the fine-tuning setting of -1 define the frequency I want to use in order to achieve the desired effect. Finally (as discussed last month) the triangle waveform is the one that best allows us to imitate the rasp of a brass instrument.

So far, so good... but I don't want the 'rasp' modulation to last for the entire duration of the note, or it will sound very unnatural. So how do I overcome the lack of a contour generator and VCA to control this?

The answer lies in the performance controls to the left of the keyboard. If you return to Figure 6, you'll see that there's a control wheel labelled 'Mod'. This allows you manually to control the level of the modulating signal. I've shown the architecture of this in Figure 14 on the next page. It may not look much like Figure 15 (the 'growl' section from last month's Synth Secrets) but, with skilful application of the mod wheel, the result can be much the same.

Amp & Filter Together

Ignoring the effect of the filter modulation, let's now consider the combined action of the Loudness Contour and Filter sections, and see what happens to any given harmonic within the spectrum of the initial sawtooth wave.

You know that, at the instant that you press a key, the low-pass filter is almost closed (but not completely, because keyboard tracking is set to 100 percent On). Therefore, the fundamental plus a handful of the lowest harmonics pass immediately

through to the audio signal VCA, and their rise time is determined by the Loudness Contour's Attack speed of 100ms. Then, because the filter opens more slowly than the amplifier (the filter's Attack is set to 600ms) the higher harmonics are let through one by one over the course of about half a second. Furthermore, different harmonics are emphasised as the cutoff frequency is swept, all of which is as we would expect in a real brass instrument. Figure 16 on the next page (which shows the response of real brass instruments) shows a simplified representation of this, and confirms that the Loudness Contour and Filter are set correctly.

Pitch Modulation & Noise

At this point, it would be useful to add the shaped noise described last month.

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► Unfortunately, while you can add noise in the Minimoog's Mixer, it lacks the formant shaping of the turbulent noise in a real brass instrument, and sounds very unnatural. Consequently, it is best omitted.

It would also be beneficial to add delayed pitch modulation (vibrato), but I have run out of facilities... the Minimoog has only one modulation source, and no spare contour generators or VCAs, so it simply isn't capable of this. Sure, I could sacrifice the growl for a steady vibrato, but I can't have growl and vibrato simultaneously. Or can I...?

Let's return to the performance controls in Figure 6 where, next to the Mod wheel, you'll find the Pitch wheel. With a bit of practice, it's possible to introduce vibrato manually, by moving this wheel backwards and forwards very slightly! This isn't as strange as it may sound — it's not dissimilar to what a guitarist does by bending strings, after all — and it can produce vibrato that is much more natural than that generated using an LFO. Indeed, with practice, you can alter the amount and speed of the vibrato, as the music requires. You can also move the wheel more dramatically to imitate the slides of a trombone, but that would be quite inappropriate for a trumpet and the other brass instruments.

The Resulting Patch

Figure 17 (below) shows all the elements I've described, and there's no reason why you shouldn't walk up to a Minimoog and patch it as shown. Your results won't be *exactly* the same as mine, because in no two Minimoogs are the voice circuits identical, nor are their knobs calibrated identically. So, be prepared to tweak things a little.

Looking back at the Minimoog block diagram in Figure 1, it's interesting to eliminate all the parts that are unused, and see how the switch positions shown in Figure 17 have configured the instrument (see Figure 18 on the next page). As you can see, many elements of the synth are unused, including Osc2, the pitch modulation, the slew generator, the Release generators, and the external input. This has simplified matters considerably, so it shouldn't be too hard to relate the switch settings in Figure 17 to the block diagram in Figure 18.

Perhaps even more intriguing is Figure 19, right underneath Figure 18, which shows just how little of Figure 2's idealised brass patch is recreated on a Minimoog. I've left the blank spaces from which I've removed all the unused modules, just to emphasise the limitations imposed by the Minimoog.

Given this, it's astonishing how good a well-patched Minimoog can sound. Sure, its limited voicing and even more limited performance capabilities will ensure that it never sounds like a real brass instrument, but with sympathetic EQ and a suitable reverb, it's remarkable how close you can get. This is especially true when playing lower-pitched brass sounds such as trombones and tubas,

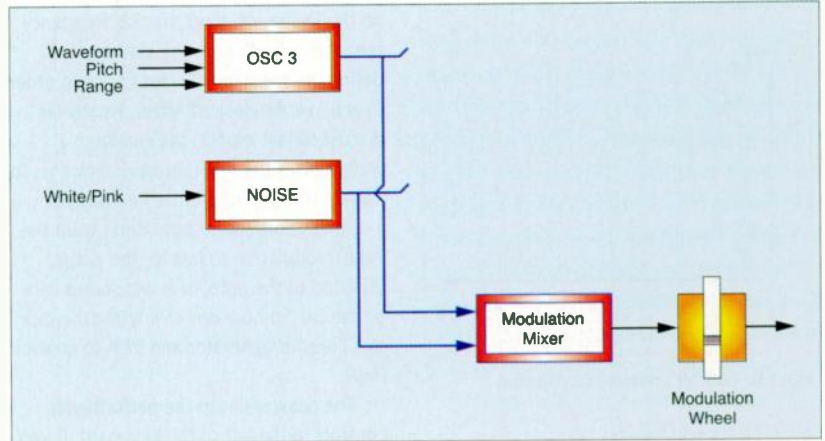


Figure 14: Using the Mod wheel to control the modulation level.

because the ear is less sensitive to the nuances of their sounds.

Other Patches

I thought that it might be interesting to compare my brass patch to those published in 1977 in *Minimoog Sound Charts* by Tom Rhea.

This book, which also contains patches by Keith Emerson and Rick Wakeman, was produced by Moog's '70s parent company Norlin Music, and was included with later Minimoogs; many people consider it to be the definitive guide to the synth. But if you inspect Figure 20, you'll see that Rhea's trumpet patch is very different from the one I've created.

Most obviously, Rhea has used all three oscillators as sound sources, tuned in unison so that (in his words) you can "add

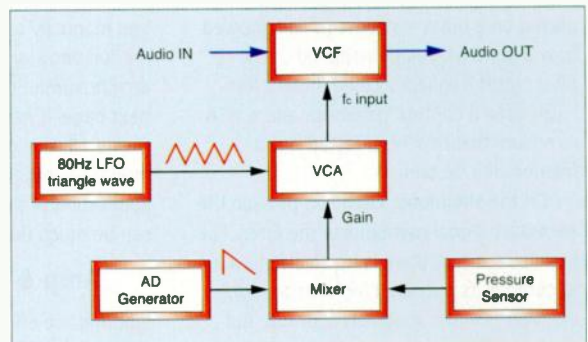


Figure 15: Adding 'growl' to the sound.

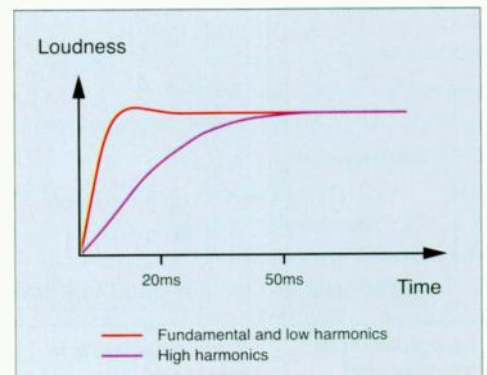


Figure 16: Higher harmonics take longer to 'speak' than lower ones.

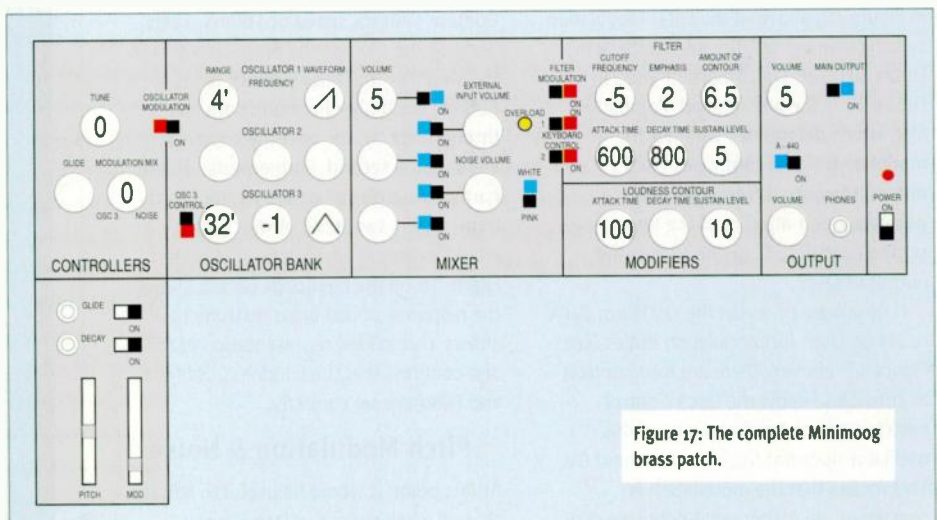


Figure 17: The complete Minimoog brass patch.

Outstanding performance



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► oscillators for progressively 'fatter' tutti sounds". This means that there is no modulation (other than any manual vibrato you add using the pitch wheel). If you study the Loudness Contour and performance panel, you'll see that Rhea's Attack

setting is a little slower than mine, and that he has added a short Decay once the note is released. But these are not huge changes... much more significant are the changes in the Filter settings. There's no filter modulation, keyboard tracking is

Figure 18: The routings used for the Minimoog brass patch.

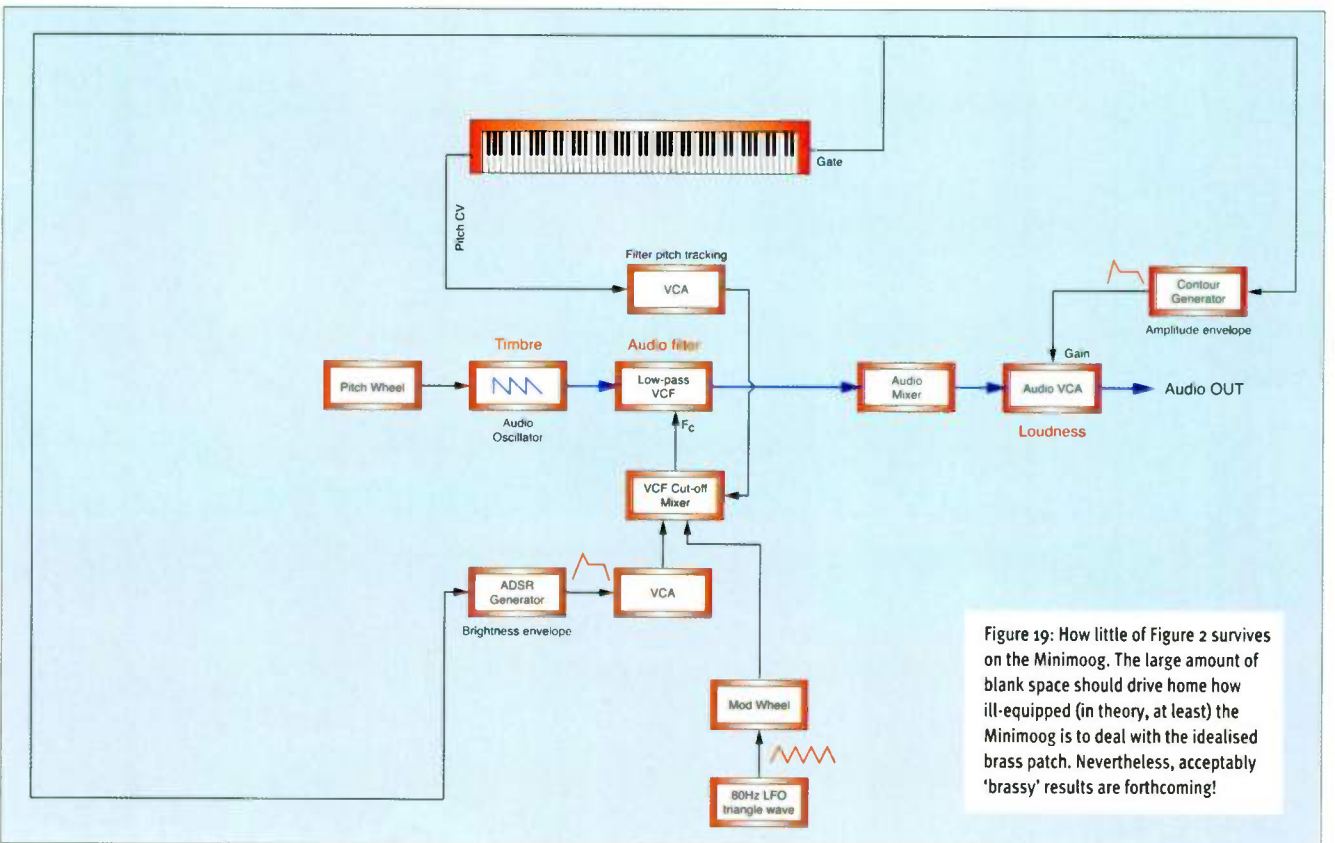
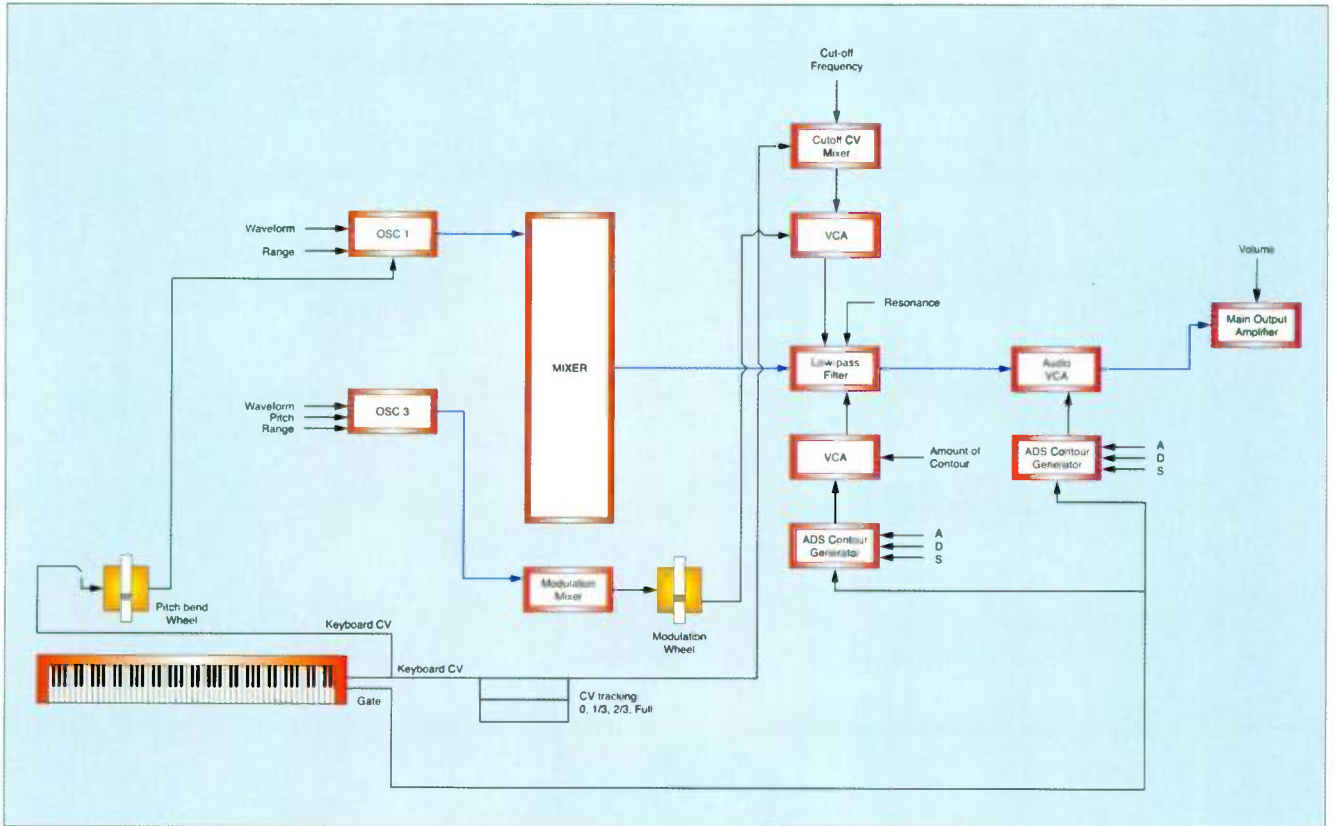


Figure 19: How little of Figure 2 survives on the Minimoog. The large amount of blank space should drive home how ill-equipped (in theory, at least) the Minimoog is to deal with the idealised brass patch. Nevertheless, acceptably 'brassy' results are forthcoming!

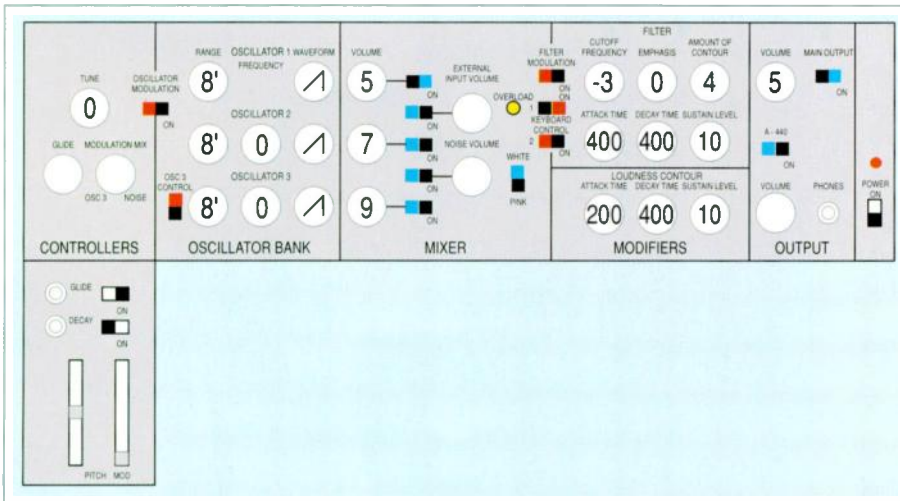


Figure 20: Tom Rhea's Trumpet from the *Minimoog* patch book.

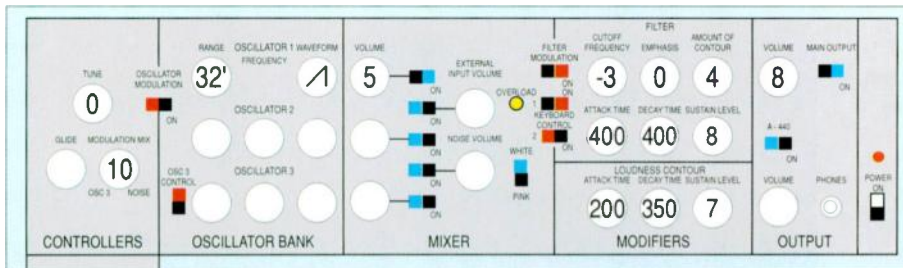


Figure 21: Tom Rhea's Tuba patch. The Performance panel has been omitted to save space (the settings on it are the same as in Figure 20).

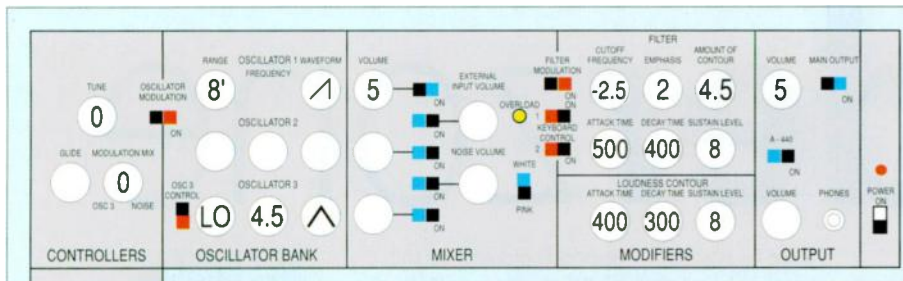


Figure 22: Tom Rhea's Jazz Trombone. Once again, the settings on the omitted Performance panel are the same as in Figure 20.

just 66 percent, the Attack is faster, the filter cutoff starts at a higher frequency, there's no emphasis, and the Amount Of Contour is lower. To some extent, two of these cancel out — the more open filter and the lesser envelope — but these settings do not really conform to the theory laid down in parts 24 and 25 of this series.

Consequently, the book's patch does not sound as realistic as mine. This may sound a little arrogant, but I have based my patch on firm scientific principles, so it would be surprising if it did not retain the essential character of the brass instrument. I find Rhea's sound to be somewhat muted, and feel that it lacks the movement introduced by the filter modulation that I have used.

In contrast, Rhea's Tuba patch (see Figure 21, above) adheres much more closely to the theoretical principles discussed here over the past couple of months. Rhea's Tuba retains the less aggressive filter contour used on his trumpet, as well as the short Decay at the end of the note, but employs a single

sawtooth oscillator and filter modulation. The most interesting part, however, is the source of the modulation. Instead of using Osc3 (and therefore risking FM side-bands) he uses the noise generator to roughen up the filter. This proves to be extremely effective. He also recommends that players experiment with the Amount Of Contour and Cutoff Frequency knobs to create brassier or more muted effects.

Finally, Rhea's Jazz Trombone patch in Figure 21 (below left) contains many of the elements described earlier. The envelopes are similar, the single sawtooth oscillator is the same, and he uses Filter Modulation. Here he uses Osc3 as a true LFO (whereas I have used it as an audio frequency modulator), and he adds Oscillator Modulation (vibrato). Personally, I find it's very difficult to limit the vibrato to a reasonable level using the Mod wheel, but this is nonetheless an effective patch when played with care.

Handle With Care

There are a couple of points that need restating before I finish. Firstly, bear in mind that your appreciation of a trumpet's sound may be very different to mine. Indeed, you might be thinking Royal Philharmonic, while I'm thinking Satchmo. This means that all of the settings shown in this article are guidelines. Nevertheless, however you manipulate the sound, it must retain the common elements shown in the diagrams here. If you stray too far from these settings — perhaps by changing the oscillator setting so that it produces a different waveform, or by altering the envelopes so that they exhibit instantaneous attacks, or by adding a high degree of filter emphasis — none of

the resulting patches will sound remotely brassy.

The second concerns performance. You may have access to the perfect brass patch, or to a perfectly recorded trumpet sample, or even to the physically modelled brass patches on a Yamaha VL7 or a Korg Z1. However, none of them will sound authentic unless you play them in a manner that is sympathetic to the original instrument. Some synthesists — Wendy Carlos is an excellent example — manage to coax remarkably lifelike performances from their synths. You and I, on the other hand, may find ourselves unable to approach the same level of authenticity, even when playing the same patches on the same instruments. When this happens, our natural inclination is to blame the equipment, the outboard effects, or the person who gave you the patch settings. But before you do this, consider your playing technique. Synthesis is not just about sounds; it's also about performance. And no amount of signal-routing diagrams can help you with that. [SOS](#)

Many *Sound On Sound* readers will be more than familiar with the classic 'bedroom studio' scenario, in which the unrelated activities of sleeping and recording share the same space. The well-equipped home recording studio of *SOS* reader Raj Dhamu is one such bedroom setup.

The studio, or bedroom, has the commendable quality of appearing spacious and uncluttered even though it's jammed with gear. Opposite Raj's bed is his large Mackie 32:8:2 analogue mixing desk, flanked by a pair of Yamaha NS10M monitors. A rack placed in the corner of the room contains the studio's main recording and processing devices, including an Alesis ADAT 8-track recorder, while another rack at the end of the bed contains Raj's most recently acquired gear, most of which is still to be used on a recording. The rest of the room is occupied by stacks of assorted DAT machines, processors and record decks, as well as Raj's bedroom furniture.

Raj currently earns his living as a locum pharmacist, working four days a week on short-term contracts in his home town of Leamington Spa and in other areas of the country. Music is still a part-time activity for Raj but it is an interest he has pursued since the early '80s. Right from the start, Raj and his older brother Jaswinder have gigged and recorded together, most recently under the band name *Guruver*. At the time of our interview, Raj had just completed a 10-track self-recorded and



Photo: Richard Eccleson

readerzone

produced *Guruver* album which the pair have released on their own Singh Song Records label.

"Singh Song is linked to my brother's book distribution company, so we have the business side all set up", explains Raj. "We have also gone along the internet route by developing our web site [www.guruver.com — Ed] and we have tried peoplesound as another way of promoting ourselves. I checked out the contract with one of the lawyers at the British Academy of Composers and Songwriters, because I wanted to make sure that we wouldn't be tied into the deal. BACS said it was okay but we wouldn't make any money from it. That's not a problem, as we're using it mainly for networking anyway."

After many years of trying to break into the music industry with the aid of management and record company contracts, Raj and Jaswinder seem to be confident that the DIY approach to recording and promoting their work is a better way forward. In fact, the DIY approach is not uncharacteristic of Raj's attitude to music in general: he taught himself to both play and record. "There was a guitar lying about the house that belonged to my brother, so

when I was about 15 years old I picked it up and began to learn", explains Raj. "I gave myself about half an hour a day and I got hooked on it very quickly. I soon started writing songs and jamming with my brother. Then, as a birthday present, I got a day's booking in a local studio. We did our first demo there, recording the first three decent songs I wrote, and then we plugged the result to the local radio stations. We just used a Roland TR606 drum machine, live bass and live guitar. It was a simple, clean sound and that was quite effective, because it got us some record company interest — we even had meetings with EMI and RCA."

Raj and Jaswinder had originally wanted to find a real drummer and bassist to help perform their guitar-orientated rock, but their efforts to find the required musicians initially proved unsuccessful. "It was difficult to get people to believe we were playing that kind of music", admits Raj. "We put adverts in local music stores, but got a very negative reaction. I needed some sort of backing so I saved some money and got a drum machine. We thought we would could program it for ourselves at least for that demo, and then later we could play people the

RAJ DHAMU

Main Equipment

- Alesis ADAT
- Toshiba T2100 SL 486DX2 laptop PC
- Mackie 32:8:2 mixer
- Roland JV880 sound module
- Yamaha RM50 rhythm sound module

report by: tom
flint

Keeping Stock

Raj's Tascam Porta 01 4-track is now stored in the overhead cupboards above his bed, along with his decommissioned Roland TR606 and TR707. Raj explains why he has kept his old equipment instead of selling it in the *SOS* Reader' ads. "My feeling is that when you buy equipment you should try to buy things that you're never going to get rid of because they're always going to be of some use in the future. So as my studio expands, all of this equipment will still be used. Bouncing tracks is not the ideal situation so I will probably upgrade the Alesis ADAT to one of the newer range of hard disk recorders like the new Tascam MX2424 or the Mackie HDR24/96 — but it will still be good to have the ADAT, in case I work with someone who uses that format."

product and say 'that's the kind of music we do'. That did work because later on we got people helping us out."

Small Beginnings

Having used the Roland TR606 and later a TR707 instead of a drummer, Raj began to realise the possibilities technology offered for music composition and recording. Building a home studio was the next logical step. "I started off on a Tascam Porta 01 4-track, which was excellent for learning how to layer tracks. After that I bought a Fostex M80 reel-to-reel, a Seck 12:2 desk, a Drawmer LX20 and a lo-fi Digitech delay which I don't use much now. I got that setup to make demos to send out to publishing companies. I also wanted to teach myself the recording side of things. At that time the equipment was still pretty expensive; the whole setup cost over £2500. Eventually my brother and I realised we had gone as far as we could go with it, so we thought we'd get something of better quality — that's when we bought the Mackie and Alesis ADAT setup."

Raj's other purchases for the new studio were a Roland JV880 sound module and a Yamaha RM50 drum module. "The RM50 has six mono outputs which you can process individually, plus two stereo outputs, and the JV880 has two stereo pairs", says Raj. "Both units are 16-part multitimbral and that's

enough for the kind of music we're playing at the moment." Still surviving the various studio upgrades is a Roland Juno 106 which Raj bought new in the mid 1980s. "I didn't know much about synthesizers, so I read recording and music technology magazines to find out what was good. I've been quite happy using it just as a master keyboard to drive my sound modules. If I ever want to use the in-built sounds, I can. For most of my analogue-style sounds I use an

Akai SG01V module."

Raj's only studio computer is an ageing Toshiba T2100 486DX2 laptop, but so far he has avoided hard-disk recording and only uses the computer for minimal sequencing work. "I have thought that perhaps I should scrap all of this and go completely into the computer side, but I've been brought up on traditional tape-based recording with overdubbing and all that", admits Raj. "I sequence in *Cubase 2.8* and I only ever use the Arrange page. The arrangements are very simple; basically drums, bass and a few little frills here and there. If I'm going to be playing live I will put my *Cubase* sequences onto floppy as Standard MIDI files and then transfer them into my Yamaha QY700, which I bought specifically for live use. It's got great timing and is rock solid. I do prefer things in nice hardware boxes, and I feel safer taking that kind of gear out live. The QY will then run the RM50 for drums, and the JV880 for synth sounds."

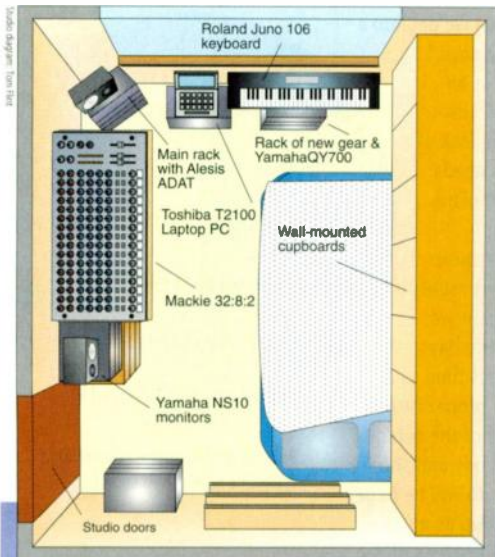
Methods & Processes

After many years of recording his own material with a familiar range of equipment, Raj has developed a fairly consistent method of composing and recording. "I write songs by recording guitar onto a cheap cassette deck with a built-in mic. After that I'll put a loop into *Cubase* and use a pad on the keyboard to get the key and the basic structure of the arrangement right. Once I've got an arrangement I'm happy with, I'm ready to start putting on everything else, so I get the sequencer synced up to the Alesis ADAT."

"My first ADAT track will be a guide guitar. I sometimes DI my guide guitar, but otherwise I use a proper mic'd up sound and try to play everything tight, just in case I do want to use that part later. Then I put the bass down, followed by a guide vocal. If I'm happy with everything I'll finish my lyrics and do a complete lead vocal. Next are the backing vocals, and finally the other bits, such as lead guitar, the breaks and the drumming."

"I've only got seven recording tracks on the ADAT, because I use one for stripping the timecode, so I do bounce tracks together, but I find that compared to my old Tascam 4-track, where I had to keep bouncing forever to get a full sound, I now have plenty of space. My vocals aren't as strong as I'd like, so I double-track them to get a harder sound. I usually bounce guitars, but I leave bass on its own."

"I try to get my sound right at source. I record everything flat and dry without any effects, although I do use a touch of compression and gating from my Drawmer MX20 to get rid of as much noise as possible. I've got a back bedroom with double glazing in a detached house, so that eliminates a lot of noise straight away, but I do make sure the leads aren't crackling, I minimise the amp noise as much as possible, I make sure that I haven't left any unused channels open, and I use the gates. When I'm recording I also try to get the gain structure right. I do all of that very carefully before each take. Some people like some noise, but I try to make it as clean as I can."





The Alesis ADAT 8-track digital recorder takes pride of place at the head of Raj's main rack.

Guitars & Vocals

Most of Raj's guitar work is done using the Yamaha SF1000 electric guitar which he bought for his very first demo. "It looks more expensive than it was, but it plays really well. It's got a booster button, which I haven't seen on many guitars, that gives the same effect as having a volume pedal, so it's good for lead breaks. The Fender Stratocaster I like for the single-coil sound.

"I use a Shure SM58 for miking up the Park 15W amp and my 100W Fender combo. I got the Park because I find you always get a better sound from smaller combos, although the Fender still gives a decent sound. I usually set my amps up in different places, such as the hallway or one of the bedrooms. I usually put the amp on a stand or chair and then close-mic straight into the centre of the cone, which is where I get the best sound, although sometimes I mic it from the back for a slightly different tone."

"My main vocal mic is the Audio Technica ATM4033A condenser. It works quite nicely for my voice and has a nice clean sound which is slightly flattering and probably makes my voice sound a little better than it really is. That goes straight into the desk. Another decent mic I got for a good price was the AKG C1000S back-electret, which I use mainly for backing vocals, although I have used it on lead vocal on a couple of tracks."

Raj has resisted the temptation to buy too many effects and processors, regarding his studio as a facility which is adequate for tracking and experimenting but not suitable for mixing or mastering. "We take our recordings to pro studios to mix, and to master with the high-end compressors for a punchier, more level sound, and for that extra-warm feel you get by using analogue tape. I do try things out here, so when we get to the studio to mix I can tell the engineer what I've tried and what I like. It's only possible to spend so many hours in the studio so it's best to have some idea of what you want. When we used to go into professional

Complete Gear List

KEYBOARDS AND SOUND MODULES

- Akai SG01v synth module
- Roland Juno 106 synthesizer
- Roland JV880 sound module
- Roland TR606 drum machine
- Roland TR707 MIDI rhythm composer
- Yamaha RM50 rhythm sound module

RECORDING AND PROCESSING

- Alesis ADAT digital 8-track recorder
- Behringer UltraFX II enhancer
- Boss SE50 stereo effects unit
- Drawmer LX20 gate
- Digitech DX777 delay unit
- Mackie 32:8:2 mixer
- Yamaha REV500 multi-effects processor
- Toshiba T2100 SL 486DX2 Laptop PC
- Yamaha QY700 hardware sequencer
- Steinberg Cubase 2.8 software sequencer
- Yamaha NS10M studio monitors

MICROPHONES

- AKG C1000S microphone
- Audio Technica ATM4033A microphone
- Shure SM58 microphone

GUITARS AND AMPS

- Yamaha SF1000 electric guitar
- Fender Stratocaster electric guitar
- Fender F230 steel-string acoustic guitar
- Lincoln 4-string electric bass
- Fender Performer 1000 100W combo
- Park G10 15W amp
- Marshall MS2C mini amp


GUITAR EFFECTS

- Boss CE2 Chorus pedal
- Boss OD1 OverDrive pedal
- Crybaby Wah
- DOD FX62 Bass Stereo Chorus
- DOD FX80B Compressor Sustainer
- Ebow Plus electronic guitar bow
- Electro Labs Fuzz pedal
- Marshall Bluesbreaker II pedal
- MTR D13 DI box

RECENT ACQUISITIONS

- TL Audio VP5051 voice processor
- Emu E6400 Ultra sampler
- Digitech Studio Vocalist EX

studios more often, we did plenty of pre-production to get the song, arrangement, tempo and key right, because we were paying big money for the studio time. That method works for us now. I'm arranging and tracking everything here, so when we get into a bigger studio it takes just a couple of days."

Above all else, Raj comes across as an organised and determined individual. His studio is immaculate, and despite the lack of space he has a setup which suits his needs. Raj sums up Guruver's DIY ethos and plans for the future: "Now we're into doing everything by ourselves, basically because it's more enjoyable and we retain a lot more control over everything. At the moment we are just promoting this CD, so it's early days. Hopefully I'll be spending less and less time as a pharmacist and can make music my proper career. I did have the idea of converting one of the garages into a studio, but it's my mother's house and she didn't want that. I think the thing to do will be to get a unit in a business complex and set up as a commercial venture, either just for Guruver's music or for other people to use. I know it's difficult to make money in this business, but I'm sure I can find a niche." 



Raj's guitars and amps, essential to Guruver's rock-driven sound.

Adding the Polish

As explained in the main text, Raj does the mixing and mastering of his recordings in professional studio facilities. "We mastered and pressed our CD at a place called Sound Disks in West London, which is run by the daughter of John Bonham [*Led Zeppelin* drummer]. There was a guy working there who was very helpful with the artwork, so we just supplied our own photographs and they turned it around in a couple of weeks.

"If I'd done it completely here I don't think it

would have come out so well. The songs, arrangements and sounds would be the same, but it would lack the extra polish and sheen you get from a professional facility. This is a bedroom, at the end of the day. I have considered buying a mastering processor, but you have to take into account the cost of something like that. Are you going to use it to its fullest capacity? You may or may not, but rather than taking a risk I thought I'd spend that money taking the album into a pro studio."

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NEW Alesis MPC2000	£849	NO DEPOSIT	6 x £141.50 = 0%	Logic Playoven	£429	NO DEPOSIT	6 x £71.50 = 0%
NEW Alesis DPS12	£790	NO DEPOSIT	6 x £131.66 = 0%	Novation			
Alesis 5000i	£1500	NO DEPOSIT	6 x £250.00 = 0%	NEW Roland VFD40C	£2200	NO DEPOSIT	36 x £300.52 = 0%
Alesis 5000ii	£1050	NO DEPOSIT	6 x £175.00 = 0%	NEW Roland F55	£550	NO DEPOSIT	24 x £72.92 = 0%
Alesis 5000iii	£710	NO DEPOSIT	6 x £118.33 = 0%	NEW Roland VPR90	£1900	NO DEPOSIT	6 x £275.00 = 0%
Alesis Ultra E4Kt	£200	NO DEPOSIT	6 x £33.33 = 0%	NEW Roland EF100	£200	NO DEPOSIT	24 x £16.67 = 0%
Alesis Artimate	£250	NO DEPOSIT	36 x £72.19 = 0%	NEW Roland VJ2000	£1100	NO DEPOSIT	6 x £183.33 = 0%
Alesis 9600 dig 8 tr	£520	NO DEPOSIT	6 x £86.66 = 0%	Shinyang VET	£240	NO DEPOSIT	6 x £40.00 = 0%
EMU ES1600	£540	NO DEPOSIT	12 x £124.91 = 0%	Shinyang Probus Pick	£800	NO DEPOSIT	36 x £55.52 = 0%
EMU ES1600 Ultra	£1490	NO DEPOSIT	24 x £124.16 = 0%	Taitern D401	£440	NO DEPOSIT	6 x £73.33 = 0%
EMU ES1600	£1190	NO DEPOSIT	24 x £124.16 = 0%	Taitern D402	£2900	NO DEPOSIT	12 x £241.66 = 0%
EMU Ultra E4Kt	£2200	NO DEPOSIT	24 x £222.87 = 0%	TC Pro Audio 300 Digital	£390	NO DEPOSIT	24 x £161.62 = 0%
EMU Proteus	£570	NO DEPOSIT	24 x £222.87 = 0%	TC Pro Audio Ring	£1700	NO DEPOSIT	12 x £141.66 = 0%
EMU Proteus II	£540	NO DEPOSIT	24 x £222.87 = 0%	TC Pro Audio Silt	£1700	NO DEPOSIT	24 x £141.66 = 0%
EMU Proteus Live	£490	NO DEPOSIT	24 x £222.87 = 0%	TC Pro Audio One & D Two	£450	NO DEPOSIT	24 x £18.75 = 0%
EMU Proteus IIi	£540	NO DEPOSIT	24 x £222.87 = 0%	TC Pro Audio Express	£700	NO DEPOSIT	24 x £29.16 = 0%
EMU Proteus III	£490	NO DEPOSIT	24 x £222.87 = 0%	Taitern TM D100	£200	NO DEPOSIT	36 x £55.52 = 0%
Fostex VF16	£540	NO DEPOSIT	6 x £90.00 = 0%	NEW Yamaha A400	£500	NO DEPOSIT	6 x £83.33 = 0%
Fostex VF16i	£540	NO DEPOSIT	6 x £90.00 = 0%	NEW Yamaha A600	£700	NO DEPOSIT	6 x £116.66 = 0%
King Tone P16	£210	NO DEPOSIT	36 x £58.33 = 0%	NEW Yamaha RST800	£1200	NO DEPOSIT	36 x £33.33 = 0%
King Tone D160	£1500	NO DEPOSIT	6 x £250.00 = 0%	NEW Yamaha AW4416	£2300	NO DEPOSIT	24 x £222.87 = 0%
King ES1 Sample	£205	NO DEPOSIT	6 x £34.16 = 0%	NEW Yamaha S02	£540	NO DEPOSIT	6 x £90.00 = 0%
King D12	£700	NO DEPOSIT	24 x £29.16 = 0%	NEW Yamaha P80 Piano	£900	NO DEPOSIT	6 x £150.00 = 0%
King Storm	£1500	NO DEPOSIT	24 x £250.00 = 0%				
King Storm II	£200	NO DEPOSIT	6 x £33.33 = 0%				

- Korg Triton Rack**
RRP £1799 **£1199**
 - Korg D16 Digital Recorder**
RRP £1499 **£899**
 - Roland VS1880GX digital recorder**
RRP £2199 **£1133**
 - Roland VS840GX RRP £649 **£649****
 - Roland VM3100 Pro Digital mixer**
RRP £749 **£379**
- All products available on 0% no deposit finance
- NEW MACKIE HDR24196**
MACKIE d8b
56 channels, 96 moving faders, Numerical workstation, Au: 1 host! New Plug-ins now in stock!
RRP £8999 - Call - Available on 36 months interest free finance!

WE ARE NOT JUST A GUITAR SHOP. HERE ARE A FEW FACTS:

WE ARE ONE OF THE LARGEST OUTLETS FOR HI-TECH IN THE UK

WE ARE NOT BOX SHIFTERS & OFFER SUPERB AFTER SALES SERVICE WITH 2 ON SITE ENGINEERS + 20 EXPERIENCED SALES PEOPLE.

WE SIMPLY REFUSE TO BE BEATEN ON PRICE AND WILL BEG, STEAL OR BORROW TO GET YOU THE BEST DEAL.

WE STOCK ALL ITEMS & MUCH MORE THAN OUR ADVERT SUGGESTS. ALL ARE ON DEMO WITHIN OUR HUGE 5000 SQ FT SHOWROOM.

ALL MEMBERS OF STAFF RUN THEIR OWN DIGITAL STUDIOS.

WE ARE YOUNG AND HUNGRY FOR YOUR BUSINESS

WE LOVE P/X & SECONDHAND DEALS

WE SPECIALISE IN CROSSOVER MUSIC, WE OFFER 1000 GUITARS & 25 DRUM KITS TO BACK UP OUR HUGE HI-TECH DEPARTMENT

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IN JUST OVER 7 YEARS WE HAVE GONE FROM A £3000 BANK LOAN + DUMPY BACKSTREET GUITAR SHOP TO ONE OF THE LARGEST OUTLETS IN THE SOUTH, WHY DON'T YOU RING OR COME IN AND FIND OUT WHY.

NEW NEW NEW Roland UP TO 36 MONTHS INTEREST FREE 0% FINANCE NO DEPOSIT!!!

NEW VS2480
The product of 2001. The first ever 24 Track Digital Workstation with 64 channel digital mixer and 17 motorized faders. Can connect directly to VGA monitor for information display and editing. 2 onboard FX processors and room for expansion for more cards! Be quick on this one. Out early March.
RRP £2899 **36 x £80.52 = 0% NO DEPOSIT**
Price includes a MASSIVE 40 GB hard drive



NEW RS5
New Mega 64 note polyphony synth
RRP £699 **24 x £24.95 = 0% NO DEPOSIT**

NEW RS9
88 note weighted version of above
RRP £899 **24 x £37.45 = 0% NO DEPOSIT**

NEW HPD35
Digital Percussionist. 300 sounds, sequencer, d-beam controller and loads more.
TOP NEW PRODUCT
RRP £300 **24 x £33.29 = 0% NO DEPOSIT**

SP808EX
E-mix studio - updated phrase sampler
RRP £3000 **£999 = 0% NO DEPOSIT**

XV5080
Imminent arrival of Roland's new high spec sound module RRP £1899
£1699 available on 0% NO DEPOSIT

XV3080
128 voice sound module. 64MB of sounds RRP £4300
£1049 = 0% NO DEPOSIT

ELECTRONIC PERCUSSION
NEW CV V-drums
Electronic cymbals, Hi-hat, & crash. Now in stock. Complete set RRP £549
24x£22.87 = 0% NO DEPOSIT

NEW TD8 RRP £1899 **36x£52.75 = 0% NO DEPOSIT**
SPD 20 RRP £549 **24x£22.87 = 0% NO DEPOSIT**
TD5 RRP £799 **24x£33.29 = 0% NO DEPOSIT**
V-Drums RRP £2799 **36x£77.75 = 0% NO DEPOSIT**

NEW EF303
Realtime filter control with MC303 virtual modelling
RRP £399 **£299 = 0% NO DEPOSIT**

XV88
88 note hammer action D-beam equipped synth
RRP £2399 **£1899 = 0% NO DEPOSIT**

MC307
Groovebox with all new patterns and turntable control RRP £649 **£495 = 0% NO DEPOSIT**

NEW RD150
Digital Piano RRP £749

ECALL XP60
Superb expandable workstation.
RRP £4399 **£684**

VS1880GX
Updated 24 bit 18 track digital workstation RRP £2499
£1199 = 0% NO DEPOSIT

VS8880 Rack mounted 8 track RRP £4399 **£899 = 0% NO DEPOSIT**

VS890
New version of the classic 8-track recorder, inc FX board & drive, 64 virtual tracks
RRP £4399 **£899 = 0% NO DEPOSIT**

VP9000
Variphrase Processor. Manipulates pitch, time & format in real time!
RRP £2399 **£1650**
6 x £275.00 = 0% NO DEPOSIT

JV1010
64 voice synth module. Onboard session 'card' + complete sounds from the 2080 make this the product of the month.
RRP £499 **£399 AVAILABLE 24 MONTHS 0%**

BR8
Entry level digital 8 track
RRP £629 **£529**
6 x £88.16 = 0% NO DEPOSIT

JP8000
The world's biggest selling synth! We all know the sounds - Here's the Mega Deal.
RRP £1000 **£799 = 0% NO DEPOSIT**

DS50A NEW
Digital monitors. Monitor your VS recorder with these 24 bit digital reference monitors.
RRP £440 **24 x £18.70 = 0% NO DEPOSIT**

XP30
1500 Patches and two new expansion slots make this the product of the month!
RRP £999 **ECALL = 0% NO DEPOSIT**

JP8080
The wonderful JP8000 in a rack far and away our biggest selling synth.
RRP £1000 **£799 = 0% NO DEPOSIT**

MC505
Incredible 64 voices 53 Arpeggiator
Patterns + 714 Dance Groove patterns 3 FX processors + integrated D Beam Controller RRP £6049 **£749 = 0% NO DEPOSIT**

VSR8800
New Rack mountable 8 track recorder with 6GB internal drive RRP £1299
36 x £36.08 = 0% NO DEPOSIT

VS840GX
Some great effects on this new version of the 8 track digital recorder RRP £949
£649 = 0% NO DEPOSIT

ROLAND EXPANSION CARDS
Over 100 in stock. Ring before 5.00pm for next day delivery.
RRP £499 **£169 Remember**
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JV1080
The world's largest selling module.
JV1080 RRP 6000 **ECALL**
AVAILABLE 24 months interest free credit 0%

BOSS DR770
Drum machine with double the sounds of the 660 & 400 preset patterns & 255 sounds. RRP £349 **£279**

MC303
PRICE FRAM
Still probably the biggest Dance sequencer in the world today.
RRP £439 **£359**

SPECIAL OFFERS

Roland RD600	£1199
Roland UB	£369
Roland VG8 Guitar Synth	£499
Roland VG8 Guitar Synth	£649
Boss VFXT	£349
Boss SP202	£249
Boss DR202	£179
Roland SRV3030 RRP £600	£199
Roland KX305 RRP £600	£589
Roland RD100 RRP £640	£459
Roland MC80 RRP £840	£449
Roland XPT0 RRP £300	£319

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We Stock Every Yamaha Product

We Stock Every Yamaha Product

S03 Synth **NEW**

700 voices, 64 poly & 64 multi Park with complete synth editing capability.
RRP £649 **£449 = 0% NO DEPOSIT**

QY100 **NEW**

Amp simulator. Advanced 8 track sequencer, 547 voices & 22 drum kits make this a versatile tool for songwriting & performance.
RRP £449 **24 x £18.70 = 0% NO DEPOSIT**

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24 channel, 4 buss motorised faders & FX.
RRP £1099 **£1799 = 0% NO DEPOSIT**

SW1000XC

Our biggest ever selling Audio recording card! Now available for both Mac and PC platforms.
RRP £499 **£349**

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Stunning Dance Sounds 64 voice polyphony Plus 2 extra realtime control knobs.
RRP £649 **From £449 = 0% NO DEPOSIT**

RS7000 **NEW**

Complete desktop studio with 1000 synth voices & 63 drum kits. Numerous features for modern dance production, integrating sampling and advanced MIDI sequencing.
RRP £1299 **24 x £54.12 = 0% NO DEPOSIT**

AN200

New analogue modelling & FM synthesis.
RRP £449 **24 x £18.70 = 0%**

DX200 **NEW**

NEW AW4416
THE PRODUCT OF THE MILLENNIUM
New 16 track digital recorder.
Incorporating O2R mixer. AMAZING!!
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64 note poly. Samples from EXS. 5 independent FX. Beat Re-mix feature. 4 MB memory + exp. slots.
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CS6X **NEW**
RRP £369 **from £989 = 0% NO DEPOSIT**

CS6R Rack version **£649 = 0% NO DEPOSIT**

O2R
The classic industry digital mixer at an amazing breakthrough price.
GAK Price from £2799 = 0% NO DEPOSIT

F51R

Powerful new synth module with unique format shaping synthesis.
RRP £649 **£429 = 0% NO DEPOSIT**

S80 **NEW**

88 note weighted action performance synth. Great sounds based on new EX series. Expandable.
RRP £1399 **£1199 AVAILABLE 0% FINANCE**

MD4S

Great 4 track minidisk with 8 channel mixer.
RRP £699 **£449 = 0% NO DEPOSIT**

O1V

DIGITAL MIXER. 24 inputs, Automated faders. Onboard FX processors. Plus loads more.
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LOWEST UK PRICE = 0% NO DEPOSIT

DSP FACTORY

The complete O2R Digital Mixer in your PC or Mac! RRP £699
NOW **£479 = 0% NO DEPOSIT**

AX16 £189 **AX44** £149

RMIX

Massive sequence remixer. Incredible machine at an unbeatable price!
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P80 Piano **NEW**

88 note graded hammer action. 64 note poly. Very lightweight (16KG).
RRP £999 **£699 = 0% NO DEPOSIT**

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Amazing new Yamaha MEGA samplers. New technology for the new Millennium. Too many features to list.
A4000 RRP £999 **£599 = 0% NO DEPOSIT**

A5000 RRP £1499 **£799 = 0% NO DEPOSIT**

NEW SU200

Yamaha's great new budget Phrase sampler. RRP £329 **£289 = 0% NO DEPOSIT**

VERY SPECIAL YAMAHA OFFERS OF THE MONTH

New SU10 Sampler	RRP £299	£129
MT400 4 track	RRP £399	£199
P200	RRP £1295	£1095
MDB	RRP £899	£749
MU15	RRP £199	EMEGA
QY700 sequencer	RRP £849	£599
NS10s monitor	RRP £349	£249
CS1X synth	RRP £599	£349
QY70 sequencer	RRP £449	£299
MU128	RRP £749	EMEGA
MDF3 data filter	RRP £329	£269
VL70 module	RRP £499	EMEGA

KORG

AMAZING DEALS

TRITON RACK

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.
RRP £1499 **£1199 = 0% NO DEPOSIT**

MS2000

Fantastic New 44 note analogue modelling keyboard with sequencer.
RRP £749 **£639 = 0% NO DEPOSIT**

MS2000R

Fantastic New Rack analogue monster
RRP £649 **£525 = 0% NO DEPOSIT**

TRITON

Probably the only keyboard you will ever need to buy. Integrating sampling, sequencing and filter performance. Features with optional expansion boards! Without doubt the best value product of 1999.
RRP £3999 **£CALL AVAILABLE 36 MONTHS 0% FINANCE**

TRITON PRO

76 note version.
RRP £3149 **£CALL AVAILABLE 36 MONTHS 0% FINANCE**

TRITON PRO X

88 note version with weighted keys.
RRP £3999 **£CALL AVAILABLE 36 MONTHS 0% FINANCE**

KORG ELECTRIBE

ES1 SAMPLER

Slice and resample capabilities with great filters. Reads WAV and AIFF files.
RRP £429 **£395 - 12x £32.91 = 0% NO DEPOSIT**

ELECTRIBE

Desktop analogue synth & rhythm machine. Incredible new sounds, the result of some stunning new analogue technology.
RRP £229 **£269 = 0% NO DEPOSIT**

KAOSS

Realtime Dynamic effects controller. A must for all DJs incorporating the touch pad of the Z1, 60 programme FX & a five second sampler.
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ONCE IN A LIFETIME BARGAINS
Korg N364 Best value workstation around. Prices start from £649
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Affordable 16 track digital recorder. Mixing, Recording & CD mastering in one unit.
From £1399 **24 x £58.29 = 0% NO DEPOSIT**

D12 **NEW**

New 12 track digital recording workstation.
From £799 **24 x £33.29 = 0% NO DEPOSIT**

KARMA

Revolutionary technology & sounds with 16 track sequencer.
£1599 **24 x £66.62 = 0% NO DEPOSIT**

KAOSS MIXER

Combines Kaoss pads unique control with pro 2-channel mixer.
NEW

D16

FANTASTIC NEW DIGITAL 16 with touch sensitive display.
RRP £1499 **£899 = 0%**

SP100 Digital Piano

Amazing digital piano. RRP £849
GAK Price £499 = 0% FINANCE AVAILABLE WITH NO DEPOSIT

SPECIAL OFFERS

SG Pro X	£1149
Great Digital Piano	
X5 DR Module	£269
Unbeatable Value	
X5 D	RRP £699 £399
Superb entry level keyboard	
Z1	NOW £799
EXCLUSIVE DEAL	
OASYS	RRP £999
£24 x £41.62 = 0%	
Ultimate sound card	
N1	£CALL
Weighted Keys. NS Synth Engine	
N364	£699
Great Workstation	

TASCAM

NEW 788

New 8 Track Digital Recorder.
RRP £799
24 x £33.29 = 0% Finance

424 MKIII

Portastudio 6 inputs with mid sweep EQ.
RRP £349 **GAK Price £299**

PORTA 02

Multi-tracker. £99
RRP £1999 **24 x £83.29 = 0% Finance**

DA78

24 bit 8 Track
RRP £1999 **24 x £83.29 = 0% Finance**

MX2424 **NEW**

Digital 24 track recorder.
£3499 - 24 x £145.79

CDRW700

New Professional mastering CD recorder.
RRP £499 **GAK Price £399 = 0% NO DEPOSIT**

DA20 MK II

Industry Standard DAT machine.
£CALL = 0% No Deposit

Novation

SUPERNOVA

voted best synth of '98. Now 20 note polyphonic, 8 part multitimbral. Amazing analogue modelling.
RRP £999 **GAK Price £919 = 0% NO DEPOSIT FINANCE**

NOVA

44 voice version now available at
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IN STOCK NOW

Nova II & Supanova II Keyboards
Prices from £1149

Fantastic desktop synth

OUT JULY
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Fattest Sounding Synth Available
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LEAD 2 RACK

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MODULAR RACK

The Industry's Best Kept Secret. RRP £1299
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Magnificent new 16 track digital recorder with 4 FX buses, 250 virtual tracks and no data compression. Massive 20GB drive.
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Award winning sampler.
NOW ONLY £399

S5000
Expandable to 128 note poly with 15 filter types! NEW Operating Software. INCLUDES 5 FREE CD-ROMS.
RRP £1799 - £1059
- AVAILABLE ON INTEREST FREE CREDIT

S3000
RRP £3099 **£799** - AVAILABLE ON INTEREST FREE CREDIT

S6000
16 outputs, 128 note poly. Removable front panel / remote controller. EBX20 FX standard NEW Operating Software INCLUDES 5 FREE CD-ROMS.
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12 Tracks of digital recording. NOW with 10 GB drive + built in 1/x card. Record on 8 simultaneous tracks with no compression!
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0% NO DEPOSIT

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64 voice techno synth rack.
£549 - 24 X £22.87 = 0% NO DEPOSIT

B3
64 voice tone wheel organ.
£549 - 24 X £22.87 = 0% NO DEPOSIT

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Urban Dance Module.
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Awesome.
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Available 0% finance with NO DEPOSIT with FREE RFX board

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128 voice virtual orchestra.
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PRODUCT OF THE MONTH

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True RELIABILITY AT AFFORDABLE PRICES!!

Delta 1010 10 in / 10 out PCI Digital Recording system	£529	Midiman Thru 1x4	£19
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Delta 44 PCI card	£195	Midiman Merge 2x2	£45
Delta 66 PCI digital recording interface	£275	Macman 1x3	£45
Audio Buddy	£85	BiPort 2x4	£129
MIDISport	£65	2x4 PC	£79
MIDISport 8 x 8	£249	4x4 Parallel	£179
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The ultimate mastering solution.
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for PC/Mac gives 2 analogue ins & 8 analogue outs
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Interface providing 8 MIDI ins & outs & SMPTE
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EMU AUDIO PRODUCTION STUDIO
64 voice sampling, hard disk recording & real time DSP
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EGO-SYS WAMI BOX £399

KORG OASYS £999

LEXICON CORE + FX DAUGHTER BOARD £369!

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ACID MUSIC £79 **ACID PRO** £209

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Cubase VST v5 for PC. 32 audio tracks with digital EQ, DSP, Reverb, FX
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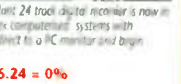
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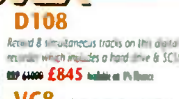
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4.20

Recording Venue: Home.
Recording Equipment: Apple G3 running Steinberg Cubase VST sequencer, Fostex FD8 HD 8-track, Shure SM58 mic.

I'm not sure what the relevance of this band's name is — perhaps 4.20 in the morning was the best time to record? Their first mix takes wah-wah'd guitar, sitar, acoustic guitar, tabla, a looped beat and vocal, and throws the lot into the musical melting pot. Most of the sounds are samples, but it sounds as though the guitars are played, and I particularly enjoyed the dynamics they added to the mix. Engineer Asham has done his best with the VST effects, but has ended up using mostly reverb when echo would also have been appropriate here and there on some of the vocal lines. I especially liked the use of the repeated vocal phrase 'Let it be' fading into the distance and the fact that it was more heavily reverberated than the main vocal line, to give it a sense of distance. The reverb on the sitar was also appropriate, and seemed uncannily close to a spring reverb in places, because of the slightly percussive nature of the sitar's sound.

Chorus has been applied to the guitar on the second song, giving it a pleasantly rich sound, but a rather heavy-handed mix

of drum level and choice of drum-loop snare sound does not suit the superbly sensitive female vocal. Indeed, the drums are too loud on all of the mixes on this CD, and a more sympathetic approach needs to be taken when dealing with such a sweet and intimate style of vocal delivery.

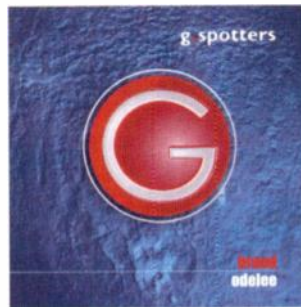
Technically, given that an SM58 was used, the actual vocal sound is OK. I'd have been more adventurous with the EQ and compression available in VST, adding presence to compensate for the lack of a condenser microphone and compression to accentuate the intimacy of the voice.

To my ears, the most striking mix was the third, with its impressive array of sound textures, ranging from Gamelan-style bells to slide and tremolo'd guitar, slowed-down drum loops, and an array of backwards effects. This one benefited from a general mid cut around 1kHz to lift the voice out of the mix, where it's in danger of being overpowered by drums and tabla. ■

How To Submit Your Demo

Demos should be sent on CD, DAT, Minidisc or Cassette to:
Demo Doctor, Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambridge, CB3 8SQ, UK. Please enclose a band/artist photograph and/or demo artwork (which we may

use here and on our web site to illustrate your demo review). Including contact information, such as a telephone number, web site URL or email address, will enable anyone who is interested in your material to contact you.



G Spotters

Recording Venue: Home.
Recording Equipment: Emagic Logic Audio sequencer running on PC, 32-channel Soundcraft desk, various outboard and plug-ins.

This debut offering from Frome-based G Spotters has a dark and brooding urban feel personified by vocalist Bugs' moody performance. In fact, Bugs could probably get a job in an Iggy Pop tribute band, if such a thing existed, as his delivery is very similar, and his vocal is given the same treatment afforded to Iggy's on the later albums — a touch of in-tempo echo and a longish reverb.

This is, indeed, the right way to make the vocal sit well against the rest of a mix which is already heavily treated to effects. With heavy chorus, reverb and echo on the various electric guitar parts conspiring to give the production a big sound, a dry vocal would seem out of place. The trick is to give the vocal enough effect to make it seem part of this sound, without sinking it too far into the mix. In addition to making sure there is pre-delay on the reverb, the critical factor is then how much effects return level you use. It seems to me that Mr O, who handled the mix in addition to playing keyboards and programming, has just about got it right. As the mix is pretty full, the triggered drum parts have quite rightly been thinned out, but without causing them to lose impact — showing that the aforementioned Mr O is considering the whole sound picture and not losing his way by focusing too heavily on the individual parts.

The second song continues in the same production style ▶

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The main demos featured this month can be heard in both RealAudio and MP3 format at www.sound-on-sound.com/sos/jun01/demodoc.htm

► (I could swear that's an old Electro Harmonix Clone Theory pedal being used on the guitar), with appropriate keyboard parts such as warm pad chords backing the spiky guitar, a neat string section, and vocal chordal stabs on fours in the chorus adding texture and dynamics. Reverse reverb and in-tempo echo effects are also well suited to both drums and vocals, being particularly impressive on the snare. It's an '80s approach, perhaps, but still very well handled. ■



Burning Rubber Icons

Recording Venue: Home.
Recording Equipment: Yamaha O1V mixer, Akai S5000 sampler, Roland MC505 groove sequencer, PC with Turtle Beach Pinnacle Multisound soundcard running CMS *Cakewalk Pro Audio* and *Sonic Foundry Sound Forge*, Boss SX700 studio effects, Dynaudio BM6A monitors, AKG C3000 microphone.

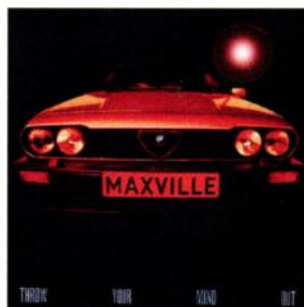
Influenced by The Chemical Brothers, Apollo 440, Senser and Lamb, the Burning Rubber Icons attempt to fuse rock and pop sensibilities to a breakbeat backbone. Yet my attention was drawn to this demo by the rhythmic use of synthesizer on the intro to the first mix. After an arresting enough start, featuring a pitch-dropping rhythmic chord loop on eighth beats, the characteristic high resolution, low cutoff and inverse EG of the synthesiser VCF produce a vocal 'wah' on the fat pulsewidth waveform bass line. As the track progresses, the band work hard to bring variety to the mix,

introducing slow pitch drops to snare voices here and there, adding simple backing vocals, and generally allowing new sounds and effects to emerge. Even at the end of the song there's something new, and I particularly liked the way the voice was thinned out on the last phrase as it disappeared into the fade-out.

Unfortunately, I thought the vocal sounds let the mixes down. For instance, the voice on the first one is muddy and could do with a bit of 1kHz boost for the sake of clarity. On the second the vocal has been heavily equalised to make it telephonic, but it's ended up sounding nasal, as if the vocalist has a cold. Another consequence of this treatment is that the frequencies of the voice end up competing for space in the same upper-mid area as the sixteenth-note sequencer loop accompanying the verse. Over-use of equalisation must be to blame, as the AKG C3000 used is a decent enough microphone for vocals and the vocal performances are fine.

As the CD progressed I began to find the songs lacked variety. The same sounds are used on the final track as on the opener, and while this gives the CD a certain continuity it also tends to weaken the individuality and impact of the songs. Nevertheless, the CD has its moments. Manchester

readers should be able to see if the band can pull it off live on June 26th at the Roadhouse. ■



Maxville

Recording Venue: Home.
Recording Equipment: Apple G3 running *Emagic Logic Audio* sequencer and *Waves* plug-ins, *Emagic Audiowerk 8 PCI* card, *Mackie 1604* mixer, *Shure SM58* and various borrowed microphones.

Netherlands-based Maxville write songs which are heavily influenced by American rock and pop acts such as Prince and Aerosmith. Even the production style has been absorbed and repackaged. There's heavy use of slapback delay on the vocal of one track, and ADT on other tracks, which is true to the style of the diminutive purple popster. Singer and main songwriter Marcel Singor goes out of his way to sound like his main influence and, to be fair, he does a rather good job. Even the necessary equalisation to give the voice a slightly hard

edge is there, and the occasional flourishes of echo on certain phrases are the icing on the cake.

On the whole, this is an album where the mixes suffer from being bass-light and harsh in the upper mids. It could be that they were mixed too loud on less-than-perfect monitors or that post-production is to blame. A cut of three or four dBs at 4kHz takes a lot of the ear-shredding harshness out of the sound, without detracting from the essential energy and presence of the mixes. This subtractive EQ also allows the lower frequencies a chance to breathe, and the bass can be drawn out even further where necessary, with a low-frequency boost of 2dB or so at 100Hz, using a wide-band parametric EQ setting.

In spite of the obvious influences and rather hard sound, this is an album of exceptionally well-crafted and well-performed songs showcasing one hell of a good singer. Given the minimal equipment ("cheap borrowed mics for the drums") they've managed to get some terrific drum sounds — especially with the application of the EQ discussed above and a touch more compression. This is a band who deserve a deal in their own country at least. Check them out on www.maxville.net ■

Doctor's Advice: The Big Picture

When I'm doing a production job, I find it important at the outset to get a really good idea of what end result I'm aiming for. This might involve going to see a band play live (if they gig), checking out their image, and talking to both band and management about how they see the project. This last may involve two points of view which are poles apart and have to be reconciled. And all this without making a start on the recording, or even

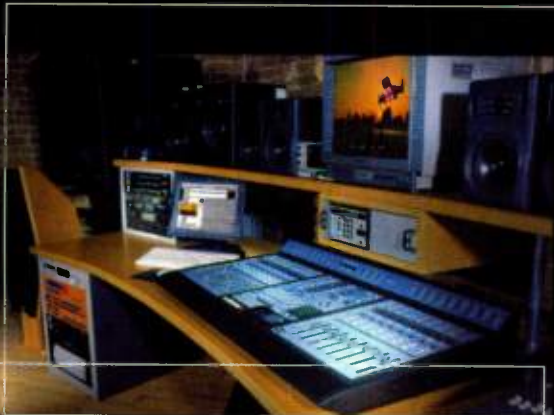
thinking about the available budget!

The importance of focusing on factors such as image is obvious these days. For example, the Dutch band reviewed this month (Maxville, see main text) have a brash rock and roll image which their mixes, arrangement and recording are in keeping with. Others reviewed this month, such as 4.20, are still developing a style, but if they want to make music a profession they will at some point need to

consider how they want to present themselves to the world, even if that may be as sensitive and slightly introverted. A high-energy production would ruin such carefully crafted songs as theirs.

So, as you build up your own tracks, always try and hang on to the big picture. Find the sounds that are right for the production, and bear in mind how the artist is going to be marketed and who the tracks are going to be played to. Obviously, in a

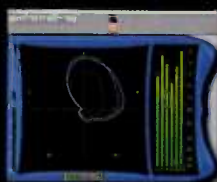
creative environment such as a recording studio the music will take twists and turns along the way, and hopefully that song you thought was going to be an album track will turn out to be a single. But in an industry run by business people, you need to have a business head as well as a creative one when you're producing. That — and some sharp work in post-production editing — may just give you the break so many of you are looking for.



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QUICKIES



Retail Therapy

The new offering from Mark Hoey (featured as Mark Malone in Demo Doctor May 2000) demonstrates a move towards acoustic pop and opens with the mellow 'Everyday'. Once again, Mark has chosen to use a professional for mastering and it sounds as though some mid-cut equalisation and heavy compression have been applied. The compression sounds good at low listening levels but seems to squash the life out of the mixes at higher ones, by removing too much of the dynamics. It also sounds a little overdriven somewhere along the line, but no more so than many CDs I've heard recently — particularly compilation ones! Musically, it's good work, and Mark does a fine job on the vocals and song arrangements, layering melody with hip-hop and R&B beats. The electric and acoustic guitars have ended up sounding very trebly and artificial, but these mixes are not really trying to be 'organic' or 'rootsy'. However, a drawback of this approach is in the HF element of the DI'd acoustic, which ends up in the hi-hat frequency area and needs to be panned a little to the opposite side of the mix from the hi-hat, to maintain clarity. ■



Cola Bear

This four-piece from London fall somewhere between indie and dance in style. Most of their song introductions are far too long and I'm sure A&R personnel would want them to get to the point quicker on a demo. On a more positive level, the heavy grooves are well handled

and I also liked the use of what sounds like triggered gating on the vocals and some of the synthesizer loops. The general production sound is gritty, especially the drum loops, which are pretty lo-fi, but there are plenty of good ideas here. Hear Cola Bear on www.peoplesound.com/artist/colabear, or visit their web site: www.colabear.co.uk ■

Hal Shaw

Hal is a retired pianist trying to make a decent CD of his playing for posterity. At the moment he's not pleased with the quality of the recording, but most of his problems seem to centre around his lack of MIDI know-how. The rather crucial piano sound, for example, seems to have lost its sustain, so I recommend getting a pedal as soon as possible. Hal could then add sustain to existing pieces, recorded with his *Notator* software, simply by pressing the pedal at the right time, recording to a fresh track, and assigning the sustain information to the same MIDI output as the piano. The drumming would benefit from the swing quantisation available in *Notator* (even in its Atari form), and the addition of a small mixer, plus some basic outboard multi-effects, would definitely widen the options at mixdown. On the subject of upgrading, it seems to me that the piano (with sustain pedal) is first in line, but there's no real point in going to the expense of changing computers unless audio is going to be recorded alongside MIDI in the future. ■

9 Bar Recordings

This is a CD from three unsigned artists who have been seven years and have achieved a modicum of success with self-financed releases in the clubs. In general, the dance mixes are well constructed, with many of the elements you'd expect from the electro, hard house and techno end of the scene, but the lack of any recording details with this CD makes it difficult to give an in-depth analysis. Yet some cuts, such as track four, 'Running Blade', clearly don't take off as dance mixes, because the groove isn't quite sitting in there until well over four minutes have elapsed. And as what precedes it isn't really attention-grabbing or rhythmic either, the track seems a little self-indulgent. Still, once the standard house beat kicks in, it gets pretty

damn good! Nine-bar do make the point that they want to produce music they enjoy, regardless of current trends, and this CD proves that with care it may be possible to make this a commercial option too. Visit their website: www.9barrecordings.co.uk ■

Kevin Walsh

Kevin is over-fond of reverb, and this shows especially on the opening mix, 'So Hard to Say'. Even on the other mixes he needs to watch those reverb return levels! My favourite track on the CD was a recording of his grandfather singing a traditional song, 'The Last Rose of Summer'. This has been rescued by *Sound Forge*'s noise-reduction tools from a poorly recorded cassette copy of an original reel-to-reel tape recording (now sadly



lost). Kevin has given it a fairly sympathetic backing, but I think this could be improved by dropping the pizzicato string/classical guitar sound playing the melody. This obscures the singing, when the voice is, after all, the primary point of the exercise. I also think that Kevin could have got away with less heavy processing and lived with a little more hiss, to allow the voice to sound more natural and less resonant. On the other hand, the restricted frequencies of the voice, and the reverberation chosen, give the mix an uncanny other-worldliness which is both emotive and fascinating. ■

Aaron Short

Aaron is a singer/songwriter who composes on piano. More Billy Joel than Tom Waits, most of the songs have amusing lyrics, often with a touch of irony, and are rarely embellished with overdubs. In fact, it sounds as though most of them have been recorded live. The last track on this four-track CD has a mix of piano and strings, but I suspect the strings are MIDI'd up to the piano, or that a layered sound has been used. A little

more effort on the production side would obviously have made a big difference to the CD, even though Aaron may favour a recording that is a fair representation of what he does

Aaron Short



live. For a 20-year-old, he's got a surprisingly mature voice, but the pitching (which, for the critical listener, has a few too many flat notes for comfort) needs attention. Perhaps a more objective ear is needed on the production side. However, both piano and voice are well recorded, with possibly a touch more compression than necessary on the voice. Aaron has a web site (www.aaronshort.com), from which you can download some samples of his music. ■



Mercury Rain

Recorded at home in Bristol, but mastered at an external facility, Mercury Rain's brand of heavy metal has an unexpected twist in Breton vocalist Sonia Porzier. Her voice glides across the rock backing tracks, with a choice of melody lines and backing vocal parts that seem to draw from classical and folk-music roots more than metal, giving the band a unique sound. On the production side, I think they could experiment with closer miking and heavier compression, to bring out even more of the vocal character. As for the post-production EQ, to my ears it sounds better on a variety of speakers with a 4dB cut at 900Hz and some LF and HF boost in addition to what has been done already. Check them out on www.mercuryrain.com ■

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Is It All Hear'Say?

Akai respond to SOS interviewee comments on their flagship samplers

While all of us at Akai R&D UK applaud Hear'Say's recent success, and also congratulate Tim Hawes and Pete Kirtley on their achievement with the success of the band's debut single and album, it was disappointing to read their comments about their Akai S6000 sampler.

It would be foolish for us to deny that problems were found in the field with the very early releases of the S5/6000 OS, but these were fixed a long time ago. With any sophisticated software-based product, some teething problems are (almost) inevitable, but thanks to feedback from many users out there, these have been addressed and fixed.

The fact is that the S5/6000 OS has undergone a process of continuous development, with regular software updates, and the issues Tim and Pete referred to have now been eliminated. Furthermore, looking at the photos of their impressive equipment rack, we can see that the operating system they are using is considerably out of date.

Amongst Tim and Pete's complaints about the S6000 was their comment that "... you

never read your letter or simply weren't interested in unsolicited demos or in your style of music. The round number of publishers you mention makes me suspect you applied to them without confirming that they were interested in your type of music.

While it is a little rude not to reply to a letter, it doesn't surprise me. Reading a letter and sending a reply could take as much as 10 minutes of a publishing employee's day (longer to listen to a demo too), and many publishers receive dozens of letters every day. Also, large publishing houses probably have enough suitable vetted material coming in from production companies, managers and producers, so if you're sending unsolicited demos, you'll be low priority. The fact that you sent the demo to a single US company leads me to suspect that you knew someone there, or that you knew they might be interested in your type of music. I think this is more likely to account for the overseas interest than any UK/US differences — I'm sure many American musicians would assure you that the US scene is equally cut-throat.

Demo Disappointment

Unsolicited demos don't make an impression on UK publishers...

I read the FAQ on sending demos in SOS November 2000 and tried to follow the advice when sending out some demos, with the aim of securing a publishing deal. I got addresses for 20 publishers and sent type-written letters to each, explaining that I was a songwriter looking for publishing, and asking if their A&R person would like to hear a demo. I included SAEs for replies, but received only three responses and was quite disappointed with this. I think it's rude that they didn't reply — even to say 'no thanks'!

The three that did reply all asked to hear my music, so I sent off CDs with covering letters and lyric sheets. Of these, I received two replies within a couple of weeks, both of which returned my CD. One of them

included a note that the CD wasn't what they were after. However, while I was waiting to hear from the UK companies, I sent a demo on spec to an American company, who got back to me promptly and have offered to publish one of my songs! Why are UK publishers so reticent about finding new music, when US companies seem much more eager to encourage musicians?

Phil Turner

Assistant Editor Mike Senior replies:

Three replies? That calls for celebration, not condolences! There are lots of musicians who receive not a single reply from many more enquiries. My guess is that your presentation marked you out for special consideration, but that 17 of the publishers you contacted either



Akai's top-flight S6000 sampler has come a long way since its 1998 release.

can't use ReCycle on it". ReCycle is supported on the S5/6000 by way of the ak.Sys software developed by Akai for Mac and PC. Additionally, Propellerhead's ReCycle2 offers direct support for the Akai S5/6000.

It may interest SOS readers to know that many prestigious artists have S5/6000s at the core of their live and studio setups. Robbie Williams uses three S6000s in his live rig and his songwriting partner, Guy Chambers, also has an S6000. Jay Kay, Gary Numan, Underworld, S Club 7 (to name but a few prominent users — none of which are endorsed by Akai, incidentally!) also use S5000s or S6000s, and we are justifiably proud that these artists have chosen our products in spite of fierce competition.

The S5000 and S6000 have come a long

Secret Service

May's 'Synth Secrets' programming article hits the spot

This is the article I've been waiting for! All the instalments of 'Synth Secrets' have been excellent, but explaining the 'complete' brass synth step-by-step is great. Just got done creating a patch on my Pulsar Modular 2 from the final flow diagram. Works as advertised. Sounds awesome. I look forward to seeing more of the same. Strings? Wind?

Robin Chard

Assistant Editor Matt Bell replies: *Thanks for your kind words. I suppose I'm biased, but I thought it was excellent as well!*

Regarding your query about how the series is set to continue, you'll see that in part 26, elsewhere in this issue, Gordon strips down the virtual brass patch given in part 25 so that it will work passably on a Minimoog (complete with reproductions of the Mini's front-panel and dial/switch settings). In part 27, he does the same for the Roland SH101 and ARP Axse. Of course, you don't need to carry out such economy measures with your Pulsar; you're in the fortunate position of being able to try the 'full-fat' patch from Part 25.

After brass, I don't think I'm giving too much away if I reveal that Gordon is going on to look at analogue modelling of plucked strings in the same detail. Hope you continue to find the series useful. **SCS**

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Universal Audio LA2A - announcing the rebirth of the Teletronix LA-2A. A unique electro-optical system allows instantaneous gain reduction with no increase in harmonic distortion resulting in the natural characteristics which have made this a classic model. Each unit is hand built and each component carefully evaluated for authenticity.

Amek 9098CL - Firmly based on the performance and character of the classic 2254 Compressor developed by Rupert Neve in the 1960's, the new 9098CL incorporates a greater degree of operational flexibility and much higher overall performance specification. However, hallmark Neve features have been retained, notably the transformer-coupled inputs and outputs.

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It is my contention that the political North/South divide in this country is three miles south of Luton. If there were a North/South divide in the entertainment industry it would be 50 yards north of the white cliffs of Dover. The inequality of wealth and power in this, one of the most important industries in the world, is nothing short of criminal. And, what's worse, there is nowhere a dissatisfied customer can go.

Who You Gonna Call?

If you have a problem with your local water supplier, you go to OFWAT. If your phone company is mucking you around, there's OFTEL. We have watchdogs for trains, electricity, and gas — there's even a body overseeing the advertising industry, for heaven's sake. But when it comes to the entertainment industry there's nowhere for musicians, singers, producers, composers, performers and punters with a grievance to turn.

At this point in my ranting, a dozen Musicians' Union activists are diving for their pens, to write and berate me about the fact that my Union is there to protect the interests of its members, and that my subscription lapsed five years ago. I would feel threatened by their power, if they actually had any. (And here I would advise anyone reading who is not a member of the Musicians' Union to join immediately, while those of us who used to be members and haven't bothered paying up should dig deep, pay our dues, and become active as members.)

Fair Dues?

Having said that the MU have no power, I admit that they do provide valuable assistance to all their members in the way of equipment insurance, free legal advice, workshops and benevolent funds, while at the same time striving to maintain decent conditions and wages for all working musicians (even if that means a lot of the orchestral work that used to be done in this country goes to Eastern Europe). But what protection do we really have as music makers against the industry at large — against rip-off contracts, stranglehold cartels in retail and on the airwaves, and chemically confused egotistical executives who think they know more about our music than we do? None!

Actually, that's not strictly true. If you do get shafted by any company within the media, you can always take them (along with their legal department) to court and slug it out. It will only cost you a fortune up-front in court deposits — a cost which will increase with every adjournment — and after a few years you might get justice. During this time all your assets (and none of theirs) will be frozen and you will be prevented from trading in any other guise.

BIG GEORGE'S GUIDE TO COMMERCIAL SUCCESS

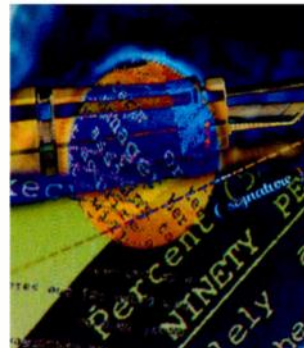
On the other hand, say you do get a break and release a record which creeps into the charts, or produce a soundtrack for a successful programme or film. Guess who will be in control of your work? Not you, that's for sure.

Bleak Prospects

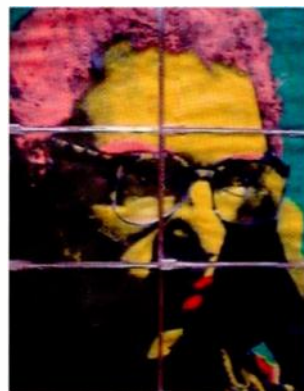
We — and I'm talking about me and you — are a powerful force in this industry. We make the music that others build empires on. I doubt that there is a record in the charts, or a piece of music on TV, radio or film that was made in this country, whose creative and technical forces were not *SOS* readers. Trouble is, we've allowed that power to diminish in the hope of a few crumbs from the number crunchers' table.

Over the past few months of researching the industry further than my own interests for this column, I've become increasingly pissed off at how the circus is run. Recent events, some of which — notably the Hear'Say feeding frenzy — have dominated the UK tabloids in the name of the music industry, have made me determined that I shall not let the trend go on unhindered. So, for as long as it takes (until I get bored, or Sony or BMG either pay me off or hire a hit man), I will poke my nose in where it's not wanted. I'll be addressing such issues as why selected new, groomed bands get immediate recognition by the entire media, when the vast majority of them show no real talent, and other artists whose ability shines out can't get a single local radio play. And why, when there is so much money sloshing around in the music business, so little money is invested in music education (at all levels). Why are there fewer artists signed to major labels today than ever before? Why is it so hard for independent labels to compete in the market, until they are bought out by a major?

I've been saying for a while that there is a revolution coming in the music business. If we don't watch out, we (and I mean all but a select powerful few) will be refugees in an industry that is based on endless re-releases, manipulated pap, and the occasional talented artist who will burn too bright for a short space of time and then burn out, rather than be nurtured and developed. That's what I think, anyway — what about you? *SOS*



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Colourful views, as ever...

Contact Big George

If you'd like to look at any of Big George's previous scribbblings for *SOS*, go to his web site, www.biggeorge.co.uk, and click 'ARTICLES'. George can be emailed at big.george@sospubs.co.uk. You might want to send him a copy of your latest demo (it's what he lives for); if so, the address to send it to is PO Box 7094, Kiln Farm MK11 1LL.

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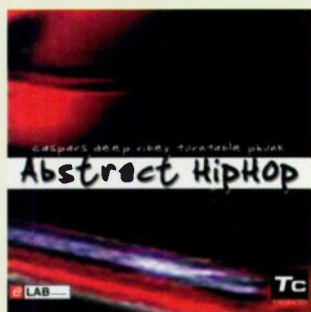
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Abstract HipHop

(E-LAB AUDIO CD SET)

The front cover of this elegantly packaged and presented two-CD set promises "deep vibey turntable phunk", which actually is as good a way as any to describe a gloriously laid-back collection of slow-burning loops and grooves. In familiar format, the package consists of a single 73-minute audio CD, plus a CD of WAV files.

Music categorisation is always a tricky subject: while admittedly I'm not a Bronx-born teenager with my hat on backwards and a skateboard under my arm, and as fantastically usable as this material is, I hardly feel it falls all that easily into the hip-hop category. There is a very heavy soul and R&B crossover flavour that infuses virtually all the material here, offering a wide degree of feel, from super-fly urban attitude to sensitive retro soul. If you thought hip-hop was all about aggression, turntables and oversized expensive trainers, producer Caspar is here to tell you that it can just as easily be about deep shag-pile carpets, glitter balls, and Barry White's enormous 'lurve thang'.

The CD kicks off with a series of construction kits, which, as usual, consist of short, fully-formed track ideas, complete with drums, bass and assorted other instrumental (and occasionally vocal) elements. These are then presented solo for easy sampling and track

construction. One of *Abstract HipHop's* main selling points is its sound quality, which is uniformly excellent. The retro vibe is kept alive with obvious vinyl trickery, such as interesting lo-fi granulation and scratchy record effects, but the producer's lovingly crafted sound gives a warmth and depth that makes many other sample CDs (and particularly some sound modules) seem clinical and soulless.

As you would expect, drumming forms the backbone of this release, and in most areas it doesn't disappoint. From grainy recorded kit sounds to retro analogue beatboxes, there is as much bottom-end meaty thump and boom to these breakbeats as there is detailed and highly infectious percussive top end. Pushing the envelope at almost every turn, *Abstract HipHop* offers the familiar alongside the experimental in a neat and highly polished musical package.

There is also a wide selection of stand-alone instrumental riffs, chords and effects, perfectly suited to the genre. These feature huge chunks of authentic and expertly handled guitar, bass, keyboard, sax, brass and flute lines, which will obviously never be as flexible or versatile as those offered by dedicated instrumental sample CDs, but are dripping with cool and inspired musicality all the same. The tail end of the disk features some extra vocal FX, a few bass licks, and a good number of individual drum samples.

All in all, *Abstract HipHop* deserves to be a firm favourite with those who like their beats laid back, funky and lovingly constructed. *Paul Farrer*

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Total Funk

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Are you a funk-mad, sample-hungry programmer with a penchant for pictures of naked women wrapped in see-through plastic? Boy, have Zero-G got a sample CD for you!

Total Funk continues Zero-G's high-scoring *Total* series with a winning format of a two audio-CD set plus a third disc containing WAV files of the material. Disc one kicks off with drum loops, which those lucky enough to own any of the other *Total* discs will know Zero-G don't scrimp on — either in terms of quantity or quality. Tempos start at 85bpm and rise incrementally to 125bpm, with anything between 30 and 60 loops in each tempo set. In total there are around 400 loops, ranging from crisp acoustic kits to grainy breakbeats, experimental sampled sounds and occasional analogue beatboxes. As they're culled from the extensive Zero-G back catalogue, there are a few elements here that some may have heard before, but enough of the material is fresh, musical, and hugely usable. It's a real cross-section of both '70s retro and 21st-century dancefloor-filling beats, obviously assembled by funk pros.

Disc Two covers pretty much everything else, casting its net wide over a huge range of

appropriate funk instrumental licks, riffs and multisamples, without ever getting bogged down in too much detail. The 20 tracks of guitars feature a jaw-droppingly impressive assortment of short chugs and riffs, ranging from twang and strum to

hard-core funk, and even including blues elements. The fun continues in the bass licks section, which, like the guitars, offers a useful set of handy track ideas listed with appropriate key signatures and organised into easy-to-use strict tempo sets. Also like the guitars, this section has a good spread of variation, including acoustic, electric and upright basses — all expertly performed and recorded.

There follows a spade-load of stabs and brass riffs, followed by some groovy Rhodes chords and riffs which sizzle and twinkle with authenticity. The flute and sax sections are also well stocked with a series of fairly disparate and unconnected, but largely useful, samples. It's nice to see so many usable multisamples (Hammonds, Wurlitzers, clavinetts, trumpets and

Star Chick Flicks

- ■ ■ ■ ■ Thelma & Louise
- ■ ■ ■ ■ The Truth About Cats & Dogs
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▶ vibraphones), too, on a release such as this.

Unfortunately, in scouring their back catalogue the Zero-G boys seem to have let their quality controls relax a little on occasion, offering us such flaccid and lukewarm sampling dross as James Brown-type vocal samples (which decade do they think we're in?) and some rather uninspired vocal snippets which we shall politely refer to as track fillers.

That said, *Total Funk* continues in the *Total* family tradition and offers quality, range, ease of use, value for money and, above all, musicality at almost every turn. We look forward to *Total Classics*, *Total Analogue*, *Total Experimentation* and any other *Total* title Zero-G care to throw at us. *Paul Farrer*

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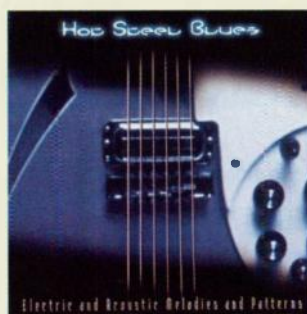
sampled' type of offering we've come to know and love, because Kevin has used DSP effects, morphing, extensive controller mapping and the occasional digital synth to produce bank upon bank of sounds with serious edge and angst — ideal for today's dance-music composers. The result is a set of polyphonic, velocity-sensitive samples that simply ooze attitude. I guess 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. There are also a few big, deep basses and massive layers — everything from phase sync to the kitchen sink! Even the few deceptively simple-sounding patches still work perfectly in the context of a mix. These samples are also good news for those people who like to work their samplers multitimbrally, as many of them are quite compact. Some large sample sets have been included, but there's still a lot to choose from that fits neatly into five or six Megabytes, or even less.

I get the feeling that these sounds are pretty much targeted at the dance market, but I like what I hear even though I wouldn't be using them for dance. In any case, it's great to have sounds like this on tap when you need them. Even people who know their way around an

analogue synth pretty well would take a while to come up with results to match these.

Ultimately, this CD achieves what it sets out to achieve, with panache and class. It won't suit everybody, but if you need angsty analogue-ish synth sounds with bags of front, you won't be disappointed. I'll give it four stars. *Paul White*

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Hot Steel Blues

(ILIO AKAI/EMU/ROLAND/KURZWEIL CD-ROM SET, AUDIO CD)

Hot Steel Blues is a double CD-ROM sample set available in Akai, Emu, Roland and Kurzweil formats, as well as on audio CD. Its Ilio pedigree suggests it might be something a little bit special, as the company have already received acclaim for their *Fingerstyles* guitar sample library.

In some ways, producing a construction kit for blues is more 'do-able' than for most other musical genres, as blues tends to follow a fairly rigid root/sub-dominant/dominant chordal structure, with turnarounds and endings in predictable places. Even so, the range of styles available on this set is extraordinarily wide, including electric, acoustic and slide examples where lead lines, chords and riffs are all provided, and all with appropriate endings.

The playing is courtesy of American session player Terry Robbs, who displays a tasteful, lyrical approach to the blues that just oozes feel rather than pyrotechnic irrelevance. A number of guitars and amps were used in the recording, including the obligatory Fender Strat and a couple of dedicated lap and upright slide guitars and, though some compression is evident, the sounds have a natural, fresh-from-the-studio quality that would allow for further processing, if required. A little natural amp noise is present, but both the electric

and acoustic recordings are to a very high standard.

The playing styles hint at the likes of John Lee Hooker, Buddy Guy and Muddy Waters, but also embrace a more modern blues feel. I was particularly impressed by some of the 'unplugged'-style acoustic chordal backings. The 'riffy' material, which is provided in a selection of keys, never gets quite as far as Status Quo, but does impinge upon R&B (proper R&B, that is, not the stuff some people try to pass off as R&B in the dance market!). Broadly speaking, the samples are divided into patterns, melodies and endings, where patterns are mapped from notes C4 to B4, melodies are mapped from C5 upwards, and endings (which are based on the same patterns but with an ending built in) are mapped from C3 to B3.

Sample sets vary in size between 4Mb and 32Mb, and everything is recorded in stereo. The CD-ROM sets also come with an audio CD for quickly auditioning the examples prior to loading them, and all samples are annotated with their tempo and key. Where complex chord sequences are used, the chord names are provided, and there's a brief description of each style in the accompanying booklet.

I can't really fault these samples for quality and usability, and if you want a more overdriven amp tone there's no reason not to route the lead lines through a decent guitar processor. I imagine that most guitar players would rather play their own parts, even if few can match the skills of Terry Robb, but anyone else needing anything from a few blues licks to a full blues arrangement will find this collection hard to beat. A thoroughly well-deserved five stars. *Paul White*

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Analog Meltdown

(ILIO AKAI/EMU/KURZWEIL CD-ROM)

Available in both Akai and Kurzweil CD-ROM formats, *Analog Meltdown* is the brainchild of Kevin Wakefield, a self-confessed analogue synth freak and experienced programmer. However, this sample collection goes some way beyond the 'classic analogue synths, lovingly

twin Q u i m 1



JoemeeK's original compressor has been tingling the ears of top mixers for years. More recently, JoemeeK tracking units have brought permanent grins to vocalists and instrumentalists. But there has never been a JoemeeK like this one.....JOEMEEK announces the TwinQ. Continuing research at Meeklabs over years has produced classic developments:- The Meequaliser; a very special EQ. The 'CurrentSense' microphone amplifier; dynamic, powerful and sweet, and now, the first JoemeeK dual/stereo optical compressor; as great as the early SC2s, yet infinitely controllable in mono or stereo.

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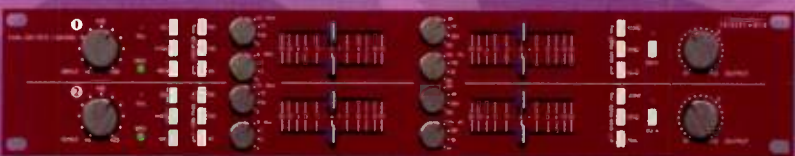
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Studio wiring may not be the most fascinating of subjects, but a little knowledge can go a long way when it comes to sorting out cable-related problems. **Martin Walker** rounds up the best of the wired web.

While audio processing becomes ever more sophisticated, thanks largely to advances in computer algorithms, the quality of the audio in our studios can still be compromised by rather more mundane factors, such as the hums, crackles and RF interference caused by poor mains and audio cabling. In the past, anyone trying to solve such problems might take a trip to the local library, which would probably yield a few dry textbooks on the whys and wherefores of electrical wiring. However, now we have the Internet, which provides a wealth of information on the subject from seasoned professionals.

Cable Talk

Choosing decent cable can make a noticeable difference to audio quality, particularly with low-level signals such as those from guitars and microphones. However, with so many types of cable available, choosing between them can be extremely confusing for the beginner. If you want to learn about the different basic types of interconnect, speaker and digital cables, look no further than Paul White's 'Wires and Wherefores' article on the SOS web site (www.sospubs.co.uk/sos/1996_articles/feb96/cables.html), which also includes brief details of unbalanced and balanced operation.

Digital Pro Sound also maintain a useful set of articles at www.digitalprosound.com/1splash/ArticlesIndex.htm, and if you scroll down to the Electrical/Electronic section you'll find all the basics about different types of cables in 'Good Connections', how to choose the correct type of cable for your application in the 'The Right

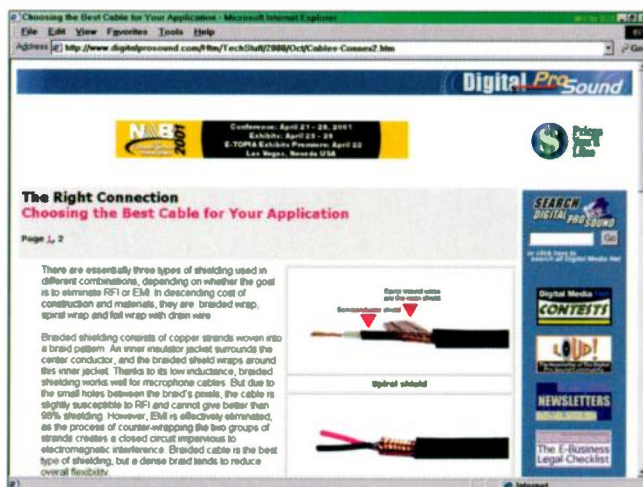
Connection', and a discussion of how to rid your system of hum and buzz in 'Keeping Quiet'.

Rolling Your Own

Of course, you may never need to know about cables if you always buy ready-made ones, and there are plenty of companies, such as Studiospares (www.studiospares.com) that sell high-quality audio cables of various lengths, terminated with a range of connectors. However, anyone who needs an unusual combination of cable and connector, or who wants to save some money, and has some time and a suitable soldering iron, can indulge in a little DIY. Paul White wrote a useful introduction to soldering back in SOS March 1994 (www.sospubs.co.uk/sos/1994_articles/mar94/soldering.html). Some people prefer to use solder with a small percentage of silver in it for audio connections, and such solder is available in short lengths or by the reel from various hi-fi and electrical outlets. Sometimes it's better to avoid solder if possible; there's a helpful description of the relative merits of soldered versus crimped connections at the Cardas Audio site (www.cardas.com/insights/solder.html).

The Cardas site offers lots of general information regarding the company's own audio cables, plus discussions of the relative merits of solid core, stranded, litz, tubular stranding, and even Constant Q Golden Section stranding! They also tackle explanations of such thorny issues as cable break-in — why many new cables (in particular, speaker cables) sound better after being used for several days.

George Cardas holds US patents for some of his cable, microphone, and connector



The Digital Pro Sound web site has lots of articles for the musician, including a survey of the different types of screened audio cable available.

designs, but many musicians still regard hi-fi cable designs with great scepticism, particularly when they see some of the prices! Still, more and more audio professionals are accepting that the quality of materials used in cables, and the type of construction chosen, can affect overall sound quality. There are plenty of companies advertising ready-made cables constructed from exotic materials, such as silver and platinum (try www.kimber.com or www.purenote.com, for instance), but musicians mostly use cables terminated in either quarter-inch jack or XLR plugs, and while both aforementioned companies offer XLR termination as an option, most others don't, and jacks aren't generally available at all.

If you want to see if you can hear the difference in your studio without spending lots of money, why not try making your own exotic cables? For some practical advice based on solid engineering principles, by someone who has presented AES papers, take a look at Jon Risch's web site (http://members.nbci.com/Jon_Risch). Jon has undertaken a huge number of tests over the years, using many different types and brands of cable, and presents a preferential list of conductor and dielectric materials ordered by audio quality.

He also recommends specific standard cable types from the huge US Belden company (www.belden.com/), mainly using standard copper conductors and foamed PTFE (Teflon) dielectric.

Top favourites are apparently type 89259 for making up unbalanced cables, and 89207 for balanced cables. By the way, if anyone sells these by the metre in the UK please let me know, as I'd like to try some for myself!

There are also plenty of web sites offering recipes for home-brew cables (see the comprehensive Hi-Fi Tweakings site at www.tnt-audio.com/clinica/tweaks.html, for instance), but since most of these involve creating cables from individual wires threaded down or wrapped around dielectric tubes, they're not very practical in the studio, even if you accept the claims made for them. However, you might want to try one for a short critical connection between mixer and amp, or DAT recorder and mixer, for instance.

If the pursuit of DIY cable excellence interests you, the real cable fanatics tend to frequent the Cable Asylum forum, which is one of many that together form Audio Asylum (www.audioasylum.com). Others are devoted to Pro Audio, Digital, and Music, while anyone into DIY Hi-Fi Tweaks will revel in the dedicated Tweaker's Asylum. There is also a large and useful set of Audio FAQs at www.audioasylum.com/audio/faq.html.

Staying Grounded

Meanwhile, many of the more down-to-earth amongst us are still struggling with that most annoying of problems — the ground loop. When two or more items of audio gear are connected ▶

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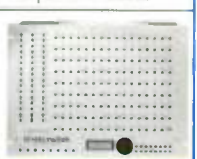


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▶ together to a common ground (or earth) point through different paths, you get one of these, and the resulting currents can cause 50/60Hz background hum, background noise, or even equipment damage in extreme cases. They will certainly prevent you getting the best results from modern 24-bit soundcard converters. If you understand the causes of ground loops, it makes them far easier to track down and solve, and a little understanding might also save your life if it prevents you disconnecting earth wires inside a UK mains plug.

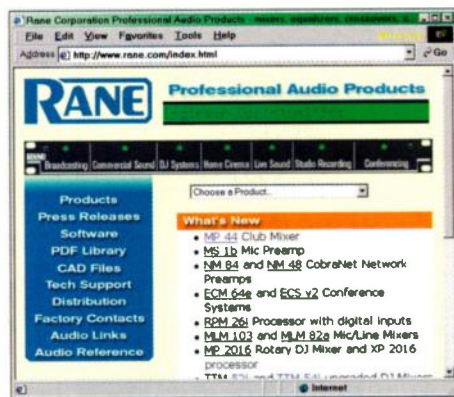
Paul White covered all the basics in the wonderfully titled 'Ground Control of Major Hum' in *SOS* August 1994 (www.sospubs.co.uk/sos/1994_articles/aug94/groundloops.html), and Tomi Engdahls covers much of the same ground in his Ground Loops page (www.epanorama.net/documents/groundloop). He also provides a set of links to more specific grounding topics for the studio, such as rack installations, digital audio interfaces, and video installations. Whether you are an absolute beginner with a hum or an experienced engineer about to install a new studio from scratch, there's a link here that should cover what you need to know.

If you're not sure what some of the technical terms mean, Rane have a very comprehensive glossary in their Professional Audio Reference www.rane.com/digi-dic.html, as well as a useful library (www.rane.com/library.html) that includes several detailed PDF articles about grounding and shielding. Further down on this same page is a list of technical notes, number 110 of which covers 'Sound System Interconnection'. Although this provides yet more information concerning ground loops, it concentrates on the right and wrong ways to connect your gear together, including transformer isolation, specially wired cables, and ground lifting, and has lots of useful diagrams. While the HTML version is the quickest to view, it's well worth downloading the 251K PDF version, since the diagrams

are a lot larger and clearer.

RF Interference

Our planet is now almost totally bathed in radio frequencies, and while this may help us to keep in touch with world events and each other, it doesn't help audio quality at all, since both audio and mains wiring acts as an aerial, letting unwanted RFI (Radio Frequency Interference) into the audio chain. Problems can range from the obvious sounds of police radio messages and passing taxis



Rane provide a comprehensive audio glossary and lots of technical notes about grounding and shielding on their web site.

appearing on our monitor speakers in extreme cases, to increases in audio background noise and distortion.

The majority of audio cables are screened to keep such interference at bay, but it may be worth using braided rather than lapped screen cable if you suffer from major RF problems, since this provides better screening coverage. You can also buy or make up screened mains cables (try www.tnt-audio.com/clinica/merlino.html for a DIY one, using standard Radiospares components obtainable at www.rswww.com), although the benefits of this are debatable (more later).

Mind you, even if we screened our entire studios we wouldn't escape, since RFI is also generated by digital gear, from CD players to computers, albeit hopefully at the low levels approved by various standards authorities. Even if you hear no obvious audio problems, you can test for RF generation near audio

equipment using an AM radio (www.audiotweaks.elosoft.com/Set02/twk_0079.htm).

Sometimes studio RF problems can simply be due to the existing screening and earths not making good connections with each other. You can remedy the fault by cleaning the offending contacts with proprietary contact cleaner/enhancers, such as Caig's DeOxit, for general use, or ProGold for plated surfaces (see www.caig.com for more details).

Persistent problems can also be cured by placing a ferrite clamp around the offending cable at the entry or exit point of the gear in question — at the output if you suspect the gear of generating RF, or at the input if external RF is getting in. You can buy these from many electrical retailers, including Radiospares and Studiospares.

Mains Wiring

For those building a studio from the ground up, Paul White and Hugh Robjohns's 'All About Studio Power And Wiring', in *SOS* August 1999, covers mains wiring in a straightforward way, helping you to make such decisions as whether to install a Spur or Ring main, and discussing the merits of RCBs (Residual Current Breakers) and the best way to distribute mains power around the studio.

But even with properly implemented mains wiring, you can still suffer from audio

problems due to poor mains power quality. Interference can piggyback on the 50Hz/60Hz pure sine wave most of us expect the mains to provide, and unless this is filtered out it can get into circuitry and downgrade audio.

In the UK, Russ Andrews (www.russandrews.com) has spearheaded the attack on mains quality problems, and his range of cables, power conditioners, and mains filters is one of the best. He and Ray Kimber (www.kimber.com) also market plaited mains cables that capacitively filter out existing interference. Another site that discusses mains filtering is that of cable manufacturers Magnan Audio (www.magnan.com).

To take things a stage further, there are specially designed isolation transformers to remove common-mode distortion (where identical interference is superimposed on both live and neutral lines). Read about the SmartLight Power Conditioner at www.sospubs.co.uk/sos/sep00/articles/smartsound.htm. Tice Audio (www.ticeaudio.com) have both US and UK models.

To bypass such problems altogether, you can instead use balanced power (also useful for running foreign studio gear). A power amp and oscillator are used to generate local power, with a perfect sine wave at the desired frequency. Equitech (www.equitech.com/) claim to be the pioneers of this technique, while the PS Audio site (www.psaudio.com) also offers lots of info.

With quality cabling, good grounding, freedom from RFI, and clean power, your audio quality should improve significantly. **SOS**

Quick Solutions

For a quick guide to signal problems and how to avoid them, look no further than Paul White's previous *SOS* article of the same name, which covers missing and intermittent signals, non-computer-related crackles and pops, hiss and hum (www.sospubs.co.uk/sos/1995_articles/nov95/signalproblems.html).

Even if your studio is working well at the moment, there are things you can do to keep it that way. 'Preventative Maintenance In The Studio' (www.sospubs.co.uk/sos/apr00/articles/maintenance.htm) discusses the best way to keep your gear clean, your sockets and other contacts in good order, your power points reliable, and your fan-cooled equipment properly ventilated.

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translator *n.* A translator is a person, or object, that changes words into a different language.

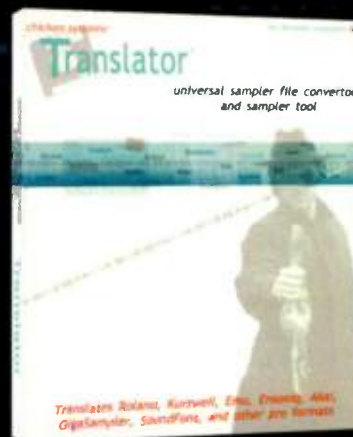
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SOS's resident MOTU expert **Robin Bigwood** looks at ways of working with audio loops in *Digital Performer*, and hands out tips on using Propellerhead's Rewire to interface *DP* with software synths.

Not many home-based musicians will even consider working with a sequencer these days unless it has some way of importing audio loops. They can serve as musician-friendly 'click tracks' as you build up arrangements one pass at a time, or you can even use them as inspiration for your songs, provided you're careful about copyright. If you're a MOTU user (and if you're reading this page, there's a good chance you are!), you'll be pleased to know that *DP* (MOTU's seemingly favoured abbreviation for *Digital Performer*) has a number of features that make working with loops relatively painless.

Pulling Them In

To start with, *DP* is able to import audio files in *SoundDesigner II*, AIFF and WAV formats, as well as others. It's also possible to drag a sound file directly from your Mac's desktop into *DP*'s Tracks or Audio Graphic Editing windows. Alternatively, you can open the Soundbites window, and select

'Add soundbite...' from the mini-menu (screenshot above). If you then navigate to your audio loop file and open it, *DP* will add it to the list of soundbites, converting it automatically into a usable format and resaving it if necessary. *DP* can't work with so-called interleaved stereo files, preferring split stereo instead. However, if you do try to import an interleaved file, *DP* will make the format conversion for you.

Stereo files or soundbites can't be placed in mono tracks (and vice versa), so if a file doesn't seem to want to 'go', check you're not asking the impossible of *DP* before tearing out too much hair!

Once your rhythmic loop is in *DP* you'll probably want to figure out its tempo (even if the loop claims to already have been recorded at a specific tempo) so that *DP*'s bars and beats counter will sync exactly to the loop. Fortunately, this is easily done.

First select the soundbite in the Tracks or Graphic Editing window, then select 'Set Soundbite Tempo...' from the Audio menu. A dialogue box will enquire how many beats long your rhythmic loop is (if you're not sure, you can always go back and count). If you know the answer, you just

type it into the 'Length' text field, and *DP* will automatically calculate the soundbite's tempo, display it in the 'Tempo' box below, and show the resulting new 'End Time' for the soundbite. If you leave the soundbite selected, and choose 'Adjust Sequence to Soundbite tempo' from the Audio menu, you'll find that your sequence and soundbite will now be in perfect rhythmic sync.

One way to get your soundbite to play repeatedly is to select it, then choose 'Set Loop' from the Change menu. You can specify start and end times for the loop, and the number of times the loop will be repeated. Another way is to select your soundbite by dragging the cross-hair pointer over it, and choosing 'Repeat' from the Edit menu (or hold down Command/Apple and hit the 'R' key). This will automatically place a row of repeated soundbites back to back in the sequence. The Repeat function works with most other types of data, too.

Looping the Loop

In some instances, you may want to import a rhythmic loop into a sequence whose tempo cannot be changed — for instance, one which is already based around a loop at a different tempo. In this situation, *DP* can do some nifty number-crunching to either time-compress or time-stretch the new soundbite. In most cases, you should be pleasantly surprised by how little the sound quality is affected.

Here's how you do it. Import the new soundbite (the one at the 'wrong' tempo), place it in the sequence, and select it. From the Audio menu choose 'Set Soundbite Tempo...', and in the dialogue box shown below, type

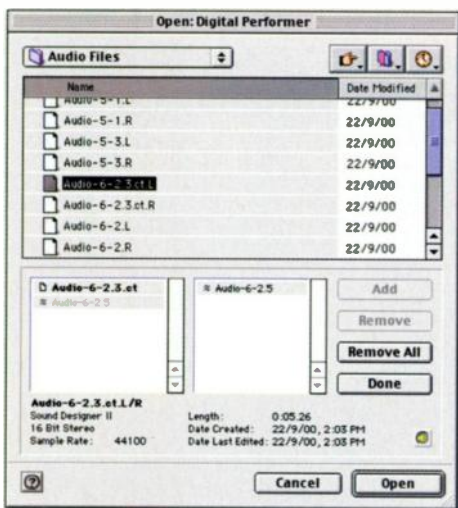
in the length in beats you want your soundbite to be (or specify an appropriate start and end time). Click 'OK', then from the Audio menu select 'Adjust Soundbites to Sequence Tempo'. The Background Processing window will appear at this point to give you an idea of how long it will take to process your audio file. When the number-crunching is complete (the speed will depend on how fast your computer is, and the size of the time-stretched file) your new soundbite will fit perfectly with your existing audio.

"Right Aboutt Nnnnoooowwww..."

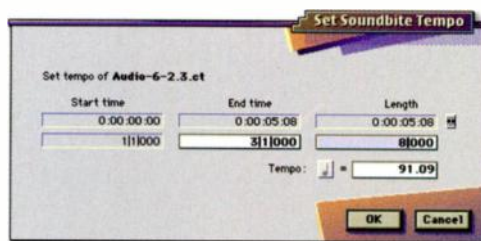
While the 'Adjust Soundbites to Sequence Tempo' function is most commonly used for the task I've just described, it can, in conjunction with *DP*'s Conductor Track, do something quite special; it can map tempo changes on to soundbites, so that the audio slows down (gets longer) or speeds up (gets shorter) as it plays. Just think of the crazy break in Fatboy Slim's *Rockafeller Skank* and you'll get the idea.

To try this out, import a rhythmic soundbite into an empty sequence, then switch tempo control of the sequence over to the Conductor Track, by selecting this option in the 'Tempo control' popup menu on the left side of *DP*'s Control Panel. Now select your soundbite and determine its tempo as described earlier. Choose 'Adjust Sequence to Soundbite Tempo' and you'll see that *DP* writes a single tempo change message into the Conductor Track at the beginning of the soundbite.

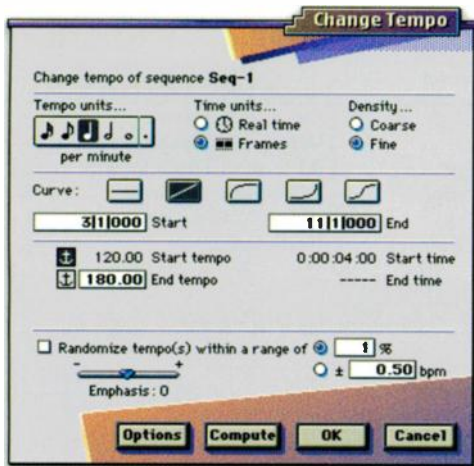
Now, make some copies of your soundbite and place them back to back, maybe using the Repeat function. In the Tracks window, drag over all of them to select them. From the Change menu choose 'Change Tempo...'. The complex dialogue box that appears allows you to very accurately define tempo changes in your sequence, even down to selecting different rate curves for the changes (see screenshot above right). The start and end



Adding an audio file to your *DP* song as a Soundbite.



Calculating the precise tempo of an audio loop in *Digital Performer*.



DP's powerful Change Tempo dialogue box, which permits time-stretching of loops without changing pitch.

times should be correct, matching up with the time-range selection you've already made in the Tracks window. Clicking on the anchor symbol next to 'Start Tempo' enters the tempo at the start point of the sequence into the value box. You can type any value you like into the 'End Tempo' box, and if it differs from the start tempo, you'll notice that DP writes lots of individual tempo changes into the Conductor Track when you click 'OK'.

Finally, if you select 'Adjust Soundbites to Sequence Tempo' from the Audio menu, after the inevitable background processing has taken place, you should hear your soundbites changing in tempo but not in pitch, just as expected. This technique can be usefully employed for dance and experimental music, sound design, and for generally tweaking or repairing recordings. The tempo changes don't have to be gradual, either — try placing a number of wildly different tempos in the Conductor Track and repeating the process.

Using Rewire With DP

Any DP user with even the scantest knowledge of software synths will have heard of Propellerhead's *Rebirth*, the software TB303/TR808/TR909 emulation plug-in, and *Reason*, the software studio. Whilst both *Rebirth* and *Reason* can be used perfectly well by themselves, Propellerhead's Rewire protocol allows them to work in tandem with sequencers which offer

Rewire support, such as *Digital Performer*. You could, for example, record the output of *Rebirth* into DP, or use a MOTU Audio System (MAS) reverb plug-in to treat the output of *Reason*'s sampler. Rewire also syncs DP with the onboard sequencers of *Rebirth* or

Reason, or both.

Although *Digital Performer*'s Rewire implementation is pretty good, Propellerhead's promise of sample-accurate synchronisation between compatible applications is still a little way off — but there are ways round that.

When you install *Rebirth* (for example) a 'Rewire' library is put in your Extensions folder, along with an accompanying 'Rebirth Engine' file. DP is aware of these files and adds *Rebirth*'s audio outputs to its list of available inputs on each audio channel.

But in order to get DP working in tandem with *Rebirth* (and this applies equally to *Reason*), the two programs must be launched in a specific order. Boot up DP first, and create at least one new Aux track (not a Voice track) with one of *Rebirth*'s outputs as its input — then start *Rebirth*.

When the two programs are up and running, you should notice that *Rebirth*'s sequencer starts

playing when you hit Play on DP's transport, and vice versa. DP's Stop, Rewind, locate and Memory Cycle functions will control the equivalents in *Rebirth*, and you should be able to hear *Rebirth* audio via that new Aux in DP.

To record this audio, you need to route the output of the Aux via a buss (or buss pair) to a record-enabled audio Voice track, and start recording — it's as easy as that. However, on my own system, I find Rewire audio reaches DP 16ms before it should! To remedy this, I inserted DP's *Echo* MAS plug-in on the Aux, specified a 16ms delay with one of the four delay taps and set the Mix control to 100 percent to stop the 'early' signal passing through.

I've heard of DP users who suffer Rewire timing problems of more and less than 16ms, so the problem may be processor-dependent. To determine what it is for your own setup, try recording rhythmic audio from *Rebirth* or *Reason* into DP, and then examine the audio at high magnification in the Audio Graphic Editing window. You should see the audio's transient peaks coming ahead of the bar/beat grid. Try different time values with DP's *Echo* plug-in, rerecording audio after each change. When you find a delay setting which puts the audio transients exactly on the beat, that's the one to go with. You might also find you need to leave a couple of empty bars at the beginning of a DP sequence and the accompanying *Rebirth* song, to allow the two sequencers to

Freeware Utilities

There are two freeware applications I find myself using quite often alongside DP.

The first is *DP Interleaver*, available from www.unicornation.com/files, which takes the Split Mono files that DP produces on a 'Bounce to Disk', for example, and turns them into interleaved stereo files, as required by some CD-burning software (eg. *Toast*).

The other is *Soundhack*, a veritable 'Swiss army knife' audio-editing package available from www.soundhack.com. I used the Varispeed function on this software recently to recreate the sound of a tape deck's motors being turned off during playback (a similar effect is used briefly on Madonna's 'Music'). Whilst it doesn't integrate with DP, I still find *Soundhack* invaluable for all sorts of sound-mangling duties.

synchronise properly.

Interestingly, some software synths, such as *Unity DS1* and those from Koblo can also use Rewire for audio output, which might suit some users.

At present Rewire doesn't carry MIDI data, so to control a Rewire instrument (like, say, *Reason*'s sampler) from DP, you have to treat it as if it were a conventional software synth. For starters, you'll have to use FreeMIDI in OMS compatibility mode, because Propellerhead don't yet offer FreeMIDI support. You'll also have to set up inter-application communication busses in OMS and make the necessary settings in *Rebirth* or *Reason* — see last month's Performer Notes for details. ☺

DP-related Web Sites

- Interesting things are afoot at Plugsound's web site (www.plugsound.com). By the time you read this, their new range of sample-based software synths should be available, in MAS, RTAS, VST and Logic formats.
- If you can't afford *Rebirth* but want those squelchy TB303-style bass lines, download the free *Muon Tau Bassline* and *M-Drive* plug-ins from www.muon-software.com. These work really well in DP under Cycling 74's *Pluggo*, and their controls are fully automatable.
- Finally, there are more *Digital Performer* links from my own new, no-expenses-spared web site: www.bigwood-digital.com. Drop by and spin my counter!



Muon's software TB303 emulator, *Muon Tau Bassline*.

This month's crop of *Cubase* tips covers the multitude of options available when exporting audio, plus ways of incorporating external MIDI instruments and effects into your mix.

Many musicians are still unsure of the best way to create a final stereo file from their *Cubase* VST multitrack songs, whether for burning onto audio CD-R, or coding into RealAudio or MP3 formats for placing on the Internet. With the latest version 5.0 it's possible to do all these things from within *Cubase* using the Export Audio function. When you use this, instead of *Cubase* creating a final mono or stereo mix in real time, as it normally does when you click on the Play button, it saves exactly the same data as a file onto your hard drive.

Once you have selected the most appropriate settings for your Export file, you simply choose a suitable folder and filename, and then click on the 'Create File' button. The export progresses at a rate determined by the processing power of your computer — with a powerful CPU it will happen much faster than in real time, while older computers may perform slower than real time.

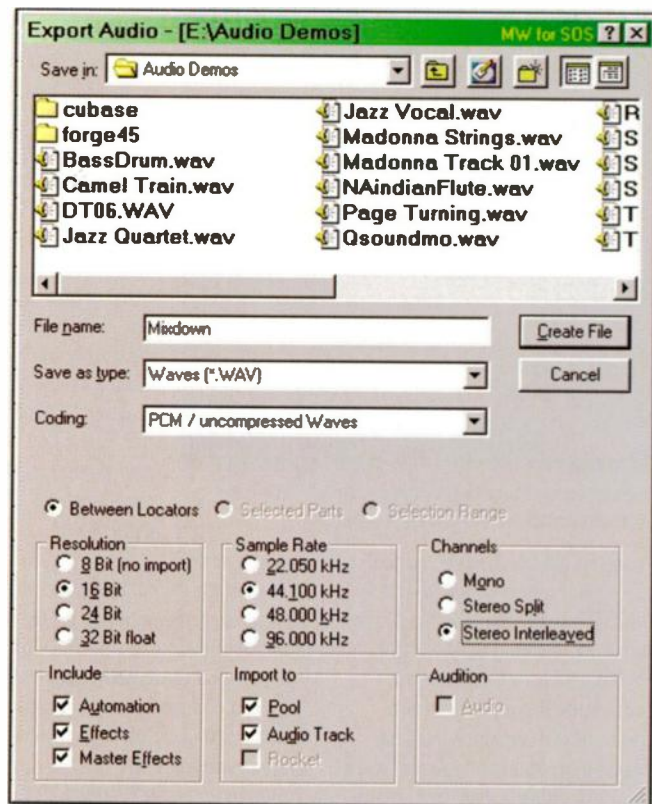
Finding A Resolution

The Export Audio function in latest versions of *Cubase* has many options. You can, for

instance, optionally include any real-time plug-in Effects and Master Effects you have added to your song, as most people will want to do. You can also include Automation, as long as the Auto Read button has been activated in the VST Channel Mixer. 'Import To' lets you automatically import the final file into the Audio Pool, or straight into a fresh Audio Track, allowing you to audition the final result immediately.

The option that seems to cause most confusion is Resolution. All versions of *Cubase* 5.0 now support 24-bit recording, while *Cubase* VST/32 also supports two additional Record Modes, 32-bit and TrueTape 32-bit (you can find an explanation of these in my review of *Cubase* 5.0 in *SOS* September 2000). Even if all of your individual tracks are all recorded at 16-bit resolution, the combined mix and the bulk of your plug-in effects will still be processed using the internal 32-bit float format, so there are always 32 bits of data resolution available for export if required.

The final resolution for the Export Audio function depends on which of the four different 'Save As' types of file you



The Export Audio window may look simple, but there are lots of options to consider. These are the most suitable settings if you want to export a file for CD burning.

choose: Waves, AIFF, RealAudio, or MPEG Layer 3. The simplest choice is RealAudio, since once you choose this most of the additional options are greyed out, and resolution is automatically determined by your choice in the Coding box. My PC displayed 17 options here, ranging from '6.5Kbps Voice' through to '32Kbps Music Stereo'. There weren't any RealMedia G2 options available, which is a shame, since these sound considerably better.

If you instead choose MP3 coding, the Resolution can either be 16-bit or 24-bit (with 16-bit being the usual option), while the available bit-rate options will depend on which sample rate you choose for your export file. With a choice of 22.05kHz the maximum MP3 bit-rate is 80kbit/s, while for sample rates of 44.1 or 48kHz the bit-rate options extend to 320kbit/s. With MP3 you can also select either Mono or Stereo Interleaved output (this choice is made automatically depending on the coding option with RealAudio). Normally, you'll opt

for a 44.1kHz sample rate and the Stereo Interleaved option, to choose the almost universally used MP3 bit-rate setting of '128kBits/s; 44.100kHz; Stereo'.

To Dither Or Not To Dither?

If you are saving in either AIFF or uncompressed WAV formats you'll get the full range of options, and here your choice of resolution will be determined by what you are going to do with the exported file. If you have already added what global effects you need using the VST Master Effects, you can export at your desired final resolution.

If you're exporting at a final resolution lower than 32-bit, it's important to correctly dither the file to make the most of its original resolution, whether the final format is CD audio, RealAudio, or MP3. Dithering is activated by clicking on the appropriate button in the VST Master Mixer, and then choosing a suitable Type for dither, and in the case of *Cubase* VST and *Score*, suitable noise-shaping and dither bits settings as well. ▶

Including MIDI In The Mixdown

Although VST Instruments are driven by MIDI data, their output appears as audio, and will therefore be automatically included in the final Export file. Stand-alone soft synths will probably have a 'Capture to File' option allowing you to create a file that can subsequently be Imported into your Audio Pool as an audio track. However, any external MIDI synths that you use will also need their contribution converting to audio tracks before they can be incorporated into the final mix.

To do this, just route the synth outputs to your soundcard input and switch to Record mode — as the MIDI tracks play back, the synth outputs will get recorded as an audio file in perfect sync, either mono or stereo as required. If you want to add audio plug-in effects to certain MIDI synth tracks, simply record these into your Song as separate audio tracks by muting all but the required MIDI track in *Cubase* before starting to record.

Martin Walker

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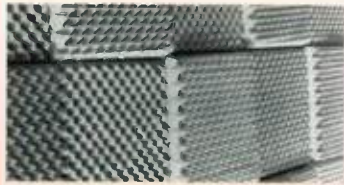
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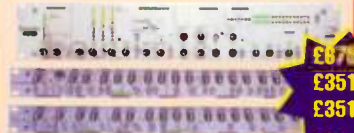
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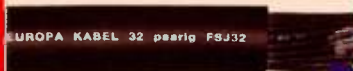
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► All *Cubase* VST 5.0 versions other than *Cubase* VST/32 give you the option of dithering down to 8, 16, or 24 bits from the internal 32-bit float format, while *Cubase* VST/32 incorporates the Apogee UV22 algorithm, which is optimised for 16-bit only.

However, if you're going to subsequently load the exported file into a stereo mastering application for further editing then you should leave the mixdown file in the highest bit resolution available — 24-bit, or in the case of VST/32, 32-bit float, as long as your mastering application supports this — and add dither only after all the editing and mastering processing has been carried out.

Exporting Sections

Having explored the main Export options, it's time to decide what parts of your song are to be included. The default is the 'Between Locators' mode, which means that what you hear when you play back the song is what gets exported. The only exceptions are any parts or tracks that are muted. If you want to export alternative mixes, you could create several different arrangements of certain tracks, and then mute them alternately. If you gather the tracks required for each



alternate version of the mix into separate Folder tracks, it will make the process easier.

If you want to create extended or shortened versions of the mix, another approach is to zoom right out until you can see the entire song, select it all, and then copy it to several locations beyond the end of the original song. It only takes a few seconds, but allows you to perfect several completely different mixes one after the other, and then export them individually by moving the locators. You'll probably find this safer than creating several Arrange pages, since it's impossible for the mixes to get separated or confused, and of course you can use the Marker

track to label them up.

The 'Selection Range' mode is very similar to 'Between Locators', except that it's designed for use with the Selection Range tool so that you can grab any or all of your song for export without bothering to set the locators. Once again, muted parts or tracks don't get included, but this mode also gives you the option of excluding tracks even if they're not muted — just draw a box around the ones you want to export.

As soon as you select any song parts, the third 'Selected Parts' mode will no longer be greyed out in the Export Audio window, and you can use this to create a separate file for each selected part. If you also tick the Import to Pool and Audio Track options, this mode is an ideal way to 'print' an audio track complete with its effects and automation once you're happy with it. You can then mute the original and use the released processing power to add more effects to other tracks. The beauty of this technique is that you still have the original tracks available for further tweaking if you later change your mind about them.

Martin Walker SOS

If you're exporting in a format containing 16 bits or fewer, you'll need to enable suitable dithering settings in the channel mixer.

Plug-In Delay Compensation

Loose MIDI timing is a common complaint with all Mac and PC-based sequencers, but many new *Cubase* users find that the timing of the audio tracks in their mixes also becomes sloppier and sloppier as they add more VST Insert effects to different channels and groups. The bundled dynamics in current versions of *Cubase* are a particularly bad culprit — simply compressing a snare drum can make it noticeably late with respect to the rest of the tracks. This phenomenon occurs because audio effect processes take time to compute, meaning that processed tracks arrive at *Cubase*'s audio output slightly later than audio which is not passing through any insert effects. Fortunately, there is a simple way to solve the problem. In the Audio Setup page (accessible via the Options menu) is a tick box labelled 'Plug-In Delay Compensation'. Ticking this causes the program to delay all the unprocessed audio by an appropriate amount, ensuring that processed and unprocessed audio remain in sync.

Sam Inglis

Automating Rackmount Effects

If you use rackmount effects it's easy to forget which patches you used on a particular song, making it difficult to recreate a mix at a later date. However, most modern rackmount effect units respond to MIDI program change commands and have a huge range of preset memories. I save the appropriate program change messages for all my rackmount effect units on a separate track at the start of my VST songs, so that they get selected automatically whenever

I start playback.

There are several ways to do this, but I find the easiest is simply to draw the desired value into the Controller Display of the Key Editor using the pencil tool. Make sure you leave a short pause after changing the patch to let it 'settle' before playing any notes, or you may get strange noises in the changeover. However, if you're careful you can even automate your external effect settings during the song.

Martin Walker

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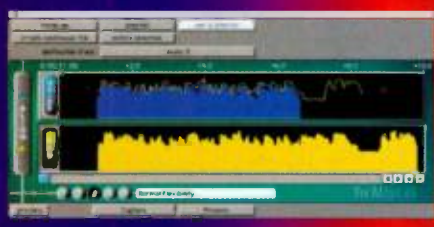
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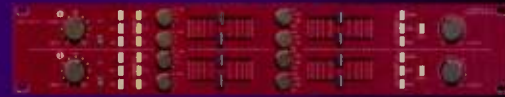
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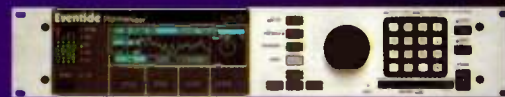
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This month we show you, step by step, how to correct the timing of multitrack drum recordings using the powerful editing capabilities of *Logic*, as well as showing you how to make the most of your audio storage space.

There are only a very few times when technology has caused my jaw figuratively to hit the floor, but Emagic's *Logic* can take responsibility for one of them. I was in the studio with a band whose drummer couldn't handle the huge bass drum that the producer had insisted he use. The poor drummer was having real trouble playing consistently, and the effort of attempting to do so meant that we could only get two or three useful takes out of him per day.

The engineer had brought along a Mac G3 running *Logic Audio Platinum*, so he and I attempted to compile a single finished take from those that we had, and this worked fine for a while. However, there came a point at which we realised that none of the takes we had to work with were well enough in time. At this point we were clutching at straws a bit, and started looking for a way in which to improve the drummer's timing through *Logic's* editing facilities. After much trial and error, we hit upon a comparatively quick way of quantising the audio, across all

11 tracks of drums, with breath-taking success. And this is how we did it...

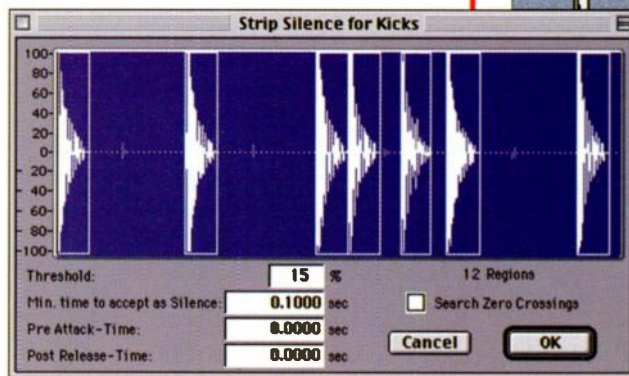
Silence Is Golden

For the sake of simplicity here, I'll use as an example the multitrack drum recording shown in Figure 1, which comprises a stereo overhead track and a mono track each for kick and snare. However, there is nothing stopping this technique being applied equally easily to many more tracks of drums — in fact, the more individual elements of the kit which have their own tracks, the better the results will often be.

The first step in the process is to make separate audio regions for each drum hit on each of the individual tracks. Doing this by hand would be an immensely tedious job, with possibly hundreds of individual drum hits in a song. However, *Logic* provides a way to automate the process, in the guise of the Strip Silence facility.

To isolate all the kick drums in my Kicks tracks, I simply highlighted the recorded kicks within the Audio window and selected Strip Silence from the Options menu. This brought up the Strip Silence window, which I set up as shown in Figure 2. The only value you're likely to need to alter when working with your own drum tracks will be Threshold, which should be set as low as possible, yet without causing regions to be created by spill on the track. You could also experiment with the Minimum Time To Accept As Silence, if fast individual hits aren't being picked out.

Once you have set the controls as best you can, click the OK button and then click the Replace button in the subsequent dialogue box — this



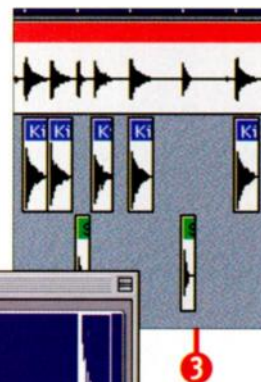
will substitute the slices for the original track. If there are any series of hits that have not been successfully separated, then Strip Silence from each of these in turn until everything has been

1 separated. Then repeat this process for the remaining individual tracks, in this case the Snare track. The result of these Strip Silence processes is shown in Figure 3.

Chopping & Changing

For the next stage in the process, you'll need to access two Key Commands. You'll need to open the Key Commands window which is available from the Settings submenu of the main Options menu. The Key Commands you need to use are Goto Selection and Split Objects By Song Position. Search for each of these by typing keywords into the Find field. When you find each one, first click the Learn Key button and then press the key to which you want to assign the Key Command. Bear in mind that you're going to need to access the commands repeatedly while simultaneously using the mouse, so it makes sense to assign them to single adjacent keys for ease of use — I used the 'Z' and 'X' keys, for example, as you can see in Figure 4.

Before you put these Key



Commands to use, highlight all of the individual tracks which have been subject to the Strip Silence procedure and select Tie Objects By Length Change — this fills in the gaps in each track ▶



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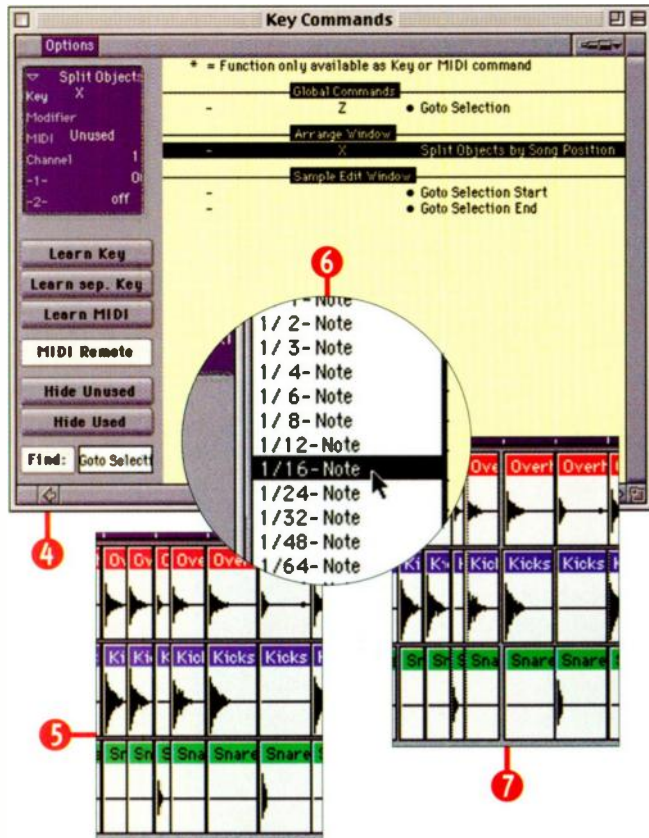
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► again now that the start of each hit has been found. If you've been careful not to move anything out of alignment, your tracks should now be sounding exactly as they were when initially recorded.

Now you use those Key Commands: highlight the first separated hit and Goto Selection. Then highlight all the drum tracks and Split Objects By Song Position. Work through each drum hit in turn in this manner, until you get something looking like Figure 5, where all the drum tracks are now split wherever there is a drum hit. However, the drum tracks should still play back unchanged. At this point I'd particularly advise saving a backup copy of the song, because the moment has now come to quantise the timing.

Highlight all the regions that have been created and open the Event List window. Click and hold on the Q button at the bottom left-hand side of the window, and then select the most suitable quantisation grid or groove template for your needs. In Figure 6 you can see

me selecting a 1/16-note quantisation grid for my example, and this shifts all the regions accordingly, as shown in Figure 7. Because the split points are identical for each track, the audio remains in sync, even though the whole performance has now been quantised. If you play back the audio now, the timing ought to be much more accurate, though there will at the moment be gaps in the playback because of the shifting of the audio regions.

Filling In The Blanks

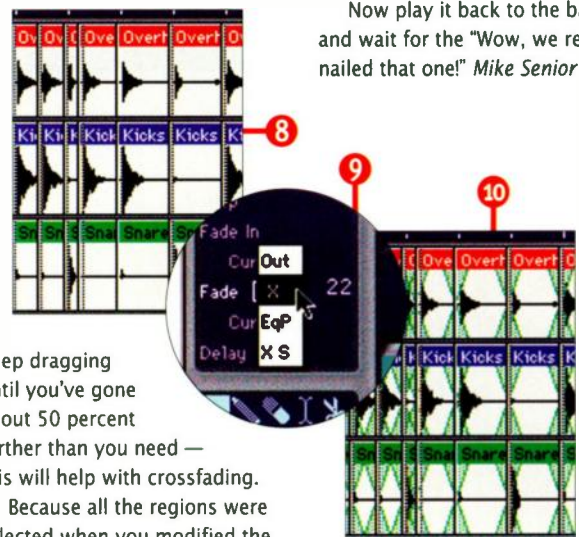
The final task is to cover the gaps which have been created in the performance by the timing changes. The easiest way to do this is to extend the start of each region back over the gap, and then to crossfade at the region boundaries. Fortunately, you can do both of these operations globally to save time.

Highlight all the individual regions and then zoom your Arrange window view in as far as you can on the largest gap you can find between regions. Click and hold on the bottom left corner of the object after the gap. Then hold down your Mac's Ctrl and Shift keys for fine control (Alt and Shift on the PC) and drag the beginning of the region back over the gap. However, don't stop when you've only just covered the gap.

region's start point, you ought now to have overlapped all the regions and therefore covered all the gaps, as shown in Figure 8. Once this has been achieved, all that remains is to crossfade between the hits. With all regions still selected, click and hold on the 'Out' of Fade Out in the Parameters box, and then select the 'X' option as shown in Figure 9. Next double-click to the right of this and enter a fade length value of around 20. The final tracks should look similar to those in Figure 10.

Now you should be able to play the drum tracks back with their new tighter timing. If there are any transitions or crossfades which sound a little unnatural then highlight the offending individual hits across all the drum tracks and tweak region start points and crossfade times for a more natural-sounding result.

Now play it back to the band and wait for the "Wow, we really nailed that one!" *Mike Senior* **ES**



Keep dragging until you've gone about 50 percent further than you need — this will help with crossfading.

Because all the regions were selected when you modified the

Conserving Your Storage Space

While working on a track within Logic it's easy to amass much more audio within the Audio window than you actually need. This can mean that you end up wasting valuable hard disk space, especially when backing up your projects. Fortunately, the Audio window provides a couple of functions which get around this potential problem.

The first of these is the Select Unused option available from the Audio window's Edit menu. This highlights any audio files and regions which are not present anywhere in the Arrange window — so if you want

to make sure that unused alternate takes remain unhighlighted then make sure they are safely tucked away in a muted folder somewhere. Once the unused files are selected, press the backspace key to banish them from the window. Note that this doesn't actually erase them from disk — it merely removes any reference to them from the current song, thereby tidying up the Audio window.

Once this has been done, the Optimise Files function can be used to reclaim storage space. If all the remaining audio files are selected and this option is selected from the

Audio window's Audio File menu, then any sections of audio file that aren't actually being used as regions in the Arrange window are removed from your hard disk, though leaving a second or so margin at the beginning and end of each section to allow for changes to crossfades and so on. Bear in mind, though, that this process is destructive, so if you're worried about burning bridges then either optimise individual files separately, or place full-length regions of selected files into a muted Arrange window folder so that their files aren't optimised. *Paul White*

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With a new computer, pumped-up RAM, and a copy of the release version of Mac OS X, **Paul Wiffen** is all set to take you through the first stages of using the new operating system for music — though the only music going on so far is solo organ!

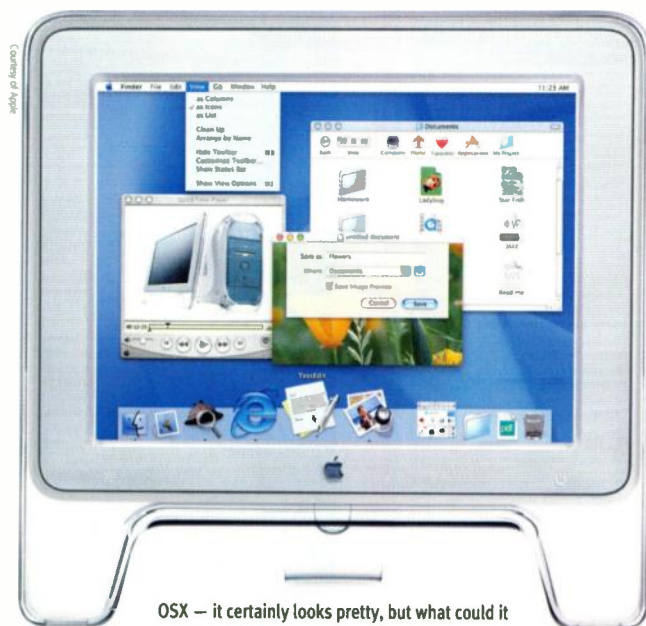
I'm happy to report that this month's Apple Notes is being written on an iBook. It's a Graphite 466 with both USB and FireWire, which I got my father for Christmas (but he didn't like as much as my old Wall Street 300MHz PowerBook, so we swapped), and both OS X and OS 9.1 are living in reasonable harmony on it, within the same partition! After my initial experience with the OS X Public Beta, which caused my computer to appear to lose nine months worth of audio recordings (see the March Apple Notes), I was loath to do any more playing around with that version and waited until Apple were able to give me the full release version. This I obtained at an excellent OS X launch party at the end of March in Zurich (Switzerland, where I'm spending a lot of time lately, has the highest per capita Mac ownership of any country in the world, so they really pushed the boat out). I was pretty glad I hadn't bothered with the Public Beta in the end, as upgrading from it to full release version looks fairly complicated, according to the PDF file that comes on the CD. It's much simpler to just upgrade from 9.1.

The Memory Effect

After letting the CD-ROMs sit there on the shelf for a week looking at me, I finally made time to go and get the necessary memory upgrade for the iBook, as OS X has a 128Mb minimum requirement. I can't believe how cheap memory upgrades for PowerBooks have become. When I was told that it would only cost me 150 Swiss Francs (about sixty quid) for 128Mb, I stopped prevaricating about whether to go

for 64 or 128! I can remember buying 128Mb of RAM for the Wall Street PowerBook at MacWorld in San Francisco two years ago, and running from booth to booth bargaining the price down to \$270 (about £180) including fitting, about half of the UK cost at the time. So go mad, people: buy yourself some more memory and get the most out of your machine.

Anyway, after a bit of a hiatus when the first chip they put into the machine prevented it from booting up (the Swiss salesperson blamed mass production, which I guess is what has brought memory prices down), they found a second chip, which worked, and I was on my way. Incidentally, it is always worth getting the dealer who supplies your memory to fit it, as theoretically it still voids your warranty if anyone but an Apple Authorised dealer opens up your computer. Also, if a dealer fits the memory for you, they can see for themselves if the memory chip is faulty, as in this case.



OS X — it certainly looks pretty, but what could it do to your music software?

OS 9.1 & PCI Audio Problems

Ever since the Frankfurt Musikmesse, I have been hearing horror stories (from Steinberg themselves, amongst others) about the inability of some PCI products to run under OS 9.1 — or, rather, their ability to prevent 9.1 from running. Apparently, sometimes when a computer with particular PCI hardware installed is started after an upgrade to 9.1, all that appears is a white screen with no mouse pointer, and the computer refuses to go any further. The two

cards mentioned most in this context are the RME Hammerfall and the MOTU 2408, and as a result both Steinberg and MOTU are not recommending using 9.1 — although apparently some musicians are able to use these products OK. I would appreciate any further info from the SOS readership on this subject, because I'm considering a series on choosing the right PCI audio card, and clearly this type of problem could have an effect on such a choice.

Having the memory fitted cost me an extra tenner, but it saved me a lot of time and trouble.

Calling in at Swisssonic on the way home to pick up the USB dongle for Emagic's *Logic* sequencer, which I had already installed on the computer, but couldn't run before because of lack of memory, one of the guys reminded me to take a *Logic* CD to get the necessary USB dongle driver across onto the iBook. While I was looking for this, I heard that a 38Mb Maxtor FireWire drive had just arrived, and got the opportunity to take it home for the weekend, to check it out for audio and video.

Laden with goodies, I returned to my apartment in a state of high anticipation. Was this the Mac system of my dreams, or the ticket to an endless nightmare? I decided to play things safe.

I would put OS X onto the FireWire drive, and that way the iBook could always be returned to its former state if everything started playing up.

I 'hot-plugged' the FireWire drive, which had already been formatted, and it appeared on the desktop a few seconds later (which I still find amazing, after all that mucking about with connecting SCSI drives and rebooting half a dozen times). Then I plugged my DV camera into the computer's other 1394 connector. I just wanted to check that *iMovie 2* could 'see' the camera (it could), and that it would record digital video to the drive OK (it did, without even breathing hard!). At last, enough space to edit the DVD I am working on!

No Going Back

Now I could procrastinate no longer. Pausing only to back up the internal hard disk to the FireWire drive (637.6Mb in under two minutes — isn't FireWire wonderful?), I popped the OS X CD in the drive and opened the 'Read before you install' PDF on the CD (always worth doing, people!). The first thing that caught my eye was the following statement: "Installing Mac OS X on a FireWire or USB disk is not supported." There was nothing for it but to put OS X on the internal drive of the iBook. First, I checked that the internal drive was HFS+ formatted, as it must be (hence the reason why the Public Beta had wanted to reformat the drive when I tried to run it before; the documentation with the full

version of OSX now warns you of this). Satisfied that it was, I double-clicked the 'Install OSX' icon. After agreeing to all the usual licence stuff without reading it (what are you going to do, disagree and not install the software?), I sat there with a sense of foreboding, watching as Megabytes of new OS were copied onto the main drive. At least I had backed up everything to the FireWire drive first! However, you can't watch a progress bar for long without suffering brain-rot, so when the estimated time came up as over half an hour, I busied myself with other things. I was alerted by the familiar boot sound from the other room that the installation was complete, and, when I came back in, was able to go through the process of creating my user account. That's right, folks — you can't just use a computer these days: you have to have an account, with a password and everything! After I had done this and told the machine half a dozen times that I didn't want to go onto the Internet right now to register with Apple and set up my email, I was into Aqua, Apple's new user interface!

What Runs (Or, What Doesn't)

As I didn't have any applications specifically designed to run directly under OSX (although I hope to get the fabulous *Melodyne* pitch- and time-manipulation software from Celemony in time for next month),

I decided to jump in at the deep end and see if *Cubase VST 5.0* would run under the OS9.1 shell inside OSX. I double-clicked on the *Cubase* icon and, sure enough, not only did a much bigger *Cubase* icon start bouncing up and down at the bottom of the screen but OSX opened up a window and started to run 9.1 inside it. This was all very exciting, but sadly once *Cubase* started to open, it quit very suddenly (although quite cleanly). Obviously, this 9.1 shell inside OSX is not exactly the same as 9.1, but I suspect things will improve with the next version.

The next thing to try was opening *Logic*. Almost straight away an error message appeared ("Error Code -221 was returned by the Mac AV Driver"), but when I clicked 'OK', to my amazement the program opened up. When I went to the Audio Playback mixer, all the channels were blank (and therefore unavailable), but MIDI seemed to be running OK. I say "seemed to be" because *Logic* uses the USB port for its dongle, so I couldn't plug a MIDI interface in without a USB hub.

After this less than thrilling start, imagine my surprise when the Native Instruments *B4* organ instrument opened up without any error message and I could use the QWERTY keyboard to play it. At last, I could hear music under OSX! Of course, it was really running under the shell of 9.1 and not under OSX, but this was still a good sign.

I found non-music software

Plug-in Piano

This month's hot tip is for those who, like me, remember the Yamaha EMT10 with great affection (I think it was one of the first pieces of equipment I ever reviewed for *Sound On Sound*). It's the freeware *MDA Piano VST Instrument*, by Paul Kellett, whose previous VST plug-ins, also on this site, include *DrumSynth*, for those analogue drum sounds of the '80s, and the *WaveTools* real-time spectrum analyser. (Sadly, both of the latter are only for PC.) Paul has excelled himself with *MDA Piano*, whose sound is very reminiscent of the classic EMT10, and has not ignored us Macheads for once, as it is available for both Mac and PC. *MDA Piano* offers Plain, Compressed, Dance, Concert, Dark and School Piano presets, amongst others, and you can edit Decay,



The freeware *MDA Piano* plug-in is a must for fans of '80s-style digital pianos.

Release, Stereo Width, Velocity Sensitivity, Muffle and Hardness parameters. Polyphony is up to 32 notes (depending on how much CPU usage you want to set), and the instrument seems fairly undemanding on my 466MHz G3 processor. <http://mda-vst.com>

more compatible, and the supplied versions of *iMovie 2*, *Outlook Express* and *Internet Explorer* all run fine under OSX. Indeed, some of this column was written in the OS9.1 shell using *Word 98*. However, you would expect this, as these programs will be operating in a more standard fashion than music applications.

My problems really began when I selected OS9.1 as the Startup System (to return to using *Cubase* and *Logic* normally) and rebooted. The computer repeatedly hung after all the Extensions and Desktop had loaded, but before the Control

Strip appeared.

The only way I found to reliably get around this was to disable any extensions that showed as having been installed by *Classic Compatibility*, the application that changes 9.1 extensions so that they run under OSX. These extensions then need to be re-enabled if you return to OSX. However, I don't see me running OSX that often, if I have to go through all this palaver to return to using *Cubase* and *Logic* under 9.1 — especially if all I can play under OSX is *B4* from the QWERTY keyboard on its lonesome! ☹

G4 Upgrades: A Reader Writes

I am grateful to David Bernstein, who writes, "Here's one for your files, in case you do a piece on Mac upgrades. I recently upgraded my 350MHz Yosemite G3 to a 500MHz G4 using the XLR8 upgrade kit (purchased from www.macgurus.com). There were a couple of hitches in the upgrade, but in the end it worked and the machine has been stable since, for a week now. *Logic* works fine, too! The difference in speed is quite noticeable, despite the mere 150MHz clock rate increase."

I have actually been trying to do a piece on processor upgrades for several months now, but despite repeated requests no-one has actually managed to get me evaluation units of any of the cards in question, so I am delighted to be able to pass on David's positive experience. I spoke to AMMicro about the PowerLogix cards they distribute and it was suggested that I look at their

G3/500 card, as well as the G4/500 (one of their customers reports that the G4 one doesn't work with *Cubase*). However, so far nothing has showed up. A friend tells me that he is running a G4/500 card from Sonnet Technologies (also with *Logic* on a Yosemite G3) and getting good results, but email requests for an evaluation unit from their UK distributor Computers Unlimited have so far met with a deafening silence.

I must pick David up on one thing: when he mentions the "mere 150MHz increase in clock rate", what he is actually noticing is the difference in power between the G3 and G4 chips. In addition to having the extra clock speed, the G4 can carry out far more instructions per clock cycle, especially if the software it's running has been optimised for the AltiVec technology it uses. (The most recent versions of *Logic* and *Cubase*, as well as soft synths

from Bitheadz and Native, have been optimised in this way.) I have heard that in some cases, particularly during DSP processing, this can make the G4 up to 11 times faster than the G3 when running at the same clock rate. So, rather than a 50 percent increase in speed, David is experiencing possibly up to a 15-fold increase in certain AltiVec-related processing, and maybe a five-fold improvement in more routine operation. No wonder he's noticing a difference!

We will continue to badger the distributors of upgrade cards, in the hope that they'll supply us with evaluation units. Maybe some calls from SOS readers to them, asking if they are music-software-safe might prod them in the right direction! In the meantime, if anyone has any similar positive (or indeed negative) results to report, I would be happy to pass them on to fellow readers.

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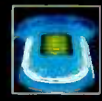
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Martin Walker has had more than his fair share of computer hassles recently, including exploding monitors, audio glitches, and the mysterious death of *Word*...

This past month has been the month from hell for me, with one computer setback after another causing totally unexpected problems and delays. Although some of these problems still remain unresolved, the approach I took to solving them may help others presented with similar situations — so here's what happened.

Vision Off

Sod's Law dictates that as soon as you buy a new piece of gear (in my case, it was the excellent Echo Mia soundcard), something else will break down to dampen your enthusiasm. Hearing what I initially thought were the sounds of my young dog chewing a Biro in the studio, I raced in to discover my four-year-old Iiyama 17-inch monitor emitting alarming cracks and sparks. Unlike most other PC equipment, there are no replaceable parts in the average monitor, so it was off to the web to research a suitable replacement.

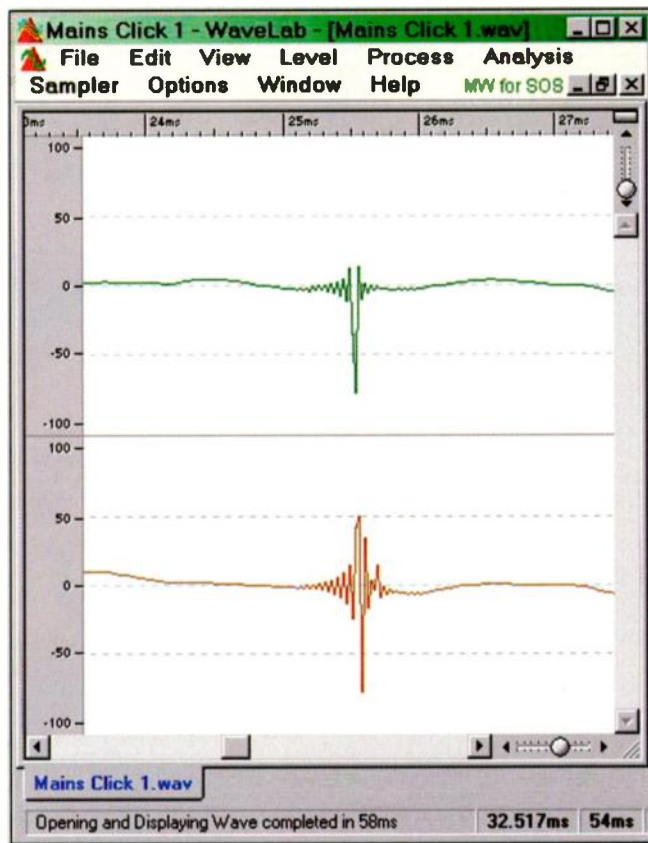
Now, this would be easy for all those of you who have several

PCs available — you'd simply plug in another monitor instead of the failed one, and then log onto the Internet. Unfortunately, the only other monitor I had available was a 10-year-old, 14-inch, pre-plug-and-play model, and plugging this into my PC resulted in the expected picture roll, as it attempted to produce the 1024x768-pixel resolution and high refresh rate of its predecessor. I had to make it work, so I set about figuring out what to do. If you should ever find yourself in a similar position, needing to connect an old monitor in place of a modern one, you may find it useful to know the steps I took.

Booting into Safe Mode provided a nice stable image (admittedly at 640 x 480 resolution), but no opportunity to change video settings. The answer was to enter the Monitor properties page inside System, and then click on 'Update Driver'. Then, using the Update Device Driver Wizard, I chose 'Display a list of all the drivers in a specific location', and then 'Show all hardware'. After choosing the topmost ('Standard monitor types') entry, I selected the 'Standard VGA 640x480 @ 75Hz' option (closest to that of Safe Mode), rebooted, and was then able to limp online to order a new monitor. I chose a NEC MultiSyncFE700+ that was recently praised for its price-to-quality ratio in a *PC Pro* roundup. I'm very pleased with its performance, particularly at the bargain price of just £169.99 plus VAT, since the picture is significantly sharper and flatter than its predecessor.

Glitch Central

My next problem concerned audio — a new batch of audio clicks. Unlike my previous waveform



Here you can see what a mains glitch may look like — very different to the waveform glitches caused by internal computer or software faults.

glitch problems, which were caused by conflicts between *Cubase* and *GigaStudio* (discussed in PC Notes March 2001), this time the glitches were definitely arriving via the mains supply. When a couple of nasty ones occurred during a recording, I had the evidence in a WAV file, and by using the *Wavelab* glitches function I could home in on them quite quickly for closer study.

Waveform glitches caused by computer software or hardware normally exhibit a missing or repeated section of waveform, with a vertical join like a seismic fault line. As you can see from the screenshot, a mains glitch tends to look very different — mine showed a rapid (but not instantaneous) rise time, but with the characteristic multiple 'bounce' often associated with switch-contact problems. Switch contacts don't open and close cleanly, but bounce several times as they change state, and this bounce will steadily get worse and worse as the contacts start to wear. Then, as the circuit is made

or broken, the resulting tiny sparks (arcing) not only put a click onto the mains but also generate RF that can be picked up by other audio and mains leads in the vicinity acting as aerials. (By the way, the arcing mentioned above is why you should never operate a light switch if you suspect a gas leak.)

The most common culprit for contact clicks is apparently the central-heating thermostat, but fridges, freezers, lights — in fact, any switch — can start to cause the problem. It's difficult to completely remove them, except at source, and the cure is to fit a switch-contact suppressor directly across the offending switch contacts. This is a capacitor/resistor network that is specifically designed to be used at mains voltages. You can buy them from many suppliers. For instance, in the UK, Russ Andrews Accessories (telephone 0800 373467) have them in their catalogue at £3.95 each.

Unfortunately I haven't tracked down *my* culprit — it wasn't the

Tiny Tips

Here's a tip you may not have come across before, but which can certainly save time when choosing files to open in an application, or simply viewing them in Microsoft's Explorer. When you choose to View as Details, you'll see the data arranged in multiple columns, but if the column is too narrow to view the whole filename it will get truncated. Now, although you can change column width by dragging the junction between columns from side to side with your mouse, if you double-click on it the column width will be automatically resized to fit the longest entry in the list.

GREAT MINDS THINK ALIKE.



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Few companies have the privilege of setting the standard of excellence within their field.

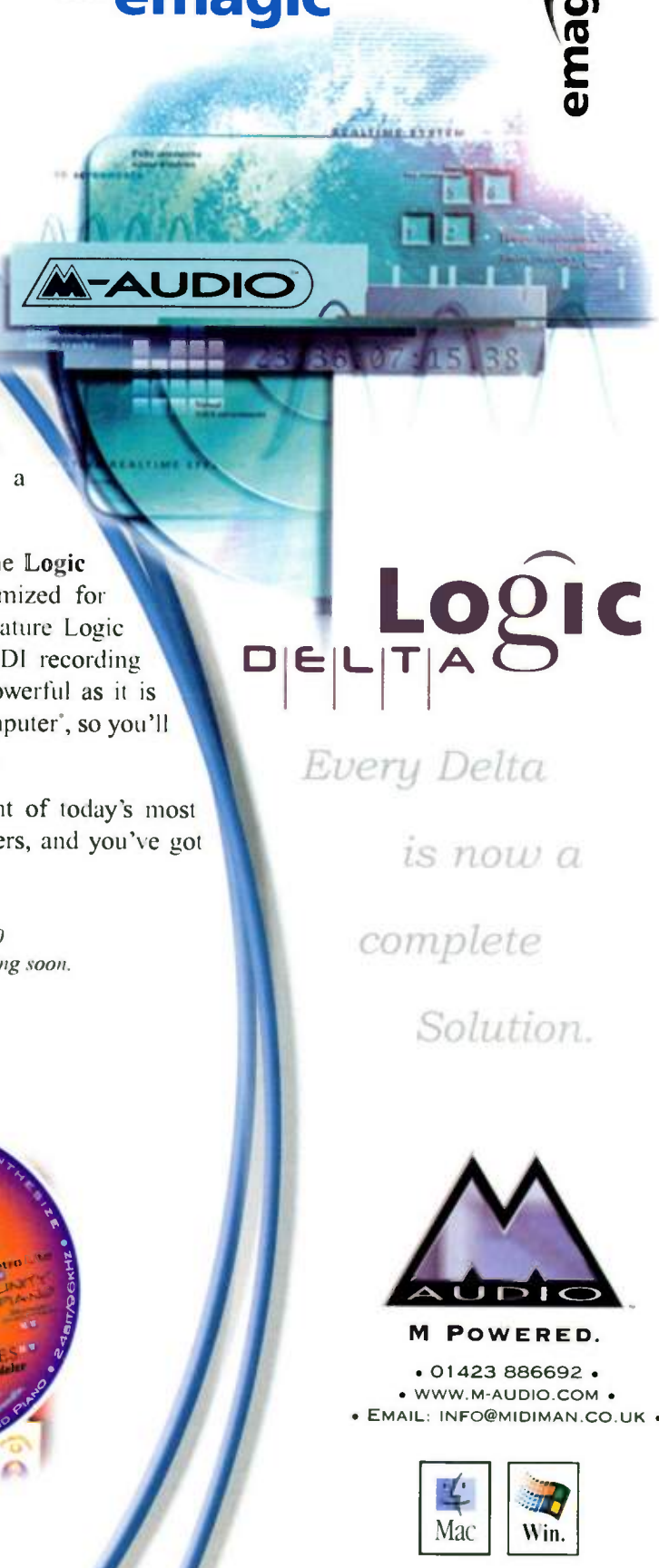
M Audio's Delta soundcards have earned their place at the top of the class with superb engineering and performance. Critics have called them "stunning" with sound quality "none can beat."¹

Emagic's Logic programs are the essence of innovation and creativity, and are celebrated the world over as a benchmark of software design.

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Add to the mix Maximum Audio Tools, an assortment of today's most popular programs by Bitheadz, Sonic Foundry and others, and you've got the right answer to your next musical question.

¹-Computer Music, January 2001; ² Sound on Sound, January 2000
* - Dependent upon CPU resources. Multicard drivers for Mac coming soon.



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► central-heating thermostat causing the clicks (they still happened with the heating completely turned off), and they didn't seem to be caused by the fridge or freezer either. In fact, I'm still flummoxed, since sometimes the clicks disappear for days, while during one particular mastering session they happened so regularly, every 100 seconds or so, that I could predict exactly when the next one would get recorded. If this scenario sounds familiar to you, do let me know!

Lost For Word

The next calamity occurred out of the blue when Microsoft *Word* refused to boot up, for the first time since I installed it nearly three years ago, reporting an 'Invalid Page Fault' in the module MS097.DLL. There were a few 'issues' related to this module in the fault-finding section of Microsoft's web site, but none that matched my problem. So the first thing I did was to run the Repair option in Word's Setup.exe file, which re-installs the original files over the top of those on your

hard drive, to repair corrupted ones, but it didn't cure my problem.

So I spent the next couple of hours making sure I had backups of everything important on my hard drive, and then used *Cleansweep* to reverse the install process and remove every change made by *Word* on my PC. Fortunately, my data is stored on a separate hard drive, but I still backed this up too, for safety's sake. Once I had *Word* eradicated from my PC, I re-booted and installed it from scratch. If you find yourself in a similar situation, this is often the only course of action, and should solve the majority of problems, but in my case it made no difference — the new installation gave exactly the same error. Apparently, this can sometimes be caused by an associated INI file, or even a rogue printer driver.

As a reviewer, I need a word processor running on the same PC as my audio software. But perhaps you'll realise why this isn't generally recommended for musicians when I say that with

the minimal choices in my Microsoft *Word* installation the program only occupied about 30Mb of hard disk space, but the *Cleansweep* log indicated that 2458 items had been installed, the majority being Registry entries. Frightening!

The next step for most people would be either to restore the entire hard drive contents from their newest image file, if you're using a utility like Norton's *Ghost* or PowerQuest's *Drive Image*, or, if not, to reformat the hard drive and install everything from scratch. Sadly, since my software changes on an almost daily basis, I don't use such a utility (although I suspect I may in future!). Also, I have absolutely loads of software installed on my PC, for comparative review purposes, that was all still running perfectly well, and had already lost so much time that I needed a fast alternative. So, on the recommendation of a friend, I installed Corel's *Word Perfect*. I found this product aptly named — for me it was the perfect solution, especially as the installation seemed extremely well

behaved, placing few files outside its own folder, and comparatively little in the Registry.

Long Term

As soon as I can, I intend to re-format my boot drive and start afresh. Some musicians do this quite regularly, but it shouldn't be necessary in most cases; despite the heavy throughput of review software and hardware on my PC, this will be the first time I've had to re-format since I bought it in August 1998.

I could install removable drive bays, as described in last month's PC Musician feature — one for my music and the other for general use — but since I spend so much time writing about the software I'm running, I personally need everything on one partition. Also, both my current drives are now in SilentDrive sleeves, so I'd lose the low-noise advantage if I moved to bays. However, I might take advantage of the opportunity to invest in a new larger boot drive, and even install Windows ME.

One thing's for certain, though — I won't be reinstalling *Word*. ☹

PC Snippets

• Emagic have recently released version 4.7 of their *Logic MIDI + Audio* sequencer (a free update to existing 4.x users), and are particularly proud of its new 'Unified Classic and Virtual MIDI Engine'. This standardises the way in which the program deals with external and software synths, so that loop functions and the many facilities of the Environment can, for the first time, be applied to sample-accurate soft synths. VST 2.0 Instruments can also now receive clock information, for linking delays and other effects to song tempo, and can use standard Program Change commands. In fact, VST support has been generally optimised. Support for the new *EVP88* piano instrument is built in too, as are many improvements for the *EXS24* soft sampler.

W www.emagic.de

• Ahead Software have released version 5.5 of their popular *Nero* CD-burning software. Its new *Wave Editor* provides non-destructive editing and a range of audio processing options with real-time auditioning. These options include noise



Ahead Software's *Nero* 5.5 now includes a full-featured audio editor that should prove invaluable to musicians wanting to burn audio CDs.

reduction, HF enhancement, time-stretching, and pitch-shifting, alongside the usual EQ, compression, delays, chorus, flange, and reverb options. *Nero* also offers sample-format conversion, with dither and noise shaping. With a new CD Cover Designer feature, an MPEG-1 Video encoder to convert AVI files for burning onto Video CD, and a Toolkit

for testing and setting CD drive speeds, the software should prove extremely popular, especially at a retail price of just \$69. Version 5.x users can download a free upgrade.

W www.ahead.de

• Linplug have announced the third in their series of *GakStoar* soft synths. Like the others in the range, Omega

features a wide variety of modulation options, for expressive sound creation. It's a 24-voice VST1 sample synthesizer that can not only play back WAV or AIFF files at up to 32-bit/96kHz, with time-stretching and pitch-shifting, but also features an analogue oscillator, an analogue-modelled multi-mode filter, three envelopes, two LFOs, and a delay section. With sample-accurate timing, this hybrid is bound to prove popular in the increasingly crowded world of VST1 samplers.

W www.linplug.de

• *FruityLoops* started life as a drum-loop creator, but has developed into a fully-fledged virtual studio along the lines of Propellerheads' *Reason*. Now at version 3.0, it fully supports VST plug-ins and Instruments, as well as providing its own soft-synth generators and plug-ins, and has a redesigned interface to make it easier to use. It comes in two versions: *FruityLoops Pro* at \$49, and *FruityLoops Full* at \$99, the latter with a traditional piano-roll editor.

W www.fruityloops.com

Get to grips with MIDI

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 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*). As the **C16** is mainly a preset device you avoid the brain-ache of having to program it yourself, and you can quickly get stuck in to using it creatively. 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.

It is easy to recall one of the *Target* presets. First, you look up its number. Then, holding down the TARGET SELECT pushbutton, you move sliders 4 and 5 until the two-digit LED display shows the correct number.



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 MIDI messages you require are not available from a preset, two programmable *Target* locations (98 and 99) allow each slider to be individually set up. Rather than cram such powerful functions into an awkward user interface, we provide an easy-to-use computer application (*Mac* and *Windows* versions are available for free download from our website).

Full details of the built-in preset *Targets* and an expanding collection of ready-made *User Targets* are also available for free download from our website (www.philrees.co.uk).

The **C16** is 210mm x 135mm x 55 mm and has a built-in mains power supply.

The **C16** has been shipping in quantity since July 2000, and many hundreds of units have been sold. In late April 2001, there have still been no units returned as faulty or damaged – there have been no service returns at all! The **C16** is proving to be an outstandingly robust and reliable product.

C16 MIDI Control Unit £148.75

Low cost thru units

Some MIDI gear may lack thru sockets. Chains of more than three MIDI devices can suffer from data corruption. You can solve these problems easily and cheaply with our MIDI thru units.

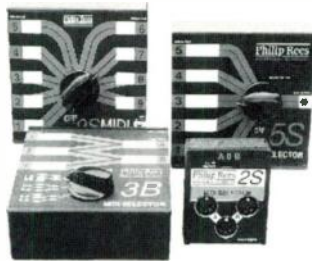
The handy **V3** is a battery-powered one-into-three thru box. The **V4** has one input and four outputs, and is line-powered. The **V8**, which has two inputs and eight outputs (arranged as two banks of four), is supplied with an external mains adaptor. The **V10** is a mains-powered one-into-ten unit. 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

Select a selector

These simple switch-in-a-box gadgets could solve your MIDI routing problems and save you the inconvenience of swapping cables about.



The **3B** is a novel ganged changeover switch, which will let you bypass your computer or sequencer without moving cables.

2S MIDI Selector £12.95
5S MIDI Selector £29.95
3B MIDI Selector £29.95
9S MIDI Selector £39.95

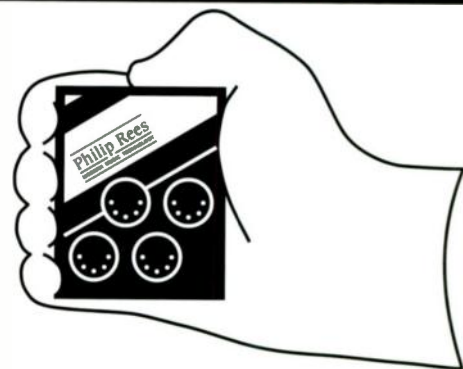
Long distance MIDI

These line driver systems overcome the 15m limit of standard MIDI hardware, by converting the signal to a differential (balanced) format.



MLD is unidirectional and has a range of 1km. The bidirectional **MTR** system has a range of 150m. Both systems have built-in mains power supplies.

MLD MIDI Line Driver £89.95
MTR MIDI Line Driver £99.00



Functional simplicity

Smarter merge units

You can't combine MIDI signals just by joining the wires together. Merging MIDI datastreams is a job for a microprocessor. There is one at the heart of each of our MIDI merge units.

These devices can handle all types of MIDI data, including *MTC* and *SysEx*. Many automatic features enhance performance and convenience.

The compact **Little 2M** merges two sources. It is powered via one of its MIDI IN lines, so it needs neither batteries nor an external adaptor.

The classic mains-powered **2M** has thru ports for both of its inputs. The **3M** merges three sources and is also mains-powered.

5M merges five sources, while **9M** merges nine. These models are supplied with mains adaptors.



Little 2M MIDI Merge Unit £39.95
2M MIDI Merge Unit £69.95
3M MIDI Merge Unit £99.00
5M MIDI Merge Unit £125.95
9M MIDI Merge Unit £169.95

MIDI to DIN Sync box

Classic drum machines and sequencers, such as the *TB-303* and *TR-808* are equipped with Sync24 ("DIN Sync") inputs. When connected up via **MDS**, they should start, play in time, and stop automatically by remote control from your MIDI master equipment.



The unit is easy-to-use, compact and contains an integral mains power supply.

MDS MIDI to Sync24 Converter.. £69.95

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Tim	Tim	Tim	Tim	Pit	Pit	Pit	Pit	Vel	Vel	Vel	Vel	S/L
12	12	12	12	D 4	D 4	A 4	E 4	93	100	90	77	81
	6	6	6	A 3	C 4	D 5	A 3	92	100	89	77	
		6	6	F 3	A 4	C 4	E 4	92	90	90	78	
		12	12	C 3	A 3	C 5	D 4	93	89	89	77	
				C 4	F 4	B 3	A 3	93	89	78	78	
				B 4	E 3	B 4	F 4	89	90	77	78	
				F 5	E 4	E 4	G 3	89	90	78	92	
				B 4	G 4	G 5	G 4	92	89	78	89	
				G 3	F 3	F 4	D 4	92	77	78	90	
				D 3	C 5	C 5	B 3	89	78	80	92	
				A 2	C 4	E 4	D 4	93	77	86	89	
				D 2	B 3	A 5	A 3	89	78	89	87	
				B 1	B 4	F 4	E 4	90	77	89	75	
				A 2	G 3	D 4	C 4	92	80	86	78	
				D 4	E 5	G 4	D 4	92	90	90	77	
				A 4	E 4	G 3	C 4	89	89	90	74	

Back when the Atari was commercially the number one platform for MIDI music-making, there were many successful software houses feeding the market. One of the top names was Dr T's Music Software, and although the company no longer exists, their software remains popular amongst current Atari music users thanks to the free, authorised availability of a number of their previously commercial products. It's currently possible to download a range of the company's synth editors, and the fabulous *KCS Omega* sequencer.

Ax To Grind

But even the most ardent Dr T's fan is unlikely to have encountered the package we're having a brief look at this month: *MIDI-Ax* was developed by Emile Tobenfeld — Dr T himself — for his own use. The program is a mixture of mouse-based MIDI controller and real-time algorithmic composition aid, almost a souped-up version of Dr T's old *Fingers* program; in fact, *MIDI-Ax*'s main operating screen looks a lot like that of *Fingers*. Most of the main operating screen is divided into a 13- or 16-column grid, which the user configures to generate data related to pitch, time, velocity and *staccato/legato* response. The bottom quarter of the screen is devoted to the four playback parts that generate the finished performance: each part can be assigned a MIDI channel, Program Change number, transposition, and a link to other

parts. Interestingly, it's also possible to give the part a temporal offset so that it effectively plays back at a different rate from the master tempo, for true polyrhythmic effects.

The data in the upper columns interacts with the parameters set in the bottom quarter; user interaction with these parameters then contributes to the finished performance. Such user interaction can come from mouse control, Atari keyboard input, MIDI controllers, or a compatible sequencer. *MIDI-Ax* integrates with Dr T's Multi Program Environment, and thus can record its performance to a sequencer such as *KCS Omega*, as well as interacting with sequences already in *KCS*. It appears that getting a *MIDI-Ax*

Derek Johnson experiences the weirdness that is Dr T's, in the shape of *MIDI-Ax*, and helps out a reader who wants to use his Atari as a dedicated TX7 editor.

performance into your favourite sequencer would involve recording it into *KCS* and saving the result as a MIDI File.

No Free Lunches

Be warned right now that *MIDI-Ax*'s screen is in no way graphic, being dizzyingly full of numbers, abbreviations and arrows for the user to click on. This functional, non-graphic approach to program design was a Dr T's trademark. (Look to the lower right of the screen and you'll find that 'St' starts the program, 'XX' stops it, 'Co' continues and 'Me' accesses the menu.) A certain amount of help is provided by the documents that come with the program, but users will still have to be prepared for experimentation and poking around as they become accustomed to it. And though *MIDI-Ax* is graphically spartan, there is a certain fascination to be had from the on-screen action as numbered cursors for the four parts move up and down the data columns.

Getting to grips with *MIDI-Ax* requires some of the concentration of learning a real instrument, or working with mouse-controlled software such as Laurie Spiegel's *Music Mouse*. There isn't room in a column of this size to do such a complex program justice. If algorithmic music tools are your bag, this is a good one which will reward your perseverance.

MIDI-Ax is available for download from the Atari-MIDI group on Yahoo, but isn't, for once, free: if you download the software, like it and use it, you're asked to buy an experimental video from Emile Tobenfeld's current company — videoware, perhaps? Non-North American readers should bear in mind that the tapes are NTSC format, though most modern VCRs should be able to play them. You can get a good idea of what the Doctor has been up to by visiting

www.foryourhead.com. SOS

W <http://groups.yahoo.com/group/atari-midi>

Ed Master: Atari Becomes TX7 Editor

Reader Chris Bond contacted the column recently asking for help in his search for an editor for his Yamaha TX7. He has a demo version of a package called *DXpert/DXorganiser* from Five Pin Din Software, which offers librarian functions in demo form, but he would like to get something that would allow him to use his Atari as a full-time TX7 editor alongside his Mac — an ideal job for a spare Atari. To the best of my knowledge, Five Pin Din are no more, so getting a full version of their software would involve placing 'Wanted' ads and asking around Atari news groups. The same goes for some other older software, such as Steinberg's *Synthworks DX/TX*, or C-Lab's *X-Alyser*. But there are alternatives.

Yamaha's six-operator FM synths were never as well-served with public domain and shareware editors as their four-op cousins, but there is a small amount of choice. The first one to go for is probably the recently liberated Caged Artists *DX Heaven DX/TX* editor/librarian, which was once marketed by Dr T's. This is also available in a version compatible with Dr T's Multi Program Environment, which allows multiple editors to be used alongside Dr T's *KCS* sequencing system. Get it

from the indefatigable Tim Conrardy's web page (<http://sites.netscape.net/timconrardy/timidi.html>). Between this and <http://groups.yahoo.com/group/atari-midi>, you'll be able to download more DX7 tools and sounds. Another possible option, which I've just heard about, is Jim Patchell's *TX816 Editor*. This is something that Jim wrote for his own use, to let him edit Yamaha's TX816 mainframe system (the rack accommodates up to eight modules, each equivalent to one DX7). I don't have a six-op synth, and Jim doesn't have a DX7, so although this editor might work with DX7/TX7, we're unable to confirm it. But as it's a free download from Jim's Synthesizer DIY page, at www.silcom.com/~patchell/, why not give it a go?



Yamaha's TX7: a powerful FM synth whose capabilities can be fully exploited if you assign your Atari to software editing duties.

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At well under £300, buying a Philips CDR775 could be the most flexible studio investment you ever made. It's a dual-deck CD recorder and a high-speed duplicator offering a staggering array of unique, musician-friendly features.

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- Infra-red remote control

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Review excerpts December 2000

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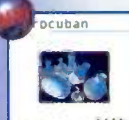
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Giga CD-Rom - £99.00



Is it a home organ-style keyboard? Is it a real synth? Is it a complete crock? **Paul Ward** explores the Korg Sigma, an instrument with a serious identity crisis...

Synth history is littered with oddities, few of them odder than Korg's Sigma. Launched in 1979, and perhaps looking more like a home-organ add-on than a 'real' synth, the Sigma instantly found favour with players looking for a simpler alternative to knob-laden analogues.

The Sigma is surely something of an ugly duckling. It certainly seems a little oversized for its ambitions. Whole expanses of front panel languish in glorious knoblessness, whilst there's so much action going on over by your left hand that you'd think a few controls had dropped off and rolled down there of their own volition. This schizophrenic charm goes right to the heart of the machine.

Split Personality

The internal architecture of the essentially preset Sigma is divided into two discrete sections, consisting of the 'Synthe' sounds and the 'Instruments'. Over to the right of the front panel are the 11 grey Instrument tabs, while in the centre of the panel are eight white tabs associated with the Synthe section. These rocker-tabs were clearly borrowed from the home organs of the late '70s. They actually do a good job of making changes quick and easy, but at a glance it can be difficult to see which ones are selected.

The Instrument tabs move up in pitch from left to right, starting with a 32' Electric Bass and ending

sigma enigma

KORG SIGMA ANALOGUE MONOSYNTH

with 4' Hammered Percussion. Highlights of the Instruments would have to be the Flute, with its ethereal quality, String, which is great as a screechy lead patch, the delicate Double Reed, and the bouncy Electric Bass. Fuzz Guitar is nicely quirky, but I doubt anyone would use it often. You'd have to be a real optimist to expect these imitations to sound very close to the real thing, but they all have a naive charm that is hard to actually dislike — although the Trumpet probably comes close to being the worst preset sound in my studio!

The Synthe tabs are a strange collection, ranging from a meaty 32' sawtooth wave to a depressingly 'plinky' 4' sawtooth. In between are pulse and square waves, and a nice 16' pulse wave with rich Pulse Width Modulation built in. A noise source is also included, with variable attack/release time.

Above each voice tab is a knob, allowing one parameter of the corresponding voice to be controlled in real time. The Flute, for instance, has a tone control above it, while Electric Bass has a filter

Above: a well-preserved example of a Sigma, from the collection of SOS contributor Gordon Reid.

“A Sigma needs effects like a dog needs legs—adding a long delay lets the sound breathe, as does a decent pre-delayed reverb.”

cut-off control. Similar knobs accompany the Synthe tabs, allowing, for example, the attack *and* release times (but via a single control, remember) of some waveforms to be adjusted. At first this seems quite limiting, and it can be frustrating for anyone brought up on full, hands-on patch creation. Some of the controls are perhaps strangely chosen, and others are just plain misleading — the ‘Decay’ control actually governs both Decay and Release. The most frustrating omission for a programmer is likely to be that of any resonance control.

One of the Sigma’s real strengths lies in the fact that any number of tabs can be selected simultaneously. Presets that sound a little anaemic on their own suddenly gain a new lease of life when combined with others, and some of the most unusual combinations have a strong voicing that the individual tabs don’t exhibit in isolation. The Tuba is a good example of this, giving a strong range of low-frequency energy to the 16’ pulse waveform, for instance. If detuning between different Instrument and Synthe tabs were possible, the Sigma might be capable of some truly meaty patches, but there’s

obviously some sharing going on inside that keeps them all perfectly locked together.

Sticking With It

Rather at odds with this slightly weedy preset-ness are some of the most inspiring performance features available at the time. The Sigma has not one but two joysticks, the left being centre-sprung and controlling LFO modulation (vibrato) in

the forward direction, noise modulation in the backwards direction, and pitch-bend from left to right. This joystick acts on the machine as a whole, although the amount of modulation is separately adjustable for the Instrument and Synthe sections, allowing for some alluring unison-to-interval pitch sweeps. The other, non-sprung, joystick controls the cut-off frequency of the Sigma’s 12dB-per-octave high- and low-pass filter — low-pass left to right, high-pass front to back. Try to imagine how much fun this is, and also how much control it gives over the Sigma’s sound. The quality of the filter is actually pretty good too — silky rather than aggressive. Unfortunately, it’s not possible to route the Instrument voices through the same filter. Neither is there any capability to route external sounds through the filter, which alone would almost make the purchase of a Sigma worthwhile.

The fun doesn’t end with joystick modulation, because the keyboard is aftersound-sensitive, too. Other performance synths of the time, such as ARP’s Pro-Soloist, also had aftersound, but personally I prefer the Sigma’s ‘playability’. One man’s meat is another man’s veggie burger, but if you long to ‘feel’ aftersound under your fingers, you’d probably find the Sigma a treat. There’s quite a lot of travel over which the modulation naturally feeds in, and you can feel the spring working under the pressure. It’s a delightfully tactile, if slightly clunky, experience.

So we have aftersound: what can we do with it? Use it to control pitch-bend and vibrato. (What a shame filter cut-off isn’t an option.) It’s possible to set the amount of aftersound sensitivity, the direction of bend (up or down) and whether it is applied to the Instrument sounds, Synthe sounds, or both. Irrespective of aftersound, vibrato may also be added to the Instrument section, with variable rate and delay time.

The useful dual joystick controllers.



Look What They’ve Done To My Sig-Ma

The story of my own Korg Sigma reads rather like a story from *Pet Rescue*. I answered an advert and was told that the machine was in complete working order, and that the owner just wanted to get rid of it to save space. I have never seen a synth in such a pitiful state. Finger grease and dirt had accumulated on the controls and keys to the point where a hardened crust decorated each one. You could actually feel the ridges of fingerprints in the grime! The voicing tabs were completely illegible; in fact they all looked the same colour — black! The small control knobs were so coated with dirt that neither their colour nor position indicator were visible. Both joysticks were broken off (although, admittedly, this is common on even the best-kept Sigmas). Several keys did not work; the mains cable and plug were a serious threat to health; the wooden end-cheeks were both loosely hanging away from the frame... In short, it was a tragic mess.

Playing the synth revealed some serious electronic faults. Pressing any knob on the right-hand side of the front panel sent the oscillators into orbit, screeching and wailing like an analogue banshee. Some tabs just didn’t work at all. I suspected that an impact had jarred the

front panel; there was some movement in the right-hand controls, allowing them to be pushed back into the panel.

Like a child in a pet shop, I just couldn’t bring myself to leave the poor thing there (you do not even want to think about what this guy had done to the two Roland SH101s in his possession!). I negotiated an absurdly low price, but left feeling as if I was somehow performing an act of mercy!

Once I had the machine back home, the first job was to strip it down and begin the distasteful process of cleaning away all those years of accumulated grime. To my joy and amazement, I found that the sheer depth of encrusted dirt had actually protected much of the synth! A couple of hours of careful cleaning revealed the controls and legending in all their glory. It was rather like cleaning an oil painting to reveal a masterpiece buried underneath. One of the end cheeks merely needed tightening up, whilst the other, although still a little wobbly, went back into place sufficiently well to wait for a proper fix on another day.

Turning my attentions to the machine’s more serious, functional problems, I spent a short time with multi-meter and crocodile-clips, determining

whether the trouble was a physical, rather than a component, problem. Flexing the main board reproduced the oscillator screech, but the symptom wasn’t consistent. After a short time, I had tracked it down to one area of the main voicing circuit board and I began to take a closer look at the tracks. One PCB track was clearly lifted away from the board, whilst another reacted to my pressing it with the multi-meter’s probe. And then I saw the problem. Some heavy impact on the front panel had obviously pushed the control knobs back through the panel, cracking the circuit board *en route*. It could have been this way for years, gradually worsening with use. I fixed the problem by soldering link wires (cut from the legs of a couple of resistors) to bridge across the tracks, and then applied some super-glue to the board itself, to try to prevent the crack in the board worsening in future.

The result? A beautiful, perfectly working synth. The end cheeks are tatty and the joysticks are still missing — the threads of the old joysticks are snapped off in place, so replacements would be hard to fit, even if they could be found, which they can’t. Unless, of course, any readers out there know better?

KORG SIGMA

- Usefully, the Sigma allows for single or multiple envelope triggering. Single triggering is useful for playing a monophonic instrument, such as a flute, where you would not want the attack of the sound to be repeated during deliberate slurring of notes. Bass sounds, on the other hand, might be better to forgivingly re-trigger during slurred playing, to keep the rhythmic pulse going.

Hold On!

The Key Hold tab may seem like a fairly mundane control, but I'd love to see it on every synth. Flip it on and the Sigma just opens its envelopes and drones. Use it for tuning, use it to play a 'pedal' note while you play another keyboard, use it to apply edits without having to keep one hand on a key. Exciting it isn't, but it *is* handy to have.

You can click the keyboard up or down an octave from its standard pitch. There's also the ability to switch the keyboard into quarter-tone tuning. I'm still struggling to imagine the design team meeting that gave us a synth with no filter resonance control, yet quarter-tone tuning!

The ring modulator is predictably riotous, actually producing a cross-modulation between the Instrument and Synthe sections, with a bias pitch of its own. Flip all the tabs and add the Ring Modulator to hear what an hour's random fiddling with a modular synth system might conceivably spawn! This is a prime source of sonic unpleasantness that can give your neighbours nightmares for months.

Rear Window

For a stand-alone performance keyboard, the Sigma has a back panel that seems to be very busy. You're able to take the Synthe and Instrument sounds out separately, or as a mix, and there's a headphone jack. Perhaps surprisingly, the rest of the jacks provide a decent amount of external voltage control for linking up to other analogue synths, sequencers, or a MIDI-CV converter. (Be aware, though, that the Sigma uses the Hz/Volts system, not the more common 1V-per-octave system.) Not only does the Sigma offer the usual key-trigger and VCO control voltage in/out jacks, but also a VCO frequency modulation and filter cut-off voltage input for the Synthe section — ostensibly for footpedal control. It's a shame that there are no output voltages for the Sigma's performance controls, which would make two coupled Sigmas react as one. I know of one person who has tried to bully a pair of Sigmas into doing just that, but finding the right points from which to tap the voltages proved extremely difficult, and the idea was eventually abandoned.

Sonic Strengths?

A Sigma needs effects like a dog needs legs — adding a long delay lets the sound breathe, as does a decent pre-delayed reverb. I have tried adding chorus to bring some movement to the very 'static'-sounding solo tabs, but this never seems to have the desired effect to my ears, maybe due to the lack of complex harmonics in the sounds. Adding a distortion or fuzz pedal can yield some good results, though.

A Sigma is unlikely to give you that thundering bass, burbling sequence line, or ripping anthemic lead that you may dream of, but it will come up with a world of strangely appealing ear candy that will more than pay for its upkeep. Flipping a fistful of tabs down can produce meaty cacophonies, further enhanced by the ring modulator.

Despite all this, if there was any such thing as a sound-to-weight/size ratio, the Sigma would seem a very poor contender, being more 'brash' than 'fat'. None of its voices are 'big' in the way of a Minimoog or Sequential Pro One. Neither do they have the squelchy charm of old Roland machines. And anyone looking to brew up some chillin' home-made sounds will initially be disappointed at the instrument's lack of tweakability.

Why Buy?

The Sigma is a difficult machine to fairly categorise. It was primarily aimed at being a performance synth (clearly indicated by the aftersoft-sensitive keyboard and joysticks), and was certainly at home serving up a home-organist's fare of predictably 'safe' lead and bass sounds. However, the Synthe section took a sideways step into the dangerous world of 'real' synthesis. It's certainly closer to being a preset 'instant instrument' than it is a fully-fledged synthesizer, yet it sports enough control options to take it quite a distance into the kind of territory held by the likes of ARPs, Pro Ones and SH101s.

It's not easy to come up with a long list of famous Sigma users. Jean-Michel Jarre, Vangelis, Rick Wakeman and Mike Oldfield all dabbled with a Sigma at some time, but I think you'd be hard pushed to have noticed. Most players overlooked the Sigma, and the ones who didn't probably wouldn't have wanted to shout about it much — with all its home-organ connotations, this was a seriously unfashionable synth. The top edge of the front panel pulls out to provide a music stand, and that's a danger sign by anyone's standards!

I've heard enthusiastic waxings about the sound of the Sigma from time to time over the years, and I've had to ask myself whether they were about the same instrument, because I'd still describe it as generally 'nasal'. To be honest, I've never been a great fan — so it would be reasonable to ask why I bought one! Well, I was constantly exposed to the Sigma for many years while working with synth duo Wavestar and solo artist John Dyson (one of the Sigma's most staunch supporters). After hearing those delicate flutes and reeds, the cutting strings and eerie filter-swept basses for so long, I realised the Sigma had its strengths, and I knew I had to pick one up if the opportunity arose. At the price I paid, I haven't regretted it one bit, but I'd be hard pushed to recommend it over more capable analogues, or even more capable virtual analogues, for that matter. So I seem to be just as confused as the Sigma's design team! EOS



The oddly named 'Synthe' section is the Sigma's nod in the direction of real sound synthesis.

“To be honest, I’ve never been a great fan — so it would be reasonable to ask why I bought one!”

Second (Hand) Thoughts

Reasonable second-hand prices for a Sigma are likely to start at around £100 and peak at £150. Any more than that and I'd suggest that you need to be looking at a very tidy machine, complete with its original manuals. Any less and you'll need to accept a few nips and tucks, though you should check out all the sound circuitry. Although relatively simple in many respects, some of the Sigma's internals are nearly impossible to find replacements for.

Those joysticks are a weak spot, and examples with both still intact seem to be a rare sight these days. Crackly pots are common, but key contacts seem fairly robust.

Don't forget that the Sigma works to the Hz/Volts control voltage standard, not the more common 1V-per-octave standard (as mentioned in the main text). Bear this in mind if you're hoping to hook it up to a MIDI-CV converter.



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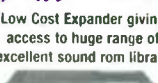
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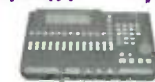
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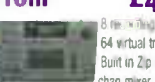
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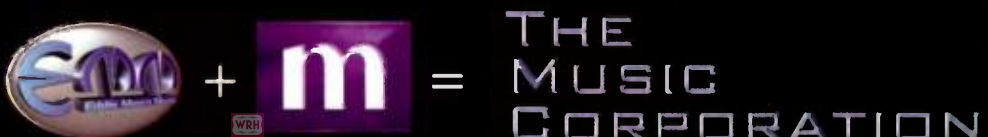
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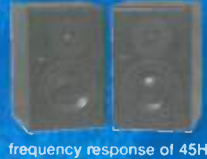
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Active monitoring system featuring dual 150W bi-polar discrete amplifiers with built in thermal, DC and overload protection.



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16 channel in line 8 bit recording console. 4 channel D160 EQ with 2 swept mids. 6 aux sends. Best quality 8 bus for the money. 168 Deposit plus 8 £10 a month. 0%.



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From £799

Plus King 168 Digital Desk £1399

Stand alone digital eight track 8 Analogue I/O plus Adat I/O. Removable hard drive. Midi Sync



Foxtex D160

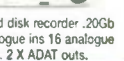
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8 Channel ADAT AD/DA converter Adds 8 analogue inputs to Foxtex VF16. Korg 168 & 1212. Motu 2408



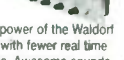
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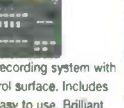
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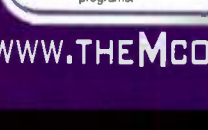
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88 Note Synth

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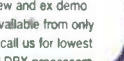
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VP9000

Variphrase Sampler

Limited ex demo units with full 3 year warranty



RRP £2199
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RS 9/RS5

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Available From £499

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Portable Pro Studio System

Powerful and Flexible Digital Multitrack System. Loaded with pro I/O and interface options. 8 track simultaneous record, 288 virtual tracks



Roland VM3100 Pro Plus VSR880
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manufacturers current models. With most of the features of the VS1880, the VS1680 offers 16 track playback, digital mixing and effects processing. This is a real bargain don't miss out.

SP303

Sampler / Sequencer



This brilliant new model from Roland gives you CD quality sampling plus effects processing and sequencing. Features include 8 note polyphony, expandable sample memory using smart media cards, 26 On board groove effects. Realtime pattern sequencer for easy song creation. WAV & AIF file compatible.

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Roland VM7100 System

Complete 8 bus Digital Mixer with Built in effects and dynamics plus separate audio and digital i/o module.

The separate component design makes the System 7000 ideal for studio, stage and front of house applications. You can place your mixer up to 200 meters away from your audio inputs & outputs with two noise free digital cables avoiding the need for expensive analog cable snakes.

10 mic/line inputs • 12 analog outs • 13 motorized faders • Stereo Digital I/O • Total mixer recall • on board dynamics automation and effects • surround sound capability • 4 band parametric EQ • COSM Speaker modelling and mic simulation • expandable



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Alesis Masterlink *Stereo Mastering CD Recorder*



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126 Voice Sampler
RRP £1299 OUR PRICE £799



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Digital 8 Bus Mixer

RRP £3999
Now From £1999



This TMC Exclusive saves you up to £2000 off the TMD4000 Professional Digital Console

High Spec includes
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• 4 band parametric EQ on each channel.
Dynamics on each channel

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• Machine control
• Surround panning
• On board stereo effects
First units sold inc MB.

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TC-M-one *Dual Digital Multi Effects*

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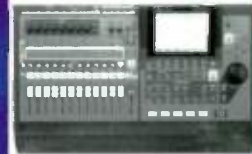


The M - One is in our opinion the best digital multi effects processor in its class. Features include 20 different studio effects such as reverb, chorus, tremolo, pitch shifting plus delay and dynamics. 100 factory & 100 user memories. 24 bit A/D - D/A converters. S/PDIF I/O. The dual engine structure allows you to run two different effects simultaneously. No other processor at this price sounds this good.

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RRP £795

Stunning CD Recorder and duplicator based on the CDR631. The CDR500 includes an additional playback deck which can be used as a digital source or an independent player. The CDR500 can record from external sources via balanced analog or S/PDIF digital inputs, clone CD's at double speed or create Disk at Once masters from source CDs. Ideal for mastering to Red Book standard. Call for our latest lower price

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Only £575

Superb development of the hugely successful CDR630, now offering the following pro-features. Balanced analog and AES/EBU digital inputs. Jog wheel, RAM buffer, CD text editing. Supports pro, consumer and CDRW media. Call for latest low price and bonus pack offer

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Only £249

The PMD330 is a Pro rackmountable CD player with backlit display. Great for studios, live work and theatres. It has S/PDIF digital plus unbalanced analog outputs, can play back CDRW discs and has frame accurate cueing.

PMD 331 - Pro CD Player

Same features as the PMD330 but with jog wheel, anti shock memory and balanced analog outputs - lovely!

Only £299

PDS220 - Pro CD Player

RRP £575



Innovative CD playback machine for the performing arts. Features include adjustable tempo and key controls (you can slow down a track without altering the pitch or transpose to another key without altering the speed). Unique voice reduction plus anti shock memory function. These units are perfect for learning material in different keys, rehearsing vocal harmony parts, practising solos and phrases or even choreographing dance routines.

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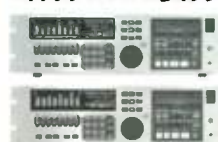


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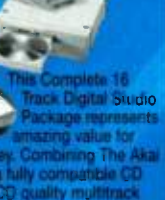


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Triple C



These stunning units feature the same compression algorithms as the Finalizer96K

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ALESIS 3630 compressor, only a few hours use on one project, complete with manuals, PSU and box, in perfect condition, cost £190 new, will accept, £95. ☎ Ian 01274 779716 or email i.chartley@btinternet.com (Bradford).

ALESIS MIDIVERB 4, superb effects unit, tech tap delay, dual effects, mint, boxed with manual, £150. ☎ Mark 0141 562 2036 or email mark.reynolds@moneyquest.co.uk (Glasgow, Scotland).

ALESIS QUADRIVERB PLUS, classic multi-effects, offers. ☎ Jon 01603 466405 or email theonicus@usa.net (Norwich).

BEHRINGER COMPOSER PRO as new with box and manual, £65. ☎ 01582 485256 or email yoy85@btinternet.com (Luton).

BEHRINGER EURORACK MX802A eight-channel mixer, new model, Spirit dynamic mic, both boxed, new, £90. ☎ 01507 606956 (Lincs).

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BOSS GTS, still in box and unused, £310. ☎ Chris 01453 750436 or email archie@crush.freemove.co.uk (Stroud, Glos).

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ALESIS SR16, hardly used, boxed with manual, £95. Paul.078.0830.0329 or email PaulBkewes@Musician.org (Birmingham).

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KORG ER1 drum machine/modeller, boxed, as new with manuals, £180. Dominic.0117.958.6642 or email dominic_wade@btinternet.com (Bristol, Avon).

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ROLAND TR909 drum machine, £850 only. Richard.020.8556.2463 (London).

ROLAND TR909 classic drum machine, £900. Gary.020.7900.4376 or email gary@frequencyhunt.com (Richmond, Surrey).

ROLAND V-DRUM kit, TD10 module, 10 cymbal kit, four double trigger cymbal pads, V-Drum rackmounting system, HH pedal, excellent condition. 01925.411984/078.1161.2109 (Cheshire).

YAMAHA A4000 sampler, CDs, demo disks, cassettes, three year warranty, boxed, manuals, receipts, £100. Stefan.079.8044.6347/01684.584637 (Malvern).

ZOOM 234 RHYTHM TRACK, superb kits and bass sounds, excellent condition, boxed with manual and power supply, £100. Martin.01244.342039 or email martin.lambert1@btworld.com (Chester).

personnel

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computers/software

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miscellaneous

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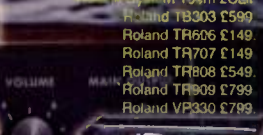
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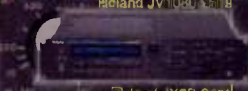
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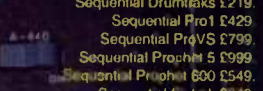
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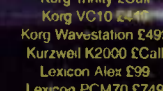
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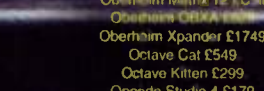
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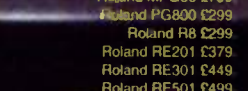
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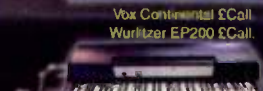
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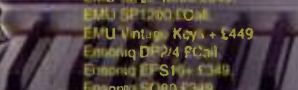
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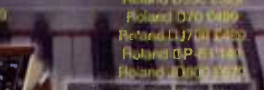
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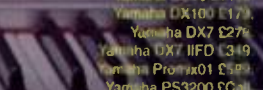
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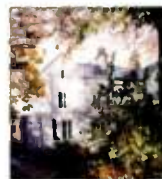
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Last week I attended a party thrown by a TV production company to premier a new 'behind the scenes' series about the Royal Air Force, for which I was commissioned to write the music. Amongst the usual suspects you'd expect to find at such an industry bash — directors (nervous chain smokers), editors (lanky, Def Leppard T-shirt-wearing *Star Wars* fans) and producers (forceful young women who talk loudly) — was a likeable, quietly-spoken chap about my own age who looked distinctly out of place, being the only person in the building wearing a jacket and tie.

This sartorial misfit turned out to be the RAF pilot who had acted as a technical consultant for the series and was responsible for most of the amazing aerial photography that made up large chunks of each episode.

Much of this, he explained, had been done in a single-seat jet fighter with the joystick in one hand and his DV camera in the other, a process he likened to trying to check your email while driving along a country lane at 400mph. In fog.

It transpired that when not running bombing sorties in Kosovo and teaching new pilots how to fly Harrier jump-jets, the pilot also had a passing interest in music technology. Having found some conversational common ground, we swapped info to pass the time. While I told him all about the latest developments in Native Instrument plug-ins, he told me what it actually feels like to land on an aircraft carrier, or fire Sidewinder missiles that cost £250,000 each.

I was surprised to learn that the Harrier jump-jet is a near perfect example of 1960s technology. "But surely", I said "it must be a headache updating the aircraft's computer systems every few years".

"Not at all", came the rather sobering reply.

Because it turns out that the main computer in your average Harrier fighter is (and I wrote this part down so I wouldn't forget it) "a bit better than a ZX Spectrum but not quite as good as a Commodore 64".

Without any hardware upgrade strategy, the jets' computers have apparently been working at 110 per cent for about 25 years, so whenever the RAF boffins come up with a new bit of software for the heads-up display or navigation systems they actually have to remove another software component to make room for it.

Even scarier, I learnt, is the fact that Tornado fighters, for instance, need their sortie information loaded into their computers every morning via a standard C90 cassette tape. While the thought of the Gulf War having to be delayed while the allied forces wrestle on the tarmac with a chewed-up cassette tape may fill every freedom-loving Westerner with dread, it does, I think, have something to tell us about our insistence on upgrading and updating as often as is humanly possible.


Why do we keep buying new sound modules and investing so heavily in newer, bigger, faster computers? Is it because the features and sounds they offer are genuinely so much better than the ones we already have, or does the presence of 'new

blood' (new gear) promise to give us a boost of ideas and sonic self-confidence?

When was the last time you took the trouble to trawl through one of your older sound modules or a familiar sample CD, looking for a fresh perspective? Under the time pressures of a working studio, very often it's a luxury we tell ourselves we simply can't afford. We see forking out another grand or two on the latest bit of kit as a much safer option — and who doesn't enjoy unwrapping a new toy?

Obviously the business of flying about at mind-numbing speeds and dropping bombs on people is a far greater priority to the RAF than petty techno snobbery (after all, who is really going to feel inferior sat behind the controls of 38 million quid's worth of airborne killing hardware?). But perhaps, more importantly, however arcane and outdated their working methods may appear to us elevated musos, the simple fact is that it works for them. Is it a problem to have a four-track cassette machine at the heart of your studio if you make interesting and worthwhile music with it?

So would this brief foray into the world of aviation history make me consider not buying a lovely new G4 Big-Mac with everything on it? Of course not, but it'll certainly make me think twice the next time I see TV footage of a fighter plane delivering its lethal payload accurately to within 3mm through the letterbox of the front door of some anonymous foreign tyrant.

Now, did you want that laser-guided cluster bomb chrome or ferric? Dolby on or off? 



Paul Farrer reveals how he learned to stop upgrading and love the music.

About The Author

Paul Farrer is a regular SOS contributor, and also a busy television and film music composer whose most recent work includes the music for the TV quiz show *The Weakest Link*.

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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