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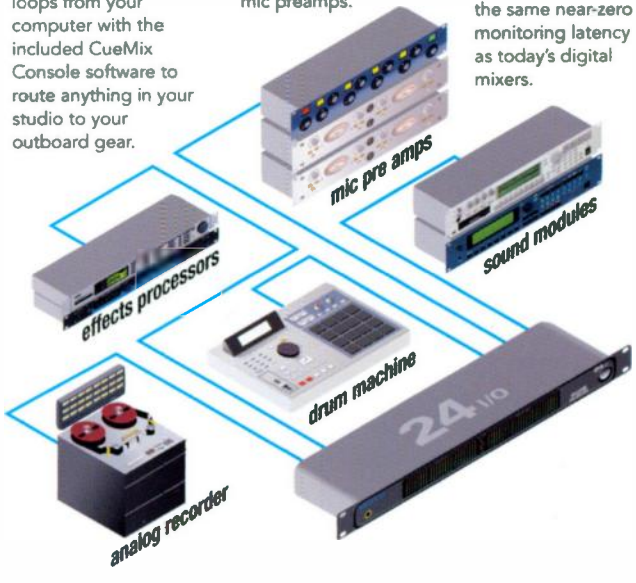

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The sleek exterior is as stunning as ever. The Titanium PowerBook G4 comes with all the refinements and esthetic touches that have made it the most coveted full-featured notebook computer on the planet: 1-inch thick, 5.4 pounds, AirPort, pure-grade titanium body, and 5-hour battery. On the inside, faster PowerPC G4 processors, powerful graphics capabilities, up to 1GB of RAM, and the world's most advanced operating system combine to deliver off-the-charts performance.

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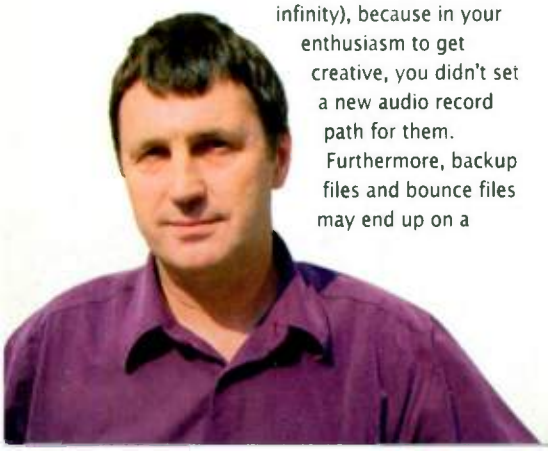
Saving Graces

I'm all too aware that a lot of my previous leaders have started out by saying something like "sequencers are really great, but..." And I'm afraid it's going to be more of the same this month!

What I like about working with audio (and MIDI) on a computer is that all your settings are saved, from the mixer controls and the automation moves to the deployment and setup of effects and processors — but there is still no equivalent of that reel of tape you can stick on the shelf and come back to when you need to. With tape, you didn't have to think about archiving your work, because the tape *was* your archive. With computers, the fruits of your labours are stored on a hard drive somewhere and, as many of us have come to learn the hard way, digital data can't actually be considered 'real' unless it exists in at least two different places, and ideally in more. So while computers allow you to neglect to fill in track sheets or to take notes about effects settings, you still need to be organised enough to implement some sort of backup regime.

It's true that CD-Rs are unbelievably cheap and provide a good way to store data — even a song using 16 to 24 tracks of audio will probably fit on a single CD-R — but I still don't understand why the sequencer manufacturers make life so hard for us when we actually try to do this. Unless you're extremely careful, you can end up with the audio files relating to the song you're working on tucked away on some remote corner of your hard drive (all called something like 'Untitled' — 1 to infinity), because in your enthusiasm to get creative, you didn't set a new audio record path for them. Furthermore, backup files and bounce files may end up on a completely different drive altogether. Then, of course, there are all the files relating to retakes and punch-ins. The audio files for an eight-track song can end up looking like the result of an explosion in a confetti factory!



It's fair to say that the leading sequencers provide various means for you to manually optimise songs so that unused sections of audio are taken out of the running, and most will allow you to create backups of an audio file or group of files in a designated folder of your choice. But given that these programs now claim to be 'professional', (whatever that actually means), would it be too much to ask for a single button that said something like 'Create Song Archive', which would automatically copy or relocate all the used audio files into a newly-created folder called something like 'SongTitle-Arc', along with a copy of the song file itself? Then we could copy the whole archive folder directly onto CD-R or DVD-R and not have to worry about whether we'd missed something out. In an ideal world, this archive would also be able to save any used soft-sampler files (to be fair, some software already does this), and it could be asked to store either copies of used audio files only, or all audio related to a song, used or not. In fact, screen shots of any used plug-ins might also be a useful addition, so that you could at least see what you were trying to replicate if you moved the work to a different system with different plug-ins. Something like this would make life so much easier, and would alleviate a lot of the grief currently associated with backing up.

With so many new features appearing in our favourite audio software packages on what seems like a monthly basis, isn't it time more software developers addressed the problem of 'backup made easy' so that their products might actually deserve the description 'professional'?

Paul White *Editor In Chief*

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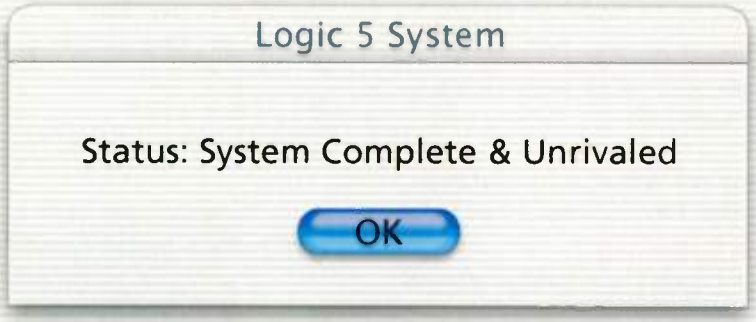

The most modern, reliable equipment is an important requirement for successful professional music production. Apple has created an operating system that more than meets these special demands: Mac OS X. With the release of Logic Platinum 5.4, Emagic is the first manufacturer to deliver a host program that supports Audio Units, Apple's new, system-level standard for DSP plug-ins. In addition, Logic Platinum 5.4 for OS X contains over 50 integrated effect plug-ins and support for all Emagic's optional Software Instruments (right). REX files are also supported, as is Emagic's current range of audio, MIDI and controller hardware. Choose the unrivaled complete studio solution for Mac OS X to fulfill the most important requirement for your success.

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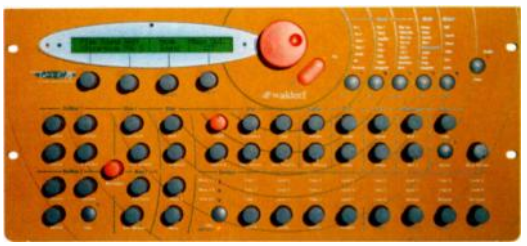

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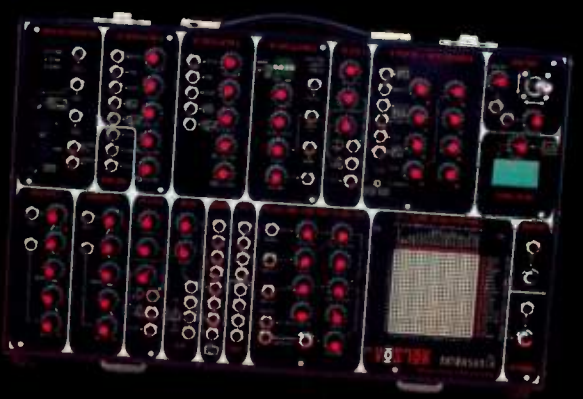

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TL Audio Ivory 2 Processors

Worth £1354

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Spirit E-series mixers from Soundcraft

Soundcraft are launching a new range of mixers under the Spirit banner, combining straightforward functionality with clear, uncluttered design. Available in six, eight and 12 mono input versions, each with two stereo inputs, the E-series mixers feature three-band mid-sweepable EQ, balanced XLR and quarter-inch jack inputs and full +48V phantom power. The E series' fourth member, the ES, has four mono inputs and 10 stereo inputs with RCA phono connectors for mixing multiple stereo sources, and a pair of RIAA preamps so that turntables can be plugged straight in. All the E-series mixers feature 100mm faders, two aux sends globally switchable to pre- or post-fade, and an internal power adaptor. Each channel has a discrete peak-monitoring LED, fed from multiple points in the signal path, which becomes brighter according to signal level. Two 10-segment LED meters display the levels of the main stereo buss and also serve to monitor solo'ed channels or the aux buss when selected. Prices start at £215 for the E6, with the E8 at £235, the E12 at £295, and the ES at £325. The Spirit E series should be available by the time you read this.

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Emagic announce *EXS24 MkII* and *Logic* v5.5

Emagic have announced a new version of their *EXS24* software sampler. *EXS24 MkII* features a new multi-mode filter, three LFOs, a new user interface and a flexible modulation routing system. The new version is available as a free update to registered users of *Logic* 5 and *EXS24* for Mac OS *and* Windows (yes, you read correctly!) and is also part of the free *Logic* v5.5 update. *Logic Platinum*, *Gold* and *Audio* v5.5 all offer enhanced Mac OS X support, and support of the Logic Control hardware controller, previously restricted to *Logic Platinum*, is now extended to *Gold* and *Audio*. There's also an opportunity for both Mac and PC users to try out *EXS24 MkII* for four weeks free of charge. The updates are available to download from the Emagic web site now.

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GMedia's new plug-in emulates ARP Odyssey

It was surely only a matter of time: the virtualisation of classic synths has reached the ARP family, with GMedia's *Oddity* Mac/PC VST-format plug-in instrument. The new synth, which is the result of a collaboration between Gmedia and OhmForce (who developed the *Predatohm* software synth), takes ARP's classic Odyssey monosynth as its inspiration. *Oddity* aims to model the original as accurately as possible, mimicking the Odyssey's interface (with accurately rendered parameter slides). The original's 'duophonic' mode of operation has also been recreated. It's a two-oscillator instrument, each oscillator being equipped with a six-octave range and capable of producing sine, sawtooth, square and pulse waveforms. The remaining features include two EGs, a resonant low-pass filter, ring modulator, oscillator sync, a pink/white noise generator, and an LFO that can be sync'ed to the tempo of the software hosting *Oddity*. The latter isn't the only bit of modernisation: *Oddity* is velocity sensitive, and features patch-morphing tricks from OhmForce. Also included with the £80 package is a 320-strong patch collection.

T GMedia Music +44 (0)118 947 1382.
W www.gmediamusic.com

Dan Dean brass and woodwind sample libraries

Sample producers Dan Dean have announced a pair of new releases. *Dan Dean Brass Ensembles*, available as a 12-CD set in Gigasampler format ($699) or as an eight-CD Akai set ($599), features stereo chromatically multisampled Trumpets, Trombones and French Horns, with up to eight layers of dynamics for each note. Legato, staccato and muted performances are represented, along with long, medium and short crescendos. The library's presets allow the user to take advantage of each note's sampled attack and release. The keyboard controller's mod wheel can be used to control reverb amount, allowing you to shorten decay times for faster passages, or to crossfade between dynamic layers, creating crescendo and diminuendo effects in real time. Various ensemble presets use slight variations in pitch and timbre in a bid to give a more convincing ensemble sound, and split keyboard presets give the left and right hands access to different performances of the same pitches.

Dan Dean Solo Woodwinds Lite ($199) is a single-CD library in Gigasampler format featuring solo flute, piccolo, oboe, clarinet, bass clarinet, english horn and bassoon samples. The stereo WAV files offer multiple velocities for each instrument and various articulations such as vibrato, non-vibrato, portato and staccato. Both CDs are available directly from the Dan Dean web site.

W www.dandeanpro.com

Are (virtual) friends electric?

Hot on the heels of their innovative *Virtual Guitarist* software, reviewed in December's *SOS* (www.sospubs.co.uk/sos/dec02/articles/steinbergvirtualguitarist.asp), Steinberg are releasing *Virtual Guitarist 'Electric Edition'*, which combines a VST-instrument electric rhythm guitarist with a guitar multi-effects plug-in. The software features 29 new 'players' or styles of electric rhythm guitar presented in the familiar format of the original *Virtual Guitarist*, which featured 25 styles divided between acoustic and electric guitar. The multi-effects board features wah-wah, an autofilter, chorus, flanger, phaser, tremolo, delay and reverb and can be used from within *Virtual Guitarist* or applied to any audio source as a stand-alone VST 2.0 plug-in. To run, *Virtual Guitarist 'Electric Edition'* requires a VST 2-compatible host application running under Mac or Windows. The new plug-in will be available in December, costing £169.99.

Steinberg have also announced *Wavelab Essential*, a new entry-level audio-editing package derived from *Wavelab v*4.0 and designed to suit the needs (and budget) of the first-time user. It offers non-destructive editing, stereo and multitrack editing with real-time fades and crossfades, MP3 encoding and decoding, and mastering and CD-burning tools. There's a range of real-time effects, and off-line effects like time-stretching and pitch adjustment, and VST and DirectX plug-ins are supported. *Wavelab Essential* runs on Windows-only (98, ME, 2000 and XP), is compatible with ASIO, WDM and MME soundcards, and costs £169.99.

T Arbiter Music Technology +44 (0)20 8970 1909.
F +44 (0)20 8202 7076.
E sales@arbitergroup.com
W www.arbitergroup.com
W www.steinberg.net

Emu turn back the clock

Veteran synth producers Emu Systems have announced the forthcoming release of a new sound module, the Vintage Pro. With a 32MB soundset sampled from original keyboards from the '60s, '70s and '80s, the Vintage Pro features a range of analogue and digital synthesizers and suitcase pianos together with a selection of samples from Emu's B3 organ module. The 1U unit's faceplate follows the styling of other Emu modules, with a two-line LCD display and four knobs for real-time control of 12 parameters. The module also features 128-voice polyphony, six analogue outputs, a digital output and three slots for Proteus expansion ROMs. The Vintage Pro will be available in the new year, costing £589.

T Emu-Ensoniq Europe +44 (0)131 653 6556.
F +44 (0)131 665 0473.
E info@emu.com
W www.emu.com

Storm in a desktop

The version 2.0 upgrade for Arturia's *Storm Music Studio* was recently unveiled at the Apple Expo show in Paris. *Storm* v2.0 boasts compatibility with Mac OS X and Windows XP, and can now be used in combination with programs like Ableton *Live*, Propellerhead *Reason* and Cakewalk *Sonar* via the Rewire protocol. In addition to a general overhaul of the graphics and user interface, two new features have been added. The *Composition Wizard* is a tutorial program designed to demonstrate the potential of the software to new users through the use of composition models in various musical styles. The second new feature is *The Hall*, a combination of a search engine for finding samples and a collection of interactive services, allowing *Storm* users to exchange samples, loops, news and chat on line. *Storm* v2.0 costs £99.99, but the upgrade, which comes on CD-ROM, is completely free to existing *Storm* users if ordered via the Arturia web site. Arturia will apparently even pay for postage and packing!

T Arbiter Music Technology +44 (0(20 8970 1909.
F +44 (0)20 8202 7076.
E sales@arbitergroup.com
W www.arbitergroup.com
W www.arturia.com

New UK distribution for Red Sound & GEM

A new company has been formed to take on UK distribution of Red Sound's product line, and they've already picked up the rights to distribute Italian manufacturer Generalmusic in the UK as well. All customer product support and dealer enquiries regarding Red Sound and Generalmusic's product lines (ie. LEM effects and mixers, and GEM and Elka keyboards) should now be addressed to Synergy. To celebrate the new distribution arrangement, Synergy have announced price cuts to several Red Sound products. The C-Loops six-voice sampler (reviewed back in January last year), which was £275, now costs £149.99. The Micro BPM combined tempo counter and headphone amp (reviewed in *SOS* November '98), which was £119, is now £99. Lastly, the Darkstar DSP-based analogue-modelling synth (see *SOS* March 2000), which was previously £399, is now £299.

T Synergy +44 (0)1827 288447.
W www.synergydistribution.co.uk
W www.redsound.com
W www.generalmusic.com

Dedicated vintage synth suppliers

RL Music is a new company based in Reading which specialises in the sale of vintage analogue synthesizers. According to RL, all instruments they sell are fully serviced and come with a guarantee. Surf to www.rlmusic.co.uk for more information.

E info@rlmusic.co.uk
W www.rlmusic.co.uk

M Audio offers *Reason* to *Live*

M Audio are bundling together Propellerhead *Reason* v2.0 and Ableton *Live* v1.5 for £399, a saving of £119 off the standard price of the two sold separately. They are also offering a pair of packages comprising *Reason*, *Live* and a USB MIDI controller keyboard. For £499, you can buy the two pieces of software together with M Audio's Oxygen 8 25-note USB keyboard (a saving of £138), while £569 will net you *Reason*, *Live* and the Radium 61-note USB keyboard (a saving of £148). The Oxygen 8 features eight assignable knobs and one slider. The Radium features eight knobs and eight sliders, with five user-definable banks of 16 MIDI parameters each.

In addition to these offers, anyone who purchased or used *Live* v1.0 or 1.5 for the first time after November 1st, 2002 can upgrade to *Live* v2.0 for free, saving £30. The new version incorporates multitrack recording and editing features, and also allows you to set the tempo at any time during recording or playback using the new 'tap-tempo' function. Time-stretching is no longer limited to loops and can now be applied to any audio material, so the whole arrangement stays in sync, and tempo changes can be edited as a continuous curve thanks to improved automation features. Ableton *Live* v2.0 will be available from December 2002.

News has also reached us of the latest addition to M Audio's Midisport line of USB MIDI interfaces, the USB Midisport 2x4. As its name suggests, this compact USB MIDI interface has two input ports and four output ports, allowing use of up to 32 discrete MIDI input channels and up to 64 discrete MIDI output channels. The unit is powered by the USB buss, and six LEDs indicate MIDI activity for each of the ports. The USB Midisport 2x4 is supplied with drivers for Windows (98/Me/2000/XP), Mac OS 9, OS X and OMS, and a six-foot USB cable, all for an affordable £89.

T M Audio +44 (0)871 717 7100.
F +44 (0)871 717 7101.
E info@midiman.co.uk
W www.m-audio.com

Hit it with your rhythm stick

New from DMI, who brought us a free physical-modelling flute VST plug-in last year, is *dmiHammer*, a free modelled 'mallet instrument' VST plug-in designed to offer xylophone- and marimba-style sounds. Available for both Macs and PCs, *dmiHammer* is 16-voice polyphonic, and is equipped with a handful of tweakable controls. The sound generator is based around four tuneable 'resonators', and the user also has control over 'hammer' parameters. On top of this are LFO and stereo-spread controls. A handful of presets is included with the plug-in, to get you going.

W http://dmi.deep-ice.com

Dark Horse to distribute Synapse Audio

Dark Horse Distribution, UK distributors of VirSyn's *Tera* soft synth, have taken on the distribution of Synapse Audio PC music software. Synapse Audio's products include the *Orion Basic*, *Pro* and *Platinum* virtual studio and the *Junglist* and *Scorpion* synthesizers. The latest *Orion Platinum* update, version 3.54, is now available. It's free to registered *Orion Platinum* users and costs £129.95 to buy new; you can find demos of Synapse Audio's software on their web site. Dark Horse Distribution have also recently released a free CD in conjunction with New Vision Records featuring five drum & bass and techno tracks produced using VirSyn *Tera* and intended to showcase the soft synth's potential. Orders can be placed by phone or email via the contact details below.

T Dark Horse Distribution +44 (0)208 204 4943.
E info@dark-horse.biz
W www.dark-horse.biz
W www.synapse-audio.com

Audio courses on the web

American distance learning web site www.audiocourses.com are offering a free introductory 'ebook' called *Studio Tricks and Tips*, taking the form of a series of emails, each concerning a different studio-recording topic. The web site offers downloadable books and courses with streamed audio lectures. The *Studio Recording Engineer* ebook and course costs $47.77.

W www.audiocourses.com

Buy Korg, get free CD

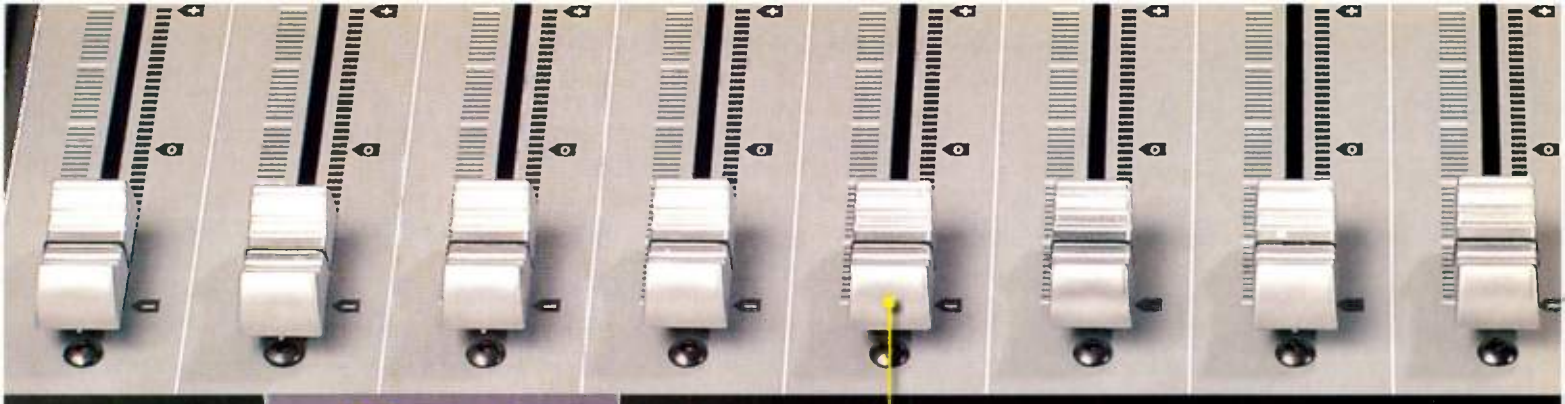
Korg are offering a free copy of their new *Sound Designer Collection* CD to anyone buying any Korg Electribe product or MS2000/2000R analogue-modelling synth, for a limited period only. The Electribe range comprises the ER1 Rhythm Synthesizer, the EA1 analogue-modelling synth, the EM1 Music Production Station, and the ES1 Rhythm Production Sampler.

The *Sound Designer* collection features new sounds, samples and patterns to load into the Korg instruments just mentioned. The new sounds come not only from the Korg archive, but from a collection of voicing experts and contemporary professional artists and producers. These include musician, sound designer and programmer John Lemkuhl (who has worked with Spectrasonics chief Eric Persing), DJ, remixer and producer Gavin Mills (credits include Arthur Baker and the Artful Dodger), musician, DJ and remixer Grant Nelson (Artful Dodger and Misteeq, amongst others), Henning Verlage, Keith Tenniswood and Andy Weatherall.

Detailed contents of the CD include 300 patterns for the EA1, 400 patterns for the ER1, and over 190 patterns for the EM1. For the ES1, over 80MB of WAV samples are provided, as well as many new patterns, while the MS2000/2000R gets over 400 new sounds. And there are are extras — all the product manuals are on the CD, as well as FAQs, Easy-Start guides and full MIDI SysEx implementation charts.

If you've already bought one of the supported Korg instruments, don't despair: just give Korg a call on +44 (0)1908 857100 and they'll send you a copy of the CD free, but for a nominal charge to cover postage and packing.

T Korg UK Brochure Line +44 (0)1908 857130.
W www.korg.co.uk/www.kaoss.co.uk



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MACKIE.

Made-to-measure studio cables

Newly formed company Solent Sound and Light are offering a mail-order custom cable-manufacturing service. In addition to supplying ready-made standard mic and instrument cables, they will make up cables to any specification. Possible studio applications of this service include multicore cables and looms with non-standard connectors, and cables of unusual length. Prices are calculated from the cost of the materials plus a small manufacturing fee. SSAL also perform induction-loop design and installation; see their web site for more details.

E sales@ssal.co.uk
W www.ssal.co.uk

Sonic Distribution take on SPL for the UK

The hand-built range of studio and mastering signal processors from German firm SPL is now being distributed in the UK by Sonic Distribution. The line includes EQs, dynamics processors, 5.1 surround tools, preamps and channel strips, and valves as well as solid-state electronics figure in SPL's designs. The distribution change should result in reduced UK pricing — contact Sonic for details.

T Sonic Distribution +44 (0)1582 843900.
W www.sonic-distribution.com

Winner nets Scottish Synth

In *SOS* May 2002 we teamed up with Macbeth Studio Systems (+44 (0)131 446 9022/ www.macbethstudiosystems.com) to give away an M3X synthesizer, a three-oscillator synth that combines vintage analogue sound with modern-day tuning stability and sophisticated MIDI control. The lucky winner was Colin Dunkerley (above), an engineer at City College Manchester's Arden Centre studio by day and a self-confessed drum & bass fiend by night. Well done Colin! Turn to page 258 for your chance to win a pair of TL Audio Ivory 2 valve signal processors in this month's competition.

Cool Edit Pro supports new Internet surround format

Syntrillium Software have released a version of their *Cool Edit Pro 2.0* that supports the new Windows Media Audio 9 Series platform. The major part of that support is the implementation of six-channel, high-resolution audio encoding; WMA 9's codec is the first to enable Web-based delivery of six-channel (5.1) surround sound with full-spectrum, full-resolution audio. As a result of the upgrade, *Cool Edit* can now encode all six audio channels to a single WMA stream at bit resolutions and sampling rates up to 24-bit/96kHz.

T Et Cetera Distribution +44 (0) 1706 228039.
F +44 (0) 1706 222989.
W www.syntrillium.com
W www.cooledit.com

Fostex MR8: eight tracks on Compact Flash

Fostex have announced their latest assault on the entry-level multitracker market, in the form of a digital eight-track for £349. The MR8 is the first eight-track recorder to use Compact Flash memory cards as a recording medium. The Tascam Pocketstudio (£399), reviewed in November's SOS (www.sospubs.co.uk/sos/ Nov02/articles/ pocketstudio.asp) also uses Compact Flash cards, but it records only four tracks of audio in compressed MP3 format. Fostex's machine records at 16-bit/44.1kHz resolution and can fit up to 50 track-minutes of uncompressed audio on a 256MB card. There's also the option of recording at 22.05kHz, thus doubling the recording time available, assuming you don't mind the loss in resolution. As 50 minutes of 16-bit/44.1kHz audio divided by eight tracks is unlikely to be enough for more than one or two songs, and since Compact Flash cards don't grow on trees, Fostex have sensibly given the MR8 a USB connector so that files can be transferred to a USB-equipped computer in WAV format for storage and CD burning. Three amp-simulation models and three mic-simulation models are built in, along with digital reverb, delay and mastering effects. There are two balanced XLR inputs with individual preamps, and two unbalanced quarter-inch jack inputs are located on the top of the unit. A footswitch input allows remote punching in and out and the user interface is kept simple, with numerous backlit buttons, seven faders (for control of tracks 1, 2, 3, 4, 5/6, 7/8 and master level), and a small yellow backlit LCD for metering purposes. There's an optical S/PDIF out, a stereo unbalanced analogue out, two headphone/monitor outputs and a MIDI out for synchronising the MR8 with MIDI-compatible outboard gear. Inevitably, given the price point, there are a few compromises in the spec — there are no effects sends or EQ in the mixer section, and only two tracks can be recorded simultaneously. As an affordable, portable recorder, however, you'd have to say the MR8 scores well — it can be powered from the mains or by six AA batteries, and there's a built-in mic for recording on the fly. It's also compact (although not exactly pocket-sized) at 283 x 65 x 215mm (WHD), and weighs just 1.6kg. The MR8 is available now.

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

New guide to *Cubase SX*

Auxbuss Publications have produced a new guide to *Cubase SX*. The book, entitled *Cubase SX Complete*, aims to help *SX* and *SL* users get the most out of Steinberg's extensive DAW software, with techniques, tips and tricks emphasising creative use of the program. The guide costs £24 (including postage and packing) and free add-on PDF files will be issued for all minor software version updates in the future.

E info@sxcomplete.com
W www.sxcomplete.com

Free REX player now available for OS X

Bitshift Audio's free *Phatmatik* REX file player is now available for OS X in both Audio Unit and Carbon VST formats. In addition to playback functions, *Phatmatik* can extract groove information from REX files and export it as a Standard MIDI File for editing. It also features ADSR amp envelope controls, a two-pole resonant filter and an LFO for sample manipulation. *Phatmatik* for OS X can be downloaded from the Bitshift Audio web site.

W www.bitshiftaudio.com

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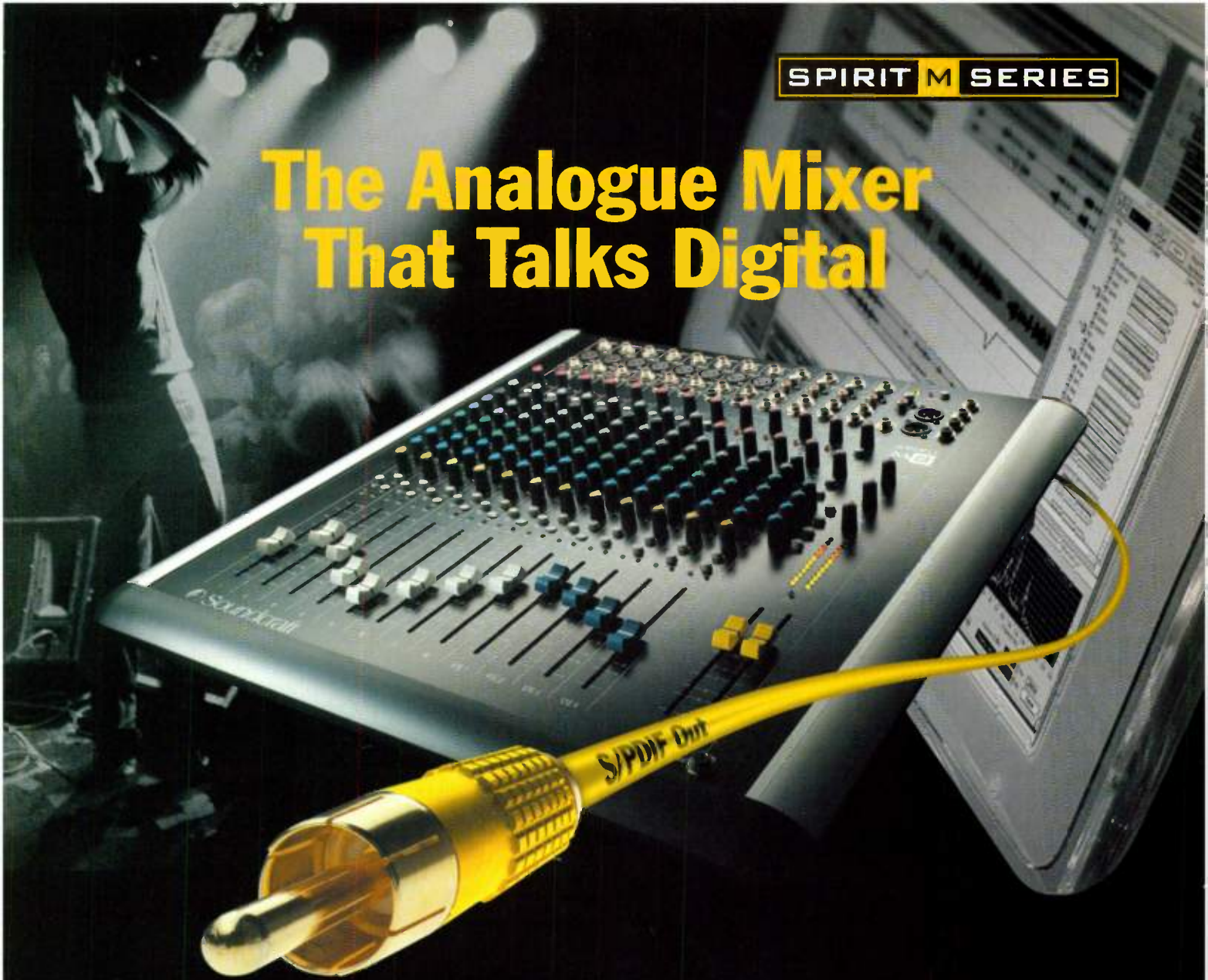

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You know how it is. Ten minutes before the gig, the band walks up with a DAT recorder and asks you to record the show. No problem. Your Soundcraft M Series console has an S/PDIF digital output so you can make high-quality, hassle-free DAT, CD or MiniDisc recordings without disturbing your existing analogue cabling.

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MSRP including VAT: M4 £499, M8 £629, M12 £758. Check with your Dealer for promotional offers.

www.soundcraft.com

Soundcraft +44 (0)1707 665000 Soundcraft US 1-888-251-8352
info@soundcraft.com soundcraft-USA@harman.com

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Kenton in a Spin

Prolific MIDI control hardware manufacturers Kenton Electronics have launched yet another MIDI controller. Their latest offering, the Spin Doctor, is an entry-level controller featuring 16 rotary knobs and costing £125. Although it lacks the onboard command editing and setup facilities of the more expensive Kenton controllers, such as the Control Freak Live, reviewed in December's *SOS* (see www.sound-on-sound.com/sos/dec02/articles/controlfreaklive.asp), the Spin Doctor is fully programmable via the free software editor. Alternatively, settings can be arranged on a Control Freak (Original, Studio or Live) and then exported to the Spin Doctor. Existing Control Freak Studio users may be particularly interested in adding the Spin Doctor's 16 knobs to the Studio's 16 buttons and 16 sliders. A wide range of control profiles for various software applications and hardware modules is also available from the Kenton web site. Profiles can be stored in the 25 onboard program memories, and a function key, an edit key and a data-entry knob provide basic program-editing controls. The Spin Doctor can send a wide range of MIDI messages including SysEx and NRPNs, and a scrolling four-character LED screen displays program information, MIDI in/out, and SysEx activity. The wedge-shaped rugged metal unit, measuring 242 x 120 x 50mm (WHD), is powered by an external DC adaptor (supplied) and features one MIDI input and one output, plus a 'soft-thru' function which automatically merges data from the MIDI in with the outgoing signal. The Kenton Spin Doctor should be available by the time you read this.

T Kenton Electronics +44 (0)20 8544 9200.
F +44 (0)20 8544 9300.
E sales@kenton.co.uk
W www.kenton.co.uk

Time Domain speaker technology reaches the desktop

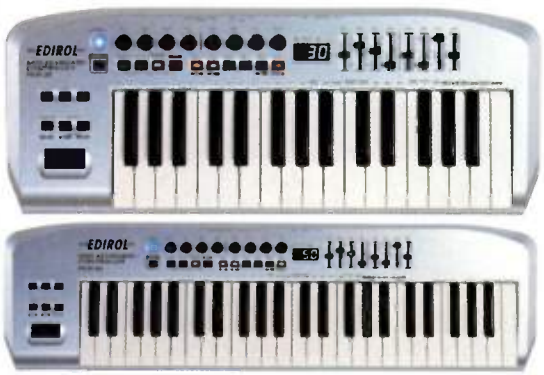
Eclipse TD, the company behind the TD512 Time Domain nearfield monitors reviewed in June 2002, have released a new pair of monitors. The TD508PA is aimed at desktop audio and AV applications, yet offers the same phase and impulse signal integrity of the larger system. The small monitors even have the same egg-shaped enclosure. This moulded, mineral-loaded resin design aims to be totally rigid, and thus to help eliminate internal standing waves and enclosure resonance. A large steel anchor weight at the rear of the driver assembly further helps with damping, and various techniques have been employed to minimise diffraction. The result of this careful design is that the eight-centimetre driver is, Eclipse claim, capable of a useable frequency response of 55Hz to 20kHz. Eclipse also note that the stereo image and overall performance is similar to that of the larger TD512. The monitors are supplied with their own amplifier (pictured on the right above), which supplies an output of 12W per channel.

T Eclipse TD +44 (0)20 7328 4499.
F +44 (0)20 7624 6384.
W www.eclipse-td.co.uk

Combined MIDI keyboard and controller from Edirol

Edirol have announced a new line of USB MIDI keyboards featuring programmable real-time controls. The top panels of both the 32-key PCR30 and the 49-key PCR50 feature eight rotary knobs, eight sliders and nine buttons, and the controls can be assigned to all types of MIDI messages, including control changes, SysEx, RPNs and NRPNs. Controller assignments are saved in the onboard memory which also comes pre-loaded with settings for Steinberg *Cubase*, Cakewalk *Sonar*, Digidesign *Pro Tools LE* and MOTU *Digital Performer*. Further templates will eventually be available to download from the Edirol web site. The PCR-series keyboards are powered by the USB buss and also feature velocity-sensitive keys, a pitch-bend/modulation lever, sustain and expression pedal inputs, and a MIDI In and Out, allowing them to act as one-in, one-out USB MIDI interfaces. The PCR50 (£199) and PCR30 (£149) are scheduled for release in December 2002.

T Edirol Europe +44 (0)20 8747 5949.
F +44 (0)20 8747 5948.
W www.edirol.co.uk



Virtual synth, real hardware from new Swiss company

Swiss company Frei Audiotechnik, a new name to us, have released a hardware/software combination modular synth for PCs, running Windows 98 or XP. Ikaron is supplied as a PCI card which provides the sound-generation hardware, thus making few demands on the host computer, and a software front-end with which you create synth patches. The card offers individual audio inputs and outputs, as well as five DSP chips that provide the computational power for up to 64 voices of polyphony. Over 40 modules are available, including virtual analogue components, sampling, FM, wave sets, and effects, with which you can create your own synth patches from scratch. The package should be available as you read this, and will sell for 865 Euros, plus VAT and postage.

T Frei Audiotechnik +41 (0)52 363 13 48.
F +41 (0)52 363 13 48.
W www.ikaron.ch

What the press say

"This is a winner of a workstation" Sound on Sound

"The most comprehensive workstation/controller on the market" Future Music

"This is a fat synth with a mean bottom end" SOS

"Superb sounds, sequencer, effects, sampler and unprecedented computer integration" FM

"Awesome and very desirable" Music Mart

"The Motif is sonically superb" Making Music

"A big impressive sound" SOS

"Effects score high for selection, variety and quality" SOS

"The actual Motif onboard sounds are fantastic" FM

"It's almost as if the Motif has become an extension of your computer" SOS

"Leaves you wondering how they managed to put in so much for such a low price" FM

With the largest wave ROM in its class, up to 190 note polyphony* and an ability to deliver a devastating wall of sound, MOTIF has already become the standalone workstation of choice for many professionals. If you look a little deeper though, you'll find features which allow new levels of communication between your synth and your PC.

• Realtime transport controls for Logic, Cubase, Pro Tools and Sonar via USB • Integrated Sampling Sequencer allowing tempo changes without pitch changes • 6 min 20 sec stereo sampling @ 44.1kHz (fully expanded) • Smartmedia and SCSI data back-up • *Expandable with DX, AN and VL synthesis (and more) using Yamaha's PLG plugin system • www.motifator.com for unparalleled product support.

Visit www.yamahasynth.com to find out more.

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Register at www.yamaha-music.co.uk to receive Play, Yamaha's new Music Production Newsletter

PLAY

YAMAHA
www.yamaha-music.co.uk

Eight tracks on location with HHB PortaDrive

HHB's range of location digital recorders has recently grown by one, with the new PortaDrive offering one significant enhancement over other entries in the range. It's an eight-track device, capable of recording audio at 24-bit/96kHz to its internal, removable hard drive. PortaDrive is also equipped with a heathy range of analogue and digital I/O: six phantom-powered XLR mix inputs and two line-level analogue ins, eight channels of AES I/O (on a 25-pin 'D'-Sub connector), plus stereo S/PDIF I/O. A word-clock output is also specified, along with a sync input and a five-pin timecode interface. The large graphic LCD enables easy access to PortaDrive's built-in mixer, as well as other operational functions. Metering is large and bright, and a

second LCD offers instant feedback of input levels, which are governed by dedicated multi-function rotary encoders.

Audio is recorded in AES31 or Digidesign *Pro Tools* v5 Session formats, generating Broadcast WAV or *Sound Designer II* audio files respectively, and allowing easy transfer of PortaDrive sessions to Mac- or PC-based audio workstations. Over eight hours of uncompressed eight-channel 24-bit/96kHz digital audio can be recorded to the supplied hard drive. An optional 5.25-inch docking station, which can be plugged directly into a PC's drive bay, can accommodate the recorder's hard drive for easy file transfer; it's also equipped with Ethernet, USB and SCSI, allowing for a wide variety of transfer and backup options.

The PortaDrive is powered by a 50W rechargeable Lithium Ion battery, which provides a minimum of two hours of constant operation. An AC adaptor is also supplied. This doubles as a charger when the PortaDrive is not in use.

T HHB Communications +44 (0)20 8962 5000.
F +44 (0)202 8962 5050.
W www.hhb.co.uk

Third-generation modular DSP synth from Creamware

The Modular III, the latest modular synthesizer system for Creamware DSP platforms, is now available. New features include a wavetable oscillator with the waveforms of the Prophet VS, a multi-mode filter, single-side-band modulation, and a build-your-own vocoder. The Modular III offers over 200 modules, including some designed according to wish-list specs supplied by acclaimed film composer Hans Zimmer, who was singing the Modular III's praises in last October's *SOS*. In a system with so much flexibility, the new Modular Remote Control seems a sensible addition; up to 16 freely selectable patch parameters can be controlled from this independent window. The Modular III is available now for PC and Mac, and requires one of the Creamware DSP cards to run (Luna, PowerSampler, Pulsar or SCOPE). It can be purchased from the Creamware web site for 259 Euros (about £163). Modular II users can upgrade to Modular III for 115 Euros (about £72).

Creamware users may also be interested to hear that French plug-in manufacturers D-Mute have released a free plug-in for the SCOPE platform. *D-Comp* emulates vintage hardware compressors and is easy to set up, with just four controls to worry about (Attack, Release, Input Level and Output Level). *D-Comp* also features a brickwall limiter, a 'side' circuit switch which alters the internal signal path, and stereo or mono operation. In stereo mode, it uses less than 40 percent of one DSP card. You can download *D-Comp* from the D-Mute web site, where you'll also find a range of free filter and modulation plug-ins for SCOPE.

W www.d-mute.com
W www.creamware.de

MasterVerb goes Mac

The acclaimed *MasterVerb* reverb from Wave Arts (US$149.95) is now available with Mac VST support, as well as for PCs in both VST and DirectX formats. In the same upgrade (to v3.02) *MasterVerb* has been improved in a number of ways. Full DirectX and VST automation of all parameters is now offered, and there's a new Diffusion control, following user suggestions, for better control over early reflections. Factory presets now number 32, including 16 new ones from *SOS* columnist Martin Walker, and output metering is now provided, with automatic adjustment of output gain to prevent clipping. The upgrade to v3.02 is free to registered users. *MasterVerb* can be purchased from the Wave Arts web site, which is where you can also find fully functional time-limited demos.

W www.wavearts.com

Apple drivers for Terratec 24/96 audio cards

Soundcard developer Terratec Electronic have announced that their entire range of 24-bit/96kHz audio cards is now compatible with Apple Mac computers; drivers are available on the Terratec web site for both Mac OS X and Mac OS 9.x systems. Cards supported include the EWX 24/96, DMX 6fire 24/96, DMX 6fire LT, EWS88 D, EWS88 MT, and EWS MIC2/8.

W www.terratec.co.uk

CD-ROM tutorial for Propellerhead *Reason*

Propellerhead Software and their distributors M Audio have produced a guide to their software studio entitled *Producing Music with Reason*. The CD-ROM costs £25 and contains three hours of audio-visual tutorials and resources for *Reason* users. You can watch a clip from the CD-ROM at Propellerhead's web site.

W www.propellerheads.se

Handy Mac-friendly add-ons from Griffin

Griffin Technology, the company behind a useful family of serial-port cards for modern Macs, have expanded their range of interesting add-ons. For example, there's the iMic, a compact, cheap USB audio interface that adds basic stereo audio I/O for Macs and PCs that lack it, or provides a higher-quality alternative to built in audio hardware. It can accommodate line or mic sources, and can even interface with a turntable's output, via *Final Vinyl*, a free Mac OS X application that is equipped with the necessary equalisation and RIAA curves.

Then there's the iCurve (see right), a desktop stand for Mac Powerbook and iBook laptops made from clear moulded plastic and styled in the manner of Apple's desirable flat-screen displays. It raises your laptop up off the desk, not only freeing up space for a full-size keyboard and mouse, but also lifting the screen to the height recommended by health and safety standards (the top of the screen should be level with your eyes). The iCurve costs just over £40 (including VAT but not shipping) and is the stylish alternative to a stack of *SOS* back-issues for the laptop owner who has it all.

Another interesting little gismo from Griffin is PowerMate. This is essentially a cross-platform (Mac OS 9/X or PC), USB-equipped, brushed-aluminium knob! More specifically, it acts as a 'multimedia controller and input device'. Its basic job is to act as a volume control for any audio application, but it can be more than that: practically any key combination that your computer keyboard can manage can be emulated by the PowerMate, with the help of the supplied utility software. For example, you can use it as a jog/shuttle wheel to scroll on-screen with video editors or MIDI sequencers, or as a mouse replacement to scroll through long PDF manuals. An integrated switch lets you mute audio, and, with the latest v1.5 software updates (for Mac OS 9 and Mac OS X), you can eject CDs if your computer keyboard lacks this handy facility. Also new with v1.5 is the so-called 'long click', which is also fully assignable. Just press and hold, for a user-definable time, to access whatever function has been assigned. In addition, a new 'Global Only' mode is available for when you just want to use PowerMate as a volume knob. You probably have to see the PowerMate, which costs £53 including VAT, to appreciate how attractive it is and decide you want one, but it definitely works for some people; apparently Griffin sold 10,000 of them in the three months following its release!

T Alta Technology +44 (0)20 7978 6644.
E info@altatechnology.co.uk
W www.griffintechnology.com

BIAS keep the noise down

BIAS's new *Sound Soap* is a noise-reduction software tool for Mac and PC aimed at music and audio enthusiasts, multimedia and web developers, and video-makers — and the control set comprises just two on-screen knobs. Simply manipulating these should allow the user to remove unwanted hiss, rumble, room noise and other background noise from digital audio files; no understanding of audio processing is required, as the software's screen 'shows' the noise being removed as the on-screen knobs are operated.

Sound Soap has been designed to deal with broadband noise such as the types just mentioned, as well as removing low-frequency rumble and electrical hum, and is capable of learning the difference between the unwanted noise and the wanted audio. BIAS say the program is most effective with subtle-to-moderate noise, but point out that even with more extreme noise problems *Sound Soap* could make the difference between an unuseable and a useable sound file. A free version is available for download from the web site below.

BIAS have also announced v3.1 of their renowned *Peak* audio editor for Mac. The new version is native for Mac OS X and fully compatible with Apple's latest OS X revision, v10.2, or Jaguar, though it will also run under Mac OS 8.6-9.x.

The update adds a number of file-format enhancements, including support for Apple's QuickTime 6, and audio encoding with Dolby's AAC (Advanced Audio Coding) audio-compression algorithm.

Feature improvements for v3.1 include:

- A Duplicate command, to allow fast and easy automatic repetitions of audio material (for example, loops) in a file.
- User-definable contextual menu support, making menu command access quicker and more intuitive.
- Enhanced WAV file support: any markers, loops and regions defined in a WAV file saved within *Peak* are maintained when the file is opened in another WAV-compatible application. In addition, Broadcast WAV files are now supported, as are 24-bit WAV files.

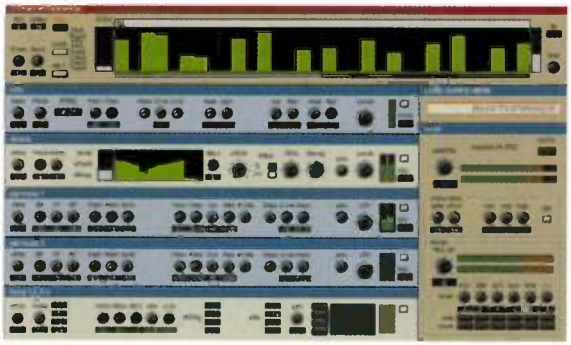
Owners of *Peak* 3 can upgrade to v3.1 free by downloading it from the BIAS web site. Other upgrade information is available at the BIAS web site, and there are free trial versions of the software for download. New purchasers of *Peak* can expect to pay £349 for the package.

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

Latest releases from Native Instruments

Native Instruments have released a new group of instruments for their *Reaktor* v3 modular studio software. *Reaktor Electronic Instruments* volume one is a dance-oriented instrument set made up of seven components:

- The *Rhythmaker* GM-compatible drum machine, with four drum-synthesis modules and an eight-channel sequencer.



- The *Titan* lead synthesizer, featuring four oscillators, three envelopes, three LFOs and two filters.
- The *Grobian* bass synth.
- The *Atmotion* sequenced atmosphere and pad synth, with sequencer-based control over filter cutoff, oscillator level, and FM depth.
- The *EnFX* envelope-following multi-effects plug-in, with input-modulated filter, distortion and delay.
- The *Longflow* dub delay, a stereo delay with long decay times, high- and low-pass filters and modulation of both delay time and filter frequency.
- The *Anima* moving filter bank, an array of graphically controlled band-pass filters that can be used together or separately.

Reaktor Electronic Instruments volume one is available now and costs £49.99. It's also available bundled together with the *Reaktor 3 software for £279.99*.

Native Instruments have also released version 2.0 of their *Traktor DJ Studio* software, which is available for the first time in both Windows and Mac OS 9.2 and OS X formats. *Traktor* allows users to mix MP3, WAV and AIFF files via an interface modelled on conventional DJ hardware, with the added ease of one-click beat matching, looping and cueing, and drag-and-drop playlist assembly. The update incorporates new MP3-decoding algorithms, filters borrowed from *Reaktor*, and improved search functions. Registered users can download the new version for free from the Native Instruments web site. *Traktor DJ Studio* v2.0 costs £109.99.

Finally, *Absynth Sounds* volume one contains 256 new sounds, presets and loops for *Absynth* users. Each of the pads, sequences, synths, effects, basses and drums is programmed with full MIDI control of velocity, modulation and other parameters. *Absynth Sounds* volume one is available now, and costs £29.99.

T Arbiter Music Technology +44 (0)20 8970 1909.
F +44 (0)20 8202 7076.
E sales@arbitergroup.com
W www.arbitergroup.com
W www.native-instruments.de

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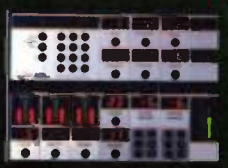

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EUROPE'S LOWEST PRICES GUARANTEE*

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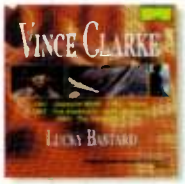

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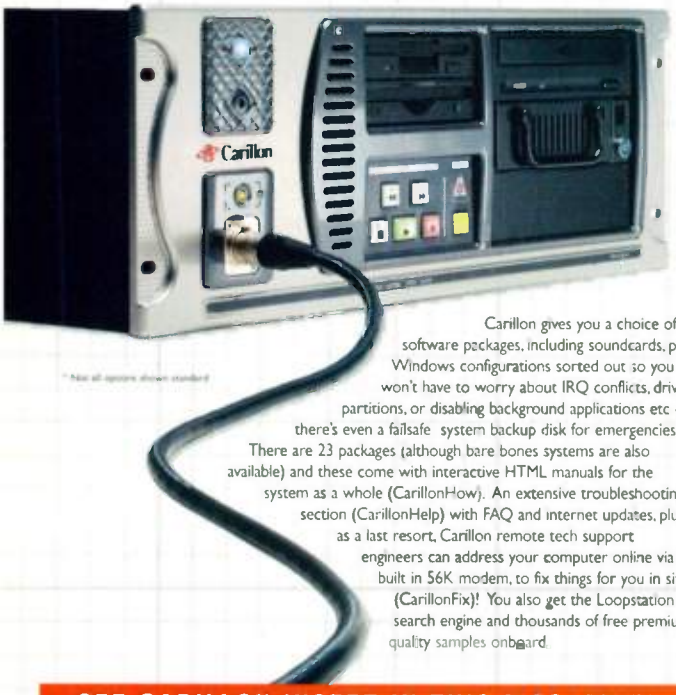
Carillon

Carillon Audio Systems proudly present the first ever "Audio Computer", designed and built specifically for music recording studio use, where noisy fans, drives, RFI interference and unreliable flimsy hardware are absolutely unacceptable!



Carillon's heavyweight steel and aluminum rackcase is built to last, won't rattle or vibrate, and provides considerable sonic and electrical isolation, and inside are Carillon's own UltraMute PSU, plus super low noise fans, a hard drive sleeve, and many other noise killing innovations, including sorbothane anti-vibration feet and rackear dampers.

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- Firewire audio interface and hardware controller with ProTools LE recording software
- 32 audio tracks in software, 2 mic/ line inputs and outputs
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- Hardware controller interface and USB hub
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- THE absolute industry standard mic
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NB Product sold is VST5.1 packaged with free SL upgrade, Halion + Sx Cubase Soundsets!

£349 STEI-CUBSL

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MXL MCASP2 CONDENSER MIC

NEW

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RRP £99 £69 MXL-MCASP2

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AUDIOPHILE SOUNDCARD

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

RRP £180 **£142.99** MMAN-AUDIOFIL

MIDI SPORT 2x2 MIDI INTERFACE

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

RRP £60 **£52.99** MMAN-SPORT2X2

1X1 ALSO AVAILABLE only £45.99
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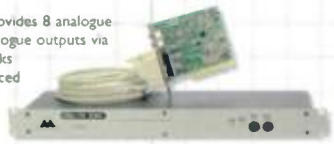
DELTA 44/66 PCI AUDIO INTERFACE

The Delta 44 midi interface consists of a full duplex PCI card and breakout box, featuring 4 balanced TRS jack ins and outs. The Delta 66 offers 4 analogue ins, 4 analogue outs and 2 channel digital I/O via S/PDIF coaxial. Both cards support 24 bit 96kHz rates and have a 103dB S/N ratio, all of which support up to 24 bit 96kHz rates. Full duplex rec / play.

FROM **£169.99** MMAN-DELTA44

DELTA 1010 PCI AUDIO INTERFACE

This PCI card provides 8 analogue inputs and 8 analogue outputs via TRS balanced jacks (accepts unbalanced as well) plus an S/PDIF coaxial I/O with wordclock BNCs. It also has the MIDI in and out and provides full duplex operation to any PC. The converters are in the outboard 1U rack and handle 24 bit 96kHz rates. Operating levels are +4dBu or -10dBV, and can achieve -100dB THD+N.



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OMNI I/O ALSO AVAILABLE only £145.99 - expansion box for Delta 44/66 featuring 4 balanced imputs (2 with phantom powered mic preamps) 4 stereo ins, aux send + return + dual monitor outs.

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BiG Briar minimoog voyager

Big Briar's cheif designer, Bob Moog introduces his latest monophonic analogue synth, the Minimoog Voyager, based on the original Model D from the Seventies, and can be thought of as a modern day equivalent of the classic Minimoog, though vastly updated and improved with a true velocity sensitive 44 note keyboard which also responds to aftertouch, compared to the original whose notes were just on or off.

*Blue backlit wheels shown are an extra cost option.

Voyager is also sporting a new touch pad, MIDI and many cutting edge features! There are 3 oscillators and a noise generator feeding two LPF resonant filter stages and a VCA, which can be modulated by two ADSR envelope generators (externally triggerable) and an LFO with selectable waveforms including two sample and hold types. Voyager features pitch bend and modulation wheels, a built in 5 channel mixer and external audio inputs. The touch pad responds to vertical / horizontal movements and pressure allowing three parameters to be controlled. There will be two versions of this synth - the Performer's Stage Edition, with a solid hardwood cabinet as described here, and a special limited signature edition with a choice of woods.

A must-own modern classic!

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SOUND QUEST INFINITY

virtual device studio

CREATE YOUR OWN PLUG-INS, SOFT SYNTHS & MUCH MORE!

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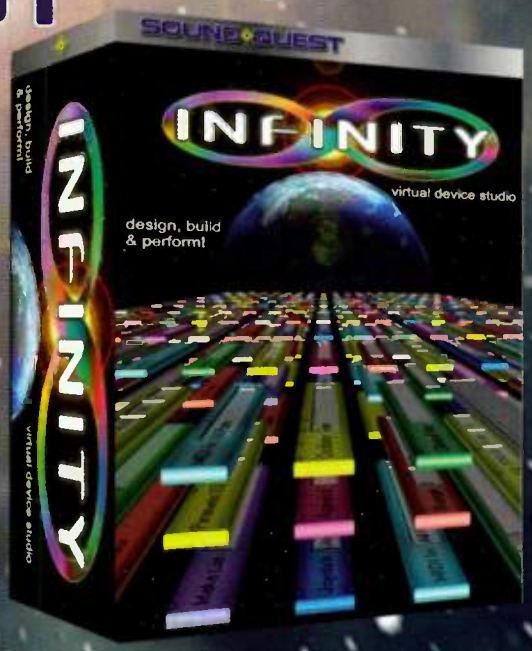

Infinity is a Virtual Device Studio program that includes a library of over 360 configurable modules that you can insert and interconnect to create the audio plug-ins of your dreams - but this is only the beginning!

Infinity also accepts VST, VSTi, DirectX or DXi plug-ins as Infinity Objects.

This means you can take your existing plug-ins (or download some from the many freeware models available on the internet) and combine them within ***Infinity*** under new front panels of your own design and register the combined device as a plug-in effect or instrument with any host such as Cubase, Logic, Sonar and Cakewalk, to name a few.

Infinity also includes an army of prebuilt virtual devices including additive, subtractive and FM synths, drum kits, organs and samplers. Dozens of audio effects units are provided, along with many sophisticated MIDI processing devices like arpeggiators, pattern sequencers and even a multi-track MIDI event recorder for outstanding device automation.

As a free standing environment, ***Infinity 2.0*** supports the low-latency ASIO standard as well as Direct Sound and WAVE drivers for Windows 95, 98, ME, 2000 and XP. For even greater portability, any virtual devices created with ***Infinity*** can be loaded and performed individually by Alpha, an included player program that you can distribute freely with your creations.

Infinity - the only limit is your imagination.

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- 12 encoders with push button functions and LED indicators
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- 67 illuminated buttons
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- Heavy duty metal construction
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Nothing but the truth.

The truth about nothing but the truth.

The problem with most so called reference monitors is they simply can't reproduce the full range of audio frequencies needed for true representation of the sound, especially low frequencies. Today's most common monitors use a 2-way design with 8" woofers to cover the low frequencies, but they can't go down low enough to give you the lowest octaves that are essential to the character of so many instruments, like bass and drums.

Ported v sealed boxes.

Some designs use ported cabinets to help do the job woofers can't do on their own. While a port can extend low frequency capabilities, it can't deliver the transient response of a sealed box. At high levels, airflow through the port produces turbulence that reduces efficiency and actually causes high frequency noise. There's no getting around it—If you want a true reference, you need a sub-woofer.

The truth about the "hole" truth.

With the advent of 5.1 surround sound, the low frequencies have received much more attention. Many companies now offer subwoofers as add-ons for stereo monitors. But when components aren't designed to work together matters can get more complicated, and new problems are often created—such as an audible hole in the sound.

Introducing the world's first 2.1 system.

21© integrated 3-way system

The Blue Sky 2.1 System is the first stereo monitor to deliver full range sound without compromises. It is a true system in every sense. It includes two powered 2-way satellite speakers and a powered subwoofer with a 12" driver in a sealed cabinet. 2.1 Bass Management circuitry directs all the frequencies where they belong. It's a true integrated three-way system. Every component is optimized for the system. Our 2.1 system delivers coherent, seamless audio that is more accurate and more full range than even the most expensive alternatives.

Your room is a part of the system.

Because of its essential design, the 2.1 system allows the user to place the satellites for optimal imaging and the subwoofer for optimal bass response. The system design acknowledges the listening environment as a major factor in what we hear.

The Blue Sky BMC (Bass Management Controller) offers a total in-place solution for controlling any 5.1 system.* With Blue Sky Systems, you get accurate, full range audio in a real room - your room. And the transition between subwoofer and satellite is totally seamless. It reproduces smooth, even bass response throughout the monitoring area.

51 integrated surround system

Why did we build such an amazing system at such an affordable price?

Because we can!

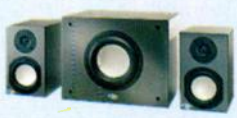
Blue Sky is dedicated to developing better solutions to improve the process of sound creation and reproduction. Our mission to to develop innovative products that are not only technologically advanced, but affordable to the greatest number of serious people.

Blue Sky 2.1 and 5.1 systems have been field tested in some of today's most demanding rooms. They've earned the THX seal of approval and raves from some of today's most well respected audio professionals.

LUCASFILM THX pm3

Visit us on the web for more complete information on our products, company, philosophy, and technology - and see who's using and talking about Blue Sky. Then hear what you've been reading about. Call or e-mail to arrange a demonstration or ask about our money back guarantee.

NEW PRO DESK 2.1 SYSTEM!



Slightly smaller than the 2.1 System, ProDesk features two Sat 5 speakers (5 inch woofer, Vifa tweeter, 60W bi-amplified design) and a Sub 8 bass unit (single 8 inch long excursion woofer with 2 inch voice coil and 100 discrete amplifier) The system manages ±3dB 30Hz - 20kHz, which is very good performance, and delivers clean output to excellent close field monitoring levels. Stereo imaging and soundstaging is also superb. 5.1 Pro Desk system also available.

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*See Bluesky website for details. SAT 6.5 and SUB 12 are approved for use in THX pm3 Certified Studios. THX pm3 is a registered trademark of Lucasfilm Ltd. The 2.1 symbol is the property of Blue Sky Intl.

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VIRAL EVOLUTION:

Quite simply this is the best digital filter I have heard - Sound On Sound '98

Overflowing with character - Future Music '00

The Virus can generate speaker shattering bass - SOS '00

If you're shopping for a new virtual analog synth, you'll be sick if you don't check out the Virus - SOS '00

The Indigo itself is built like a Panzer tank - SOS '01

The Virus Rack sounds superb - SOS '01

I doubt that I will ever tire of it's sound - SOS '01

Undoubtedly the most powerful virtual analogue synth - SOS '01

You can't fail to have fun with this, or to find inspiration playing it - SOS '02

A beautifully designed little beast with a huge personality - SOS '02

The Virus C is a gorgeous instrument, equally at home reproducing anything from polysynth overkill to hardcore trance and ambient textures - SOS '02

The best analogue-style synth on the market - SOS '02

A seductively rich, smooth and natural analogue-modelled sound with a beautifully exuberant character - FM '02

An exceptional synth that's destined to become a classic - FM '02

VIRUS C
VIRTUAL ANALOG - DEFINED.

MUSIC MAGAZINE READER AWARDS 2002
No.1 HARDWARE SYNTH

The Virus C is here - it sounds spectacular, it's drop dead gorgeous, and the enhanced engine is totally turbo-charged!

32-voice polyphony, a friendlier front panel, 3-band EQ per part, undo/redo/random, and 1024 killer presets are just a few of the exiting additions to make it your favourite synth ever.

Experts regard the Virus as THE quintessential modern synth , with the world's best sound and features (check out the review comments opposite). The highly-evolved C sings with the legendary warm analog character that made instant classics of its award-winning predecessors. It's incredibly flexible and easy to use, with the unmistakable sound that infected an entire industry, and of course enough headroom for generations of future software evolution and innovation (always free from Access!).

Give yourself the sound your music deserves.

VIRUS C

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32 NOTE POLYPHONIC
16 PART MULTITIMBRAL
INCLUDES SOUND DIVER
98 SIMULTANEOUS DSP EFFECTS
SURROUND SOUND
BUILT-IN POWER SUPPLY
1024 PROGRAMS

VIRUS KC

6 OUTPUTS, 2 INPUTS
32 NOTE POLYPHONIC
16 PART MULTITIMBRAL
61 NOTE VELOCITY AND AFTERTOUCH SENSITIVE KEYBOARD
98 SIMULTANEOUS DSP EFFECTS
SURROUND SOUND
1024 PROGRAMS

VIRUS INDIGO 2

6 OUTPUTS, 2 INPUTS
32 NOTE POLYPHONIC
16 PART MULTITIMBRAL
37 NOTE VELOCITY SENSITIVE KEYBOARD
98 SIMULTANEOUS DSP EFFECTS
SURROUND SOUND
1024 PROGRAMS

VIRUS RACK XL

6 OUTPUTS, 2 INPUTS
32 NOTE POLYPHONIC
16 PART MULTITIMBRAL
INCLUDES SOUND DIVER
98 SIMULTANEOUS DSP EFFECTS
SURROUND SOUND
BUILT-IN POWER SUPPLY
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VIRUS RACK

4 OUTPUTS, 2 INPUTS
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16 PART MULTITIMBRAL
INCLUDES SOUND DIVER
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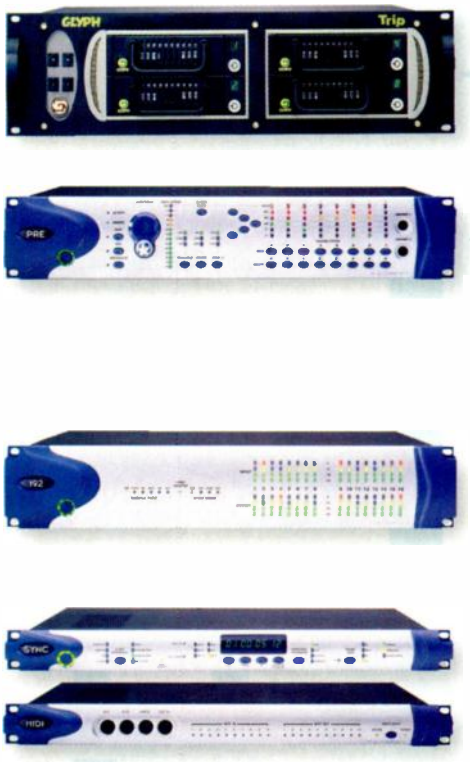

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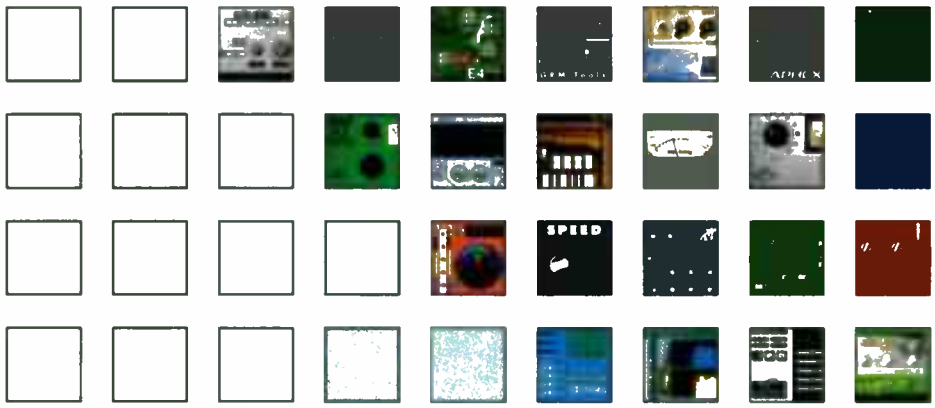

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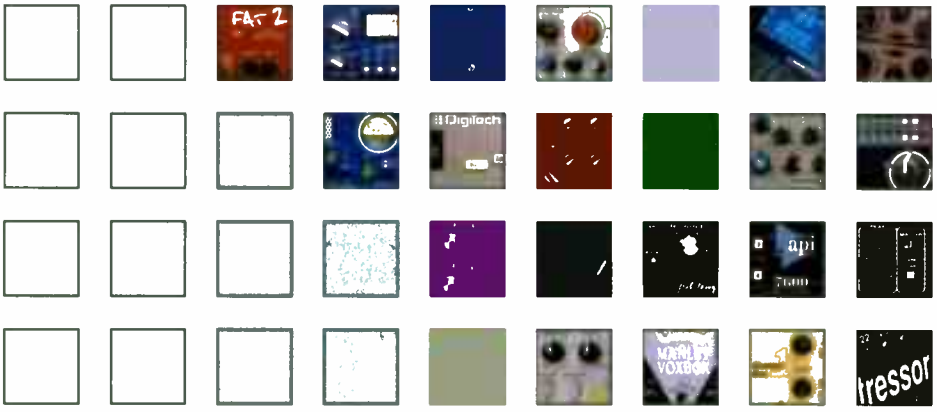

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- Combination stereo mic preamp of high quality solid state front end and reference quality A/D converter based on PSX
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Avalon VT737SP

- High end valve channel strip with mic / line / guitar jack input, classy preamp with HPF, polarity and 48V
- Excellent transparent and musical compressor
- 4 band semi-parametric EQ, switchable pre/post
- £1699

Empirical Labs Distressor

- 1U rack stereo hard knee compressor with settings ranging from soft to an oddball "Nuke" mode that adds considerable distortion as an effect
- Generates 2nd and 3rd harmonics in abundance
- £1299

Eventide Eclipse

- Two channel version of the Orville multi-effects unit
- 24 bit 96kHz processing
- Intelligent pitch shifting, reverb, spacious stereo chorus and much more
- Fully MIDI controllable
- £2199

Focusrite ISA-220

- The new Session Pack is a bargain half price Producer Pack! Slightly fewer controls / options
- Mic / line, 2 band para EQ, hi / lo shelf, sweep HPF
- Comp, de-S, limiter and optional 24bit 96kHz A/D
- £1199

Focusrite ISA-430

- Transformer balanced mono channel strip
- Mic preamp with line and high Z instrument input
- 4 band EQ, noise gate
- Optional 24 bit 96kHz A/D
- £2099

Lexicon PCM91 FX Processor

- Currently one of the best sounding digital reverbs money can buy
- AES/EBU digital I/O
- In-depth editing + MIDI
- Excels at small acoustic spaces + early reflections
- £1579

Studio Electronics DC2S

- Solid state Class A dual mono compressor
- Classic transformer coupled FET circuitry
- 1U rack design with full manual control and LED metering, and stereo link
- £1699

TC-Electronic M3000

- 24 bit VSS™3 Digital Reverb
- Full Editing Facilities + MIDI
- PCMCIA Card for 2MB Backup
- Easy or Expert Editing Modes
- £1189

TC-Electronic Finalizer 96k

- Now supports 96kHz via double fast AES/EBU
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- Levelling, sample rate conversion
- £1566

TC-Electronic Fireworx

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- Digital cruncher, ring modulator, vocoder, formant molding & more...
- £969

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- TL Audio's C1 soft knee valve compressor gets a new facelift!
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Q&A

Your technical questions and queries answered

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

Q Can I use my drum pads to trigger drum machine sounds?

I currently own some Roland SPD6 MIDI drum pads, and I want to be able to record from them into some kind of drum machine, so that I can use the rhythms in a live situation later (I play guitar and sing in a trio with a guitarist and synth player.) My local music shops tell me that things like the Zoom and Boss drum machines on the market today will not do this, as they say you cannot connect via MIDI and record the external MIDI information into them. Is there any other product that might be worth looking at?
Mark May

Reviews Editor Mike Senior replies: *If you're happy with the kinds of sounds you can get from the average drum machine, you could consider getting one of Yamaha's little QY-series hardware sequencers — the most recent we reviewed was the QY100. These*

MIDI pads such as the Roland SPD86 are ideal for capturing a live, stick-led drum performance.

have MIDI recording (called MIDI sequencing) facilities built into them, along with a MIDI sound module to provide the sounds. You could plug your SPD6 pads into the MIDI input on one of those machines and record your performance in real time. Then you could re-record sections or edit note-by-note, if you wished. The QY100 is inexpensive, and very portable, too, so it would be good for gigs. You can check out the specs in our review (SOS February 2002, also available on the SOS web site, www.sound-on-sound.com) and by downloading the manual from the Yamaha web site's library (at www.Yamaha.co.uk). Check out the rest of the QY range, too, because each one offers a different balance of facilities.

If you're after more realistic sounds, I'd suggest something like an Akai MPC2000, which also contains a MIDI sequencer.

However, instead of a generic MIDI sound module, you get a drum sampler, which allows you to use the most suitable sounds for your music. You could also look at the Yamaha RS7000 for this, and perhaps the Korg Triton or Trinity keyboard workstations with the sampling option (though these would be rather more expensive). Each provides these kinds of sampling and sequencing facilities in a slightly different format.

Q Are red indicators in audio software significant?

What is the best level, or what should be the highest indicator point in mixing, using computer software such as *Nuendo* or *Samplitude*? At times the mix will sound low when the LEDs are hitting red. Am I using my compressors wrongly? Also, how can you tell that your song is really going to have the desired punch in a club setting? This has given me headaches with clients complaining that their songs are not 'punching' hard enough. My overall compressor is the *Timeworks* mastering compressor.
Chris Musyoka

Features Editor Sam Inglis replies: *Red lights in any digital system, including computer software, indicate digital overloads and should be avoided. When a signal exceeds the maximum level available in a digital system, the audible result is digital distortion, which is not at all like the 'warm' sound of an overloaded analogue tape recorder or mixer channel, and is usually very unpleasant.*

Having said that, there are sounds (such as snare drums) where brief overloads are not very noticeable, and the mixing engines in many software packages seem designed to alleviate some of the audible consequences of overloading. As usual, if it sounds good, don't worry about how it looks! It should, however, be possible to get a punchy mix without continually overloading channel busses — if you find all your channels in Nuendo *are showing red lights, pull the faders down on all the channels and boost the Master channel instead.*

The usual way of achieving 'punch' is to process the mix buss with a stereo compressor and/or limiter: multi-band models generally achieve more transparent results than full-band ones. However, if your mix isn't punchy to start with, no amount of mix buss processing is really going to help that much, so you probably need to address some more fundamental issues. Is your monitoring system properly set up? Do your sounds sit well together in the mix? For instance, do your bass and kick drum sounds get muddled because they occupy the same frequency range, or do they complement each other?

Reviews Editor Mike Senior adds: *The best advice I can give is to ask your clients to bring in tracks which they consider to have the required amount of 'punch' and then to adjust your compressor and EQ settings to match these reference tracks. Set up your monitoring system so that you can quickly switch between your mix and the output of your mix buss — it's vital that you A/B very quickly, as this stops your ear compensating for any deficiencies in your mix.*

If you need advice on compression and EQ, I'd suggest looking up the Advanced Compression workshops (in the December 2000 and January 2001 issues of SOS*) and the two EQ workshops in July and August 2001. You might also want to look up the Advanced Gating workshops (April 2000 and May 2001), and the multi-band compression workshop (August 2002). This is only the tip of the iceberg, though, given that there are eight years or so of back issues available free to read on-line, many of them workshops. Mix processing is an extremely difficult thing to do effectively, so don't be afraid to mix things several times in order to experiment.*

Q What is 'zero level'?

Could you give me a definition of 'zero level', or explain what it is? I am a University student in my first year, studying sound recording, and I can't seem to find a definition for this anywhere! Any reply will be greatly appreciated.
***SOS* Forum posting**

Technical Editor Hugh Robjohns replies: *Virtually every book published in the last 20* ▶

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Q&A

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years that discusses recording techniques explains zero level in some depth (I have a bookcase full of them here), so the best thing to do would be to investigate your college library and do the homework for yourself. However, because there may be some confusion out there, I'll try and provide a simple explanation.

Audio signals are measured in decibels, as you no doubt know, and zero level is slang shorthand for the 0dB point — ie. where the reference and measured signal have the same value. However, that reference changes depending on what you are talking about.

- *0dBA is the threshold of hearing — the quietest sound an average person can hear.*
- *0dBu is a common reference level for line signals, and is usually the target of the 'zero level' term. It equates to a signal voltage of 0.775V rms. Another very common reference level for line-level signals is +4dBu (a signal voltage of 1.223V rms) and this is also usually (but certainly not always) the reference point for 0VU, the zero mark on a traditional VU meter.*
- *0dBm is irrelevant to audio these days, but was the correct term when everything used matched 600Ω impedance terminations. It defines the voltage when one milliwatt of power is dissipated in 600 Ohms... which just happens to be 0.775V rms.*
- *0dBV is rarely used in audio circles. The reference level for semi-pro gear is actually -10dBV, a signal voltage of 0.316V rms*
- *0DBfs is the highest possible value of a digital signal. Unlike analogue systems, which all encompass a certain amount of usable headroom above the 'zero level', digital systems stop at precisely 0dBfs, so a working headroom has to be built into the system alignment. Depending on the standard used, this is somewhere between 12 and 24dB, with 18dB being a common European standard. Consequently, 0dBu is often said to equate to -18dBfs.*

Q Can you advise me on vocal recording and microphones?

I currently have a small home studio and am making a a few different styles of music but mainly house and trance. I've used samples for remixing tracks but never done any actual vocal recording myself. Not so long ago I was asked by the lead singer of a group if I would help them do some recording. I really am interested in doing it, but the problem I'm hitting is acoustic treatment for the recording booth. It's so expensive, and reading the Studio SOS article in the October issue this year I see Paul White using a duvet for dampening down room reflections. Would it be good enough to hang duvets on the walls of the vocal booth ? Also, I'm not sure what mic I will be buying, as I don't know a great deal about them. I'll be on a budget of about £4-500. The mic will be running straight into the mixer itself, which hopefully will be the Mackie 32-channel. I have been told that it would be fine to run the mic straight into the mixer, as the Mackie's quality is very good.
Craig Young

Reviews Editor Mike Senior replies:
Regarding your acoustics, a couple of duvets should do the trick here. If not, you can always upgrade your treatment at a later date with some acoustic foam. To address your second question, at that price for a mic you've got an awful lot of choice. You should only need a cardioid (unidirectional) polar pattern, and you ought to be able to do without pad or filter switches — vocalists aren't likely to get that loud and you can filter low end on the mixer channel.

Your main choice will be whether to go for a solid-state or a valve model. The solid-state ones will give good results on a variety of different sounds, but the enhancement provided by a valve model may be more suitable for your vocal-only applications, if you want that kind of sound. If you're after a solid-state mic, our Editor Paul White very much likes the Rode NT mics — the NT1 is currently excellent value. There's also a very nice Rode valve mic, the NTK, which is within your budget. Another one to have a look at is the AKG SolidTube, which I've heard models its sound on my personal favourite vocal mic, the AKG C12. Having a quick look through the Turnkey ad in this month's issue, there's also a good deal on the AKG C414, a classic solid-state mic, which brings it within your price range. There's also the Neumann TLM103, which is another lovely mic from a pedigree manufacturer, for around £470. In short, you're spoilt for choice, even without considering the flood of super-cheap Chinese-built clones from XIX, Joemeek, Red5 Audio, Studio Projects, Canford, Samson, MXL, and a growing number of others. The good news is that you shouldn't go wrong with any of the mics I've named above. Furthermore, any money you spend on a good mic will certainly not be wasted, so don't necessarily head for the cheapest option.

As for plugging the mic directly into your mixer, if you're getting one of the Mackie 'VLZPro' models, the mic preamps should easily do your choice of mic justice.

These days, even quality valve mics like this Rode NTK are very affordable.

Q Why have my faders stopped working?

I'm using a Roland VS880 digital multitrack, and one of my songs has developed a weird bug. The faders aren't working — they're just dead. Looking into the track parameters, I see that the channel mix levels are stuck on a fixed value with an asterisk after it (eg. 'CH MIX LEVEL=102*'), and using the wheel to vary the value is now the only way I can think of to alter it. Any ideas?
Alan Pittaway

Reviews Editor Mike Senior replies:
I have a couple of ideas as to the root of the problem. That asterisk after the fader value means that the position of the physical fader is not representative of the actual internal level parameter. This situation can easily arise in normal use, because of using the same set of faders to adjust several sets of level parameters, and also because the automation can move the level parameter but not the physical fader.

If a mismatch between the level parameter and the physical fader occurs, you can normally set the level parameter to the physical fader position simply by moving the fader. However, if the Fader Match mode (set in the System menu's System Prm sub-menu, I think) is set to 'Null', you have to move the physical fader through the current

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Q&A

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level parameter value before the level parameter will follow the physical fader again. If you want it to work as it did before, simply switch Fader Match to 'Jump'. If this does't sort things out, it's probably because you've got the machine's local control switched off. Head to the System menu's MIDI Prm sub-menu and switch the Cntrl Local switch to 'On'. What is the MIDI Local Control switch there for, I hear you wonder? It's for using the VS with a sequencer, so that you don't get a situation where the VS faders and the sequencer are both sending control signals to the VS's internal digital mixer.

Q Does normalising have any adverse effects on audio?

I have a question to which I haven't really been able to find an answer. Most of the time, I tend to record audio to my *Pro Tools LE* system at somewhat under digital full scale, so that I'm 100 percent certain of not getting any distortion. Recordings are then normalised, maximising the peaks and making the audio as 'loud' as possible while maintaining dynamics, before I start mixing. What I'd like to know is whether the normalisation process actually changes or degrades the audio in any way, beyond adding bits to increase level.
Alex Elliott

Technical Editor Hugh Robjohns replies: *The normalising process searches the audio file for the highest recorded peak, and then applies gain to the entire file to raise that highest peak to 0dBfs, thus raising the level of the entire file. A lot of people work this way, and it is a useful technique, since you can allow sufficient headroom during recording to avoid transient overloads, yet peak levels can subsequently be maintained at a similar level to commercial products.*

Obviously, the amount of gain added to normalise the signal will also raise the noise floor by the same amount, but with the prevalence of 24-bit converters these days, the noise floor is almost certainly going to be dominated by your own recording environment rather than the resolution of the recording system, so you are not losing anything in this process. The original dynamic range will be maintained.

The only other possible cause for concern is the issue of 0dBfs peaks. While working on the signal within the DAW environment (assuming a floating-point DSP system) this causes no problems whatever. However, some thought and care needs to be given to using normalised signals for making CDs. Although it is common practice to peak signals to 0dBfs during CD mastering, some mastering engineers are now making -0.5dBfs (or even lower) their maximum level. The reason is to avoid the danger of overloading the D-A converter in the replay system, since reconstructing a signal which has several 0dBfs peaks in close succession can create an analogue waveform which has a greater amplitude than its source samples. This can overload the D-A converter or the analogue electronics, which is clearly not a good thing.

If you really want orchestral realism, there's nothing to beat a sampler (perhaps a soft sampler like Steinberg's *HALion*) and some decent orchestral sample libraries.

Q Can I obtain better orchestral sounds on a budget?

I have a very humble home studio comprising a PC running Windows 98, a Creative Labs Soundblaster Live soundcard with MIDI interface, a basic 76-key controller and Steinberg *Cubasis VST* software. I write classical compositions, which means all of the above gear has been an investment, enabling me to score at 10 times the speed of transcription by hand.

The problem I have is that the SoundFonts supplied with the Creative package are OK but not accurate enough and produce a bad simulation of an orchestra. This defeats the purpose for me. Can I get hold of better banks of SoundFonts, say on CD somewhere? If this is not possible, is my only option to purchase a sound module such as the Emu Proteus?
Allan Wiseman

Features Editor Sam Inglis replies: *You can buy sample CDs in the SoundFont format, although it's fair to say that many of the more professional libraries are only available in other formats, such as Akai and Gigastudio. With your setup, you'll also be limited by the fact that the Creative card only has a certain amount of memory onboard to load SoundFonts. If you want to try to look for better SoundFonts, your first port of call should probably be Time + Space, who distribute most of the sample CDs sold in this country (their web site is at www.timespace.com).*

If your PC is a recent model with a reasonably fast CPU and plenty of memory, however, my suggestion would be that you look for a software sampler or synthesizer instead. (It would be worth checking that your version of Cubasis *supports VST Instruments, as this would be the most convenient format for you.) If you want the ultimate in realism, you would choose a software sampler such as* HALion *and a selection of orchestral libraries on CD. However, this will be expensive and time-consuming to set up, and if you want an all-in-one, easy-to-use solution, the most obvious choice would be Edirol's Orchestral Instrument (www.edirol.co.uk). It won't give you the same realism that you'd get from a nine-CD, £1000 set of string samples, but I think you would notice a substantial improvement over the Creative SoundFonts.* SOS

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Cutting Edge wonders whether G4 clock speeds and hot computers are connected, and speculates on a possible way forward for the Mac OS.

Dave Shapton

I was recently called in to give advice to a television studio about which editing system to buy for high-definition video. HD video is roughly analogous to high sample-rate 24-bit audio, but the data rates are astonishing, at nearly a thousand times the rate of CD-quality audio; that's around 140Mb of data per second. You need eight SCSI drives in a RAID level-zero 'stripe' to achieve this type of performance, and even then you can see from the drive activity lights that the things are working very hard indeed.

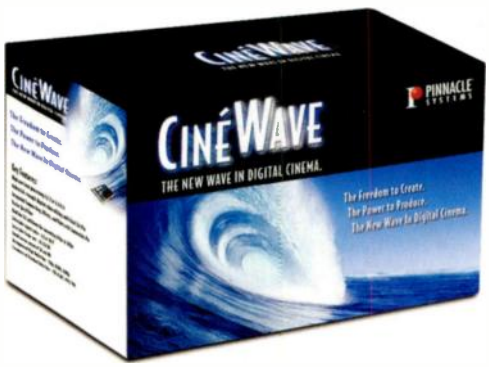
So you'd probably expect that any technical problems with an editing system would be caused by the high data rates and the fact that the host computer has to run flat-out just to put a picture on the screen. But no. The problem, it seems, is that the computer gets too hot.

The video editing device I was considering for the studio was the Pinnacle Cinewave. And the computer? A Mac.

Where There's Smoke

Cinewave is the first video-capture device that works with *Final Cut Pro* on a Mac at high-definition TV resolutions. I remember that there were surprisingly few technical issues when the device first came out, and I'd heard mostly good things about it. There isn't much demand in the UK for HD TV because it isn't a broadcast standard. In the US it is, and there is much more of a buzz around it. It will come here eventually (probably as a premium service on a satellite channel) and when it does I'll be very pleased, because it looks fantastic. Also, the improved production values might possibly provide more work for composers, because superb video demands superb soundtracks. (Well, we can hope!)

I suggested a Cinewave system to the studio because it seemed an obvious choice, given that the alternative they were looking at was 20 times the price, albeit somewhat more powerful. They decided to go ahead with my suggestion, so I started to do some background reading on the Cinewave user groups. The good news was that the product seemed well sorted.



Is the inside of a fast Mac too warm for comfort where Pinnacle's Cinewave is concerned?

The bad news was that it didn't appear to run on the latest Macs!

Now, there's nothing very new about this type of revelation. It's a constant problem for audio and video system integrators. High-performance digital media hardware is very fussy about the platform it runs on. Even a minor revision to a motherboard (or to an operating system!) can stop a device from working altogether. It's a big problem for manufacturers, whose only effective way round it is to refuse to support their products on anything other than a single platform, often an IBM or Compaq. Digidesign's Pro Tools professional systems are an example of this: on the PC platform, the only supported products are the IBM Intellistation and the Compaq EVO W8000 (although I've had Pro Tools HD working on several more 'generic' platforms, without, I should say, pushing the performance to any great extent, so I might have missed potential problems at the edge of the system's capabilities).

So I wasn't surprised to find that there were issues with the latest generation of Macs. But I hadn't expected to find that the oneissue was overheating.

The Cinewave board has Pinnacle's Hub 3 'memory-centric' video processor on board. It's a custom-build chip that generates a lot of heat — just like any chip that works hard — so it doesn't help if the computer it's in can barely keep itself from meltdown. And it seems that the latest-generation Macs are just too hot for the Pinnacle device to tolerate. (I have now heard that the Cinewave is working with the newest Macs, but that Pinnacle are still advising extra ventilation.)

Now I don't think you could accuse Apple of being careless with their design. It's very unlikely that they simply got the ventilation wrong. No. I think it's symptomatic of a deeper problem: perhaps their famous 'Supercomputer-on-a-chip' processors just won't go fast enough. The problem seems so severe that one explanation, in particular, is looking at least plausible: that they are having to resort to 'overclocking' their processors (making them go faster by simply turning up the clock speed), and living with the consequences, the most obvious of which is more heat.

Faster, Pussycat

By the time you read this, you should be able to buy 3GHz Intel Pentium 4 processors. Pentiums running at 4.7GHz have been demonstrated in the labs, and you can easily overclock current Pentiums to 3.3GHz. AMD are not far behind with their cheaper range of Athlon chips. What's the fastest Mac processor? 1.25GHz at the time of writing.

Clock speed isn't everything. But it certainly is something, and the more Apple fall behind, the more frantically they try to convince us on their website that their slower chips are really faster. Yes, OS X is a software miracle. It squeezes every ounce of performance from the G4 chip with its clever scheduling and multitasking. With a 64-bit PCI bus and a sustained throughput of 266Mb per second, together with a workstation-like architecture, there's no doubt that Apple have built a phenomenally efficient machine. But now it's time for a better engine. For every claim on the Apple website that applications like *Photoshop* run faster on a Mac, I've seen benchmarks run on fast PCs that appear to contradict these claims. I haven't done the tests myself, so I'm not in a position to confirm this, but I have used some of the latest 'twin Xeon' PCs and they certainly 'feel' faster than any Mac I have used. (A Xeon is a type of Pentium processor that is designed to be used in multiples. A twin Xeon PC is analogous to a Dual G4 Mac.)

So where can Apple go from here? They've got great design, a fantastic operating system and ▶

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customer loyalty that most religions would envy. But they need a new processor. What they certainly don't need is me and hundreds of other journalists telling them this. But in the absence of any kind of road-map, and absolutely nothing else concrete to report on, what else can we do but speculate?

Platform Games

The funny thing is, Apple have been here before. Several times. They've shown that they can successfully port their operating system to new platforms, and persuade their developers to come with them. And it's always been worthwhile: the benefits of platform migration have always been apparent. A year ago, at the beginning of 2002, there were reports in the computer press, and web sites such as www.osopinion.com, of a new 'G5' chip that boasted an even greater number of 'supercomputer'-type features. Interestingly it was slated to run at between 800MHz and 2GHz. You can make the comparisons with Intel's offerings yourself. Today, you'd think we'd have more concrete details, if not products sporting the chip itself. But we don't. Of course we may have tomorrow: you can never tell with Apple.

The trouble is that now is really not a good time to have another "we're moving to another platform. Again." conversation with the makers of Mac OS applications. Commercially and financially it's never a good time, but this time it's really bad, because most developers have been flat out for the last couple of years converting their software to run natively under OS X — when they could have been adding new features or tweaking their software in other ways.

For the last year or so I've been hearing rumours about Apple developing a version of OS X to run on Intel chips. Certainly, the 'Darwin' core of OS X exists in an Intel version, and Apple even documents it for developers (http://developer.apple.com/darwin/news/2000-04-05.html).

Building an Intel version of OS X is another matter. I've seen claims, about whose veracity I have absolutely no idea, that for every G4 version of OS X, Apple maintains an Intel one. But this would be such a major undertaking that I doubt it is true, unless Apple are very close indeed to releasing an Intel-based product. However, there is more to an operating system than just the core and the user interface. There's the utterly non-trivial matter of drivers. Every hardware element in a computer needs to have a close relationship with the operating system, and this level of intimacy is achieved through the use of hardware drivers. You couldn't run existing OS X applications on an Intel version because they would ask the OS to do things with hardware that wasn't there, or was different. Operating systems (and the BIOS, for that matter) do their best to 'abstract' hardware from software, but there are limits to this process and they are never more apparent than with programs such as sequencers, audio editors and software synths.

Imagine what would be involved if, say, Direct X was ported to another platform. It would have to be re-written from scratch — the kind of issue that acts as a reality check for anyone suggesting that Apple could easily move to an Intel or any other platform. To do so would be painful to developers, confusing and frustrating to loyal customers, and possibly one call too far for Apple.

So, either way, these are difficult times for Steve Jobs' baby. If Apple don't come up with some faster machines soon, they will lose customers to Windows/Intel. Sales of iMacs are already below targets. If they move to another platform, developers may desert — the ones able to survive at all, that is. What a waste for such a great product.

But maybe there is another way: a third way, if you like.

Perhaps Apple should polish up the work they've done with Intel compatibility, but come at it from a slightly different angle. Maybe they should make the Mac OS a better way to run Windows programs on Intel machines.

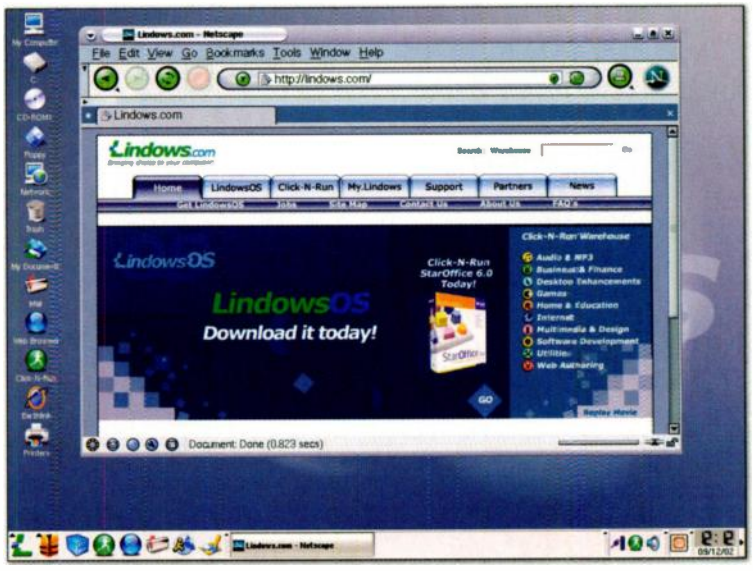
Lindows: A New View

What I've just suggested might sound like a very messy solution, but it's not as daft as it sounds. As a Windows user, I love the look and feel of Aqua and the Mac OS. I'd love to be able to use it, but I can't re-invest all the money I've spent on Windows programs over the years. It would be great if I could wrap a Mac-type interface around them. This doesn't get around any of the difficulties I've written about above — and I can't begin to imagine what the legal implications would be — but I think it would be a great halfway house to being able to run Mac programs natively on PCs. It would, at the very least, give Apple application programmers a breathing space (although I guess they'd worry about losing business to Windows application programs until their new Apple/Intel versions were ready).

If all of this sounds daft to you, I readily admit that it does to me too. Or, at least, it would if it weren't for Lindows.

No, it's not a typo: that really is Windows spelled with an 'L'. Lindows is actually a version of Linux, incorporating some clever stuff that allows some (but only some) Windows applications to run under it — without a single byte of Microsoft operating system on the computer. ZDNet news reports that Microsoft *Office* runs happily on it. However, I can guarantee that *Cubase SX* won't!

Still, it does give some idea of what might be possible, doesn't it? SOS



Windows is not the only PC graphic OS, as the Linux-based Lindows sets out to prove.

The Real Lindows PC

Evesham have announced that they will be selling a Lindows-based PC. This exotic sounding device sells for the utterly mad price of £249.99 (including VAT, but excluding monitor). Remember, you won't be able to run your music software on this, but you will be able to do all the stuff that you'd rather not do on your powerful music PC (or Mac), such as word processing, web browsing and email. At that price, a lot of people will get one just to see what Lindows is like.

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Lexicon MPX550

Dual-channel Effects Processor

Lexicon update their MPX500 with more editing parameters, extra mastering processes, and more user patches.

Paul White

While many studio processors have been replaced by software plug-ins, host-powered reverbs tend to be either a little unrefined or inordinately greedy when it comes to CPU power. The very best reverbs are way out of the price range of most UK project studios, while entry-level models often sound somewhat disappointing, but in the £300-750 range are to be found a number of excellent-sounding units that, although they don't equal their high-priced cousins, can come surprisingly close. One such was the Lexicon MPX500, which has just been replaced by the MPX550, offering more user memories, more effect algorithms and new dynamics processing.

At the heart of the MPX550 is the same Lexichip III reverb engine that powers some of Lexicon's high-end machines, though the algorithms have been simplified to some extent, as has the degree of user editability. The I/O is nothing if not comprehensive, featuring both XLR and jack analogue I/O (balanced) plus S/PDIF digital I/O on phono connectors. Sample rates of 44.1kHz and 48kHz are supported. Power comes from the mains, not an annoying adaptor, and the 24-bit converters deliver more dynamic range than most home studios could hope to do justice to. In fact the only pro feature that's missing is a word clock input.

Like the MPX500 before it, the MPX550 offers true stereo operation with a number of routing options including stereo-in/stereo-out, dual mono-in/stereo-out and dual mono-in/mono-out. There are also several dual effect algorithms based around both serial and parallel configurations. MIDI In and Out/Thru connectors are provided for patch dumping (the Out/Thru function is software configurable from within the System menu), real-time parameter control or tempo control, while a TRS footswitch jack enables two footswitches to be connected to operate the bypass and tap tempo functions.

So far, then, the description is very close to that of the MPX500 and, indeed, aside from new front-panel artwork, the controls and display are identical. The real differences happen inside the box, specifically the new effect algorithms and the increase in memory space. Now there are 255 preset effects and 64 user memories, whereas the MPX500 had only 30 user memories. Compression can now be used in conjunction with EQ, and there are new dynamics algorithms offering full-featured compressors within the reverb algorithms, as well as dedicated mastering dynamics algorithms. For those unfamiliar with the original MPX500, I'll quickly go through the operating system, as that's one part of the machine I really like.

Driving The MPX550

The controls start out predictably enough with an Input trim control, but, instead of LED meters, stereo bar-graphs are available via the display. Patches are selected by turning the Program dial to move through patches one at a time or by pressing and turning it at the same time to step through banks. Pressing Load loads up the selected program, though a system preference option provides for automatic program loading 0.75 seconds after the Program knob stops turning. If you select a new patch without loading it, the display switches back to the original patch after a few seconds, but the number of the new one is 'remembered' and may be loaded by pressing Load at any time after selecting it.

In edit mode, a custom LCD window shows a page of up to four parameters at once, where each can be adjusted directly using one of four dedicated rotary Edit

SOUND ON SOUND

Lexicon MPX550 £399

pros

- Good-sounding reverb algorithms, including ambience.
- Friendly user interface.
- Non-reverb effects are also good.

cons

- Mastering programs have slightly too much delay to be used for individual track processing via insert points.

summary

A worthwhile upgrade to the already excellent MPX500.

knobs to the left of the LCD. Many functions also now include graphic elements, which makes the effect of adjusting the control more obvious — for example, changing the reverb decay shows a typical exponential decay envelope that changes in length as adjustments are made. The first parameter in the first page is always Adjust — a control that changes multiple parameters at once to help speed up editing of programs. For example, Adjust control of room liveness may change decay time, early reflections and tonality all at once. Each effect algorithm has up to 20 adjustable parameters (four more than the MPX500) ▶

which means up to five pages of four settings to adjust. The Edit Pages button makes light work of skipping through these and the display always tells you which page you are on. As a rule, the most commonly accessed parameters are on the top page, while the compression parameters within reverb algorithms tend to be found on the last page.

System setup, accessed using the System button, allows various utility settings to be made relating to the operation of the bypass control, the digital I/O settings, MIDI settings, patch loading mode and so on. You can also choose whether the wet/dry mix settings apply to every program or whether they are saved separately for each program. Normally, if you're using the MPX550 via a mixer's aux send/return, you'll want to set the patches to output wet signal only.

A Tap button quickly sets tempo-related delays and other effects, and some tempo-related parameters may also be sync'ed to MTC or MIDI Clock. Delay and modulation parameters can be set to tempo over the range 40-400bpm, and it's possible to choose a global tempo value for all patches or save each program with its own tempo setting. There's also an audio tap feature that uses the time measures between two audio events — holding down the Tap button activates this mode until Tap is released. Tempo can also be locked to MTC or MIDI Clock by activating this feature in the System menu. Tap and Store may be pressed together to initiate the MIDI learn mode, where any parameter can be accessed using continuous MIDI controllers, aftertouch or pitch-bend. Turning the edit knob associated with the parameter identifies it as the one to be mapped, after which you only need send the unit the desired continuous controller message and the relationship is formed.

Using The MPX550

Unlike some really sophisticated effects boxes where you can set up everything from scratch, the MPX550 adopts the now familiar format whereby you pick a preset that uses the algorithm you want (including the routing option you need), then adjust the parameters to suit. The dual mono-in/stereo-out algorithms enable the unit to behave as two separate effects processors, where the stereo outputs are mixed, so you can feed it from two aux sends and return it through a single stereo aux return. There are also dual mono-in, mono-out modes for where that is appropriate, but for anything involving reverb I find it's best to work with stereo outputs.

Alongside the now very familiar reverb, modulation, delay and pitch effects are versions of the famous Lexicon Ambience algorithm, rotary speaker (complete with separate high and low rotors and proper acceleration/deceleration dynamics), and of course the new Dynamics section. Compression is included in many of the reverb algorithms and dual-effect programs, but the separate Dynamics section provides dedicated stereo processing intended for mastering applications. The manual rightly points out that, because such complex processing introduces a perceptible delay, it should not be used via individual channel insert points while mixing. This section includes a Peak expander, which makes all sounds above a user-defined threshold louder, A conventional compressor with variable ratio, threshold, attack and release, and a tape saturation emulator that attempts to bring back some of that analogue warmth by recreating the non-linearities of hard-driven tape.

The MPX550 is joyously simple to use, and the fact that it is filled with so many good-sounding reverb algorithms means that you generally only need to tweak a couple of parameters to get exactly the sound you want. The room and ambience programs exude a sense of real space, and even the longer reverbs can be used at quite a high level without drowning the original signal or fogging up the mix.

The non-reverb programs are also very strong, and though few offer anything truly new, they are clean and professional sounding. The pitch-shifter isn't great, but then it seems impossible to make a good one at a project studio price, but for detuning and theatrical effects, it's perfectly fine. I was also favourably impressed by the inverse reverb algorithms, which lend a convincing backwards character to the sound, and the addition of compression to the reverb algorithms adds a nice sense of density and space while keeping the reverb level firmly under control.

As to the mastering dynamics algorithms, I wouldn't dream of suggesting that they're a suitable replacement for a proper multi-band dynamics processor, but they do a good job without inflicting too much of their own character onto the sound being processed. Even the tape saturation algorithm is quite subtle, but it definitely adds warmth and smooths off those abrasive peaks. Used with care, demos can be made to gel better using these facilities and, as with most Lexicon boxes, you have to work quite hard to get a bad sound.

As a replacement for the already fine MPX500, the MPX550 has a lot going for it, not least its extremely good reverb algorithms and its friendly user interface. Good reverb makes a lot of difference when mixing, so choosing to use something like the MPX550 in place of a plug-in or budget unit could make more difference to your music than you might think. The sound of the MPX550 is significantly better than the budget MPX100 and its direct offspring. Although it won't fool a 480L user, it comes closer to the sound of the PCM80s and PCM90s than you might expect, and its reverb quality is every bit as good as the MPX1. If you already have an MPX500, I don't think there's any pressing need to rush out and upgrade, as the basic reverb quality seems to be exactly the same, but given that the MPX550 costs no more in the UK than the MPX500 used to, the extra memories and dynamics algorithms are worth having if you're in the market for a new effects unit that does serious reverb. SOS

Test Spec

- MPX550 OS v1.02

information

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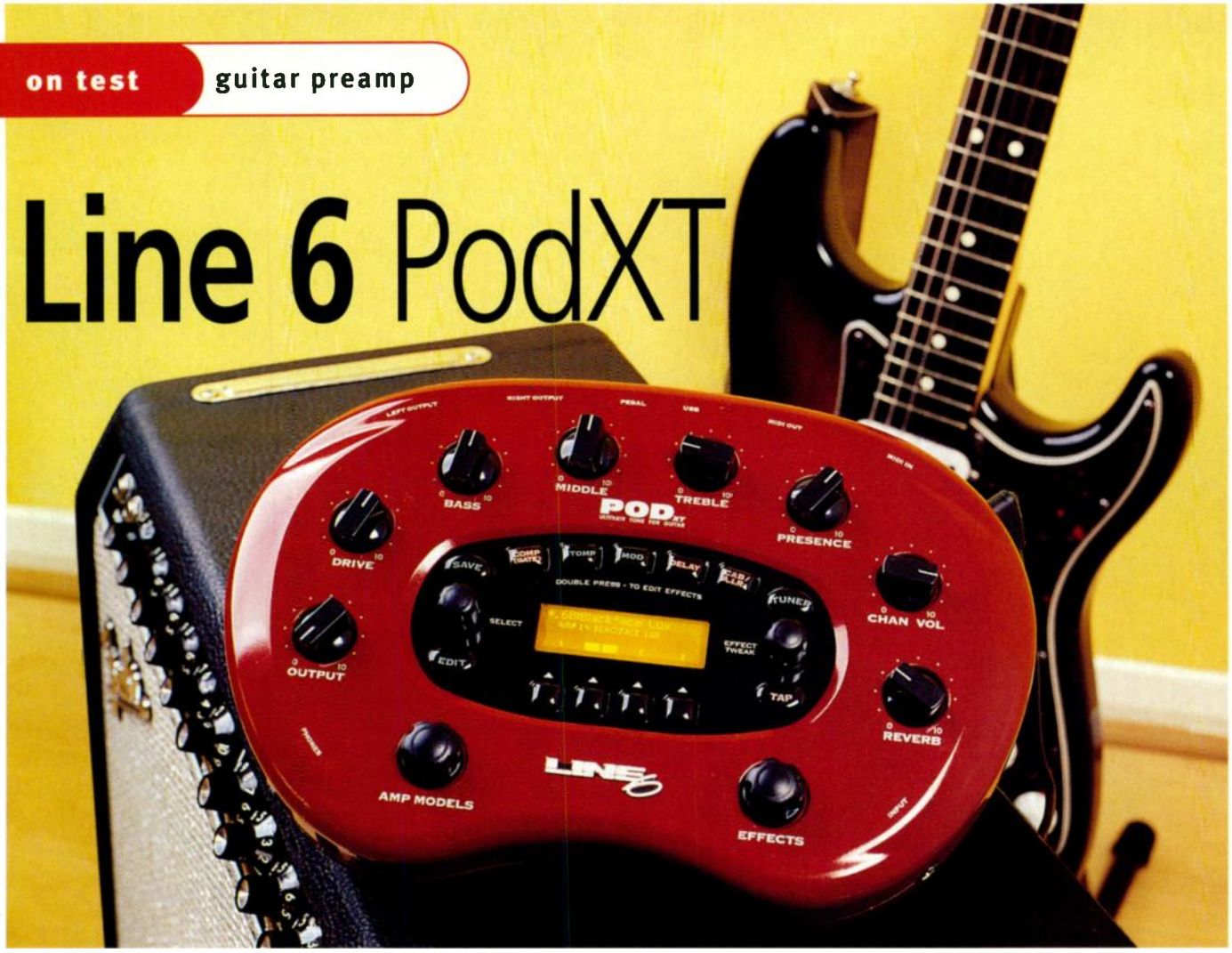
Line 6 PodXT



Photos: Mike Cameron

Modelling Guitar Preamp & Effects Processor

This new version of Line 6's ground-breaking Pod guitar processor combines improved amp modelling with a host of high-quality effects plundered from the company's range of rack processors.

Paul White

Though Roland were the first to make serious inroads into guitar modelling, there's no doubt that it was the Line 6 Pod that captured the imagination of the mass market. With its simple controls, low cost and instant-gratification sounds, it was destined to be a winner, but inevitably other manufacturers quickly jumped on the bandwagon, some offering lower cost, others offering tangible improvements in certain areas, specifically effects. With the launch of the PodXT, Line 6 have drawn a new line in the sand by utilising the technology from their new generation Vetta high-end modelling amplifiers to provide better amp emulations, and by incorporating more effects (many taken from their Modeler range) and better audio performance. They've also included a USB port so that the output from the PodXT can be recorded into a sequencer or other audio program without the need for a separate audio interface — however, this requires drivers which were not yet available at the time of this review.

Next Generation

Though the original Pod was clearly a ground-breaking product, some players felt it didn't have quite enough touch-responsiveness and, while it was great for creating overdriven sounds, its clean sounds were considered weak by some. Then there was the effects system, which forced you to choose between effects that you might reasonably want to use together. Particularly limiting was the way compressor usage was restricted depending on the other effects being used. Given the low price to which the Pod has now fallen, perhaps these restrictions can be forgiven, but the PodXT includes a lot of features and improvements that will help endear it to serious players.

Modelling a guitar sound involves looking at the way the various stages of amplification and EQ shape the sound, how the speaker and cabinet frequency response contribute to the tone, and even analysing how the choice and position of recording microphone changes the results. Because DSP is cheaper and more powerful than when the original Pod was launched, the Vetta amplifiers are able to model smaller stages of amplification, even down to individual components, providing more control over the model, plus the new algorithms produce a better dynamic response. By using Vetta algorithms in the

SOUND ON SOUND

Line 6 PodXT £369

pros
- Significantly improved amp model sounds, dynamic response and feel.
- Straightforward user interface.
- Superb guitar-specific effects section.

cons
- Although a USB socket is provided, USB drivers for using the PodXT as an audio interface are not yet available.
- Still can't quite get my '60s big chord sounds.

summary
The PodXT is a significant advance on the original Pod and includes the best guitar effects from the Line 6 Modeler range.

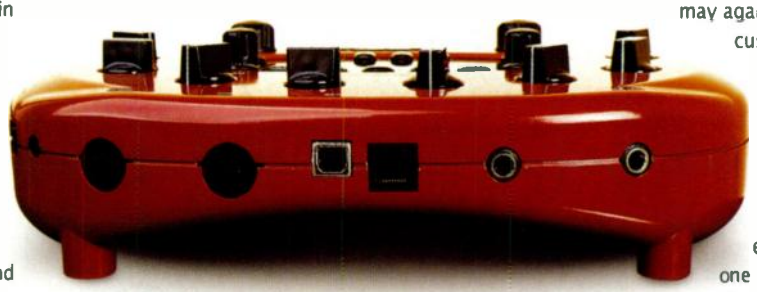
PodXT, the performance of the original Pod has been vastly improved upon, but, in addition to the sonic benefits, the PodXT has also gained a much improved control system that can access every parameter without the need for editing software (though a software editor is apparently planned), plus it has four simultaneous effects sections, in addition to reverb.

To accommodate the extra controls, the PodXT's case has been made a little larger, though it still retains its familiar kidney shape. There are now eight rotary potentiometer controls with four further rotary encoders and 13 buttons. Also new is a considerably enhanced display, which can show patch names, parameter settings and virtual control positions during sound editing. MIDI In and Out connectors allow patch dumping and remote editing, there's the USB port, and a foot control connection (Ethernet style) hooks up to the new Shortboard floor controller — this is needed to access the pedal wah effects.

The only new control to join the main amplifier controls is the Presence knob, so there's no longer need to use the 'shift treble' function to change the presence setting. In this respect, the PodXT has the same Bass, Middle, Treble and Presence controls as many classic amplifiers as well as the usual Drive, Channel Volume and master Output settings. Reverb has its own knob, as do the selection of amp models and effect types, but everything else is controlled from the ingenious centre section. Outside Edit mode, Select is used to move between stored patches, while the Effects knob calls up effects or combinations of effects — there are 64 ready-made effect settings (all overwritable), both single and combinations, that can be directly accessed to save the user having to set them up from scratch.

Streamlined Operation

Four buttons access the compressor/gate, stomp box, modulation and delay effects sections, with the Cab/AIR button addressing the speaker cabinet models and the AIR (Acoustically Integrated Recording) settings, the latter relating to the virtual mic setup and the influence of the room acoustics. Here you can choose from on-axis and off-axis versions of Shure's SM57 dynamic, an on-axis Sennheiser MD421 and a capacitor model allegedly based on the Neumann U67. The Save, Edit, Tap and Tuner buttons of the original Pod are retained, but four new buttons have been added directly below the display. While editing, or when the Tap or Save buttons are lit, these simply select which of the four parameters that can be displayed on each page is to be accessed via the Effect Tweak knob. Outside Edit mode, on the other hand, they select one of four patches from the current bank, and the Effect Tweak knob generally changes the main parameter of the effect, such as speed or intensity. Tap controls the speed of things like modulation LFOs or delays. It's also worth mentioning at this point that the new Tuner has a vastly superior on-screen display to the old one and seems much more accurate. The dedicated post-amplifier compressor section is based on the same LA2A compressor model used in the Bass Pod, although stomp box-style compressors are also available in the general effects section.



The PodXT is powered from an external supply which feeds the rear-panel power socket at the far left. Next to the power socket are MIDI In and Out sockets for remote editing and patch dumping, and a USB socket designed to allow the PodXT to be used as an audio interface for a computer once the requisite drivers are available. The Ethernet-style socket is for connecting the optional Shortboard pedal controller, and this socket is followed by balanced jack sockets for the left and right audio outputs.

Any of the 32 amp models can be called up using the Amp Models rotary selector and each loads up with its own default speaker cabinet and control settings, which can be customised by the user if required. When you use the PodXT, different output settings are required depending on whether you're using it live into a power amp with guitar cabs, live into a guitar combo, or DI'ing it into a studio or PA mixer. Holding Tuner while turning Select accesses the page that lets you select the appropriate destination type. The manual also suggests that you try to set up the patches with the Output control set fairly high, as this provides the best resolution by making the best use of the converter's headroom.

PodXT's memories are organised into 16 banks of four patches, most of which come loaded with virtual amplifier rigs that you can either keep as they are, modify, or replace altogether. A further 64 memories are used to hold the effect settings, which may again be overwritten to create a custom effects library. This means that when you're setting up a new sound, you can load in any one of the library effects or combinations with their settings intact. If you want to make changes to a patch, either press Edit or double-click one of the four Effects buttons or the Cab/Air button, which will select the appropriate section for editing and simultaneously switch the system into Edit mode for you. The four effects buttons each light up when they're active, so to turn them on or off outside Edit mode you only have to press the corresponding button.

If you go into Edit mode then turn the Select knob, you can page through every amp and effect setting and adjust them directly. When the amp settings are being adjusted, representations of the six control knobs show up in the display along with their stored settings. If you move a control, the new position is shown alongside the stored setting as indicated by a dot on the circumference of the knob. Virtual knobs also show up when you go to edit the effects, and you can choose which parameter the Tweak knob addresses if you don't agree with the default choice. Furthermore, the volume pedal, delay and modulation blocks may be moved either before or after the amp model. Another neat feature, derived from the Modeler pedals, is that certain effect parameters (specifically modulation rate and delay) can be linked to tempo by note value, so that you can decide how many times per bar something should happen. The tempo is set using the Tap button as usual.

Most of the effects have fairly simple, stomp box-type controls, where you select ▶

The Designer Speaks

I asked Marcus Ryle, co-founder and President of Line 6 to explain how the Vetta/PodXT modelling differs from the older Flextone/Pod technology. "We took the opportunity with Vetta to revisit our entire modelling process from the ground up," he said. "Since we knew we were going to build in more processing power, we were able to provide for more detail in our tube modelling, as well as add new sonic elements that we hadn't modelled before. For example, the age of the capacitors in the power supply can be modelled in order to introduce the appropriate amount of AC hum modulation to the audio signal when playing loud. Although this is a seemingly undesirable artifact, we found it was actually part of the signature sound of amps like the Vox AC30.

"Another significant difference is that our processing is now 32-bit floating point (as opposed to 24-bit fixed point, as found in Pod v2.0 and lots of other places). This extended dynamic range is quite valuable, since there is so much potential gain within an amp model circuit."

LINE 6 PODXT

the effect type, then adjust two or three (virtual) knobs. However, the reverb is far more flexible than on the original Pod, with just as many simulated spaces as most rackmounting reverbs, albeit with much simpler parameter adjustment.

Using The PodXT

Even though the PodXT has a somewhat different operating system to the original Pod, you don't really need the manual to get around the basics of sound selection and editing. The designers have gone to great lengths to include factory sounds that relate to well-known musical styles (and even specific songs), but I found that most of these needed tweaking a little to work well with my own guitar, which is not at all surprising given the differences between guitars and playing techniques.

The output is definitely less noisy than on the original Pod, to a noticeable degree, and the sound is also much more responsive to playing level — if you back off the guitar volume, the sound cleans up nicely without becoming lifeless. When using heavily overdriven sounds, it is sometimes hard to tell the sound of the new Pod from the old, apart from the improved dynamics, but the XT is significantly better on clean sounds and those with just a little overdriven edge to them. Furthermore, the AIR section now allows for four different miking arrangements, and the influence of the room is a fully variable parameter rather than being simply on or off. The impression of the amp being moved further away in a live room is quite uncanny — the higher the Room setting, the more the amp moves back and the more the room reflections predominate.

During my tests, I found that some of the more lively models could cause what sounded like internal clipping if the Chan Vol parameter was set too high, so the best approach seems to be to use the Output control at around three-quarters up, then use the Chan Vol control to balance the clean and dirty sounds. This way you should avoid any problems.

Though the clean sounds are brighter, more responsive and generally all-round more useful than on the basic Pod, I found I still had to work at them to get some of the sounds I wanted, and the most elusive still seem to be those big '60s chords where the sound is only slightly dirty yet hugely powerful. There are several examples of this type of sound on the early The Rolling Stones and The Who records and I've discovered that it's not easy to duplicate them using any DI method I've tried to date. Gratifyingly, the piezo model coaxes a more than reasonable electroacoustic sound out of an electric

Second Opinion

I bought an original Pod when they were first launched, but soon found it disappointing for direct recording. Whilst many of the heavily distorted sounds were eminently usable, the more subtle clean to softly-overdriven 'Blackface' Fender sounds that I prefer were probably the unit's weakest area. I also felt that the original Pod tended to rob guitars of some of their individuality, so that there was little distinction between a good Strat and an average one and, most damning of all, even a Tele would sometimes sound little different from a Strat. Ultimately, I felt that amp/cabinet modelling was a great concept whose time had not yet come.

To my ears, PodXT is in a different league. The sophistication of the modelling now allows the guitar and the player to interact with the sound just as you can with a high-quality valve amp. The way the amp models respond to guitar volume control settings is particularly impressive, as is the absence of noise and the significantly extended headroom — dig into a dynamic amp model and you get something back. The effects are strong and the user interface a delight, but even if they weren't, this time the sound alone is enough to convince at least one sceptic that, in the PodXT, desktop amp modelling has finally come of age. *Dave Lockwood*

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- '2x12 Blackface' — 1965 Fender Blackface Twin.
- '2x12 Match' — 1995 Matchless Chieftain.
- '2x12 Jazz' — Roland JC120.
- '2x12 Class A' — 1967 Vox AC30.
- '4x10 Line 6'
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- 'Fuzz PI' — Electro-Harmonix Big Muff Pi.
- 'Screamer' — Ibanez Tube Screamer.
- 'Classic Distortion' — Proco RAT.
- 'Octave Fuzz' — Tychobrahe Octavia.
- 'Blue Comp' — Boss CS1.
- 'Red Comp' — MXR Dynacomp.
- 'Auto Wah' — Mutron III.
- 'Vetta Comp' — Line 6 special.
- 'Auto Swell' — slow envelope attack with compression.

MODULATION EFFECTS
- 'Sine Chorus'
- 'Flanger'
- 'Opto Tremolo'
- 'Bias Tremolo'
- 'Auto Pan'
- 'Analogue Chorus' — Boss CE1.
- 'Jet Flanger' — A/DA Flanger.
- 'Phaser' — MXR Phase 90.
- 'U-Vibe' — Uni-Vibe.
- 'Rotary Drum & Horn' — Leslie 145.
- 'Rotary Drum' — Leslie Vibratone.
- 'Analogue Echo' — Boss DM2.
- 'Analogue w/Mod' — Electro-Harmonix Memory Man.
- 'Tube Echo' — Echoplex.
- 'Multi-Head' — Roland RE101 Space Echo.
- 'Sweep Echo' — echo with filter.
- 'Digital Delay'
- 'Stereo Delay'
- 'Ping Pong Delay'
- 'Reverse Delay' — reverses everything up to two seconds after you play it!

REVERB EFFECTS
- 'Lux Spring' — Fender Deluxe dual spring.
- 'Standard Spring' — Fender Twin triple spring.
- 'King Spring' — Line 6 multi-spring.
- 'Small Room'
- 'Tiled Room'
- 'Brite Room'
- 'Dark Hall'
- 'Medium Hall'
- 'Large Hall'
- 'Rich Chamber'
- 'Cavernous'
- 'Slap Plate'
- 'Vintage Plate'
- 'Large Plate'

guitar — even one without a piezo bridge.

While the amp sounds are most definitely better, you shouldn't let this overshadow the effects section, which plunders the best guitar effects from the whole Line 6 Modeler range, including some great analogue and tube echoes, the excellent reverse delay and a whole range of nice modulation treatments. Because the modulation and delay sections are separate (and mainly stereo), there's no restriction on the way these can be combined, so you can always have reverb, compression, a modulation effect, a delay effect and a stomp box running at once if you've a mind to. There are no pitch-shifting effects, but then I've never found one at anything like this UK price that works well enough to actually use.

For live use, the new Shortboard is a practical and ruggedly built addition, as it provides on/off controls for all the individual effect sections and the post-amplifier output compressor stage, as well as bank and patch selection, a decent-sized display of the patch name and a pedal that can be used for volume or wah-wah. It's also possible to connect an optional EX1 expression pedal to the Shortboard for variable control of two parameters at once. Patches may be saved from the Shortboard, but my guess is that most people will only use it when they're playing live or when they need volume or wah-wah control in the studio.

Test Spec

- Line 6 PodXT OS v1.0

Verdict

I don't think any modelling amplifier DI'd into a mixing console is a satisfactory replacement for the real thing in all circumstances, but Line 6 have most definitely narrowed the gap with their PodXT. The overall sound quality is improved, the dynamic response is more natural and the clean amp models are an order of magnitude more authentic than in the original Pod. On top of that, the effects section is far more serious and could easily replace additional rack effects and stomp boxes in the majority of applications.

It's a shame the software drivers weren't available for me to check out the audio interface, as this could be another big bonus for those computer users who only need to add the odd guitar part to their mainly MIDI compositions — you could even record vocals using the Tube Preamp model by connecting a mic preamp to the XT's input.

Whatever you think of amp modelling, the PodXT has more than made up any ground that Line 6 might have lost over the past two or three years. It can deliver the right kind of sound in most recording situations , the guitar-specific effects are great and the user interface has actually been improved and simplified, notwithstanding the XT's far more powerful effects section. I think Line 6 could justifiably be feeling pretty pleased with themselves right now! SOS

information

- £ PodXT, £369; FBV Shortboard, £229; EX1 expression pedal, £45. Prices include VAT.
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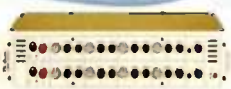

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Studio SOS

This month *SOS* helps Alan Pittaway improve his drum kit recordings, and also helps him get his two Roland multitrackers working together.

The multi-mike setup used for recording Alan Pittaway's drum kit.

Mike Senior

Now that samplers and physical modelling processors are so affordable, it's possible to get commercial-quality recordings without miking up anything more than a vocalist. It's hardly surprising, then, that some home studio owners find the task of multi-miking a drum kit a bit of a challenge. So when Alan Pittaway emailed through to the *SOS* office saying that he was having trouble with his drum recordings, I decided to head down to his home studio in Buckinghamshire and help him out.

Alan is lucky enough to have a room in his house set aside as a studio, and he uses it to record his friends and various local musicians on a pair of Roland VS880 recorders — one an old VS880 VXpanded and the other a newer VS880EX. However, he'd not had much luck in getting the kinds of drum sounds he was after, even with a fairly decent selection of mics and outboard gear to hand.

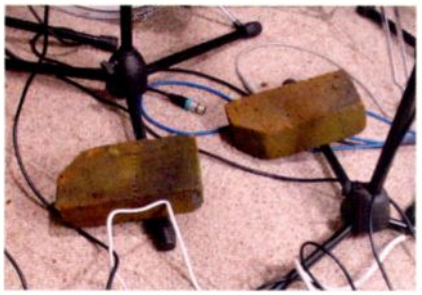
Setting Up Overheads

Once the kettle had been boiled for the first cuppa of the day, the first thing to do was to have a listen to the kit while Alan manned the sticks. Although the studio room was quite large (about 7 x 4m), the carpeting, blinds and furnishings were doing a very good job of damping reflections, so the sound was quite tight. Although I'm not a drummer myself, I felt that the drums themselves sounded pretty good, so we pressed on with setting up mics. Alan's usual way of working thus far had been to set up the kick and snare close mics first, and only then to add in the sound of an overhead mic. However, I felt it would be best to start work with the overheads first, because of the lively sound he was after — he had suggested Blondie's recent single 'Maria' as a good reference, so we were treating that sound as our goal.

The overhead mic Alan had been using up to that point was a single boundary microphone dangling from the end of a mic stand on a piece of wire. This was presenting the drums completely in mono and was also messing with the mic's frequency response — boundary mics are designed to be placed against a large flat surface such as a wall, and their responses are significantly different without this assistance. Fortunately, Alan had a pair of much nicer Rode NT1s, so I suggested we use these as overhead mics instead. We ran them first through old Studiomaster console, to provide them with phantom power, and then straight into the VS880EX. I decided to use the newer Roland multitracker because it has slightly better converters, and also because it has phase inversion facilities missing on the earlier model.

After setting up basic levels on the mixer and multitracker, I grabbed a pair of enclosed headphones to check the sound while I set up the mics. Positioning the mics a few feet above the kit on either side, angled downwards towards the cymbals, the sound seemed to be fairly well balanced, so I did a quick test recording. Listening back to this on Alan's B&W speakers, we had an acceptable unprocessed overhead sound, with the cymbals nicely balanced, so we decided to start adding in some close mics to give definition to the individual drums. Before we moved on, though, I asked Alan if he could furnish me with a couple of bricks to weigh down the legs of the boom

An old Studiomaster console was used to supply phantom power to the two Rode NT1 overhead mics.



A few bricks helped to keep the boom stands steady.

stands — they were both quite extended, and I didn't want either one overbalancing while we were recording.

Adding In Kick & Snare Close Mics

To start with, I set about adding in the close-miked sound from an Audio Technica DT25 which was already set up inside the kick drum. This was routed through Alan's Focusrite Penta preamp/compressor directly to the VS880EX. After the basic level-setting had been done, we did another quick test recording so that we could experiment with the phasing of the kick mic against the overheads using the VS880EX's internal phase switches — the mic combined best with the overheads without inversion, so we left the switch out on the preamp.

One of Alan's biggest concerns on contacting *SOS* was that his kick drum sound didn't have enough attack or weight, and this was apparent from the sound we were getting — although a couple of cushions inside the drum made the sound fairly tight, it lacked any real definition. Straightaway, I moved the mic closer to the point where the beater was hitting the skin, to get more of a 'click' at the start of each hit, and then I had Alan patch in one channel of his Aphex 109 EQ between the Penta and the VS880EX. Although we could have used one of the multitracker's internal digital equalisers after recording, these have a rather harsh sound in my experience (especially when boosting), so I find that I get the best results by doing most of my EQ'ing in the analogue domain while recording. With Alan playing the kick, I used the Aphex to add about 4dB boost in a fairly narrow band at 80Hz for weight, and I also emphasised the beater click with a couple of decibels broadband boost at around 2kHz.

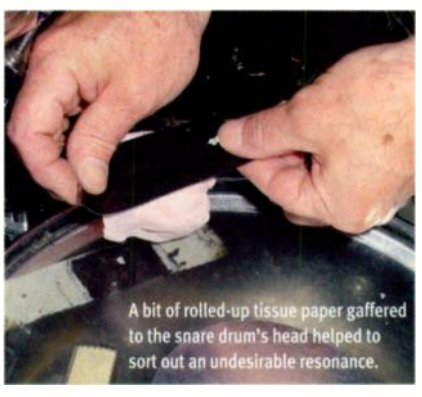
Another audition on the speakers confirmed that these changes had improved the sound considerably, but I felt that a little compression might also help emphasise the attack, so Alan headed back to the kit while I dialled some in. Starting from the Penta's Kick preset, I slowed down the default attack setting to let through the sound's attack, and then adjusted the Compression control until about 4dB of gain reduction was showing up. Once I'd slowed down the release a little as well, to avoid messing with the kick's decay, another test recording was done. Alan professed himself pleased with this sound, so we decided to move on to close-miking the snare.

Alan already had an SM57 set up on the snare, although its positioning was a little out of the ordinary. It was pointing across the drum from the hi-hat side towards the tom-toms, and Alan told me that this was to get maximum separation between the snare and hi-hat. Given the sound we were after, I felt that greater separation between the snare and the tom-toms would be more

An SM57 was positioned looking over the top lip of the snare, pointing towards the centre of the drum and away from the toms.

important, so I repositioned the mic to a more usual position looking over the rear lip and angled slightly downwards towards the centre of the drum — the hi-hat was still about 90 degrees off axis. We routed the mic through Alan's Focusrite Voicemaster to the VS880EX, and set up sensible levels using the voice channel and recorder metering. Another quick recording confirmed that the snare mic sounded best with its phase flipped relative to the other mics, so we engaged the phase button on the Voicemaster. I also activated the Voicemaster's low-cut filter, set at 100Hz, to avoid spill on the mic interfering too much with the low end of the kick drum we'd already set up.

Listening back to the recording, we could



A bit of rolled-up tissue paper gaffered to the snare drum's head helped to sort out an undesirable resonance.

hear the snare ringing a little too much, so we tackled the problem at source by gaffer-taping some rolled-up tissue paper at the edge of the batter head in two places. This sorted out the ringing nicely, but Alan still felt that the sound needed more 'sparkle' to it, so I hit the snare while he experimented with the EQ on the Voicemaster. In the end, we added about 4dB of Presence and 2dB of Breath before we were satisfied with the sound.

Finishing Touches

At this point we were getting a nice balance of kick, snare and cymbals, including the hi-hat, so we retired to the kitchen for some well-earned lunch! Afterwards we had another listen to the Blondie track to get our bearings and, although we were definitely in the right ball park, we were still a long way away from achieving the large room sound of 'Maria' — hardly surprising really, given that those drums were recorded at a big professional studio! My first instinct was to try to record more of the ambience of the room, so I quickly put up one of Alan's small-diaphragm Shure mics in front of the kit, pointing out into the room to capture more of the room sound. Running this through a Dbx 376 voice channel I'd brought with me, I added some compression and mixed it in with the overheads. Although this made the sound more ambient, it didn't really help increase the size of the perceived space very much, so we quickly abandoned this approach and resolved to simulate a larger room sound artificially.

Alan had a Lexicon MPX100 in his rack and, seeing that I've had good experiences with a similar Lexicon unit in my own setup, I plumbed this unit into the system to see what it could do. We connected the reverb's input to an auxiliary send on the Roland and returned the reverb through the remaining two analogue inputs on the VS880EX — the reverb was fed mostly from the overheads, although a little was also added to snare. With a test recording playing back, we auditioned various Ambience and Room presets first, followed by the Hall, Chamber and Plate patches, but we couldn't find anything to match what we were after, even after experimenting for some time and exercising the Adjust knob. I have to say that I was rather surprised at this — I dare say we could have found a suitable setting if we'd had more time, but editing was too restrictive for us to get results in a hurry. In the end, I resorted to using the internal effects processor in the VS880EX, using the Large Room patch as a starting point. I increased the room size to 22m and pulled the reverb time back to 0.9s to remove any noticeable reverb tail. As a final touch, I increased the density to 60 to smooth out the sound a little, and then adjusted the ▶

effects return to a suitable level.

Comparing with our reference Blondie track confirmed that we were much closer to the required sound, although we both felt that a little extra high end was required on the kit overall, so we added a few decibels to the overheads using the Studiomaster's high-frequency EQ, and a few decibels of 14kHz 'air' to the whole kit sound by using Alan's Focusrite Mixmaster patched across the VS880EX's main outputs. We also used the Roland's digital EQ to shelve off some low end on the overheads (-5dB at 200Hz) and the snare mic (-5dB at 500Hz), in order to tighten up the low end a bit more.

Even though the overall sound was now pretty well established, the toms were sounding rather distant. Seeing that we still had inputs free on the VS880EX, we put up a spare SM58 covering the two rack toms to see if we could pull their sound forward a little. We plugged the mic straight into one of the VS880EX's mic inputs and, given that the cymbals were quite low over the toms,

An SM58 was used as a close mic for the toms, and was pointed downwards to minimise cymbal spill.

I decided to point the mic directly downwards between the two drums to increase the separation. Listening to another test recording showed that the close mic was giving quite a warm tone, where we were after more definition, and also that the toms were ringing in sympathy with kick and snare hits, adding a rather undesirable boomy element to those sounds.

One of the deficiencies of the VS880 multitrackers is that there is no proper gating or expansion available, which would have been my first choice of processing to remedy the tom resonance — the multitracker's Noise Suppressor insert effect is a threshold-dependent filter which is unsuitable for most drum expansion tasks. In the absence of a gate, I decided to try dealing with the problem using the Roland's digital EQ, rolling off a fair bit of low end and low mid-range: -5dB of low shelf at 400Hz and -5dB of mid-band at 900Hz, with a Q value of one. This reduced the ringing of the toms, but also made the close mic sound pretty thin on its own. Fortunately, the tom sound coming through the overheads was quite warm, so the toppy close mic actually helped the overall sound cut through nicely, matching the kick and snare. We didn't have the time to put another close mic on the floor tom, which

That Sync'ing Feeling

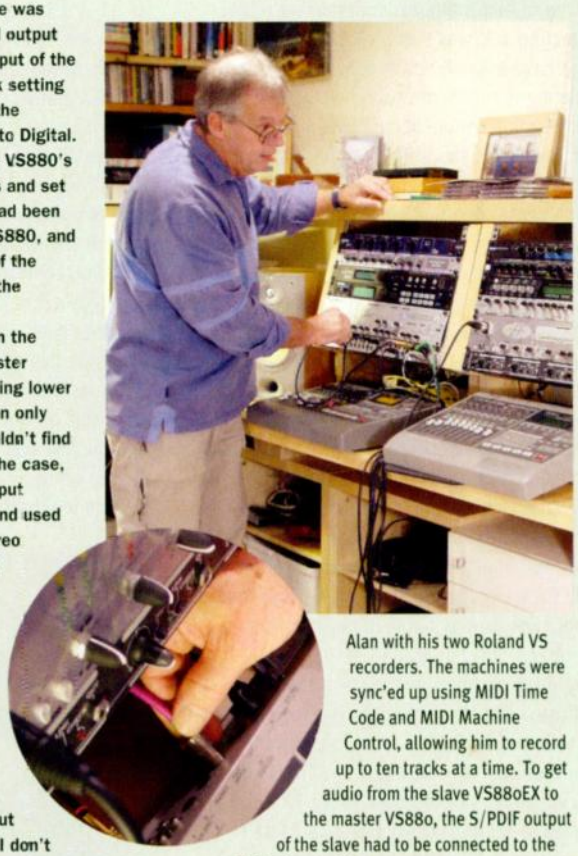
Like many owners of smaller multitrackers, Alan wanted to synchronise two recorders to increase the simultaneously available I/O and track count. As I described in the Q&A pages of *SOS* November 2002, combining digital multitrackers has its limitations, particularly in terms of combining aux buss signals from the two machines, but this didn't worry Alan in his situation so we set to work with hooking the two machines together.

The first task was to synchronise the two transports, so that the older VS880 controlled the newer VS880EX. Digging into the master unit's System menu first, we headed for the MIDI Prm submenu and set the MMC Mode to Master, making sure that MIDI Thru Sw was set to Out and SysEx Tx was set to On. Next we went into the Sync/Tempo submenu and set Sync Gen to MTC, ensuring that MTC Type was set to 30 and Source was set to Int. Moving over to the slave machine, we went to the System menu's MIDI Prm submenu and Set the MMC Mode to Slave, checking that SysEx Rx was On. Finally, we opened the Sync/Tempo submenu and set Source to Ext, making sure that MTC Type was set to 30.

That's an awful lot of parameter juggling, so here's how it all fits together. We set the master recorder to transmit two kinds of MIDI message: MIDI Time Code (MTC) and MIDI Machine Control (MMC). The MTC messages tell the slave where in the song the master is located, and the MMC commands operate the slave's transport controls remotely. The slave was set to recognise each of these types of MIDI message, in particular the 30fps MTC being sent by the master. With these settings made, the VS880EX responded to the location and transport operations of the VS880, and the playback of the two machines remained in sync once playback was started. Furthermore, with tracks enabled for recording on the slave machine, operating the master's Record transport button enabled recording on the slave machine, even when no tracks were record-enabled on the master.

At this point, however, there was only control information passing between the two recorders, so our next job was to get audio from the slave machine's mix buss into the master machine's mixer. A dedicated S/PDIF cable was used to connect from the digital output of the VS880EX to the digital input of the VS880, and then the Master Clk setting in the System Prm submenu of the VS880's System menu was set to Digital. The last step was to go into the VS880's master fader editing parameters and set Stereo In to Digital. Once this had been done, we pressed play on the VS880, and were rewarded with the sound of the VS880EX's mix combined with the VS880's.

However, there was one fly in the ointment. I noticed that the master meters on the VS880 were reading lower than those of the VS880EX when only the VS880EX was playing. I couldn't find any reason why this should be the case, so I switched to the VS880's Input Mix/Track Mix mode instead, and used input channels five and six (stereo linked and with the buss switch set to pre-fade) to feed the VS880EX's audio directly to the VS880's mix buss. This gave identical meter readings on the two machines, as I'd expected from my own experiences, so I can only assume that some level offset is automatically incurred by using the stereo input facility in Input To Track mode. I don't like the idea of a mixer doing things to the audio without it being told to, so I suggested to Alan that he get to grips with Input Mix/Track Mix mode to avoid this — anyway, it's much more flexible and also makes bouncing tracks and effects much less hassle.



Alan with his two Roland VS recorders. The machines were sync'ed up using MIDI Time Code and MIDI Machine Control, allowing him to record up to ten tracks at a time. To get audio from the slave VS880EX to the master VS880, the S/PDIF output of the slave had to be connected to the S/PDIF input of the master.

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▶ definitely needed it, but another SM58 fed into the VS880EX's final mic input would almost certainly have done the trick.

One Step At A Time

Like many studio activities, the process of sorting out Alan's drum sound involved a series of small steps, with auditioning of the results at each stage to gauge the effectiveness or our actions. Although the differences at each stage were often quite small, the cumulative effect was a radical change in the sound. Switching back and forth between monitoring on headphones (while Alan was playing) and monitoring on speakers also underlined the importance of doing test recordings when you have no separate control room — you can take an educated guess at EQ and compression settings on enclosed headphones, but it's vital to check everything on speakers as well to avoid any nasty surprises.

Although we'd managed to sync up Alan's two VS recorders (see 'That Sync'ing Feeling' box), I advised Alan not to split his drum recordings across the two machines, because of potential phasing problems arising from the inherently unpredictable nature of the synchronisation. I suggested that he should limit himself to six drum tracks and then use the other machine to record any other band members, being careful to avoid spill from their performances bleeding onto the drum mics. Spill could be kept to a minimum by using the COSM guitar amp simulation on the VS for guitar and bass guide parts, and by placing any acoustic instrumentalists or singers in a bedroom down the corridor from the studio. After capturing the drum parts, I'd be tempted to overdub everything else so that I could reuse the various analogue processors — again, if you make the sounds as good as possible on the way into the VS recorder, then you'll usually get much better results than by trying to fix things in the mix.

If band recording is going to be a frequent activity for Alan, however, I'd suggest that he get himself a slightly more flexible mixer to allow him to set up a decent sound for all the band members together. I'd suggest a four-buss console, something like a Mackie 1604 VLZpro or Behringer Eurorack MX2642A. This would allow Alan to completely avoid the Roland multitracker preamps, the quality of which I've always found slightly questionable, and would give him access to phantom power and three-band EQ on every channel. That would free up his Aphex 109 and Focusrite Platinum units for critical tasks. Both of the desks I've mentioned allow channels to be assigned to the four group busses and master mix buss separately, and these six outputs could be fed straight to the VS880EX for recording the drums. Four extra signals could then be fed to the VS880's analogue inputs from auxes three to six on the Mackie, or from the individual channel direct outputs on the Behringer, leaving at least two mixer auxes for extra foldback, in addition to the two auxes on the master VS880. I'd also suggest that Alan upgrades his outboard reverb processor to something more flexible, perhaps an MPX500 if he likes the Lexicon sound, so that he can more easily tweak the sound to suit the job in hand. SOS

Alan's Session Notes

"When I asked *SOS* for help I was having two problems. The first was that I'd been unable to sync up my two Roland VS recorders, so I was limited to recording a maximum of six tracks at a time — I felt like I was driving an expensive car, bristling with features, but with little idea how to use them once the engine had been started. Mike arrived at about 10am (with some alarmingly expensive-looking boxes and mics — thoughts of selling Granny came to mind) and in less than an hour he had them talking to each other. Terrific! Now I can mike up a drum kit and still have tracks spare for guide vocals or a bass line. If you already own a VS880 or VS840, then getting hold of another one second-hand will greatly improve your options.

"The second problem was my supreme ability to make a top-notch drum kit sound like cardboard boxes being played in the deep end of the local swimming pool! At first I was confused that Mike spent so long setting up the overheads, moving them around and tweaking the sound. I normally sort out the snare and kick drum first, only then adding the overheads to fine-tune the mix. However, comparing the results showed that this approach had been totally back-to-front and, from that point on, the techniques became more understandable.

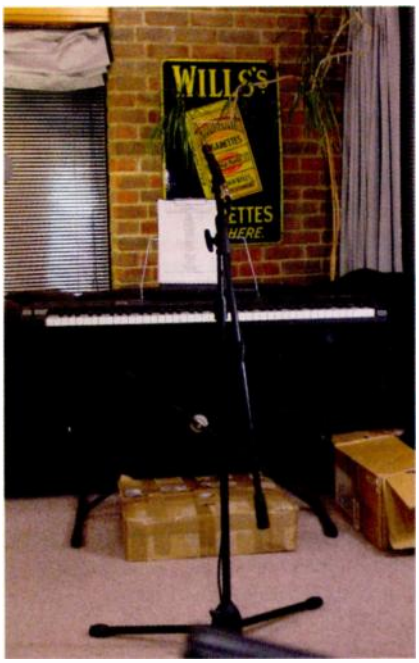
"Once we'd spent the time getting the positioning and sound of the overheads right, we moved onto the snare and kick mics. One thing I hadn't realised, until Mike demonstrated it to me, was how much the phasing of the mics can affect the overall sound. Fine-tuning the EQ and compression on the way into the VS also made a big difference, although the snare, kick and toms seemed to have strongly defined sounds, so it took less work to get them right. Mike stressed the importance of getting the signals into the VS as hot as possible, to make the best of the converters, and comparing with the Blondie track to keep what we were doing in perspective.

"Another thing I learned was to forget dramatic reverbs and delays for my drums, and to work instead with subtle ambience effects on the overheads. Once some close-miked kick and snare had been added to the overheads for definition, a touch of extra ambience made the mix suddenly start to sit together.

"And what of the expensive gear Mike brought with him? Well, we managed to sort things out using just my own kit, so Granny is still around! It's tempting to feel a little smug about that, but I have to acknowledge that 80 percent of my studio has been bought after reading *SOS* reviews, so my subscription must have paid off! However, if they publish the picture of the PZM mic hung up with garden wire then I'll probably sue them..."

An Aphex Anomaly

Before we plugged up the Aphex 109 to process our kick drum mic, Alan noticed that the red overload LEDs on both channels were rapidly flashing on an off, as if high-level LFO signals were passing through them, even though both inputs and outputs were disconnected on the patchbay. I tried adjusting the settings on one of the EQ channels, and noticed that if I reduced the gain on both bands to below unity the light on that channel stopped flashing, which suggested to me that a feedback loop of some type was causing the problem. Plugging into the lower sockets on the patchbay immediately turned the overload LEDs off, which confirmed my suspicions. It turned out that Alan had connected the inputs above the outputs on the patchbay, but hadn't defeated the normalling on those patchbay channels, which meant that the Aphex's inputs were connected to its outputs whenever nothing else was connected, hence the feedback loop.



A first attempt at increasing the apparent room size involved pointing a Shure small-diaphragm condenser mic out into the room to capture extra ambience, but in the end a more useful result was achieved using the VS880's Large Room effects program with the Reverb Time parameter reduced.

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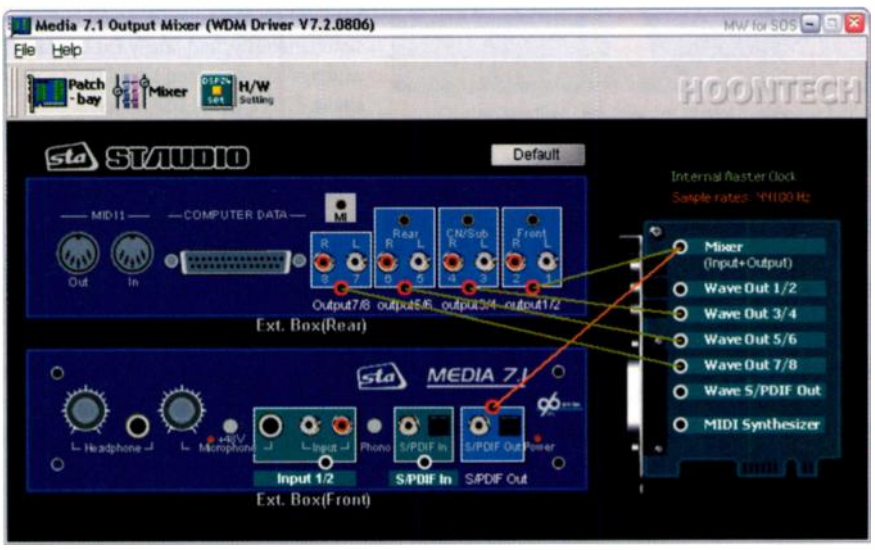
DSP24 Media 7.1 Brief Specifications

- Soundcard internal I/O: CD in, Aux in, via 18-bit AC97 codec, supporting up to 16-bit/48kHz.
- Soundcard external I/O: stereo line in, mic in, mix output, all via 18-bit AC97 codec and on 3.5mm jack sockets.
- Breakout box analogue inputs: stereo -10dBV line/RIAA-equalised phono in (switchable), quarter-inch jack balanced mic in with switchable +48 Volt phantom power and front-panel gain control, 3.5mm stereo jack mix input (from card external mix out).
- Breakout box analogue outputs: eight phono line outputs, duplicated with 3.5mm stereo jacks for Front (1/2), CN/Sub (3/4) and Rear (5/6), plus quarter-inch stereo headphone output with volume control.
- Breakout box digital I/O: co-axial S/PDIF in and out, Toslink optical S/PDIF in and out, MIDI In and Out (MPU401 compatible).
- Onboard GM/GS hardware synth: DREAM 4MB ROM with 48-voice polyphony, 16-channel multitimbrality, with reverb and chorus.
- A-D converters: 24-bit 64x oversampling (part of AK4529 chip).
- D-A converters: 24-bit 128x oversampling (part of AK4529 chip).
- Signal-to-noise ratio: >100dB (A-weighted).
- Total harmonic distortion + noise: not stated.
- Frequency response: not stated.
- Supported bit depths: 8, 16 and 24.
- Supported sample rates: 22.05, 32, 44.1, 48, 88.2 and 96 kHz.
- Digital I/O: up to 24-bit/96kHz, non-audio mode transmits AC3 streams.



The graphical patchbay makes the various connections between the soundcard driver devices and physical I/O sockets immediately obvious.

▶ combined output from the soundcard's DSP mixer.

Patchbay & Routing Options

Like most other soundcards, the Media 7.1 is supplied with its own Control Panel utility. This has three pages labelled Patchbay, Mixer and H/W Setting, and by default appears with the Patchbay visible. Both the front and rear panels of the breakout box are displayed in graphic form along with a symbolic version of the soundcard itself, above which are displayed the current clock and sample rate settings.

There are five pairs of physical hardware outputs available as possible patchbay destinations: the analogue outputs 1/2, 3/4, 5/6 and 7/8, plus the S/PDIF out. To these you can drag virtual patch cords from the internal soundcard signals and the analogue or digital hardware inputs, providing zero-latency monitoring of the latter. The internal soundcard signals available comprise the four stereo Wave playback pairs, labelled Wave Out 1/2, 3/4, 5/6 and 7/8, along with Wave S/PDIF Out, MIDI Synthesizer (the output of the internal hardware synth) and Mixer (from the internal digital mixer). Each of these displays the current playback level behind its text name as a horizontal peak-reading bar meter, whose colour flashes red when it exceeds -1dBFS.

You can't merge signals, so each physical output can be connected to just one input or internal signal, but there's no restriction on how many destinations each internal signal can be patched to. So, for instance, you could connect the MIDI synth to all five output pairs if you wished, although by default, Wave Outs 3/4, 5/6 and 7/8 are all connected to their equivalent physical output while the Mixer output goes to both physical outputs 1/2 and the S/PDIF output. There are various source/destination restrictions, and only those connections that become highlighted when you grab them are permissible.

Unlike many similar products that use simple text-box source and destination options, the functional graphics and virtual patch cords of the Media 7.1 patchbay make it easy to understand what's going on within the first few seconds. However, unravelling the options and the current settings does end up taking longer, simply because following patch cords and studying the possible options for each source or destination takes longer than reading text boxes — you can't have it both ways.

The Digital Mixer page lets you create a monitor mix of the various possible source signals, which comprise Wave 1/2 through to 7/8, S/PDIF Out, S/PDIF In and Input 1/2 for zero-latency monitoring, and MIDI Syn. Each has its own pre-fade peak-reading meter, fader, pan slider, mute and solo button, while a pair of Master channels with their own meters, faders, and global mute button control overall output level. Four presets can ▶

The Media 7.1 features zero-latency input monitoring, along with a comprehensive internal DSP mixer to set up monitor mixes.

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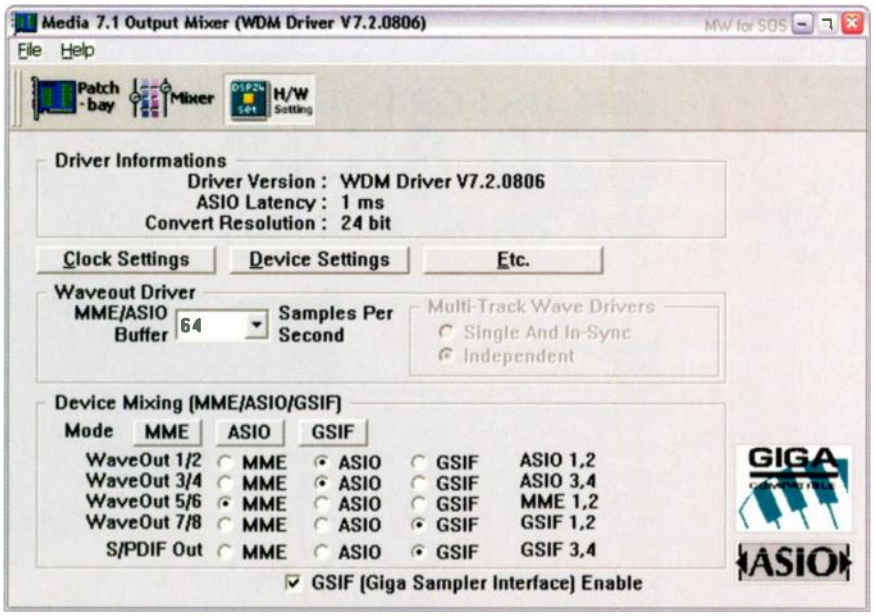
be saved or loaded using the buttons at the top right, which is handy for quick recall.

Hardware Settings

The H/W Setting page displays the driver version information, along with its current latency and resolution, and below this are three buttons that call up extra information about the Clock, Device and other settings. The Clock options include a rather superfluous one that allows you to record and play back at bit depths greater than those supported by the card — perhaps these drivers are also used by other Hoontech products. More useful are the options for internal and external master clock, as well as a display of the current sample rate, which can also be set manually and then locked, rather than being chosen by the music application.

ever need it. Unfortunately, the allocation also determines the ASIO and GSIF driver numbering within applications: in the example above, after choosing the ASIO drivers inside *Cubase SX*, you can choose from 'Analog Output (1) 1/2' and 'Analog Output (1) 3/4', while *GigaStudio* also displays its GSIF output options as 1/2 and 3/4, despite actually using WaveOut 7/8 and S/PDIF Out. Meanwhile, all the MME options will still be available to applications, but only the one labelled 'MME-WDM ADSP24 Ext.5/6 Audio Device' will work, the others giving error messages. Admittedly you won't be changing such settings very often, but this is a source of initial confusion. Having said that, the ability to mix and match driver types is certainly useful, although various other soundcards I've reviewed have managed to perform the same feat in a more transparent manner.



You can allocate each output pair to a different driver format.

The Device Settings let you adjust ASIO buffer size, and eight settings are provided ranging from 1536 down to 64 samples (incorrectly labelled as samples per second). Under the Device Mixing section (which in the printed manual is more correctly referred to as Multiclient Support), you can independently decide which driver format is used by each of the WaveOut and S/PDIF Out devices, by ticking the appropriate button. So, for instance, you could allocate WaveOut 1/2 and 3/4 to ASIO for use within *Cubase*, WaveOut 5/6 to MME for a stand-alone soft synth, and WaveOut 7/8 and S/PDIF Out to GSIF for *GigaStudio*. This works well, although as you might expect, you have to make your selection before launching your music applications. There's a further tick box labelled GSIF Enable, which does exactly what it says, although I'm not sure why you would

The final page is labelled Etc, and contains a couple of further options. Multi Channel Device Support will primarily be used with software applications like *WinDVD* or *PowerDVD* to play multiple audio channels using a single MME device, while S/PDIF Out offers a choice of Consumer or Professional modes. You can also move between the various pages using menu options, while an additional Call Internal Mixer option launches the standard Windows mixer for controlling the AC97 codec playback and recording features, should you decide to use them.

Test Spec

- Soundcard driver version: 7.2.0806.
- Intel Pentium III 1GHz processor, Asus TUSL2-C motherboard, 512MB Crucial SDRAM, running Windows XP.
- Tested with: Steinberg *Cubase SX* v1.02 and *Wavelab* v4.0d, Tascam *GigaStudio 160* v2.50.48, NI *Pro 52* v2.5, Cakewalk *Sonar* v2.0.

In Use

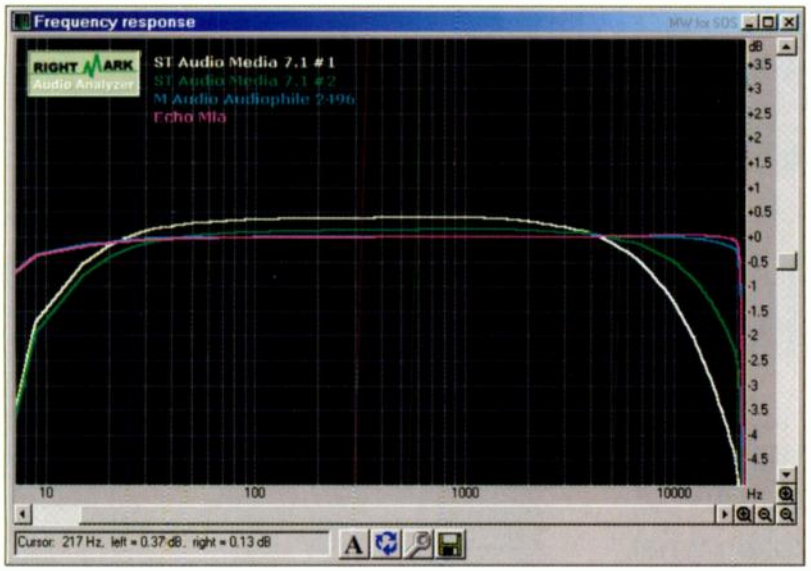
The Media 7.1 wave playback quality sounded reasonably similar to my Echo Mia, which is hardly surprising considering that the former uses an AK4529 codec and the other an AK4528 codec. However, the Media 7.1 lacked crispness at the top end by comparison, and the Mia obviously has a lower-jitter clock, as its transient detail was noticeably cleaner and its imaging more precise. The AK4529 codec also has slightly higher noise levels, and with 24-bit/44.1kHz recordings the RMS background noise measured a reasonable -98.2dB. This is about the same as Terratec's DMX 6Fire, and about 1dB worse than their EWX 24/96 and M Audio's Audiophile 2496, but some 6dB worse than the Mia. The 24-bit/96kHz figure was -96.6dB RMS, this further rise of a couple of dBs being fairly typical for the doubled bandwidth.

My tests with Rightmark's *Audio Analyser* 4.0 showed similar background noise levels, but confirmed my listening tests as far as frequency response was concerned. While the Media 7.1's low-frequency response was only -0.4dB down overall at 20Hz, it was -3dB at 15kHz for both 44.1kHz and 96kHz sample rates. I repeated my tests using the Echo Mia as a reference to measure the Media 7.1's A-D and D-A sides separately, and this proved that the A-D recording side was fine at +0.12/-0.79dB between 20Hz and 20kHz. The D-A playback portion was causing the problems, measuring +0.34/-4.69dB over the same range.

Suspecting that I'd received one of several early cards sent out with incorrect capacitor values, ST Audio sent me a second one to test. While both cards had an identical low-end roll-off, the second one was rather better at high frequencies, rolling off to -3dB at 20kHz when using a 44.1kHz sample rate, extending only slightly to 23kHz with a 96kHz sample rate. All other performance aspects of this second Media 7.1 card were identical to the first.

This is much more acceptable for an eight-channel card that retails at £230, and although 96kHz recordings will show little improvement over 44.1kHz or 48kHz ones, I still maintain that at this end of the market these lower sample rates are more suitable anyway. If you really do want to record at 96kHz, two similarly priced cards that I have tested that exhibit a wider frequency response are M Audio's Audiophile and Echo's Mia, both of which are only 1dB down at around 42kHz using a 96kHz rate, but have far fewer channels.

It's extremely handy to have a GM/GS MIDI



While the audio differences are subtle, the first sample of the DSP24 Media 7.1 soundcard showed a very early high-frequency roll-off, but thankfully the second one I received was significantly better, although still not as flat and extended as either M Audio's Audiophile 2496 or Echo's Mia.

synth in hardware, since of course it consumes no CPU overhead, but with a 4MB ROM you can hardly expect it to set the world alight. Even so, its sounds are relatively rich and smooth, and sometimes quite powerful, if somewhat lacking in expression given the short length of each sample. The printed manual does help in extracting the last drop of performance from it, with a full list of sounds and bank variations, plus a comprehensive SysEx implementation table for getting deeper into sound and effect editing.

The ASIO drivers worked extremely well in *Cubase SX* 1.02, with no glitching on my test songs even at the lowest 64-sample setting, which at 44.1kHz gives a 1.45ms buffer latency, while the GSIF drivers gave a faultless performance with *GigaStudio 160*, and the WDM drivers gave me an excellent 5.8ms latency in *Sonar* 2.0. With *Pro 52* in stand-alone mode the DirectSound drivers managed a reasonable 25ms, and only the MME performance with *Pro 52* at 45ms was mediocre — not a cause for much concern given the other available options. The S/PDIF I/O also gave an accurate bit-for-bit copy of a DAT transfer.

I would advise against using the AC97 codec at all, since its audio contribution is permanently added to breakout box output 1/2, and as soon as I plugged in the extra 3.5mm jack-to-jack lead from soundcard to breakout box, low-level digital hash appeared in the background, along with crackles each time the display was altered or mouse moved.

Final Thoughts

With its eight outputs and wide variety of input options, the Media 7.1 will obviously appeal to musicians interested in low-cost surround sound, and here a couple of obvious competitors are Creative Labs' Audigy (reviewed in *SOS* November 2001), and Terratec's DMX 6Fire (*SOS* April 2002). I still feel that with its fixed 48kHz engine and poor noise performance, the Audigy causes more problems for musicians than it solves, although it does provide SoundFont support and FireWire ports. However, the DMX6Fire is a much stronger competitor, providing similar performance and background noise levels to the Media 7.1, and a similar complement of analogue and digital I/O, including an RIAA preamp. However, for its additional £50, the Media 7.1 also features a built-in hardware MIDI synth whose output can be internally recorded using the Ext 3/4 input, as opposed to a WaveBlaster connector, while its mic input has +48 Volt phantom power.

Overall, despite the AC97 codec features (which can be ignored if you prefer, or pressed into service for Windows sounds and lo-fi audio CD playback), and a subtle roll-off at the top end, the Media 7.1 gives the impression of a fairly rugged, straightforward design for musicians, and will no doubt find plenty of users. SOS

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Understanding Impedance

No home studio is immune from issues of impedance, yet the subject can seem very confusing. In this workshop we explain what the recording musician needs to know about impedance, and show you how to avoid lifeless guitar sounds, digital glitches, and fried amps!

Hugh Robjohns

Anyone who has read the technical specifications of any mixer, preamplifier, microphone, or pretty much any other piece of audio equipment will have come across the term impedance. Input impedance, output impedance, terminating impedance, matched impedance, and characteristic impedance are all fairly common terms in the tech specs, but what do they all mean and why are they relevant? In this article I will try to answer these questions and to explain what you need to know about impedance in practical terms, without too much maths and science. So any electronics students reading this can stop right now and go and do their homework instead...

What Is Impedance?

Okay, let's start with a basic definition of impedance. We should first think about electrical resistance (represented by R), measured in Ohms (symbol Ω). Imagine a simple circuit consisting of a battery and a resistor. The battery generates a voltage which tries to force a current around the circuit connected between the battery's two terminals. The resistor resists that current — the higher the value of the resistor, the lower the current will be, and vice versa. In resisting the current, a voltage difference is developed across the resistor. This important phenomenon is defined mathematically in Ohm's Law, where the battery voltage (represented by V and measured in Volts) equals the current (represented by I and measured in Amps) multiplied by the resistor's resistance value. Expressing this law algebraically, V=IR, a simple bit of algebraic rearrangement gives I=V/R. So if the battery is 12V and the resistor is 120Ω, the current flowing around the circuit will be 12V/120Ω, which is 0.1A, or 100mA.

This simple example is of a Direct Current (DC) circuit — the battery voltage is steady and unchanging (ignoring the effect of the battery losing energy over time). However, when we are dealing with audio electronics, the signal voltage changes amplitude continuously to represent the changing amplitude of the audio signal, and it alternates between positive and negative cycles. The currents that flow therefore have varying amplitudes and alternate in direction as well, and we have what is known generically as an Alternating Current (AC) circuit.

This is where things become slightly more complex, because, in addition to the resistance, there are two other fundamental components which affect the current flowing around an AC circuit. In addition to the simple resistance we have already discussed, there is also capacitance and inductance to consider. In simplistic terms these also act like resistors, except that their resistance to current changes in proportion to the frequency of the signal voltage fluctuations — the rate at which the current flowing through the circuit is made to change direction by the audio signal voltage, in this case.

All audio electronics have combinations of resistors, capacitors and inductors connected in circuits, along with 'active' components like transistors or valves which provide amplification or act as switches. To make life slightly easier for ourselves, we often consider the total 'resistance' of a complex circuit involving resistors, capacitors and inductors as a composite lump, and that's what we call the impedance.

Impedance has the symbol Z — hence references to high-Z inputs, for example — and is still measured in Ohms. However, the actual value depends to some degree on the frequency of the signal voltages involved. In audio input and output circuits the impedances are principally resistive to make interconnection easier — the impedance won't change too much over the range of audio frequencies. However, the impedance to radio frequency (RF) signals will often be very different to that at audio frequencies in order to keep RF interference out.

Input & Output Impedances

Any device which generates a voltage has what is called an output impedance — the impedance value of its own internal circuitry as 'seen' from the outside (ie. as measured across its outputs). Similarly, any device which expects to receive a voltage input has

an input impedance — the impedance 'seen' by any equipment connected to its inputs (ie. the impedance measured across the inputs). The output voltage from the source is developed across the input impedance of the destination (often called the load impedance, or simply the load), and therefore the signal voltage is passed from source to destination. However, the input and output impedances will also affect the current that flows around the circuit too.

In cases where it is necessary to transfer the maximum power from a source to a destination (power being proportional to both voltage and current), the output impedance of the source and the input impedance of the destination must be equal; a situation referred to as having matched, or balanced, impedances. (Strictly speaking, the input impedance should be the conjugate of the source impedance, but I only mention this in case those pesky electronics students are still reading!) If the source and destination are physically separated by a large distance (in relation to the wavelengths of the signal frequencies being passed), then the connecting cable should also share the same impedance as both source and destination.

In a matched system like this we have the ideal power transfer arrangement, but the output voltage from the source device is shared equally across both the output and input impedances (assuming negligible cable effects). This is not a problem, as it is taken into account in the design of equipment for matched systems, but is worth bearing in mind, because it has some implications which I will return to in a moment.

The Birth Of The 600Ω Standard

Now let's have a look at what happens if the source and destination impedances are unmatched. Well, basically, some of the energy being transferred from source to destination is reflected back from the destination (or wherever there is an impedance mismatch in the connecting circuit) towards the source — not a good thing, in general. Theoretically such reflections could manifest as echoes, or cause signals at certain frequencies to be reduced through cancellation. The telephone industry discovered the practical ramifications of impedance matching almost a hundred years ago. The wavelength of an audio-frequency signal travelling down a cable as an alternating voltage can be anything from 15000km at 20Hz to about 15km at 20kHz (wavelength reduces as signal frequency increases), so telephone cables used to carry conversations between people living in different cities can be considered to be of significant length compared to the wavelength of the signals they carry.

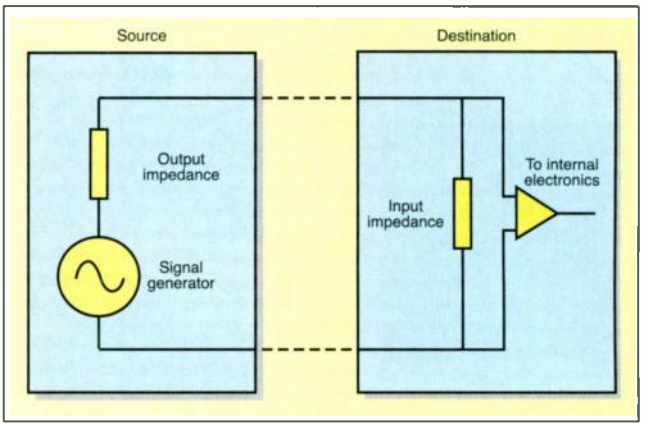


Figure 1. Input and output impedances, also called source and load impedances.

Since cable lengths between towns were comparable to the wavelength of the audio signals carried, it was important that the impedances of the sending and receiving telephone exchange equipment, along with the characteristic impedance of the cables (see 'Characteristic Impedance' box), were properly matched. If the impedances weren't matched correctly then reflections would occur (heard as echoes and colorations), and little energy from the source would reach the destination, resulting in faint signals coming out of the earpieces of the two telephones. These kinds of effects are rare these days, because the majority of telecoms systems are now digital — the basic problems are the same, but the technology has been developed to get around them.

In order to deal with impedance matching problems, the telecoms industry quickly standardised on a connecting impedance to ensure good transfer of audio signals with minimal reflections, and that was 600Ω. In practice, the actual telephone cables tended to have a characteristic impedance of about 140Ω, so matching transformers were employed all over the place to match between the 'standard' 600Ω, and the actual 140Ω installations.

Matched-impedance Systems In The Studio

The broadcasting industry, and later the recording industry, grew up directly from the technology of the telecoms industry — the VU meter being a prime example of a telecoms measurement system which has survived unchanged in the recording industry to this day. One consequence of this direct borrowing of technology was that early broadcast and recording studios also employed the 600Ω matched-impedance principle for almost everything — tape machine outputs, console inputs, and so on. However, the idea of matching impedances is not particularly relevant or practical in a recording studio, for several reasons.

For a start, we are not really interested in the transfer of power between source and destination — it's the signal voltage fluctuations which carry the information we're interested in — and it is extremely unlikely that any studio cable is going to be 15km long! For these reasons, there is no technical requirement for impedance matching. Secondly, it is common in studios to want to distribute one output signal to several device inputs (say, one mixer output to several tape recorder inputs), and there are problems with doing this within matched-impedance systems.

Consider a mixer outputting a nominal 0dBm line-up signal from a 600Ω output impedance, connected to a tape recorder input of 600Ω input impedance. (For the difference between dBm and dBu, see the 'Signal Levels' box.) The tape recorder input meter will show a signal level of 0dBm as well — so far so good. However, plug a second tape recorder input across the mixer output and its 600Ω input impedance interacts with that of the first machine to produce a new combined input impedance of about 300Ω. (Without getting too far into the physics here, this is because the two inputs are wired in parallel.) The result is a reduction in the signal level at each tape recorder input, as the same source signal current now has to be shared between the two destinations, therefore developing half the voltage across each input impedance. A halving of voltage is a 6dB reduction in signal level and, consequently, the tape recorder meters show an input level ▶

Impedance & Frequency Response

The output impedance of a device and the capacitance of its connecting cable form a simple first-order low-pass filter, producing a 6dB/octave attenuation above a certain frequency. However, you need either quite a low output impedance or quite a long high-capacitance cable to bring the turnover of this filter into the audio band. Even so, it's best to select cables which have as low a capacitance as possible, and to keep cable runs as short as practicable.

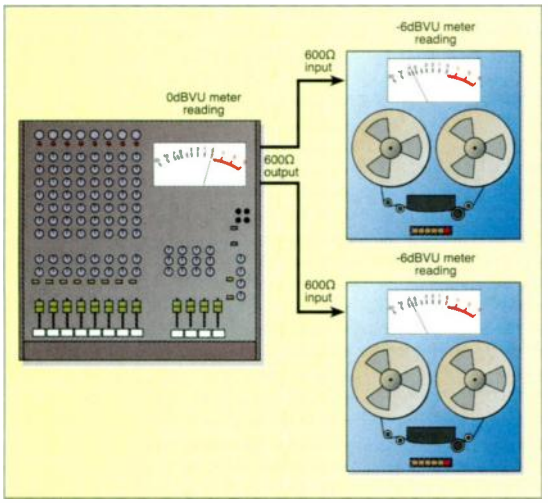


Figure 2. In a matched-impedance system working to the 600Ω standard, connecting two tape machine inputs to the same console output would cause a level drop of 6dB, because each of the two parallel 600Ω loads only receives half the signal power.

Relatively high-impedance inputs such as these are called bridging inputs, and they have the advantage that several devices can be connected in parallel without decreasing the impedance to any significant degree — the voltage developed across each input remains high and the source does not need to supply a high current. (A low impedance is often referred to as 'loading' the output or circuit, because of the high current it demands.) Let's have another look at our earlier example, where a console output is feeding two tape machines. Say each machine now has an input impedance of 30kΩ; connecting two in parallel will only reduce the combined input impedance to 15kΩ, which is still substantially higher than the 150Ω output impedance of the console. Hence, the input voltage will be virtually unaffected — I calculate a loss of 0.04dB, in fact! Even connecting a third device to the output, the impedance would only fall to 10kΩ — the level would fall by a further 0.05dB, which I don't think anyone would hear! Because bridging inputs make studio work so much easier, the idea of voltage matching is now employed almost universally in line-level audio equipment, irrespective of the actual reference signal levels used.

▶ of about -6dBm instead of 0dBm. This is clearly not a good situation, and is very restrictive in terms of what can be connected to what.

Voltage Matching & Bridging Inputs

The solution to this problem is to dispense with the idea of matched impedances completely, and use what is called voltage matching instead. The idea here is to engineer the equipment to have the lowest possible output impedance and a relatively high input impedance — the difference between them must be at least a factor of ten, and is often much more. Modern equipment typically employs output impedances of around 150Ω or below, with input impedances of at least 10kΩ or above. With the minuscule output impedance and relatively high input impedance, (the cable impedance can be disregarded completely in comparison) the full output voltage should be developed across the input impedance.

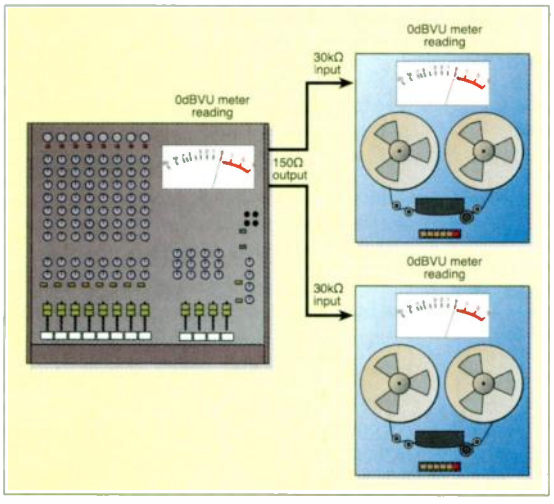
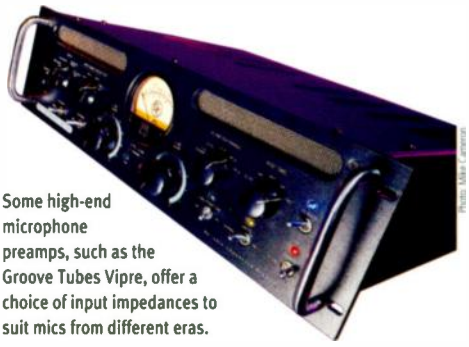


Figure 3. In a voltage-matched system, two tape machines can be connected to the same console without an appreciable drop in level at either of the machines — the two parallel 30kΩ impedances are seen as 15kΩ by the source, which is still very high compared to the 150Ω output impedance.

Microphones & Preamplifiers

In the early days of microphone development, with ribbon and moving-coil designs being the only high-quality devices available, most microphone and preamplifier systems were designed with impedance-matched interfaces — typically operating at 300Ω, although other standards did exist. Later on, with the introduction of capacitor microphones and their internal impedance converting head amplifiers, the idea of voltage matching was adopted and is retained to this day for all microphone types. There are a few microphone preamplifiers available which are designed specifically for use with vintage ribbon microphones and still include impedance-matched interfaces. However, these are rather specialised devices and are of little practical concern to most of us.

Typically, most microphones therefore have an output impedance of 150-200Ω, and most preamplifier inputs offer an input impedance of between 1.5kΩ and 3kΩ — on the limit of the 'ten times higher' rule of thumb I mentioned earlier. It is a good idea to keep the input impedance of mic amps relatively low (at least compared to typical line inputs) since resistors generate noise when current flows through them; the higher the resistance the greater the noise. Since the signal level from microphones is relatively weak, a lot of gain is generally required, amplifying the resistor noise along the way. This is the reason why mic preamp specs should quote the source impedance when providing the Equivalent Input Noise (EIN) measurement; the lower the source impedance, the lower the noise will be. A good EIN figure can be achieved for the spec sheet by measuring the input stage with a 50Ω source impedance. However, this noise figure will be totally unrealisable with a real-world 200Ω microphone!



Some high-end microphone preamps, such as the Groove Tubes Vipre, offer a choice of input impedances to suit mics from different eras.

Impedance Considerations With Electric Guitars

The pickups generally used in electric guitars and basses are primarily inductive rather than capacitive (because of the coils used under the strings), and are also highly resistive simply because of the sheer amount of wire involved (typically up to 10kΩ), although different styles and makes of pickup can vary enormously. Since the pick-up presents a relatively high output impedance, it is normal to provide guitar preamp and DI inputs with a hugely high input impedance. A minimum value is typically 470kΩ, but many are over 1MΩ and a few, designed for accepting feeds from magnetic pickups in some acoustic guitars, are rated even higher than this.

If the input has too low an impedance, the most noticeable effect will be a loss of high end — in fact, even using guitar cables with too high a capacitance can audibly reduce ▶

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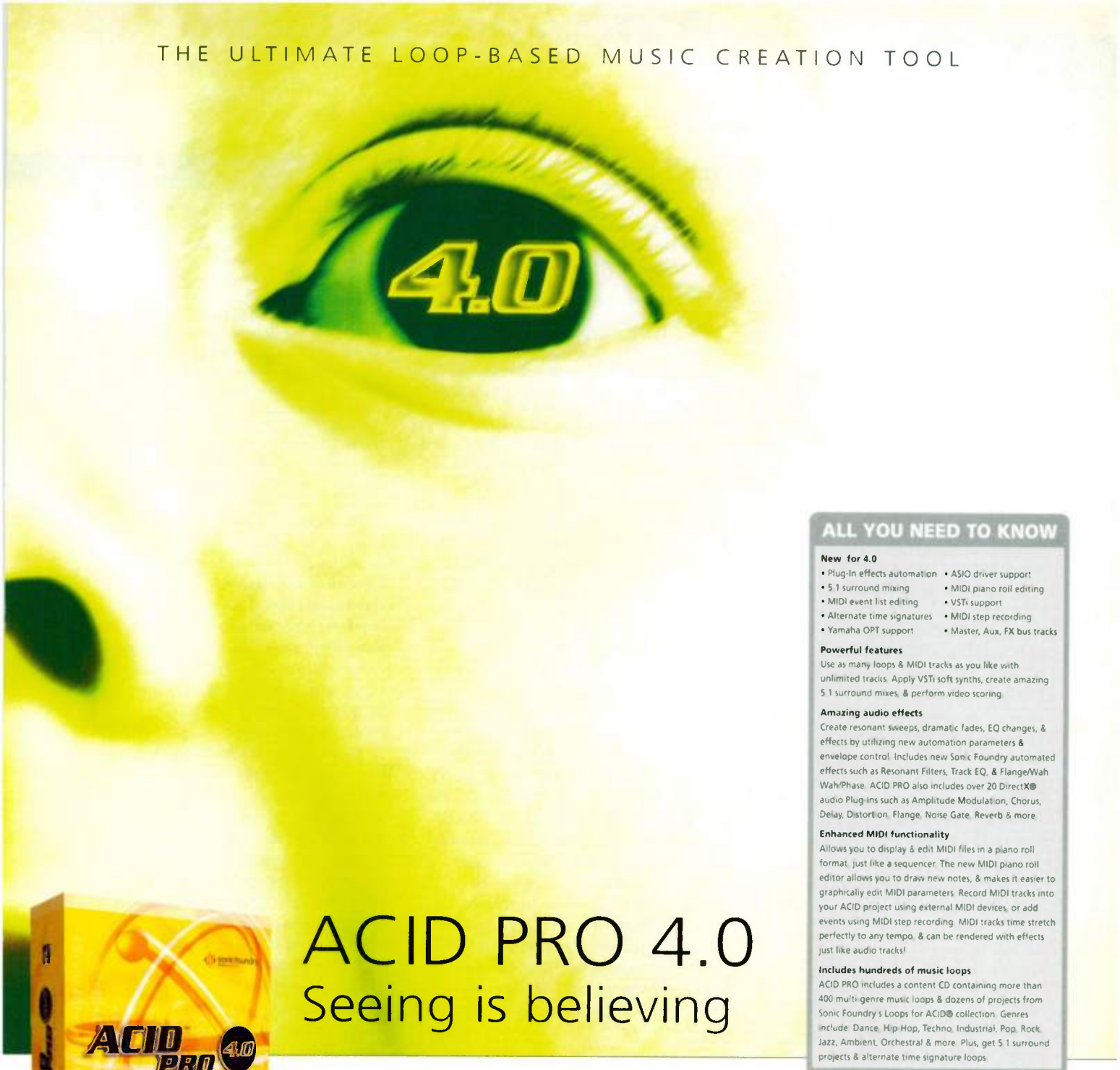

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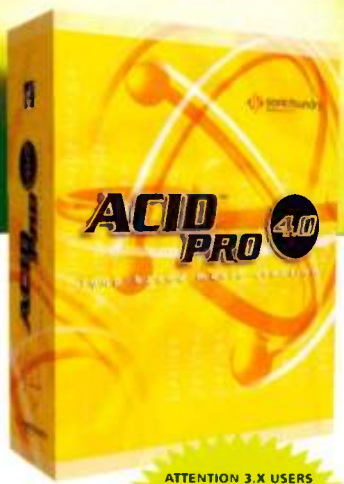

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high frequencies (see 'Impedance & Frequency Response' box for details of this effect). The sustain is also affected, giving a 'dead' sound.

Loudspeaker Impedance

Most readers will be aware that loudspeakers are quoted with a nominal impedance of usually four, 8, 15 or 16Ω. The last tends to be used with vintage valve amplifiers, the first with automotive and battery-powered systems. Loudspeakers are very complex things, and those with passive crossovers are often challenging for the amplifier(s) to drive. Many loudspeaker manufacturers reproduce plots of the impedance curves of their designs showing impedance against frequency. A cursory examination reveals just how variable the impedance can be, and therefore how difficult it can be for the amplifier to deliver its signal accurately at all frequencies.

In general, amplifiers are designed to have an extremely low output impedance (usually fractions of Ohms) so that the loudspeaker impedance is significantly higher. However, the impedance of the connecting cable can also have an audible effect on the sound quality. For example, the dreaded 'bell flex' so often used with cheap and cheerful systems presents a relatively high resistance and, since it is in series with the loudspeaker, a portion of the amplifier's energy will be dissipated simply in heating the wire. The cable resistance may also interact with the crossover's characteristics.

There is a great deal of black magic associated with speaker cables (and line-level

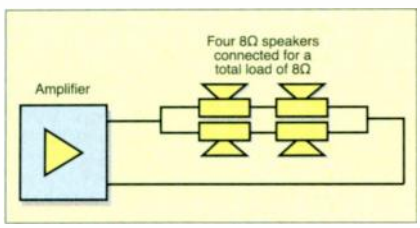

Figure 4. Here's a way you can connect four 8Ω speakers to a single amplifier while maintaining the overall 8Ω load.

interconnects for that matter) by the hi-fi press, most of which, in my opinion at any rate, is complete hogwash. Nothing more than common sense and sensibly engineered equipment is required. By using good-quality, thick cables which are terminated properly, the cable resistance will be sufficiently low to become as irrelevant as the capacitance. While there are plenty of good, high-quality speaker cables available, heavy-duty two-core mains cable is just as good in almost every situation, and considerably cheaper!

Incidentally, it is worth knowing that if you connect loudspeakers in series, the impedance increases by the sum of the individual units. For example, two 8Ω speakers in series present an impedance of 16Ω. Working out the impedance for speakers wired in parallel is slightly more complicated. If the speaker impedances are R_1, R_2, R_3, and so on, the combined impedance is:

$$\frac{1}{\frac{1}{R_1}+\frac{1}{R_2}+\frac{1}{R_3}+\cdots}$$

For example, two 8Ω speakers in parallel offer and impedance of 4Ω. By combining these two effects you can, for example, connect four 8Ω speakers to an amplifier intended to drive an 8Ω load as in Figure 4. Although each speaker in this configuration will receive less power than a single speaker, the combined power will be almost the same. However, there are advantages to using multiple speakers: each speaker can be cheaper, because it needs to produce less power; and the combined surface area of the speaker cones can be increased, which can be used to improve the system's bass performance — hence the multi-speaker design of some bass guitar cabinets.

Headphones

Headphones, like loudspeakers, also present a load impedance to the driving amplifier. However, there are three main classes of headphone design — and I'm talking just about impedances here, not the arguments over closed-backed, open-backed, or in-ear designs. The impedance of a headphone is determined by the design of its voice coils — the length and size of wire used, the number of turns around the former, and so on. Consequently, the impedance will affect the volume produced by the headphone — but so too will the strength of the magnet, and several other aspects of the design. The best guide is the quoted sensitivity of the headphone in terms of decibels per milliwatt (dB/mW). The design of the amplifier used to drive the headphones will also have a significant bearing on the output volume.

Broadly, headphones can be categorised into three groups by their impedance: broadcast, professional or portable. The 'broadcast' group have a relatively high impedance, typically of between 1.5kΩ and 2kΩ. The idea behind this relatively high impedance is so that the headphones can be plugged into a patch bay to monitor a signal source without loading it unduly and causing a drop in the level. The ubiquitous Beyer DT100 can be specified with a 2kΩ impedance, for example.

The next group are the 'professional' designs which typically range from 150Ω to 600Ω. Within this group it is often the case that the lower the impedance the higher the volume. It is an obvious marketing ploy, but, given two otherwise similar designs, the one with the lower impedance will sound louder when plugged into the same amplifier — and, of course, some purchasers may be swayed into purchasing one pair of headphones over another simply because of the extra volume. The Sennheiser HD250 is available with a 150Ω impedance, for example.

The third group are the designs intended for use with portable CD players and the like. Power is the product of voltage and current, but, since the supply voltage to the amplifiers is limited (because you're using batteries), more power requires more current. That can only be achieved if the headphones have a low impedance. Typical designs provide

The Sony MDR7509 headphones have a very low impedance which means that they can generate high playback volume even with low-voltage devices such as battery-powered portable CD players.

High-impedance Hi-fi Standards

Although the vast majority of hi-fi equipment uses the voltage matching concept, there is some which employs a very different strategy, and it is worth knowing about this strange idea lest you ever come across it! The DIN organisation (Deutsches Industrie Normal) defined an interface standard many years ago which uses current sources instead of voltage sources to generate the output signal. The DIN interface usually employs DIN sockets (now better known for their use in MIDI interfaces) — in three-, five-, seven-, or sometimes eight-way configurations. The five-way version is standard for stereo interfaces and can accommodate stereo inputs and outputs simultaneously, with a common earth connection.

The significance of using a current source to generate the output is that the signal voltage seen by the receiving device depends almost entirely on its input impedance. The DIN specification states that the current source should give an output voltage of 1mV per 1kΩ of input impedance. Typically, the input impedance of a DIN-compatible unit would be 100kΩ, and so would see an input signal voltage of about 100mV.

Hi-fi equipment with phono connectors usually employs the voltage matching concept, with very low output impedance and much higher input impedance (although rarely as high as 100kΩ). Typical signal levels vary between 250mVRMS and 1VRMS, although CD and DVD players are usually specified with an output voltage of 2VRMS.

impedances in the 8-32Ω region — the Sony MDR7509 is specified with a 24Ω impedance, for example.

Increasingly, people tend to use high-quality 'professional'-impedance headphones with portable equipment, and this is rarely a problem, except that the maximum volume will be reduced compared to a lower-impedance design — which is no bad thing in most cases and could potentially increase the battery life of the player. It is worth noting that most manufacturers offer a variety of impedance options with many of their headphone models — Beyerdynamic are particularly comprehensive in this respect, but it is often worth asking the question if a favoured model appears not to be of a suitable impedance for your application.

Audio Metering, Video & Digital Audio

To wrap up this discussion of impedance issues, I'm collecting what may seem a strange combination of topics under one heading, but all will make sense shortly. As you will now appreciate, the accurate level metering of audio signals requires a certain knowledge of the interface configuration and the appropriate impedance or voltage matching. In general, outboard meters — whether proper test and measurement devices, or just external meters of some kind — will be designed with high input impedances. This is so that they can be connected across an audio circuit without loading it and affecting the level. After all, it would be pretty silly if plugging the meter in drastically changed the signal level you were trying to measure! With the normal voltage-matched interface arrangements, there is therefore nothing to worry about — you can simply plug the meter across an audio circuit and all will be well.

However, connecting a high-impedance meter straight across the output of a device intended to operate in a matched-impedance environment will produce erroneous results. This is because the source's output is designed to drive into 600Ω — anything else will mess the levels up completely. Test and measurement meters are often equipped with a switchable 600Ω termination facility for exactly this reason.

Although it is extremely rare to find any 600Ω matched-impedance audio equipment outside venerable broadcast institutions like the BBC these days, it is worth considering the issues involved, because they also apply to digital audio and video — both of which are matched-impedance systems. Video interfaces normally operate with 75Ω matched-impedance connections. In other words, outputs source their signals from 75Ω, inputs present 75Ω, and the coaxial cables have a characteristic impedance of 75Ω — nothing else will do!

A lot of video equipment provides switchable 75Ω termination on the input connections, but that is to provide flexibility rather than to denigrate the balanced impedance concept. In a balanced impedance system, provided that the source, destination and cabling all present the required 75Ω impedance characteristic, everything is fine. However, it is often necessary to connect multiple devices to a single output, and that is not strictly allowed in a matched-impedance system. One way around the problem is to connect the inputs of the destination equipment in parallel (by using special T-shaped adaptors to connect from one unit to the next), with only the last providing the necessary 75Ω termination — the others all present a very high input impedance. In this way the source 'thinks' it is only driving one destination, and the correct impedance matching is

Signal Levels: dBm Or dBu?

Another inheritance from the telecommunications industry is our 0dB nominal line level. The telecoms industry, because it was interested in the transfer of power, measured audio signals in terms of milliwatts. In fact, the standard signal level was 1mW. The relationship between power (symbol P, measured in Watts), resistance and voltage is:

$$P = \frac{V^2}{R}$$

For 1mW into 600Ω, V is therefore 0.775V. Sound familiar? It should, because that is the value we still use today as a standard line-level reference RMS (Root Mean Square) voltage.

We measure audio signal amplitudes in terms of decibels for convenience, and the reference value is always 0dB. The nominal telecom signal level was defined as 0dBm — the 'm' signifies a reference of 1mW in 600Ω.

When the broadcasting and audio industries moved away from matching impedances and towards bridging inputs, the '1mW in 600Ω' reference became meaningless, but the same nominal signal amplitude was retained. To make this change clear in the specifications the term 0dBu was coined — the 'u' meaning the impedance is unspecified, but assumed high (and therefore not loading the source to any appreciable effect). Thus a 0dBu reference level is still an RMS voltage of 0.775V.

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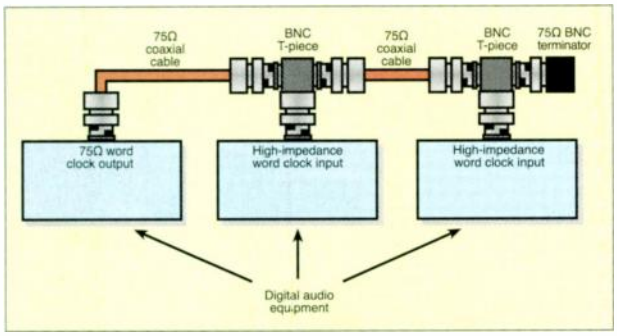

Figure 5. Although digital word clock inputs and outputs are meant to be impedance matched, it is possible to daisy-chain a number of inputs from a single output if you make sure only to have the 75Ω termination impedance at the end of the chain.

maintained, provided that the 75Ω termination is at the end of the line of connected equipment.

This same matched impedance concept is used for S/PDIF digital audio signals (on phono or BNC connectors), and also digital audio word clocks. Again, 75Ω interfaces are used with 75Ω coaxial cable. Don't be tempted to use any old bit of screened wire, because the unmatched characteristic impedance will result in reflections and signal attenuation which will either prevent the data transfer completely, or mess it up sufficiently to make the interface extremely unreliable.

Most S/PDIF connections are on a one-to-one basis, so both the source and destination devices present 75Ω impedances, and expect passage over a 75Ω cable. However, word clock signals are frequently distributed to multiple destinations, so many manufacturers have adopted the same kind of approach with their clock inputs as video equipment manufacturers. In other words, the word clock input may be of a high impedance design with a switchable 75Ω termination. The same rules apply here as for video. Only the last piece of equipment in the chain should provide the 75Ω termination — any other arrangement will result in reflections and signal loss. Beware that a lot of digital equipment has only fixed 75Ω impedance on word clock inputs, and in this case it is not possible to daisy-chain a word clock feed. A distribution amplifier will be required instead to provide one-to-one clock feeds, maintaining the impedance matching.

AES-EBU digital audio is also interfaced with an impedance-matched system, this time designed for 110Ω impedances. Again, it is wise to use only cables designed with the appropriate 110Ω characteristic impedance, although I have found that the balanced nature of AES-EBU, combined with the fact that the signal starts off at a very healthy voltage level, makes it far more tolerant of impedance mismatches than either S/PDIF, word clock, or composite video.

The AES-EBU specification states that the interface is intended as a one-to-one system and distribution amplifiers should be used if one output is required to feed several inputs. Having said that, the original AES-EBU specifications allowed for one source to feed directly up to four destinations, and I have often found this works satisfactorily — mainly because of the very robust and tolerant nature of AES-EBU. The potential problem with a passive distribution arrangement like this, though, is that if one receiving device is disconnected, the signal reflections from its unterminated cable will return to the distribution point and interact destructively with the source data, preventing the other destinations from decoding the signals. SOS

Characteristic Impedance

It's not only circuit components that have impedance — cables also have an impedance value, called characteristic impedance. If you thought that a cable was just a couple of pieces of wire with a screening braid wrapped around them, then think again! In fact, every cable exhibits capacitance between the wires and the braid, and inductance along the length of the cable too (although the capacitance typically dominates the impedance value). Consequently, a look through any cable catalogue (Canford Audio's catalogue is particularly useful in this regard) will reveal the characteristic impedances of cables, along with values for their inter-core capacitance per metre of length.

One difference between cables and components, however, is that the characteristic impedance of cables doesn't increase appreciably when cables are linked in series (assuming no impedance mismatch at the connection), except where extreme cable lengths are involved. This means that you can freely use passive digital patchbays in matched-impedance digital systems to connect between different pieces of equipment.

Speaker Loading & Valve Amplifiers

Whereas most modern solid-state amplifiers are virtually bombproof in terms of whether their outputs see proper loudspeakers (of any nominal impedance) or a short or open circuit, most valve amplifiers are far less tolerant. In fact, the majority of vintage valve amps will self-destruct if driven without the correct speaker load attached! The reasons are complex and depend to some extent on the design of the output circuit, but can be boiled down to what are called 'reflected' impedances.

Most, if not all, practical valve amplifiers employ an output transformer. The use of the transformer is principally to translate the effective load impedance between that required by the valves, and that of a practical loudspeaker — a typical valve output circuit requires a load of between 5kΩ and 10kΩ, whereas a practical loudspeaker presents a nominal impedance of between 4Ω and 15Ω. The transformer does this by 'reflecting' the loudspeaker's impedance through the transformer (as a function of the square of its turns ratio) to create a different (in this application, higher) load impedance for the valve output stage. Thus a 15Ω speaker will appear to the output valves as a 9kΩ load, say. It is important to note that it is the physical loudspeaker's impedance that defines the operating load for the output stage, and that valve amplifiers are very fussy about their load impedance. If a loudspeaker with a different speaker is connected, the output valves will see a different load and their performance and operating characteristics will change as a result.

Consequently, to make the system more flexible in accommodating different loudspeakers, many valve amplifiers have different output terminals (or some way of selecting nominal output impedances) for different loudspeaker loads. This is achieved by using different tappings on the output transformer so that an 8Ω speaker connected to the correct terminals will produce the same reflected impedance to the output stage as a 15Ω speaker connected to its appropriate terminals.

So what happens if the loudspeaker is disconnected? Well, instead of the 15Ω load being reflected into a 9kΩ load for the valves, we now have an infinite load, which will be reflected as an infinite load to the valves. For a given current, an infinite load requires an infinite voltage. Imagine a brief positive transient audio signal (a drum strike, perhaps) driving the output valves to the unloaded output transformer. When that transient stops, the magnetic field developed in the transformer collapses and generates a reverse polarity signal called the 'back EMF'. With an infinite load impedance, the back EMF will tend towards an infinite reversed voltage spike and this is applied directly to the valve anode plate. Depending on the valve in use, this huge back EMF is likely to far exceed its rated values and so may cause the valve to break down, damaging or destroying the grids or anode plate, and resulting in one very poorly amplifier.

However, this huge back EMF can only be generated if the amplifier is being driven in the first place. If there is no input signal to the amplifier, there will be no output signal, and so no back EMF. Under these rather exceptional circumstances there is unlikely to be any damage. The most sensible thing to do, however, is to always check that a suitable loudspeaker is connected to a valve amplifier (with the correct output terminals or transformer taps selected), before you connect or turn up the input.

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- MP401 MIDI Interface

Example Packages	Tower	Rack
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Cubase SX, M-Audio Delta1010LT	£1459.99	£1599.99
Edirol DA2496, Cubase SL, NI Kontakt	£1669.99	£1769.99
Echo Mia 24, Joemeek MQ1, Cubase SX	£1449.99	£1549.99

(As reviewed in SOS october 2002 issue.)

Upgrades	
Joemeek MQ1	£35.99
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synths

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Native Instruments Dynamo on demo at DV.

Native Instruments Absynth

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Computer Music, 10/01

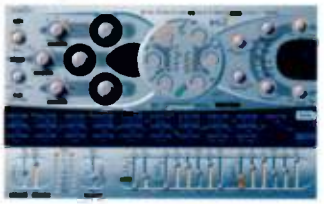
Alesis Andromeda A6

The ultimate polyphonic true analogue synth, on demo at Digital Village.

Native Instruments PRO53

The third generation of the virtual analogue classic is now available.

Emagic ES2



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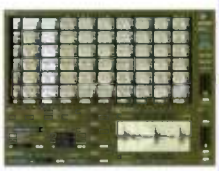

music production

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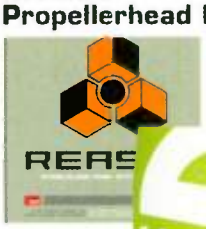
M-Audio Propellerhead Reason 2



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Cakewalk Sonar 2

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"Cubase SX is an amazing next generation product, featuring nearly everything you'd expect from a cutting edge music production tool" Mark Wherry SOS August 02

Emagic Logic Platinum 5

Emagic's flagship production environment, on demo at all DV stores – with Logic Control

Emagic Logic 5 Big Box

Big Box is dual platform and contains a new version of Logic, bundled with full versions of EVP73, ES1, EXSP24 and a decent sample CD.

Music production and audio editing solutions from DV include; Ableton, Arturia, Bitheadz, Bias, Cakewalk, Digidesign Emagic, IK Multimedia, Making Waves, Propellerhead, MOTU, Orion, Sonic Foundry, Steinberg, Syntrillium and TC Works.

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M-Audio Oxygen 8

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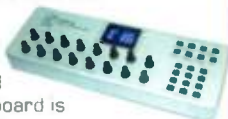
Ideal for adding more real-time control when a keyboard is not required.



Edirol PCR-50

USB realtime synth, sequencer and sound module controller.

Kenton Spin Doctor

Heavy duty steel chassis controller.

Akai MPD16

Drum controller, ideal for Native Instruments' Battery, Waldorf Attack etc.

Errors and omissions excepted. Prices and specifications subject to change without notice.

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firewire solutions

Digidesign DIGI002

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MOTU 828

The 828 is an affordable, FireWire based digital audio hard disk recording system for Mac OS and Windows.

MOTU 896

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PreSonus Firestation

The PreSonus Firestation is a FireWire enabled audio interface, featuring 8 analogue inputs and outputs, 2 channels of microphone preamps with insert points and 8 channels of ADAT optical I/O. The Firestation also features zero-latency monitoring of recording sources while overdubbing

Metric Halo Mobile I/O

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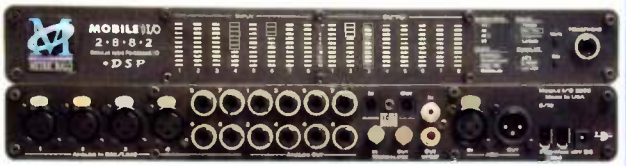

USB solutions

M-Audio Audiosport Duo

M-Audio Audiophile USB

M-Audio USB drivers allow you to independently scale bit depth and sample rate to deliver the lowest USB latency.

Edirol UA-20

The UA-20 brings portable MIDI and 24-bit quality I/O to your Mac or PC applications, powered by your computer through the USB bus.

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- 24-bit stereo
- S/PDIF digital I/O
- USB-powered operation
- Two analogue inserts
- 48V phantom power
- Headphone output with dedicated volume control.

Edirol UA-5

A USB interface featuring, 2 mic-pres with phantom power, line level and digital I/O and audio recording at up to 24bit/96kHz. PC and Mac Compatible.

EMAGIC EMI2/6

Emagic's Active MIDI Transmission Technology (AMT) provides exact MIDI timing.

Apogee Mini-Me

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USB MIDI interface

M-Audio Midisport
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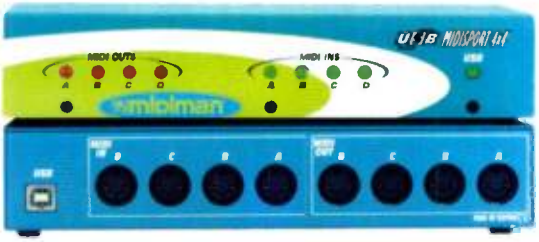

Emagic AMT8

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PCI solutions

M-Audio Audiophile
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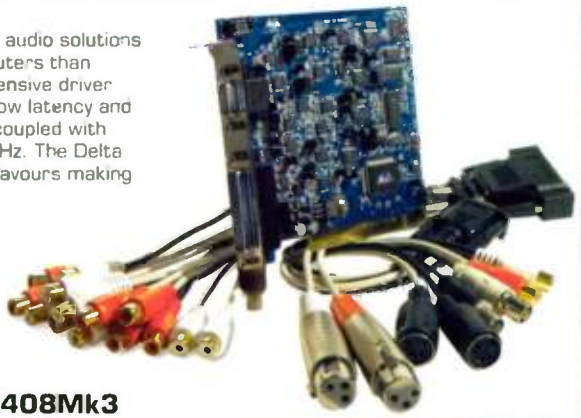
Delta1010LT (pictured),
Delta410,
Delta44
Delta66
Delta1010 (rackmount)



Digidesign MX001

Edirol DA2496

MOTU 2408Mk3

MOTU 24I/O

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Computer Solutions available from DV – Aardvark, Apogee, Creamware, DACS, Digidesign, Digigram, Echo, Edirol, Emagic, Focusrite, Fostex, Line6, Mackie Soundscape, M-Audio, Metric Halo, MOTU, PreSonus, RME, ST Audio, Steinberg Nuendo, Swissonic, Tascam, Terratec and Yamaha.

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mix controllers

Mackie Control
Mackie Control has eight channel strips, each of which includes a 100mm touch-sensitive motorised fader, mute, solo, and record arming buttons, Signal LED, a Channel Select button, and a V-Pot® that can be used to control panning, send levels, EQ, dynamics, and other DSP plug-in modules. One of the key features of the Mackie Control is the extensive DAW software support that exists – see DV website.

Emagic Logic Control
Hardware controller for Emagic Logic users. Expandable - the Logic Control series will grow with your studio.

Digidesign Control 24
With 16 Focusrite Mic Pre-amps, 24 motorised faders, transport controls, and a master section, Control 24 gives you the look and feel of a conventional mixing desk with the recording features of a Pro Tools workstation.

Mackie Baby HUI
An 8 fader MIDI controller that provides in-depth mixing, automation and control for many DAWs.

Omnirax Studio Furniture
A range of very high quality furniture designed specifically for pro-studio applications.

digital mixers

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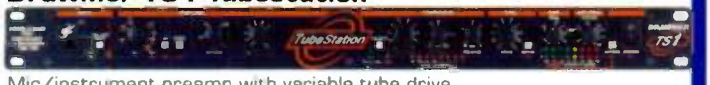
Drawmer TS1 Tubestation



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dynamics

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Neumann M147

Neumann M149
shown with the suspended shockmount

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- Innovative bass-reflex-system
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Closed dynamic headphones offering excellent ambient noise isolation and a linear response designed for reference monitoring.

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Designed for audio monitoring applications where size, comfort and performance are primary requirements.

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Roland XV-2020

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- 24 - track / 24 - bit / 96 kHz
- 64 channel, fully automated digital mixer

Roland MC-909

NEW

The new MC909 follows on from the traditions of the orginal MC303 but adds some fantastic new features including a sampler with up to 272Mb storage, an on-board mixer and a USB interface. The second generation XV engine provides the synthesis, and the unit is compatible with the SRX range of expansion boards.

Roland XP-30

Boss BR-1180CD

Roland HPD-15

Roland XV-5050

The new XV-5050 may be small in size, but it's big on sound. Look inside and you'll find the same powerful synth architecture used in the acclaimed XV-5080 complete with four stereo tones per patch and expressive Matrix Control.

Roland XV-5080

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Photos: Mike Cameron

Analogue Solutions Vostok

Analogue Pin-matrix Synth

Pin-matrix synths, like EMS's legendary VCS3 and Synthi A(KS), are fairly scarce these days, but Analogue Solutions' Vostok revisits the concept in more affordable form. Is it a vintage-inspired classic, or is it just history?

Paul Nagle

If you know something of the history of synthesizers, the mere mention of a suitcase-based analogue synth featuring a pin matrix, a signal meter and joystick might just ring a few bells — and if not, check out www.sound-on-sound.com/sos/dec00/articles/retrozone.asp, wherein the history of EMS's Synthi A and AKS is discussed in some detail. Analogue Solutions are at pains to point out that their latest creation, the Vostok, is *not* intended to sound like an EMS clone. Nevertheless, they have cunningly devised an instrument that offers many of the features that made (and still makes, as EMS are still in business to this day) a Synthi A or VCS3 much sought after. Although the Vostok is not physically modular in design, its individual components are sourced from Analogue Solutions' range of modules, and as only one is internally patched (the signal meter), you first need to connect the various bits of the synth together with patch cords or its pin matrix before you hear anything. ▶

SOUND ON SOUND

Analogue Solutions Vostok
£1644

pros

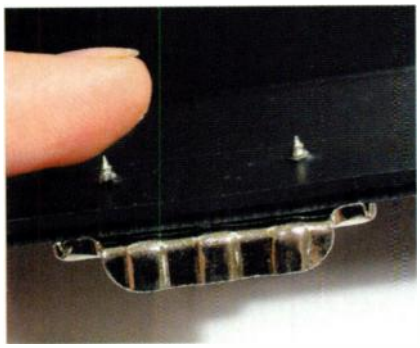
- An interesting collection of modules in a convenient package.
- Pin matrix *and* patch connections for maximum flexibility.
- Good basic tones and rip-roaring filter.

cons

- General calibration problems found throughout the review unit.
- Matrix not fully buffered.
- MIDI interface rather basic.
- Digital oscillator of limited value.
- Rather expensive, given the above issues.

summary

A complete synth in a suitcase, featuring a pin matrix, sequencer, joystick and MIDI. Although not cheap, here is a machine well suited to creating weebly noises, manic analogue sequences or squelchy bass sounds. Currently, there isn't anything that's going to do these things quite like the Vostok.



Casing the Joint

Images on the Analogue Solutions web site don't prepare you for the Vostok's diddiness — it's the Toulouse-Lautrec of synths! The black plastic case is particularly lightweight, and is not intended as a replacement for a true flightcase. The construction left a little to be desired, too — sharp bare screws were left exposed on the review model, sticking through the lift-off front cover, as you can see above. With the cover removed, the Vostok measures just 44 x 27 x 13cm — so it would occupy very little space in a studio or live rig. The case accomodates the equivalent of two rows of 85HP (1HP — Horizontal Pitch — equals 0.2 inches or 5.08mm), and is also available separately, meaning that you could buy one and stock it with modules of your own choice from the range of compatible modulars by other companies, for example the unrelated Analogue Systems, and Germany's Doepfer. Power is supplied by a conventional mains supply, and its large green illuminated On/Off switch is positioned on the left-hand side of the case (see picture towards the end of this article).

With its red-tipped knobs and red-and-white lettering, the Vostok has a certain brash charm, although the Cyrillic-style front-panel legending takes some getting used to. In operation, it can be placed on its back for table-top use or, more typically, it can stand upright on its rubber feet.

The Once-Over

It's immediately evident that the Vostok takes the Swiss-army-knife approach to synthesis, offering a generous array of tools. A MIDI interface is provided (so you can drive the voltage-controlled Vostok from a modern sequencer — see the 'Vostok & MIDI' box opposite) along with two VCOs, two LFOs, two envelope generators and a filter featuring resonant high- and low-pass sections. A third oscillator (based on digital wavetables), plus a step sequencer, ring modulator, joystick, signal meter, mixer, multis and noise/sample & hold, all add up to a comprehensively stocked toolkit. The pin matrix is supplemented by extensive 3.5mm mini-jacks for ease of connectivity with other modular systems. Should you want the Vostok to talk to larger-format synthesizers, two quarter-inch adaptor jacks are provided, and the main output is also offered in quarter-inch format — all the better to plug into your mixer with.

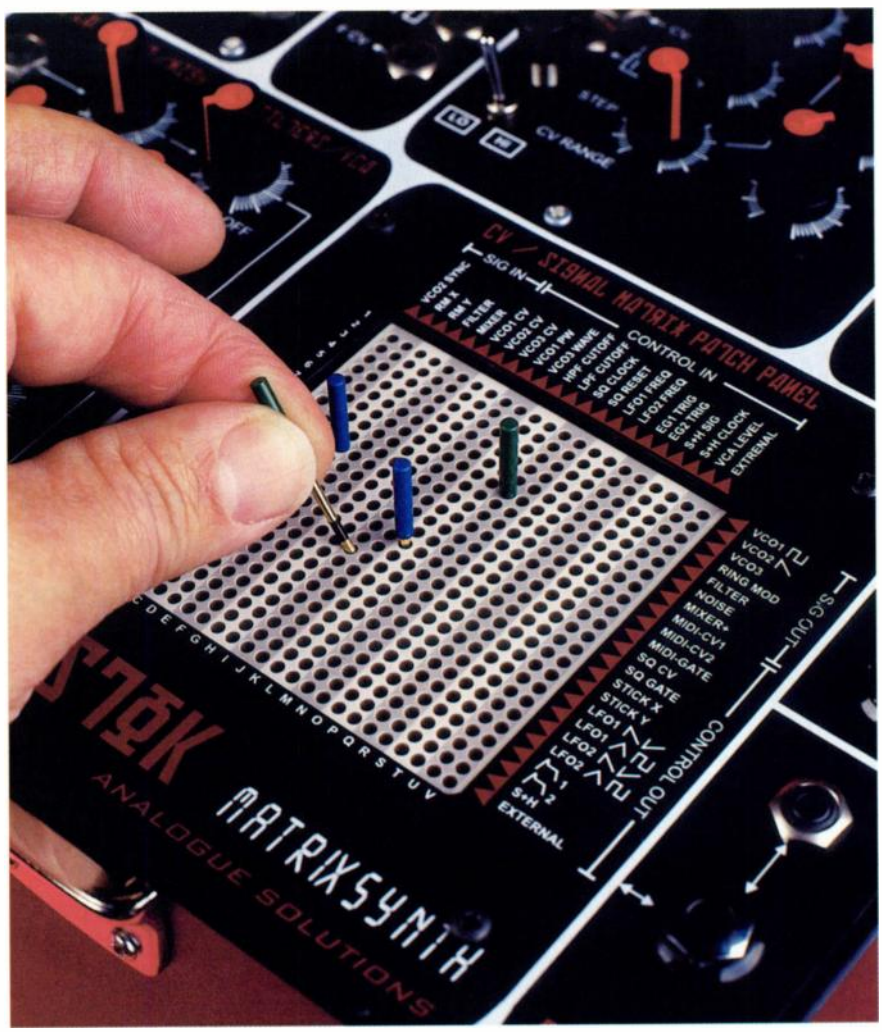
The Matrix

Probably the most eye-catching and innovative feature of the Vostok is its 22 x 22 pin matrix: a good enough place for us to kick off our tour. This tiny grid (around seven centimetres square) offers access to most of the Vostok's signal routing and, by lining up source and destination, you can assemble a complete patch without all that messy cabling. Indeed, as no cords are supplied, it will probably be to the 15 included matrix pins that you turn first in order to make some noise.

Each pin has a 10kΩ resistance and multiple connections can be made to the same source or destination without drastic loss of signal. The pins are small and you need a good eye to accurately link up the inputs along the top of the matrix with the outputs that run vertically. The two types of signal — control voltages and audio voltages — are grouped logically together in the matrix. Audio Signals and CV Outputs are labelled by named function down the right-hand side of the matrix and by numbers down the left side (see below). Similarly, the upper axis is labelled using meaningful names, its lower half by the letters A-V — with no obvious correlation between names and letters. Naturally, this being a voltage-controlled synth, you can patch audio signals into voltage inputs and *vice versa*.

According to the manual, all the signal and control outputs are buffered, and many of the inputs too, although despite this, I did experience voltage drops when making some connections, such as plugging the output of an LFO into the CV input of a VCO. Analogue Solutions have since confirmed that not all of the matrix connections are buffered, so expect a degree of unpredictability!

Some of the connections not present in the matrix include the VCO1 sawtooth



Patching connections with the pin matrix. Only those with a steady hand and good eyesight need apply!

output and sync input, plus the VCO2 square-wave output and pulse-width CV, but, on the whole, the matrix encompasses most of the synth's functionality. In theory, you could patch into the same modules with cords and the matrix simultaneously, although the onus is on you to be well organised and avoid making conflicting connections. Experimentation is the key to understanding most modular synths, and, if anything, this is even more relevant with the Vostok.

Oscillators

Two VCOs act as the main sound sources, and provide simultaneously available sawtooth and variable square waves. A dedicated pulse-width knob sweeps the latter from a narrow pulse through to square and back. External control of pulse width is also provided, with amount of modulation being determined at the CV source rather than destination. Actually, many Analogue Solutions modules have output amounts set in this way; thus the oscillators have dedicated output levels for each waveform, and the mixer has no controls at all.

Both oscillators have dedicated Glide knobs so they can slew at separate rates. Unfortunately, the review model's oscillators had a small amount of glide present all the time, even when the control was set to zero. Analogue Solutions claim that this will be dealt with on all Vostoks built from now on, but early models may suffer from this 'feature'. I'd have liked a fine-tune knob to have been included too, since the single control present, with its available range of plus-or-minus one octave, made subtle detuning a little awkward. A sync input jack is present for both VCOs.

Oscillator 3 seemed, on paper, to be the most interesting — a digital eight-bit wavetable oscillator featuring no less than 256 waves in 64K of memory. The four-character 'bubble'-type LED has, apparently, been selected for its retro look (see right). It's fairly readable (though would possibly look better behind darkened glass, Sinclair watch-style) and displays the note name and wave number (in hexadecimal). The initial wave can be selected via a knob and these proved to be full of digital fizz: buzzy noises, mellow organs, and clavinet sounds issued forth, all with a healthy dose of aliasing artifacts.

The Vostok & MIDI

The Vostok includes a basic MIDI interface which generates a gate signal and two CV signals based on incoming MIDI events. As well as a MIDI In socket there is also a Thru and, usefully, you can activate the module's trigger output manually with a dedicated button. Setting up the MIDI channel is as easy as pushing the MIDI program button and either playing a note or moving the mod wheel on your connected controller. Thanks to the interface's built-in Learn function, the MIDI channel on which the incoming data is received is the one stored, and when you play a note to initialise the interface, CV2 is set automatically to output a signal derived from velocity. You can no doubt guess that moving the mod wheel instead sets CV2 to produce a signal based on the MIDI controller sent by the wheel. Either way, CV1 always represents the MIDI note value.

Other than that, the MIDI interface has just two additional outputs: Accent and Legato. The former outputs a voltage of 5V when it receives a note with a velocity higher than 81 (the synth's panel says the velocity threshold is 100, and the manual claims 79), returning to zero only when a velocity of less than this is received.

I got useful results using the signal generated by the Accent jack as a clock source for the sequencer. With it, gentle playing does not advance the sequencer steps, but forceful playing does — so you can choose when to introduce a variation in tone intuitively as you play. The Legato socket outputs a 5V signal when any notes overlap and returns to zero when none are overlapping.

Neither of the oscillators in the review model tracked my connected MIDI keyboard very well, leading to noticeable pitch variances over just a couple of octaves and restricting the range over which the synth was playable. At first I thought that the oscillators themselves were not scaled correctly, but they proved quite accurate when I removed the Vostok's MIDI interface from the equation and played them via my Roland SH101's CV outputs. Fortunately, scaling trimpots are available on the MIDI interface's front panel for some degree of fine adjustment.

And that's about it for the MIDI interface. It doesn't respond to anything else (say pitch-bend or aftertouch) and the manual is quite clear that it is aimed at sequencing.

A switch selects between bank A (waves 0-127) and bank B (waves 128-255) and there are also CV inputs to perform wave and bank selection via external control.

I eagerly patched in this module, thinking of my happy experiences with the digital oscillators in my Digisound modular and my recently acquired Dave Smith Evolver. However, it was only after some time struggling to get the Vostok's digital oscillator to play anything like a melody that I checked the manual, and noted the significant statement 'VCO3 works best when used with the internal analogue sequencer'. I duly connected the sequencer and tried stepping through oscillator's pitch and waveforms automatically with it. Only then did I start to hear hints of how cool this oscillator could have been, had it only been possible to give it more accurate tuning. The oscillator has a range of four octaves, and does its most interesting stuff in the lower ranges. Ultimately, I'd have to sum it up as a curio suitable for weird noises, or for its aliasing and stepped waveforms, rather than a vital inclusion as a musical sound source.

LFOs & Envelopes

Two LFOs offer a selection of sawtooth or inverted sawtooth plus square or triangle waveforms. An ingenious selection method, and one seen on previous Analogue Solutions products, is via knobs that pull outwards from the front panel, thereby acting as switches as well as knobs (and before you look at the pictures accompanying this article, it's not obvious from just looking at the controls which ones pull out and which don't). So, for a conventional sawtooth, you push the knob in, and for an inverted sawtooth, you pull it out. Then, in simple but effective fashion, turning the knob sets the output level of the selected waveform. A voltage input is provided so you can vary the LFO rate using another LFO, envelope or whatever. The minimum speed wasn't nearly slow enough for my tastes (until I patched in a negative voltage to slow it down) but I guess as soon as you make someone like me happy with a very slow LFO, someone else will complain it doesn't go fast enough. The manual doesn't specify the LFO range, but it does reach audio levels at its highest frequency.

The two envelopes seemed, at first glance, to be straightforward ADSR types. Envelope one has a green LED which lights to show it has received a gate, while envelope two has a yellow one — and each has a bi-polar control for amount. Each envelope also has a repeat function, and this I disliked instantly. Don't get me wrong — I love repeating envelopes — but the ones present on the review model leapt into repeat mode not at a zero sustain setting for each envelope (as designed) but at settings far higher than that. Apparently Analogue Solutions are exploring the possibility of fitting a separate switch to engage the Repeat function; as it was, I found it ▶

▶ impossible to set the envelopes so they were suitable for snappy sequencer work.

Filter & VCA

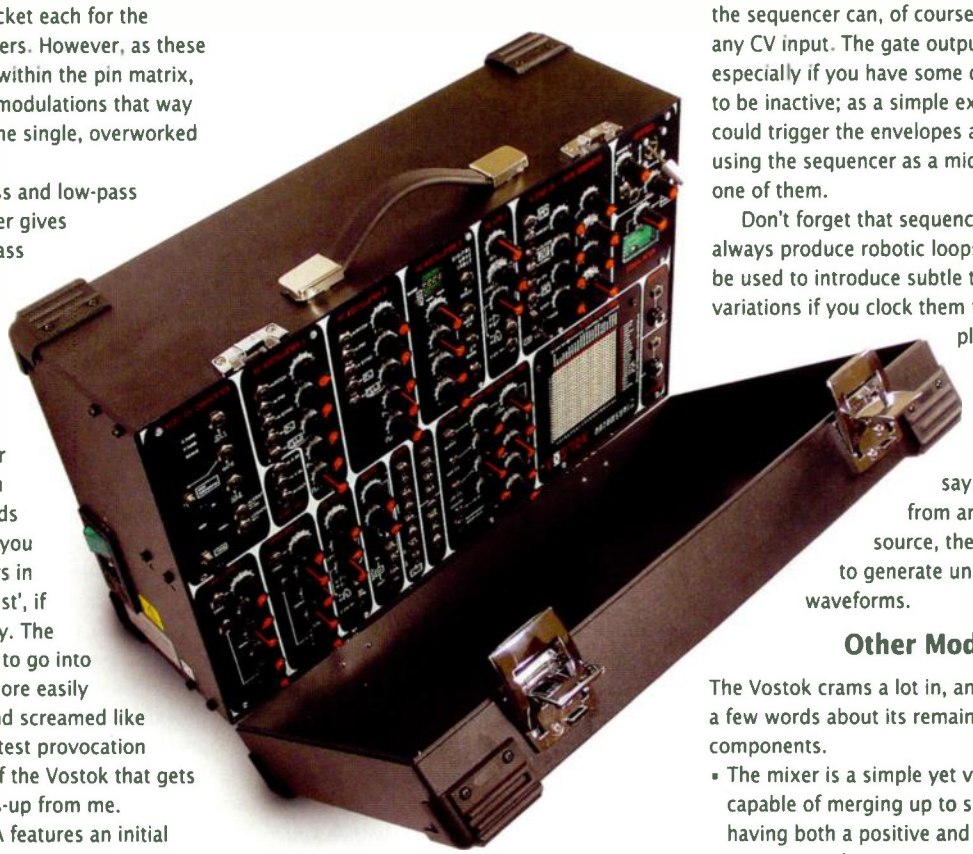
The filter is none other than Analogue Solutions' 12dB-per-octave SY02 — itself based on the Korg MS20 filter. I found this dual high/low-pass filter to be an excellent choice, and a pleasant change from yet another Moog clone. Indeed, it was already my favourite Analogue Solutions module, and has long had its place in my own modular system. The Vostok's version lacks some of the input jacks of its ancestor, having just one CV socket each for the high- and low-pass filters. However, as these inputs are also found within the pin matrix, you can add multiple modulations that way rather than by using the single, overworked mixer.

Use of the high-pass and low-pass cutoff controls together gives a very flexible band-pass filter, and having independent resonance for each is a source of awesome wibbly noises or more subtle solo patches. The filter can also be overdriven quite easily, and sounds pleasantly dirty when you do so. Think 'The Corrs in a mud-wrestling contest', if that helps in some way. The review model seemed to go into self-oscillation even more easily than my own SY02, and screamed like a banshee at the slightest provocation — this is one aspect of the Vostok that gets an unreserved thumbs-up from me.

The integrated VCA features an initial level control that you can use when fading in drones and the like (more conventionally, you'd connect an envelope to its CV to shape the output). The main volume control resides here too, and the signal output is available in both 3.5mm and quarter-inch formats — a nice idea.

Sequencer

I briefly alluded to the sequencer earlier when discussing the digital oscillator, and if you think a mere eight steps don't add up to much fun, think again. Step sequencers are more about control and immediacy than hammering out long complex patterns, and this one is no exception — it adds considerably to the Vostok's appeal. Programming is accomplished by simply spinning the knobs during playback or, for more accurate tuning, by adjusting the knobs one at a time before setting the sequencer running, while stepping manually through the sequence. To program a riff where the sequencer's CV is routed to pitch, for example, you push the button, tune the step via its knob and move on to the next step until your sequence is complete. Running the sequence requires that you patch in an external clock source (there is no built-in sequencer clock) such as an LFO's square wave. However, very interesting (and not entirely predictable) things happen when you clock the sequencer with other waveforms, such as a sawtooth or triangle wave. Using some of these alternatives, the sequencer direction can vary wildly and, depending on the cycle of the LFO, can suddenly start to go backwards, skip forward several steps or even replay the same step for a while. If you want to break up the rhythms generated, pulling out any individual knob turns that step into a rest (that is, no gate signal is generated). Progress through the sequence is indicated by the blinking yellow LEDs and, anorak that I am, I found it entertaining to keep the sequencer running at all times, even when not controlling anything. Hey, I'm surely not alone in my love of flashing lights!



A switch determines whether the CV range produced is between 0 and 10 or 0 and five Volts. The latter makes it easier to tune melodic sequences, but the former might be of more value for large control changes. The sequence is restarted whenever a trigger is received at the Reset jack and this made me think that individual trigger outputs for each step (as on Korg's SQ10 for example) would have been really handy — that way you could reset the sequence at any step by patching the step's trigger out to the Reset jack. As it is, only the output from Step 1 is available. The clock input also features a Thru jack, which is ideal if you have multiple step sequencers or wish to allow the clock signal to continue, perhaps to drive the sample-and-hold module.

The CV signals produced by each step of the sequencer can, of course, be directed to any CV input. The gate output is useful too, especially if you have some of the steps set to be inactive; as a simple example, you could trigger the envelopes alternately by using the sequencer as a middle man for one of them.

Don't forget that sequencers needn't always produce robotic loops. They can also be used to introduce subtle timbral variations if you clock them from each note played and direct their output to pulse width, or a filter control voltage, say. Or, if clocked from an audio-level source, they can be used to generate unique waveforms.

Other Modules

The Vostok crams a lot in, and here are just a few words about its remaining components.

- The mixer is a simple yet vital module, capable of merging up to six inputs and having both a positive and inverted output. So, if you mix control voltages you gain access to both positive and negative modulation sources simultaneously. The mixer can handle audio or CV sources.
- The backlit moving-coil meter is an improvement on Analogue Solutions' original module — simply because that *had* no light. The manual reminds us that this is not a precision device, but is handy all the same for monitoring audio or control signals. It measures positive voltages only, and is permanently patched to the positive output of the mixer.
- The joystick feels reassuringly smooth and has CV outputs (with individual amount controls) for the X and Y axis. It has enough resistance to use with confidence and remains in position when you release it — just as you'd want. Its maximum range is ±12V.
- Two simple 3.5mm-to-quarter-inch

adaptors are provided, with one of them available in the matrix. And, for multiple connections, two handy 'multis' (labelled 'split') are available, with four connected sockets each.

- A combined noise source and sample & hold module features controls for noise level and slew amount. To create an S&H modulation source, connect the noise to the S&H input, then pipe in a clock signal and you're away. Slew smooths the output from the module for less drastic changes.
- A ring modulator is also tucked in neatly next to VCO1 and reminds me how nice it would be if the main oscillators had produced sine waves — the ideal source of those pure ring-modulated 'bell tones' we all know and love.

Conclusions

Drawing any meaningful conclusions about the Vostok requires that we consider who it's really aimed at. Such an eclectic collection of modules (try saying that after a few pints of Old Scrotum) indicates a laudable desire to do something slightly out of the ordinary. Analogue Solutions have shown that it is still possible to rediscover underexploited backwaters of music technology and produce something that is both new, yet reminiscent of classic designs.

However, at over £1600 including VAT, the Vostok isn't a cheap synthesizer, and when you bear that price tag in mind, you start to look more closely at some of those rough edges, the calibration issues and technical imperfections. Personally, I'd expect something that exuded a little more quality if I were handing over such a sum. I'd certainly insist that the issues with the envelopes and oscillator pitch were resolved, but I also think it not unreasonable to demand a more fully featured MIDI interface, and perhaps a more robust case too. It also occurs to me that the Vostok's price tag is not a million miles away from the price of a brand-new EMS Synthi A (amazingly, these can still be ordered from EMS for around £2100 including VAT, although there is a waiting list).

In fairness, Analogue Solutions have claimed that some of the issues I raised during the course of the review, such as problems with oscillator glide and envelope repeats, will be dealt with before future Vostoks are constructed. As a small company, they certainly have the freedom to do this, although nothing definite was in place before the end of my review. It's also possible that these problems are less significant to some potential punters than they would be to me. For, make no mistake, this is a synth with a specialised appeal and the Vostok's behaviour, range of sounds and performance undoubtedly does bears comparison with those classic EMS instruments. It scores by being slightly cheaper and having such extras as a MIDI interface, a sequencer, mini-jack connections and more. The VCOs sound fine, the filter marvellous and even the digital oscillator could be the source of some very strange sound effects or funky, wave-changing sequencer loops. I mean it as no insult to say that it could be an awesome self-contained sound-effects machine. In that context, the Vostok could do just fine. SOS

information

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Echo Comparison Chart

Specification	Mia	Gina24	Layla24	Mona
Digital connectors	S/PDIF	RCA & Optical S/PDIF,ADAT	RCA & Optical S/PDIF,ADAT	RCA & Optical S/PDIF,ADAT
Analog outputs	2	8	8	6
Digital outputs	2 (8 virtual)	2 or 8	2 or 8	2 or 8
Analog inputs	2	2	8	4
Digital inputs	2	2 or 8	2 or 8	2 or 8
Nominal output levels	yes	yes	yes	yes*
Nominal input levels	yes	yes	yes	no*
Default nominal level	+4	+4	+4	See below
Analog input gain	no	no	no	yes*
Analog input auto level	no	no	no	no
Input clocks	S/PDIF	S/PDIF,ADAT, Esync	S/PDIF,ADAT, Word	S/PDIF,ADAT, Word
Output Clocks	Esync	Esync	Word, Esync	Word, Esync
Midi	no	no	yes	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
Other	Multiple client support On-board DSP	headphone output	headphone output	4 built in Mic pre-amps with Phantom Power
Laptop Card Bus Available	no	no	yes	yes

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

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

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On The Record

Running Your Own Record Label • Part 5

The earlier parts of this series explained how to set up your label. Now it's time to start looking at ways to get your work out and on sale to the public.

Tom Flint

Last month we discussed how PR agents, publicists and pluggers can be used to promote your label and its recordings. Naturally, a successful promotional campaign will result in numbers of people looking to buy your records, but all efforts will have been wasted if your music is not readily available. What you need now is a distributor — in the most basic of terms, the company who takes the freshly-pressed records and gets them out into the nation's music stores.

It's well known in the industry that many of today's record shops are finding it hard to stay in business, particularly with stiff competition coming from large supermarkets, who can afford to undercut the specialist shops. As a consequence of this situation, music shops have become a battleground where shelf space is the holy grail, and sales reps have to use all the tricks of the trade to persuade the chains to spend their cash resources on a new batch of records.

Looking at it from the point of view of shops fighting for survival, they naturally want to make sure their shelves are packed with the music that will sell the fastest and attract the most customers. This is bad news for relatively unknown artists hoping to get their records in the racks alongside Madonna or Eminem, but at least a good distributor has the sort of experience and bargaining power that a humble label does not. A distributor will also have the infrastructure to deal with the logistical nightmare of shipping CDs and albums across the country, and warehousing them ready for departure.

Wheeling & Dealing

It is sometimes possible for a label to strike what is known as a 'manufacturing and distribution' deal, in which the distributor co-ordinates and funds the process of having the records pressed. Deals like these are vital for labels who can't afford a large and costly pressing, but in such cases the distributor's risk is larger, so their percentage is bigger too. It's not hard to find lists of distributors; the *Showcase Music Business Guide* (as mentioned last month) is one source, and the web is another, but unfortunately, like all good things, securing a satisfactory distribution deal is not so easy. Large distributors will have many labels on their books, and if they are going to put money up front, or at least assign some of their staff to the job of looking after label business, they need to ensure that they will get a return on their investment.

If your music is somewhat esoteric, you may do best by searching out a distributor who specialises in your style of music and can get your records into more specialist shops. There will be more on the intricacies of niche distribution next month, but for the time being, let's assume that you have impressed your distributor so much by your talk of loyal record-buying fans that you've persuaded them to take you on. At that point you will need to negotiate a contract, and your lawyer will be the first person you need to call for advice. Toby Marks, owner of Disco Gecko records, reveals one of the things to watch out for.

Toby Marks, owner of the Disco Gecko record label.

"The bigger music retail shops, and chains, negotiate with the distributor for the right to return. That means that if they can't sell the records they can send them back after a few months! The distributor is doing the work of sorting the CDs, putting them into vans, getting them delivered, and then having to get them back into the warehouse when they're returned — and obviously they need to cover themselves for that expense — so most distributors charge labels returns or stock movement fees.

"The deal that I've done with Pinnacle includes a five-percent returns-handling fee. That's fairly high, I suspect, but there are various points where you can 'trade' when

negotiating your contract, and that's one point I conceded."

Unwelcome Return

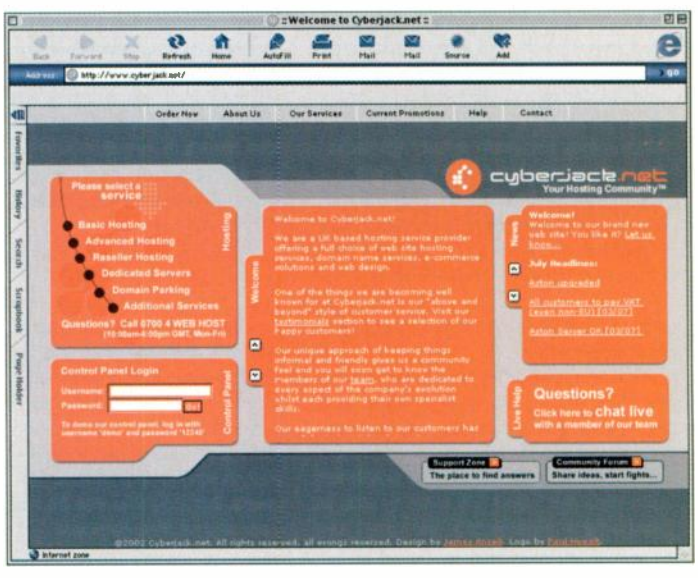
Once you have arrived at a deal outlining the distributor's cut and the agreed percentage for returns and any other services, it's time to stop worrying about your deal and start worrying about how potential return stock will affect your cash flow. As Toby explains, if you're not careful, you can end up spending money you don't actually have, because of the way the system works. "You often find that the big retail chains will do a 'scale out' deal which means, that, for example, the central buyer for Virgin will decide to take 1000 albums in July and put a percentage of those in every Virgin shop in the country. By August or September you get paid for them. The problems is that, for example, there may be no Banco De Gaia fans in Wigan, but the Virgin store in that town have still been given 20 albums by head office. Come November, when Elton John, Kylie and Cliff Richard have their greatest hits albums coming out in time for Christmas, the Wigan store will want to make space, so they pick the albums that haven't sold and send them back under the sale-or-return agreement. So traditionally November is a bit of a scary time, because you may find that none of your supposed sales actually went over the counter, and you get them back, together with a big bill. You firstly have to refund what you've been paid and then you get the percentage on top for returns-handling costs!

"One thing that may or not be a godsend is that distributors tend to hold back a certain percentage of your money against returns, so if, for example, you sell 1000 albums, they may only pass on the money for 750 and sit on the rest of it for several months. Then, if there are returns, the money is there to give back to the shops. Distributors are actually protecting themselves, because if too many labels spent the lot and then couldn't pay for the returns, the distributor would go bust. When I released the *Magical Sounds* album, Pinnacle held back a pretty large chunk of money against returns, but I needed money for cashflow and I couldn't afford to have that much sat in their bank account, so after negotiations they agreed to reduce the withheld amount. In the end, I got quite a few returns and it worked out about right, but at the time, I thought none would come back. In retrospect, they saved me from a potential financial crisis."

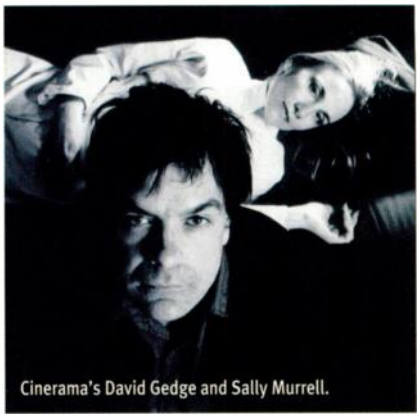
The New Order

Finding a sympathetic distributor could potentially be a sticking point for your label, especially if you are not a well-known DJ or band. Fortunately, thanks to the power of the Internet, hiring a traditional distributor is no longer the only option available. Selling CDs from your own web site by mail order is now a very economical proposition, and a good way to get a foothold in the market — and ultimately it may help you build up enough of a following to pique the interest of a major distributor. The point has to be made here that web surfers are not going to stop off at any site to buy music without being attracted by advertising and promotion, but on the plus side, a web site makes music available to anyone in the world, in a way a traditional music shop could never do. These benefits also apply to merchandise and back-catalogue releases, which can be made available as mail-order purchases.

To get started the first thing to do is contact an Internet Service Provider, from whom you can rent server space. Simply typing the phrase 'Internet Service Provider' into a search engine will provide a list of suitable candidates. Depending on the quality of services on offer, prices vary, although a basic service may only cost a few pounds per month. You also need to think about your site's design. You may wish to design the site yourself (if so, take a look at the six-part *SOS* series which started in July '99, or surf to: www.sound-on-sound.com/sos/jul99/articles/websites.htm), but bear in mind that a web site, like anything else, needs to be maintained, with up-to-date news and general content written and posted regularly. What's more, someone needs to be on hand to get things up and running if there is a server problem or software failure. With this in mind, you might wish to hire a third party to design and manage your site. Naturally, the web is full of professional-looking agencies offering their design services, but for the sake of keeping costs low, you could try to develop a symbiotic relationship with an enthusiastic fan of your music. There are always a few technical wizards out there who are more than willing to run a site for their favourite band, or who are prepared to work for free so that they can use the project as an advert for their design skills. Regular



The web site of designers Cyberjack.



Cinerama's David Gedge and Sally Murrell.

contributor to this series and owner of Scopitones Records, David Gedge, has a site hosted by one company, Cyberjack, and maintained by another, called the Starfish Consultancy.

Gedge explains how he found them. "Every other person you meet these days seems to be a web designer so I didn't have to do any research to find someone to do my site. Cyberjack is actually the company of a friend who once interviewed me for a fanzine. I hadn't given it much thought until she offered to design the web site for free because she wanted to put her skills into practice. After it was all up and running she became bored with that side of things, so the Starfish Consultancy took over the maintenance and design. They were also people I knew, so they run the site for free too, even though I offered them some money for it! So really I have no idea how much it should cost — I suspect quite a lot. I wouldn't mind learning to do it myself but it's finding the time when I have other things to do, like making music and running a label."

Setting Sales

From his web site, Gedge sells Cinerama CDs, vinyl records and merchandise, including ▶

T-shirts and sweatshirts. To keep costs down, everything ordered on the site is processed and posted by Cinerama's keyboardist and backing vocalist, Sally Murrell. "There's not really a problem doing it on a day-to-day basis, because we only get two or three orders a day," explains Gedge. "But when we've been on tour it gets put on the back burner. We've just been to the US for a few weeks and there are loads of orders to sort out, which is a bit bad, but there is no other way to do it without getting outside help. Sally usually cashes the cheques and postal orders and waits for everything to clear before sending the stuff out, particularly if it's an order from a new customer, although it's rare we get a cheque that bounces.

"To make sure we have enough stock, I contact the distributor whenever I have an album or single release, and I put in an order for a small number of records. I find that it takes about six months after a single has been released before people start calling up because they can't buy it in the shops any more, but I don't mind keeping it here for that time."

Another DIY aspect of the mail-order operations is the slightly unusual points table for calculating the cost of postage and packing. Gedge explains how and why he devised the system. "Being a mathematics graduate, I thought it was logical to use a system of points so that people could work out how much their particular order would cost. It's probably much more complicated than it needs to be but I wanted it to be fair. Most people understand it, although a lot of Americans don't seem to realise it's not in dollars! I basically collected a selection of Jiffy bags, CDs, tapes, sweatshirts, 12-inches, CD singles and T-shirts, found some really accurate scales and weighed everything. Then I looked to see what the Royal Mail postage rates were for different parts of the world. There doesn't seem to be any problems sending everything via Royal Mail, although if they were more expensive packages, Customs and Excise might have something to say."

Pleasing Your Masters

Before you can have your records 'printed', there are a few technicalities that need to be taken care of. For a start you need to check that all the relevant coding is in place, not least of which are the ISRCs (International Standard Recording Codes), as explained in part three of this series, which ran in the November 2002 issue (available on line at www.sound-on-sound.com/sos/Nov02/articles/diylabel3.asp). There are many other formatting considerations too, such as PQ coding and copy protection, but to get the full rundown on these it's worth reading part three of Paul White's Stereo Editing series, from the March 2000 issue of *SOS* (available at www.sound-on-sound.com/sos/mar00/articles/stereoedit.htm).

You will also have to make sure that your artwork is ready and saved in a suitable file format, complete with barcodes and all the text for printing on the CD itself. The 'New Label' info pack provided by PPL (Phonographic Performance Limited — see part three of this series, as above, for more details) contains, amongst other papers, a Copyright Protection leaflet showing exactly what text needs to go on your CD and what to do with the ubiquitous 'P' and 'C' symbols.

As part of the general preparation process, you may also decide to have your work properly mastered so that (audio-wise) it is optimised for release. Toby Marks explains why he chooses to have his albums professionally mastered. "So far, all my album tracks have been edited together to run continuously, but before I mix them together I take the individual tracks to the mastering suite to EQ and level them. Then I load them into my computer and do the crossfades and the general compiling of the album back at my studio. Lastly, I return to play the final 70-minute master back into the mastering system.

"I do use Emagic's *Wave Burner Pro* on my G4, in which I can handle all the edits, PQ codings, ISRCs and copy protection, and I can also do all the compression, limiting and expansion that an expensive production suite does, but I don't fully trust my ears, my monitoring or my acoustics, and I don't have 30 years' experience as a mastering engineer. There are some things which I know other people can do better, which will vastly improve the final result, and mastering is one of those: I couldn't handle listening to one of my CDs and knowing it was wrong."

"I am also not convinced that your average computer drive is necessarily that good at writing audio CDs, even in real time, and that may be an overriding reason to get a mastering studio to do it all. At least that way you can be pretty sure it will all be OK. I have heard tales of people getting their masters sent back from the manufacturing plant, having been told that there were too many errors to go into production."

If you are confident in your mastering skills, you may wish to save cash and deliver your finished coded file and artwork direct to the manufacturer. They will have charges, including one for the glass master, which has to be created before any CDs can be manufactured. The other main cost is for the manufacturing itself, and that will vary depending on the size of the production run. Toby provides some guideline figures. "It's all to do with economies of scale: a production run of about a thousand CDs with reasonably good artwork costs about 60p per CD plus VAT. £600 for 1000 CDs isn't much compared to what you might have to spend on recording or on a designer to create the artwork. I spend more than that on mastering, which costs me from £1000 to £1500 quid an album, but I'm fortunate to have access to very good mastering suites. If you sell 10,000 CDs, it's worth spending £2000 on the mastering process, but for 500 it's probably not.

"Marketing could potentially be the most expensive part of the whole process. If I stick to the principle of spending one pound per copy, I'm spending more on marketing than manufacturing. On a £15 CD in the shop, the government takes £2, VAT will be £2.30, the shop will take about £4, and the distributor will take about £2, so suddenly 60p doesn't seem a lot. If you could sell your stuff on the web and take out all those other people, suddenly your 60p CD can be sold for a hell of a lot less than £15."

1 Ⓟ Notice

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The Ⓟ Notice is an internationally recognised symbol of protection. Its inclusion is a legal requirement in certain countries, and should be prominently shown on all publicly distributed copies of a sound recording. It indicates the year in which the sound recording was first published and the facts in the Notice will be presumed correct unless the contrary is proved. It is therefore vital that the Ⓟ Notice contains accurate information.

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Do not combine the two notices, for example, Ⓟ & © 1996 XYZ Records, as this may invalidate both notices – and yes, we are well aware that, unfortunately, this is common practice within the record industry!

3 Copyright Warning Notice

Below is an example of a standard copyright warning notice which should also be clearly displayed on the label or sleeve of your sound recording:

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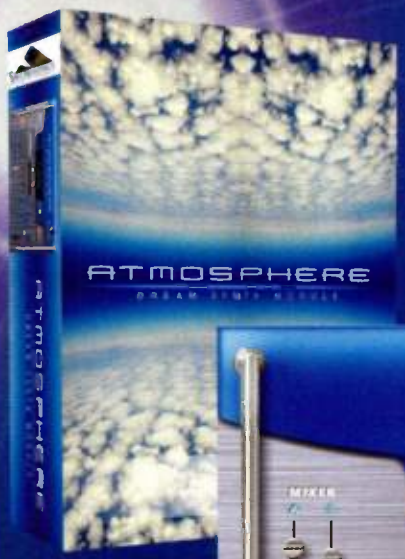

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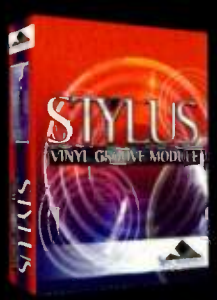

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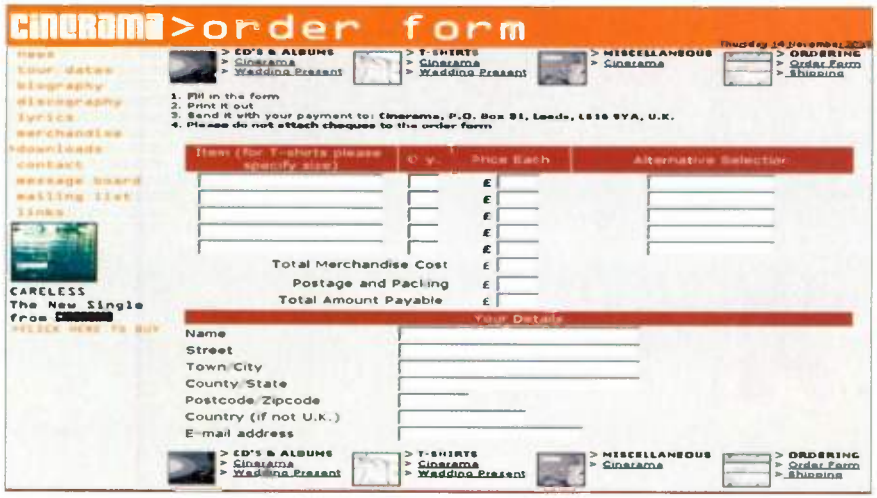
Playing The Card

The one obvious thing lacking from Gedge's setup is the facility for people to use their credit cards to purchase Cinerama's merchandise, although the majority of sales are via traditional distributor/shop channels, so the limitation has not been an issue until now. Nevertheless, if you are intending to use the Internet as the main outlet for your records, card handling will be a higher priority. There is an ever-growing number of companies offering card-handling services on the Net. For a commission fee, these companies will provide a secure server, screen customers for possible fraud, approve their credit-card details, and provide them with all the necessary communications and verifications. The order information is then passed on to you, the distributor, and then all you have to do is make sure the CD or record is posted. Traditionally it was necessary to set up a merchant account with a bank in order to process card orders, although there are some newer services — like the eBay-owned Paypal — who require no setup fees and no merchant account.

Toby Marks has also been distributing Banco De Gaia merchandise from home. Unlike the Cinerama website, Disco Gecko now takes credit-card orders. The incentive for Toby to set up a card service was his acquisition of the rights to his old albums, which were previously released by Planet Dog, and then sub-licensed to Ultimate Records (the full story of how the liquidation of Ultimate led to a legal dispute over the ownership of Banco De Gaia recordings was featured in part one of this series). By gaining the rights to his old records, Toby also obtained a lot of stock which had been held in distributor Pinnacle's warehouse for several years during the legal case, so it made sense to set up a credit-card system to cope with orders from long-waiting fans. Toby explains how he picked a suitable service: "I knew that if I could get on-line credit card



Part of the mail order section of the Cinerama site.

handling sorted out I could do a lot more direct sales and I would gain from having no distributor's fees. I talked to the bank about it first, but it was really expensive — something like £20 a week minimum maintenance fee, plus the setup fee — so I ruled out that possibility. I then spoke to people at other labels I knew to see how they were doing it. One friend used a company who take the stock from Pinnacle, and do the mailouts and all the card orders, but because my wife and I have been handling our own mail-order stuff for a long time there was no need to pay somebody to do that part of it. We just needed someone to process the orders on the credit cards and then pass the orders on to us. Another friend recommended the company that I now use, which is run by an ex-tour manager who had realised that every band he'd worked with has a certain amount of merchandise to sell. He decided it would make sense to offer that service to all the bands that he knew. He's providing the card handling, technical backup and a secure server, and he's also running the web site. In practice, he sends me a weekly list of the orders they have received, which we then mail out, and every month I get a cheque for the amount they have received, less their commission. I don't know how the cost compares to other companies, but he's taking 25 percent net. That means that if an album is £10, then 17.5 percent VAT is taken off the £10 to leave £8.50 and the 25 percent is taken from that. I charge £1.50 postage on top of the £10, so the customer actually has to pay £11.50, but the postage bit is accounted for separately and not included in the 25 percent. We thought about making it 20 percent of gross, but it made more sense to take it from the real revenue.

Toby Marks' Disco Gecko label site.

"It is a couple of quid for every £10 CD, but I'm making more from those direct sales than I am through a distributor. In the past, some people from overseas didn't know what International Money Orders were and we got endless enquiries from people begging us to take dollar cheques, but with credit cards you can take the order from anywhere in the world and the bank will do the conversion from the UK price on that day, at whatever the exchange rate happens to be."

Looking After The Pounds

One of the key issues for a label selling its releases on-line is how to price them so that they bring in enough revenue to pay for all label expenses. At the end of this article, the 'Breaking It Down' box explains how a CD can be priced for retail, but selling on-line cuts out the retailer and therefore offers a label the chance to either make more money or sell cheaper.

Toby's pricing decisions are complicated further because some of his releases are not only available on his web site, but also on other web sites and in the shops too, having been sourced directly from Pinnacle. Toby explains why this is a problem. "I figure it would be crazy to charge high-street prices ▶

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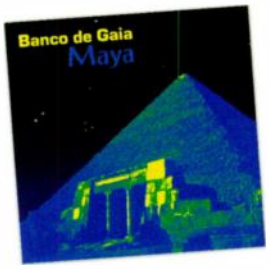

Because a large Internet retailer chose to offer the Banco De Gaia *Maya* CD at a big discount, Disco Gecko made much less on every copy they sold.

▶ on-line, so I try to keep them low, but you can easily order from Amazon US or CDNow, or one of the US retailers, and their stock is invariably cheaper. Ironically, even Amazon UK have undercut me! When I re-released my album *Maya* for £9.99, Amazon were doing it for £7.99, because they get a massive discount from the distributor. I won't go into where that leaves Disco Gecko, but it meant that we were getting practically nothing from every copy they sold! It's nice that people can buy the records cheaply, but unfortunately it was at the label's expense. All HMV or Virgin shops, and the other chains, get good discounts, and a lot of the independent shops will too, if they are good customers. I just have to accept the prevailing discount offered by the distributor to its customers."

Home And Away

As a small label, you might not need international distribution if you are happy to deal with foreign orders by posting them one by one, but if overseas sales grow to the point when posting Jiffy bags to far-off places is no longer viable, it becomes necessary to hire some outside help. One option is to sub-license your recordings to a foreign label, so that they can take care of the sales and royalty collection in that country. but there is also the possibility of hiring a trader to export and distribute your home-produced records abroad. David Gedge tells how he gets Scopitones releases out to the world.

"I've been exporting finished product, because it is more cost-effective and you get more per CD than you would from the percentage that a licensee would pay you. In Spain I have a separate deal with a company called Disc Media who export so many thousand Cinerama CDs and do a bit of their own marketing and promotion as part of the deal. However, it can get complicated if you have a deal for every country in Europe, so I also use a company called VoicePrint who do an overall deal for Europe and take care of all the export tax and shipping for a small commission. In North America I have a licensing deal with Manifesto Records, because exporting finished product to the USA is expensive and there are tax problems. They also licensed a few Wedding Present records from RCA, so it's an ongoing relationship. Manifesto do the equivalent of Scopitones here, so we hand them the artwork and the finished audio file for an album, and they press over there. I know the Manifesto staff really well, so we can co-ordinate release dates and touring schedules. The songs are also published in North America, because otherwise I wouldn't be able to keep track of all the royalty agencies over there."

Next month, we'll finish off the subject of distribution by focusing in on some of the smaller niche distributors, to find out how they can be of use to you. SOS

Breaking It Down

Now that this series has covered artist and writer royalties, manufacturing costs, distribution deals and various other running expenses, it's a good time to see how all those expenses are paid from the price of a CD. Toby Marks provides an example of a typically priced album.

"These days, £12.99 is a common retail price, so I'll start there. From that figure, 17.5 percent VAT is paid to the government by the shop, so subtract £1.93 and you have a net of £11.06. Shops generally mark up about 50 percent on the wholesale price charged by the distributor, so in this case the dealer price is £7.37, of which 17.5 percent VAT is paid to government by the distributor. Many shops get a discount due to their buying power; small Independent labels might get a few percent, while big chains like HMV or Virgin might secure around 10 or even 15 percent. I'll assume an average discount of eight percent, so the net to the distributor will be £6.78. The distributor takes usually between 20 and 25 percent commission, but for this example I'll say 25 percent. That means that the net to the label is £5.09, of which 17.5 percent VAT has to be paid to government by the label, if the label is VAT registered.

"The MCPS (Mechanical Copyright Protection Society) take 8.5 percent of the published dealer price, which, in this case, is 8.5 percent of £7.37. (Bear in mind that the set dealer price declared by the label is not necessarily what they actually receive from the retailers if a discount deal has been struck.) In this example the MCPS collect 63p. This is eventually passed on to the publisher, if there is one, or the songwriter(s), less MCPS commission, which I think is around seven percent. If there is a publisher, they will then take 20 to 30 percent before eventually, many months later, passing the rest on to the songwriter or writers.

"Manufacturing costs vary hugely, depending on quantity and packaging, but if you keep the artwork and packaging simple, a fair figure for a run of 1000 CDs is 60p each. Promotion costs can theoretically be unlimited but, as a very rough guide, £1000 will buy one quarter-page B&W ad in *DJ* and *Muzik* magazine, and will pay for 2000 flyers, and a mailout to about 500 people. That works out at £1 per CD for a batch of 1000.

"After these expenses, the label can expect to receive about £2.86. Out of that they will have to pay for recording and mastering, the latter costing anything up to about £1500. You also have to budget for artwork, unless you do it yourself, and the glass-mastering process, which is the actual master the factory creates to produce copies from. To put it into perspective, if you were signing an artist and they were on just a low-ish royalty rate of 14 percent of dealer price, the royalty would work out at £1.03. Paying for that from £2.86 would make it hard to stay afloat at this level. The other option is a profit share which, in my experience, generally means splitting what's left after the label has paid for all of the above expenses, including artwork, promotion and mastering costs. On a run of 1000 CDs, I wouldn't expect to see much profit — in fact, I wouldn't expect to break even. Managers vary, but in my experience they take about 15 to 30 percent of the band's income before tax (in this example, 1.03 per CD). In my case it used to be 17.5 percent of what I received, excluding VAT.

"Be aware that if you are not VAT registered, you will be paying 60p plus VAT (70p) per copy for manufacturing, £200 plus VAT (£235) for glass mastering, and £1000 plus VAT (£1175) for your adverts and flyers. But you will still only be receiving £5.09 from the distributor. What's more, if you did want to increase the price to earn more, in order for the label to receive an extra £1, the retail price has to go up by £2.80!"

If you'd like to see how that breakdown works on paper, here's how the calculations can be done:

Retail Price	£12.99
VAT paid to government by shop	£1.93 (£12.99/1.175 = £11.06)
Net to shop:	£11.06
Shop marks up 50 percent of	
Official Published Price to Dealer (PPD)	£11.06/1.50 = £7.37
PPD	£7.37
Shop gets eight percent discount	£7.37/1.08 = £6.78
Net to distributor	£6.78
Distributor takes 25 percent	£6.78 x 0.75 = £5.09
Net to label	£5.09
(Label pays 17.5 percent VAT to government if it is VAT registered)	
8.5 percent of £7.37 PPD to MCPS	£7.37 x 0.085 = £0.63
(20 to 30 percent of £0.63 taken by publisher)	£5.09 - £0.63 = £4.46
Manufacturing cost of £0.60	£4.46 - £0.60 = £3.86
Promotion cost of £1.00	£3.86 - £1 = £2.86

So the label gets £2.86, less any artist's royalty at 14 percent of PPD (£7.37x0.14 = £1.03), and less mastering, artwork, and wages for freelancers.

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Fame Academy.

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David Gray.

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Korg D1200

Digital Recording Studio

Photos: Mike Cameron

John Walden

Having upgraded their D16 to the D1600, Korg have now revamped the 12-track D12 to the D1200. So where does Korg's latest offering stand in the competitive digital multitracker marketplace?

The D1200, the latest multitracker from Korg, is a revamp of the D12, which was first released some 18 months ago as a baby brother to the D1600, itself an upgrade to the earlier D16. All three units have been the subject of *SOS* reviews: the D16 in *SOS* February 2000 (www.sound-on-sound.com/sos/feb00/articles/korgd16.htm), the D1600 in *SOS* May 2001 (www.sound-on-sound.com/sos/may01/articles/korgd1600.asp) and the D12 in *SOS* July 2001 (www.sound-on-sound.com/sos/jul01/articles/korgd12.asp).

The digital multitracker market continues to advance at quite a pace. However, probably the most significant change since the appearance of the original D12 has been the release of Yamaha's AW16G, reviewed in *SOS* October 2002 (www.sound-on-sound.com/sos/oct02/articles/yamahaaw16g.asp). At £899 in the UK including the CD-RW drive, this product has brought 16-track digital recording that much closer to the masses. Is the transformation of the D12 to the D1200 enough to deal with such stiff competition?

More For Your Money

Essentially, the D1200 is still a 12-track 'studio in a box' and, like the D12, the user can chose between a 12-track, 16-bit mode or a six-track, 24-bit mode. In both modes, simultaneous recording of four tracks is possible. The D1200 retains the same virtual track system of the D12, giving extra flexibility for multiple takes and when track bouncing. In 12-track, 16-bit mode, the same arrangement of six mono tracks and three stereo pairs is present, along with the nine, 45mm, non-motorised channel faders (plus red Master fader). The organisation of the effects processing appears almost identical to the D12: Insert, Master and Final

effects all based upon Korg's REMS (Resonant structure and Electronic circuit Modelling System) processing, with a maximum of eleven effects available simultaneously and three-band EQ on each input and playback channel. Some 200 rhythm patterns are built in and can be chained to construct a basic drum part. Scene-based mix automation is provided and the comprehensive MIDI specification allows both dynamic mix automation of key parameters and MMC control via an external sequencer. Finally, with the optional CD-RW drive fitted, audio data can be backed up, burned as an audio CD, or moved to a computer.

So, having identified what has stayed more or less the same, what (other than the '00' name tag) is new in the D1200? The physical layout of the unit has undergone quite a number of changes. Aside from the dedicated guitar input and the headphone output, all the D1200's analogue inputs are on the top surface rather than along the front edge. As a result, the LCD has been repositioned and the various buttons seem to have been shrunk slightly in size to fit within a smaller area. The LCD itself can now have its angle adjusted — a nice touch that can make it easier to find the best viewing position.

The other very obvious physical change is the addition of three large control knobs beneath the LCD. These are used in the Modelling mode, which provides a shortcut route to the recording process. Pressing the Modelling button brings up three icons on the LCD, allowing the user to select what type of signal source they wish to record — guitar, bass or microphone. Once the selection is made, two things occur. First, channels one and two are automatically put into record-ready mode (their status buttons turn red). Second, three new icons appear representing three parameters in a suitable effects chain for that signal source. For example, for guitar use, these are Drive, Tone and Cabinet. The three knobs can then be used to make rapid adjustments to these settings. Turning the Drive knob dials through ten different overdrive types (with names like Tube OD, Classic Dist, and so forth giving a hint of what to expect). The Tone knob dials in the degree of tube simulation, while the Cabinet control moves from 1x8 through to 4x12 types with most of the obvious combinations in between, including a 'full range' speaker option. Of course, behind the scenes, these knobs are adjusting a number of other REMS parameters used in the digital modelling process.

In my original review of the D12, although I was very impressed by the combination of features and audio quality achieved at the price, one concern I had was that no phantom power was available. However, individually switchable phantom power is now provided on the D1200, on two of the four analogue inputs. All A-D and D-A conversion is now also at 24-bit resolution (the D12's only 24-bit I/O was via the optical S/PDIF connections). This will certainly make the D1200's six-track, 24-bit mode a more attractive proposition for some musicians. Gone from the rear panel is the D12's SCSI port, but this is replaced by USB connectivity. As discussed more fully below, this is a decision that has some considerable advantages in use. Also gone is the D12's built-in microphone. The final major upgrade is in the hard drive capacity — the 40GB model included here (2GB of which is partitioned for USB use) provides plenty of capacity for even the most ambitious of concept albums.

Modus Operandi

When it comes to the actual operation of the D1200, the basic process of recording, overdubbing, editing, mixing and CD burning is essentially identical to both the D12 and the D1600 and very little needs to be added here to the descriptions given in the earlier reviews. Three of the new features are worth discussing further though. In operation, the new Modelling mode is a useful addition, making it easy to get an idea recorded with as few button pushes as possible. It is not without it's limitations, however. Firstly, activating the Modelling mode automatically arms tracks one and two for recording, and some care is needed to avoid the possibility of recording over something vital already on those tracks. Second, while the three Modelling knobs do give instant, hands-on control over key elements of the REMS processing, if you want complete editing control, then you really have to enter the full-scale editing mode (as used on the D12) — at which point the three large knobs become redundant. It is a shame they are not integrated into other editing processes in some way (although maybe this is something that could be addressed in an OS update).

Korg are clearly marketing the D1200 as 'guitarist friendly' and the Modelling mode is one of the selling points in this regard. The quality of things like the amp or cabinet modelling is therefore quite a significant issue. Without having a D12 to hand, it was difficult to directly compare the various amp/cabinet simulations on the two units. As a guitarist however, my gut reaction was that the D1200 offered some good overdriven and clean sounds, but wasn't quite so good with the sort of 'just breaking up' sounds loved by many blues players. I also found myself tweaking the EQ settings to get rid of a little fizz in some of the overdrive/distortion presets — although this is also a matter of personal taste and the guitar being used. Given the choice, I'd go with a dedicated amp modeller (such as the Line 6 Pod, Digitech Genesis 3, and

SOUND ON SOUND

Korg D1200 £799

pros
- Excellent audio quality.
- Significant new features compared to the original D12, including phantom power and 24-bit option.
- Easy transfer of data to computer via USB.

cons
- Some tracks only available as stereo pairs.

summary
The D1200, like it's predecessor the D12, is a very capable digital multitracker. There can be no doubt about its audio quality and impressive feature list, but it faces very stiff competition from the likes of Yamaha's AW16G.

▶ Behringer V-Amp 2, amongst others), unless I was set on a one-box solution.

A comparison between acoustic recordings made in the 16-bit and 24-bit modes revealed a subtle, but perceptible, difference in audio quality. For example, acoustic guitars recorded using 24-bits tended to sound just a little brighter and clearer, with a little more presence. At this price point, 24-bit recording might not be the most important selling point for many musicians, particularly as it then restricts the user to six tracks. However, if you have the need to do the occasional location-based recording where 24-bit quality is required (for example, a stereo recording of a string or vocal ensemble using two phantom-powered mics), the D1200 would be a possibility.

The significance of one further feature didn't really strike me until I started to use it — the USB socket. The D1200's hard drive essentially has two partitions: the bulk of the 40GB space is used during the recording process, but data can then be moved from this partition to the 2GB USB partition. Any data held there can then be accessed from a USB-equipped computer. Both Mac (OS 9.0.4 or later) and PC are supported. For the latter, connectivity will work out of the box for Windows 2000, ME and XP, while there are drivers for Windows 98 SE available on Korg's web site. I tested the connection using Windows XP and, once the D1200 had been put into USB mode, the PC automatically identified it, with the D1200's USB partition appearing as another disk drive on the PC — files could simply be copied back and forth as required.

This has two obvious applications. First, audio can be copied to a computer for backup or further editing. Second, updates for the D1200's OS can be downloaded via the web and simply copied to the D1200's USB partition from where a few button pushes will get the new OS installed. Of course, both these tasks can also be achieved via the optional internal CD-RW drive. However, the sheer simplicity of making this connection, and the ease with which data can be moved between D1200 and computer, means that anyone who already has CD burning on their desktop computer could easily live without the D1200's CD-RW drive — and could therefore save themselves a good chunk on the purchase price. Well done Korg!

Competition Comparison

I'd be failing in my duty to the *SOS* readership if I didn't offer some thoughts on how the D1200 stacks up with it's direct competition, and in this case the obvious competitor so far is the Yamaha AW16G. The two units have a considerable amount in common, both in features and in the way they operate, but there are also some key differences. For example, I prefer the guitar amp/speaker modelling offered by Korg but, as a guitarist, I'd still be budgeting for a Pod-a-like to go with either unit.

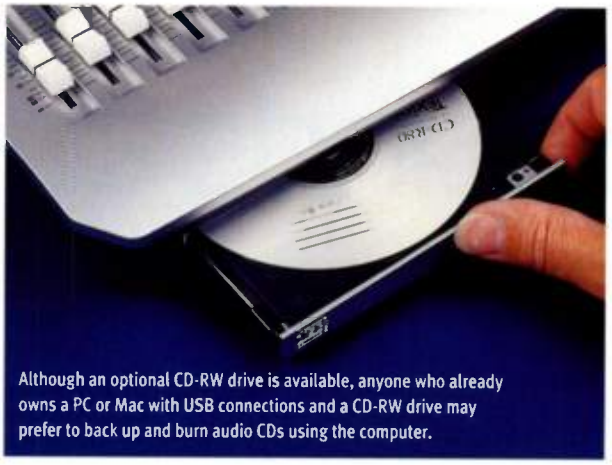
However, it is the specification differences that ought to give potential purchasers a steer in the appropriate direction. For example, the AW16G offers 16-tracks to the 12 of the D1200, but the

Test Spec

- Korg D1600 OS v1.00

AW has no 24-bit recording mode. The AW offers eight inputs and eight-track simultaneous recording in comparison to the D1200's four of both. The D1200 has three-band EQ, whereas the AW16G has four-band. You get a fixed selection of drum patterns with the D1200 but the Quick Loop Sampler in the AW16G. The D1200 offers a dedicated number of Insert, Master and Final effects that are simultaneously available while, on the AW, the available effects grunt has to be relocated on occasions — however, the channel dynamics of the AW16G could be seen to make up for this. And, of course, depending upon whether or not you need the D1200's internal CD-RW drive, there is a difference in the respective UK prices.

Perhaps answering three questions ought to help clarify matters for those with cash in hand. First, are 12 tracks enough, or do you need 16? Second, is 16-bit recording adequate or do you need a 24-bit option? Third, is four analogue inputs sufficient or do you need eight? My answers would be as follows; I've never got enough tracks, I record a lot of noisy guitar amps where the benefits of 24-bit recording are perhaps marginal, and I occasionally like to mic up a full drum kit. On this basis, for my money I'd go with the Yamaha — but that would be because of my specific needs, and your needs may well be different. Both units offer excellent quality, an amazing range of facilities for the price, and are very easy to use.



Although an optional CD-RW drive is available, anyone who already owns a PC or Mac with USB connections and a CD-RW drive may prefer to back up and burn audio CDs using the computer.

information

- £ D1200, £799; optional internal CD-RW drive, £199. Prices include VAT.
- T Korg UK Brochure Line +44 (0)1908 857130.
- F +44 (0)1908 857199.
- E info@korg.co.uk
- W www.korg.co.uk
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Verdict

The Korg D1200 is an excellent digital multitrack recorder. It is well-specified, a breeze to use and capable of producing recordings I'd be happy to use in many commercial contexts — it is a worthy successor to the D12. This said, it faces very stiff competition, particularly from Yamaha's AW16G. The two units do, however, have enough differences in specification to make them distinct, and this ought to help potential purchasers decide where their money might be spent. You would win with either. SOS

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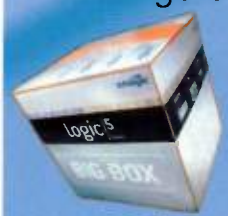

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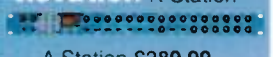

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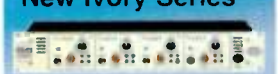

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Edirol SD80 Sound Module

The latest Studio Canvas module from Edirol aims to expand the sound palette available to those who need GM and GS compatibility.

Paul White

The Edirol SD80 is the latest in a long line of Sound Canvas and Studio Canvas synthesizer modules, but it goes rather further than offering basic GM/GS sound sets. It's very similar to the SD90 reviewed in *SOS* July 2002 (www.sound-on-sound.com/sos/jul02/articles/edirolsd90.asp), but without that unit's audio interface functionality. Packed in a half-width 1U metal case, the SD80 is, perhaps surprisingly, mains powered with no adaptor in sight. It offers 32-part multitimbrality, courtesy of two sets of MIDI ports, and for computer users, both Mac OS and Windows drivers are provided enabling a single USB connection to be used in place of MIDI. Mac users need to use OMS or FreeMIDI to make this work, though the setting up instructions in the manual take you through the installation and setup of the USB interface (for both Apple and Windows computers) in very simple, clearly described steps.

To service 32 parts, the instrument has 128-voice polyphony (though some sounds use more than one voice per note) and incorporates sound sets based on 1050 individual tones plus 30 drum sets. Three sets of multi-effects are also built in, offering all the usual suspects plus guitar overdrive effects, rotary speakers and various modulation effects designed to work with electric pianos. The GM side of the machine supports GM2, GS and XG Lite modes, and both 16-part sound engines have their own stereo outs as well as separate MIDI Ins and Outs. Alternatively, the audio outputs can be configured as four mono outs for greater assignability, while for use with digital systems, there are also S/PDIF outputs on both co-axial and optical connectors.

Though the front panel provides access to the various sound sets, sounds and drum kits, and allows effects to be selected and adjusted in level, any deep editing has to be done using the included editing software. This allows in-depth user patch editing.

Controls

Unlike some earlier SC units, the Edirol SD80 has a particularly stylish front panel, dominated by an LCD window and a rotary Value Dial and supplemented by 10 further functions buttons, a volume knob and a headphone outlet jack. The dial is used for changing parameter settings, and holding down the Shift key helps you move through the values more quickly. A pair of Page buttons moves between screens when more than one screen is required to undertake a task, while Enter works in the usual way to confirm an action or execute an operation. A Preview button allows currently selected sounds to be auditioned, and of course no Sound Canvas would be complete without its repertoire of demo songs.

Instruments are selected using the Inst button, which leads into a simple menu system where instrument or drum sounds can be selected. The various sound set options can be chosen here, and then the individual patches within the sets can be accessed. A pair of arrowed Part buttons determines the part being accessed, while Effects is used to select an effect type or to adjust an effect parameter. Status indicator LEDs show which sound engine is being accessed, what mode is active and also the MIDI or USB communication status. The MIDI ports are always active unless a USB connection is detected, in which case the USB interface takes over automatically and the status LEDs change to reflect this.

Around the back of the instrument, there's a grounding terminal to provide a

The SD80's 32 possible parts can be accessed either via two sets of MIDI ports or, from a computer, via USB.

SOUND ON SOUND

Edirol SD80 £629

pros
- Good range of GM and GS sounds.
- Editing software included.
- Can be used via USB or MIDI.
- 32-part multitimbral with 128 voices.

cons
- Could be too complicated for some applications.

summary
A well-specified and nice-sounding GM/GS synth with included software editor, the SD80 has the ability to produce non-GM sounds, but its main application will be as a GM-compatible module.

Internal Effects

The SD80's internal effects comprise separate chorus and reverb blocks, an EQ section and the multi-effects section. Though the type of chorus and reverb is set globally, the amount that can be applied to individual parts is adjustable and there are around half a dozen choices for each effect type. The EQ can be applied only to the physical outputs to which the sounds are routed. Certain routing options are included to give greater flexibility when using the SD80 with a mixer, so parts may either be sent to a multi-effect processor and then to an output, or sent to one of the outputs (either stereo or mono) without having multi-effects added. Only one multi-effect block can be applied to an output — there is no way to cascade multi-effects.

solid earth for the metalwork of the unit — as shipped the unit appears to have an inbuilt ground lift to help avoid ground-loop hum, but in some situations, hard grounding of the casework may be preferable. The power inlet is a standard three-pin IEC socket and the four analogue outputs are on unbalanced, quarter-inch jacks; the front-panel volume control affects only the level of Output 1. Conventional phono and Toslink connectors provide the co-axial and optical S/PDIF outputs and a USB cable is provided to connect the USB socket to a computer where required. That leaves just the MIDI sockets: two sets of Ins and Outs are fitted, but there are no dedicated Thru connectors. Instead, a small slide switch reconfigures the MIDI routing so that messages arriving at MIDI In 1 are output again via MIDI Out 2. In USB mode, the MIDI In signals are automatically routed to the computer, whereas in MIDI mode they control the sound generators of the Edirol SD80 directly.

Sound Generators

As stated, the SD80 can play up to 32 parts at any one time, where each part can be an instrument or a drum part. These parts are separated into A and B groups, each containing 16 parts and addressed by its own set of 16 MIDI channels. There are four sound-generation modes, listed as GM2, Native, GS and XG Lite. GM2 is the latest incarnation of General MIDI, and is backwards-compatible with standard GM data. It includes provision for limited sound and effect editing, which the original GM format didn't, but in general, this is the mode to use for GM MIDI file playback.

GS Mode, as most Roland aficionados know, is an enhanced version of the GM spec, which allows alternative sounds to be used in place of the original GM 'capital tones'. For example, there may be a choice of acoustic pianos that can be used for patch 001. Because GM and GS sounds are supposed to be standard, they cannot be changed, though certain settings may be adjusted — for example, chorus and reverb type and depth. The number of alternative sounds varies enormously from patch to patch, with some having as many as 10 variations and a typical instrument having between two and four.

Native mode is non-GM, though it makes use of the same basic waveforms. However, it does allow far greater freedom in editing and includes two special sound sets that show off the un-GM-ness of the SD80 to good effect. Finally, XG Lite mode is a simplified version of Yamaha's XG system, which is their own take on the idea of GS. The same GM sounds reside in the same locations in both GS and XG formats, but there are some technical differences, such as the type of bank change command required. XG Lite facilitates the playback of ▶

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▶ MIDI files recorded to the XG standard, though the degree of control over effects and settings is quite limited.

The GM2 and Native sound sets are further categorised into four categories for GM2 and six categories for Native. The four shared categories are Classical, Contemporary, Solo and Enhanced, with Special 1 and Special 2 being added to the Native set. Classical aims to give the greatest compatibility when playing generic GM MIDI files, whereas Contemporary aims to make the individual instruments a little more expressive. Solo mode takes this further and contains sounds that work well as lead or solo voices, while Enhanced provides sounds that have been teamed with specifically designed multi-effects. For example, here you'll find organs set up with rotary speaker effects, guitar patches fed through distortion effects and so on. Up to three Enhanced sounds can be used at any one time, the limit being in part due to the multi-effects structure of the SD80.

The two Special sound sets can be used only in Native mode, and include a mixture of sounds taken from the Enhanced sets and more abstract sounds not part of the GM sound set. Many of the sounds use the multi-effects capabilities of the SD80. In all modes, parts may be muted or soloed, but sound parameters can only be controlled from the front panel of the unit when it is set to either GM2 or Native mode. Any changes made can be saved as a user patch. Part parameters are fairly basic and include the obvious things like volume and pan, but in those modes where editing is allowed, you also get access to filter settings, modulation depths, portamento, envelope settings, effect levels and so on.

The SD80's editing software looks very similar to that provided with the Roland XV2020, suggesting that this machine is based on the latest XV engine. A main page, styled after a hardware synth, provides access to all the subsections, each of which has its own page. This way you can stay near the surface making only superficial changes, or you can get right down into the nuts and bolts to build your own sounds and effects settings from scratch.

Those using the SD80 with their Mac or PC benefit from in-depth editing software.

Lasting Impression

The SD80 benefits from a manual that is somewhat clearer than the usual Roland offering, but there's a still a lot of depth to explore if you've a mind to. When used as a playback device for GM MIDI files, the quality of the sound is generally good and reminds me of the GM bank in my Roland JV2080. Some of the string sounds are exceptionally nice, though as with earlier Sound Canvas units, I feel that some of the patches are somewhat lacking in sparkle and/or depth. Certainly the sounds integrate well in a mix, but if you want something to stand out, you really need to experiment with using the Enhanced or Solo sounds. As ever with Roland products, the drum kit sounds are strong and cover a variety of styles, from rock and pop to electronic.

While the non-GM sound capability of the SD80 is to be applauded, you need to use the editing software to make any significant inroads into sound creation or customisation. For those with the patience, there's the potential to create sounds that rival those of the Roland JV and XV machines in complexity and depth, though I don't think the factory sounds offer anything that strays too far from 'safe' Roland preset territory.

The final question concerns the nature of the user. I could be wrong but I'd imagine an education user or an entertainer looking to play back GM MIDI files would appreciate something simpler, while the more serious musician could be frustrated by instrument's limitations. For me, the SD80 falls somewhere inbetween the traditional Sound Canvas and something like the Roland XV2020. Maybe this is in response to demand, in which case the SD80 should be a roaring success, but I'm still a little unsure as to which market the product is aimed at. That concern aside, the SD80 does what it does very well, the manual is more helpful than most (though it still skimps a little on issues related to sequencer use and the index includes all the words except for the ones you really need) and the generously extended GM sound set is augmented by a very capable 'roll your own' section. So, the SD80 is more silk than canvas, but it's up to you to decide if it's your bag. SOS

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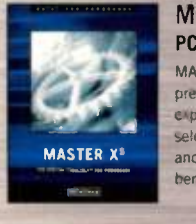

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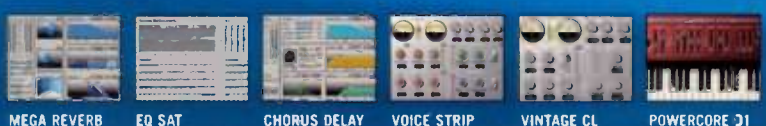

System Requirements: *Mac/PC, POWERCORE, VST/MAS Sequencer.*

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KORG MICROKORG

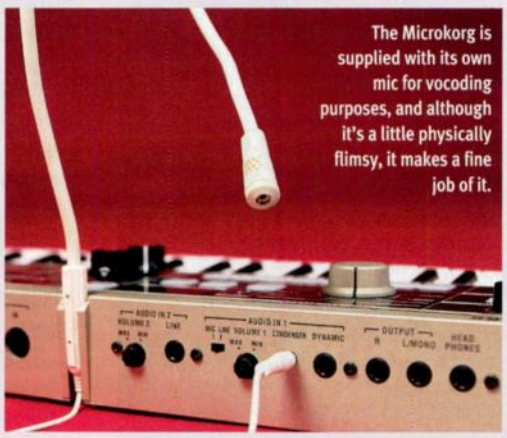
The Vocoder

The Microkorg's vocoder retains the synth's four-voice polyphony, utilising an oscillator and a noise generator per voice. As with all vocoders, two input signals are used. The so-called Modulator signal (often, but not necessarily, a vocal input from a mic input) is analysed by envelope followers and split into 16 frequency bands, the relative level of which are used to impart the incoming signal's frequency spectrum on the other signal, the so-called Carrier (often a synth pad or tone, although again, this doesn't have to be the case), by means of 16 corresponding band-pass filters.

The cutoff points of the filters can be shifted up or down to raise or lower the overall frequency response of the vocoder effect (carefully set, this could allow you to simulate a male vocal from a female voice, or *vice versa*), and resonance may be added to colour the sound. The current vocoder frequency response can be 'frozen' at any time by pressing the Formant Hold button. For editing purposes, the filters are arranged as eight pairs, or 'channels' and, at the output of the carrier signal, each channel has an individual level and pan control. The Envelope follower sensitivity is adjustable, as are gate threshold and gate attack time. Controls are provided to determine how the modulator signal's high-frequency content will be treated, either passing through unhindered, or being heard only when a note is being keyed. The volume of the passed high frequencies can be altered for subtlety or overly sibilant effects, and experimenting with this can aid intelligibility if the modulator is a voice.

The vocoder modulation options are not as varied as they are for a synth patch, but this is to be expected. The carrier filters may be modulated by the amp envelope, either of the LFOs, velocity, keyboard tracking, the pitch-bend wheel, or mod wheel. The provision of individual volume and pan controls for each of the eight output channels is generous, and allows the creation of lush stereo spreads.

The supplied microphone slots into a socket on the rear of the case and has a flying lead that plugs into Audio In 1 via the 'condenser' mic mini-jack socket. A second 'dynamic' standard jack socket is also available to which line sources may also be connected, and there's a mic/line selector switch, which is a nice touch. Audio input 2, on the other hand, accepts line-level signals only. Both audio inputs have a small trim control knob by the socket (labelled 'Volume'!) in order to match as wide a range of sources as possible. Unfortunately, I found it all too easy to overload the inputs, yet keeping the level back didn't give me a hot enough signal into the vocoder. A compressor would help, but that's not really a sensible option if you're only using the supplied mic. The mic is suspended at the end of a long bendy plastic arm, and Korg warn against bending this arm any more than necessary; I'll admit to wondering how long this device would last with some players I could name! The quality of the mic, though, is well up to vocoding standards — in fact, it seemed to me to produce better results than a high-quality mic, probably due to the vocoder's analysers and filters having an easier time of it with an signal of slightly reduced bandwidth. One very useful aspect of this vocoder is that an external signal can be used as a Carrier if you wish, so you're not limited to the classic '70s-style 'robot voice' effect, where a voice is used as the modulator, and a synth pad as the carrier; you could, for instance, vocode rhythm guitar with a drum loop. There's certainly no shortage of creative possibilities!



The Microkorg is supplied with its own mic for vocoding purposes, and although it's a little physically flimsy, it makes a fine job of it.

▶ a new note is played, or to pick up from the release level of the previously played note.

In the amplifier section, there's a simple level control to determine the overall patch level, although this acts as a balance between Timbre 1 and 2 when a layered patch is created. A pan pot determines left/right balance and variable key-tracking will increase or decrease volume level across the keyboard. The amp section also offers a useful distortion processor, a simple on/off control which relies on the levels set in the mixer to determine just how much distortion is applied.

The Microkorg's two LFOs are near-identical, with the exception that LFO2 offers an triangle wave rather than LFO1's sine wave, and also contains an unusual 'positive-only' square wave in place of LFO1's more usual positive/negative square wave. A positive-only wave can be useful, for example, where you might want a pitch warble to flip between the played pitch and a higher interval, whereas the more usual positive *and* negative wave would warble the pitch at above and below the played pitch. There's no positive-only equivalent for the sine or triangle wave, though, which could have been useful in simulating guitar vibrato. Key sync of the LFO is possible, as is tempo sync, so modulation can be synchronised to either the internal arpeggiator tempo, or an external MIDI Clock source at a variety of cycle values, from four beats per one cycle to one beat per two cycles.

As mentioned earlier, four so-called virtual patch routings are available, and it is here where much of the Microkorg's strength lies. Each Patch allows the selection of a modulation source and its application to a modulation destination, with a variable positive/negative intensity. Modulation sources include both LFOs, both envelope generators, velocity, keyboard tracking, and the mod and pitch wheels. Destinations include pitch, Osc2 tuning, noise level, filter cutoff, amplitude, pan and LFO2 frequency. As you might well imagine, this gives you scope for a whole world of modulatory mayhem, and some of the factory presets show what can be achieved with a little thought and application.

Effects, Arpeggiation & Global Settings

The Microkorg has are two onboard effects types: modulation and delay. Modulation effects are confined to three basic types: a flanger/chorus, ensemble effect and phaser, and the only controls provided are speed and depth. The Delay effects also come in three flavours: stereo delay, cross delay (where feedback is interchanged between left and right) and left/right delay (ie. stereo ping-pong). Despite their simplicity, the effects are of good quality. I particularly liked the phaser: it seemed capable of bringing out a certain 'graininess' in the synth's sound that reminded me of an old MXR stompbox.

In addition to the two effects, a two-band equaliser puts in a welcome appearance too. This seems to be standard fare for the current crop of analogue-modelling synths, but Korg offer sweepable frequency bands, which increases the EQ's usefulness.

The onboard arpeggiator offers six basic types of arpeggio, including up, down, up/down and random settings. A further 'Trigger' option is not strictly speaking an arpeggio at all, but is very handy nonetheless; it allows staccato chords to be retriggered at the arpeggiator tempo. The arpeggiator allows a very generous degree of ▶

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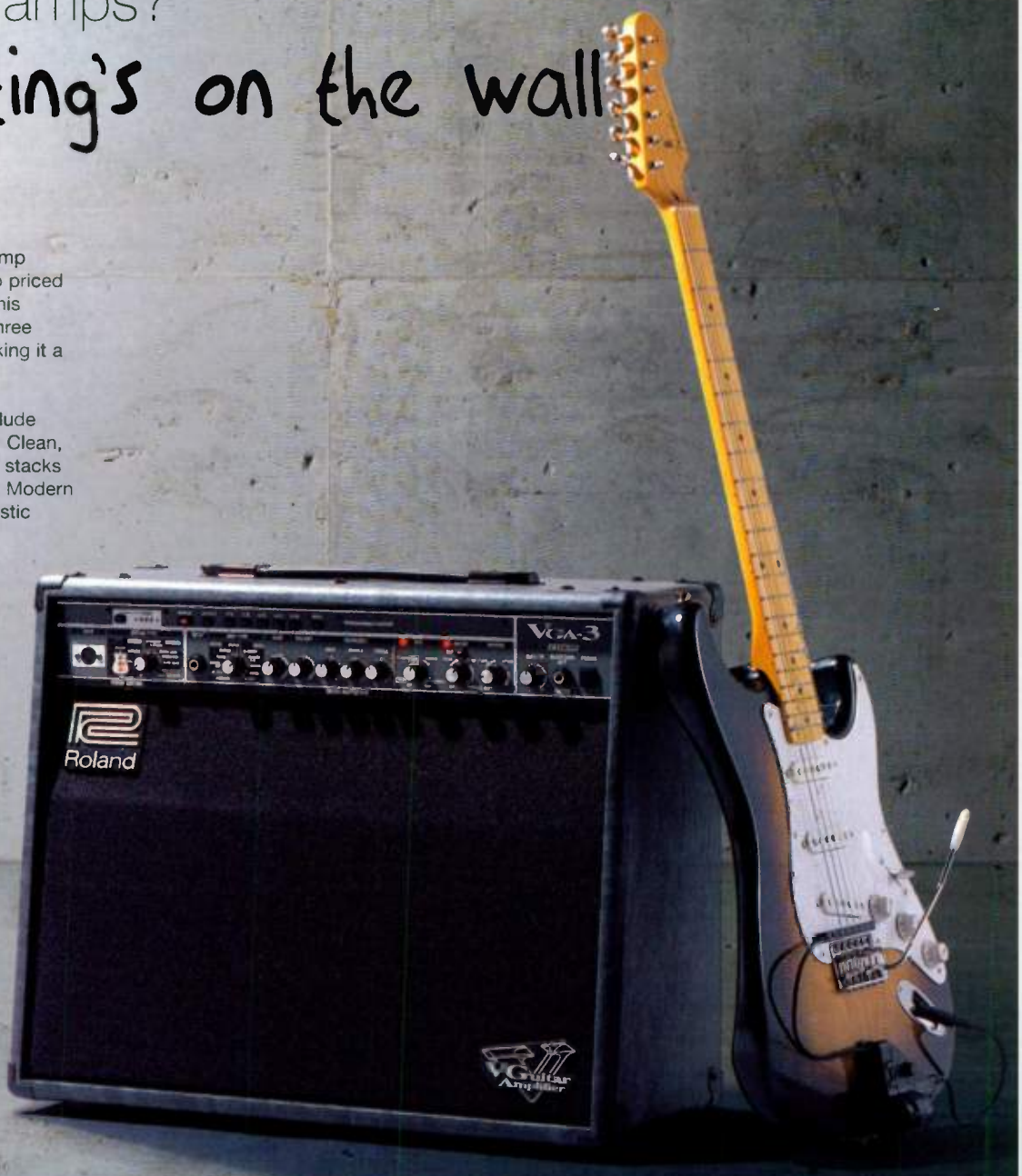

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WRH

Not a bad range of connections for such an affordable product — there's the full complement of MIDI connections (no dual MIDI Out/Thru here), plus the two sets of audio inputs and headphones socket. It's a shame there are no pedal connectors, and there's only a stereo output, but this is hardly unreasonable at the Microkorg's price.

control over its abilities, including note resolution (which is adjustable from quarter- to 24th-note settings), gate time (0 to 100 percent), range (one to four octaves) and swing (-100 to +100 percent). The number of arpeggio steps can be set between one and eight, and the arpeggiator may be set to run freely, or to retrigger from the start of its pattern with every key press. An option to latch the arpeggio after all keys have been released is also provided, but it would have been nice if this control had made it to a dedicated front-panel button. The arpeggiator can act on either or both of the synth's Timbres.

It's a nice touch that when you're editing an arpeggio, the Program Number buttons light to represent the active steps in the current arpeggio pattern. By turning individual steps on and off with these buttons, it's possible to modify the arpeggio's rhythmic pattern. If you don't have fun with this, it's time to take up a new hobby!

Global settings determine the Micro's master tuning, transposition, and whether signals arriving at the audio-input sockets will be passed through to the synth's audio outputs. That the Micro's keyboard is velocity sensitive at all must be seen as something of a bonus, so I was surprised to see a parameter to alter the keyboard's velocity curve. It was slightly disappointing, then, to realise that this actually only allows the selection of the keyboard's 'normal' velocity curve, or to fix the velocity output at a predetermined (ie. non-velocity-sensitive) value between 1 and 127. I was extremely pleased, though, to see an option to determine the routing of external MIDI. Essentially this enables an external keyboard to act as if it were the Micro's own keyboard, with its signal capable of triggering arpeggios, or alternatively to bypass the arpeggiator and play the synth's Timbres directly.

MIDI Capabilities

While we're on the subject, the Microkorg's MIDI capabilities are not to be scoffed at either. Local control can be switched on or off, and the synth will respond and transmit on any of the 16 channels, although there doesn't seem to be an Omni option. The Microkorg will also send or receive MIDI Clock messages. In addition to the usual discussion of note, control and SysEx implementation, Korg have included a very comprehensive section in the manual detailing the Microkorg's many MIDI NRPN messages. These allow the user an exacting degree of control over the arpeggiator (even allowing it to be switched on or off over MIDI) and the vocoder, to name just two parts of the synth. If you're not afraid of using controllers, there's a great deal of power to be tapped here. I tried a few examples using a combination of controllers sent from *Cubase* and my old Kawai MM16 fader bank, and can happily report that everything worked fine.

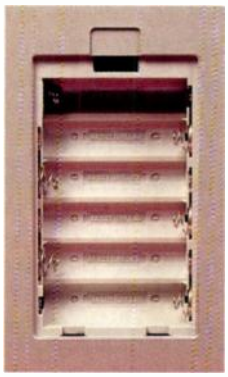
A MIDI filter feature can be accessed by

User Interface

There aren't a lot of controls on the Microkorg's top panel; this is clearly a synth designed with speedy live editing in mind. To the left is the volume control, the arpeggiator On/Off button with associated LED tempo indicator, and a pair of tri-colour up/down keyboard transpose buttons. Both pitch and mod wheels are present, though they are slightly smaller than those on a less size-conscious synth; as a result they are a little more difficult to use with subtlety. Further to the right are the Program selection controls, audio input activity LEDs, the three-character LED display, and Write and Shift buttons. To the right of the Program Selection controls are the Edit Select controls (see above). The rest of the control surface is taken up with the printed matrix of program/vocoder parameter descriptions and the five Edit Controls (above).

The Edit Controls are normally assigned to adjust (from left to right) filter cutoff, filter resonance, envelope attack, envelope release and arpeggiator tempo, but once the Edit Select controls have been moved, the five knobs then control the corresponding parameters denoted in the screen-printed matrix below. Alongside the Edit Controls is an LED that lights to indicate when the physical position of the control being moved matches its current parameter value. This is important since in order to prevent sudden jumps when editing, you have to turn a control to pass through its original value before any changes take place. While this is undoubtedly useful in a live context, I did find it becoming annoying in the privacy of my studio, and would have liked the opportunity to turn the feature off. Fine incremental edits are carried out by using the Octave Shift buttons while holding down the Shift button, and holding down both Octave Shift buttons resets a parameter to its original stored value.

holding down the Shift key and hitting Program Number button 4; here program changes, control changes, pitch-bend and SysEx messages can be selectively removed from the MIDI stream. Holding down Shift and hitting Program Number key 5, on the other hand, allows you to specify the control message transmitted by many of the Microkorg's parameters. This in turn enables you to use the Microkorg as a programmer for software synths, and makes it an viable companion to a compact, computer-based recording setup. Combine this with the Microkorg's option for battery operation and it's not hard to imagine a neat laptop system with this synth in tow — though dedicated USB connectivity would have made this neater still.



In addition to employing mains power, the Microkorg can also be driven from six AA batteries for use on the move.

Sounds

Whilst I'm suitably impressed by the Microkorg's extensive synthesis capabilities (as I was with those of the MS2000), I have to say that many of the presets don't truly do it justice. I'm the first to admit that this is largely a matter of taste, but I think it would be a shame if the Microkorg's presets remained in place, as they might if users don't wish to tangle with the editing interface. There *are* some good factory sounds in there, but there are also some turkeys just waiting to be overwritten — maybe that's Korg's ploy to encourage you to come up with material of your own! Probably due to the restricted polyphony on offer, there aren't many pads, but I programmed a few of my own and achieved acceptable, if slightly 'cold' results — even allowing for the polyphony. Some of the basses, on the other hand, are superbly fat, and there's enough edge in many of the lead sounds to cut through the densest of mixes. Chunky sequence lines are also handled with aplomb.

Conclusions

I'm finding it hard to sum up my feelings about this synth. The synthesis engine is first class, and the vocoder is up there with the best of the current breed, but I can't help feeling they have been delivered in the wrong box! The mini-keyboard is where the problems will start for serious players, and although it has MIDI inputs so that you can connect a full-sized keyboard, it can't be rackmounted. Gigging DJs might be interested in the vocoder and hands-on filter tweakability, but the powerful synthesis features are unlikely to be tapped by that market — indeed they might even prove off-putting. For the serious synthesist who *will* find these features attractive, there's plenty of depth and flexibility here, but accessing it via the Microkorg's interface can be frustrating. It's to Korg's credit that they have designed an editing system that works as well as it does, with so few actions needed to leap between so many parameters, but although I was itching to get at the controls, I was slowed down greatly by the need to keep running my finger along the printed matrix and spinning the Edit Select knobs to get at the parameter I needed. Maybe time would bring familiarity.

Then there's the price... if the Microkorg had cost three hundred quid instead of four hundred, I could have forgiven it a lot, but as it is, there are other synths within reach that are also worthy of a close look, such as Novation's A-Station. The second-hand market is also beginning to pass down machines such as Roland's JP8080 (which also contains a very capable vocoder), and even Korg's own MS2000 and MS2000R are also available at a not-too-dissimilar price.

In short, the Microkorg has plenty of positive aspects and some negatives. It's a powerful synth in a compact, affordable package, but you have to go through a fair bit of button-pushing to tap that power. It offers flexible vocoding options with a dedicated ready-to-use microphone, and if you like the idea of working on the move, the battery operation will be a godsend to you, but you may not like the mini-keyboard and limited polyphony. Personally, I felt that the Microkorg's compromises might prove too much to accept — but depending on your priorities, you might feel it's made for you. SOS

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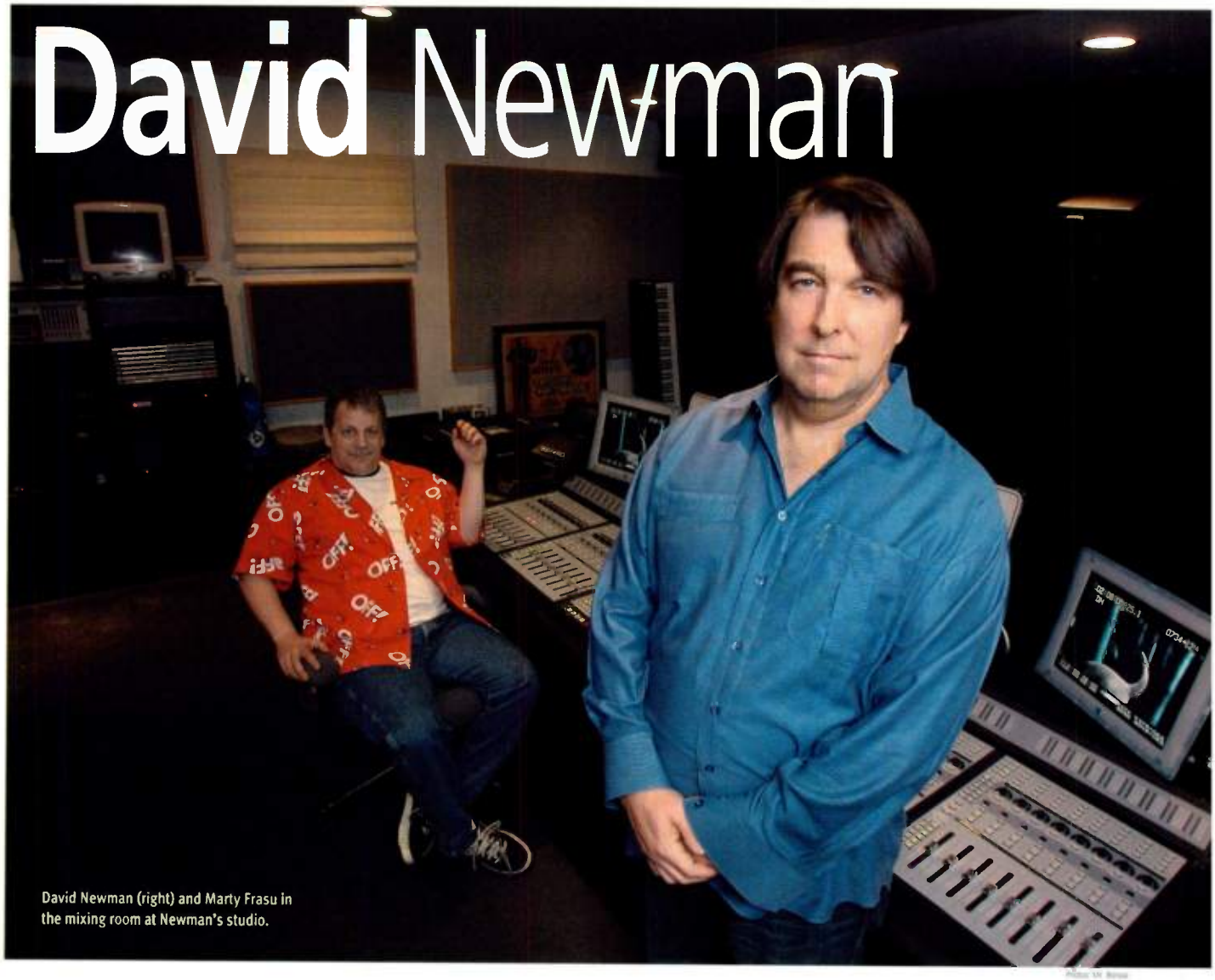

David Newman (right) and Marty Frasu in the mixing room at Newman's studio.

Paul White

Composition runs in David Newman's family, and he's become one of Hollywood's most sought-after writers of music for film.

Given his family background, it seems inevitable that David Newman would become a composer. Son of legendary composer Alfred Newman, David is also brother to composer Thomas Newman, cousin to Randy Newman, nephew to composers Emil and Lionel Newman and cousin to composer Joey Newman. Though trained as a violinist and conductor, David now spends the majority of his time composing film scores and was nominated for an Oscar for his score to the 1997 animated film *Anastasia*. His more recent work includes *Scooby-Doo* and *Ice Age*, but the list is huge and includes many of the lighter Eddie Murphy films, the excellent *Galaxy Quest*, *Bill & Ted's Bogus Journey*, *Don't Tell Mom The Babysitter's Dead*, *Throw Momma From The Train* and *Critters*.

Most of David's scores are for orchestra or a combination of orchestra and electronic sounds. The main body of the composing work is done at David's home studio near Malibu in California, where David works with engineer/technical guru Marty Frasu who ensures that the studio runs smoothly. Indeed, David and Marty work so closely together that during the interview they ended up answering each other's questions and finishing each other's sentences — they clearly function as a very efficient unit, which is just as well given that some film scores have to be completed in only a couple of weeks. The building contains separate rooms for composing and mixing.

The Computer Studio

"Primarily the studio is based around a *Logic*/Pro Tools TDM system using the Emagic TDM Bridge so that we can run both *Logic* and TDM plug-ins," explains David. "The main samplers are *Gigasamplers* running on six PCs fitted with removable drives for backup. They're fitted with 120GB drives and we fill them all up with samples — five of them are used for orchestral samples, with the remaining one handling any other stuff. We may need to expand this further, because every time a new library comes out, we have to reconsider what we're doing. We also do a lot of in-house work with the samples, combining elements from different libraries to provide the best orchestral sounds we can. The *Logic* Environment is set up so that the whole orchestra is available, but what's weird about this is that *Gigasampler* isn't yet able

to do what we did on our Roland hardware samplers, which is set several different parts to the same MIDI channel. We're hoping this will be addressed in an imminent update. Each PC is identical and all are fitted with RME Hammerfall cards which have both lightpipe and analogue outputs. There's no real mixer any more — we have a Mackie 3204, but that's really just for monitoring. All the sequenced parts are ultimately saved as audio tracks and mixing takes place in the Pro Tools TDM environment. All the hardware synths and *Gigastudio* PCs return into ADAT Bridges and 1622 interfaces. That way you get the mix balanced in *Logic* the way you want it, you save it and you're good.

"I have a Logic Control and expansion unit, which is all kind of new. It's very nice but there's also a kind of obtuseness to it. Also, when you're used to controlling *Logic* from the mouse and screen, then all of a sudden the control is over here, you've got to readjust your thinking. It's necessary for me to be able to work really fast — almost like touch-typing. I have my sampled orchestra already set up in my *Logic* default song so I can just start playing, and the video is running slaved to *Logic* so I can use *Logic*'s markers to identify cuts and cue points. I work through the project in a serial manner, writing as I go along. Pro Tools is great for recording and editing audio, but I write in *Logic* and then when we're done and the director signs off on everything, we make audio files of everything — of all the synths that won't be replaced by the orchestra. From then on we work in Pro Tools.

David Newman's main workstation in the composition room, with no fewer than three computer screens and two video displays. Visible in the rack are (from left), Korg Triton Rack and TR-Rack modules, Yamaha CS6R module, Mackie line mixer, Emu Proteus 2000, Audity 2000 and Planet Earth modules, Roland XV5080 module and VP9000 processor.

"I come from a notation-based classical music background as a violinist and conductor and originally I would orchestrate all my own scores — I had no orchestrator at all. Then, because of the schedules, I started using an orchestrator. Now, I can get a score 70 to 80 percent orchestrated within *Logic* — *Logic* has a scoring facility, but it's not really professional enough to print. When I'm done and the director is happy with the cue and the scene is locked, I will do one of three things. Either I will print out my *Logic* score, which is somewhere in between an orchestration and a sketch, or I will stay within *Logic*, then send the piece to an orchestrator who will import a MIDI file of the cues into *Finale*, which is what the copyists use, then whatever issues need to be dealt with by the orchestrator will be handled before it is sent to the copyist. Because orchestral music generally varies in tempo throughout, I spend a lot of time using *Logic*'s Rebar feature to create the correct tempo map for what I've played so the score will look right. I don't think *Logic* handles this as well as *Digital Performer*.

"I have actually orchestrated some cues using only *Logic* and had parts printed from it, but it doesn't look very good and it's difficult to print up the standard 9 x12 score sheets. It's lacking quite a few professional features — it's bad with uneven meters such as triplet meters, and you can't even ▶

Sound & Picture

One technical development that David Newman has enthusiastically embraced in recent years is the ability to run digital video alongside a sequencer within his Apple Macs. "In our rig there's an old Miro Video DC30 Plus card, which still works to this day," says Marty Frasu. "It's been discontinued so we even bought a few spares off Ebay and we use it digitise the movies from the tapes we're sent. Some of the FireWire boxes look pretty good too, such as this Canopus model we have — back in the old days, you'd have to slave the audio to the video recorder and keep rewinding the thing, then wait for it to sync up, but now the audio is the master and the video slaves to that."

"In Pro Tools the video behaves as just another track and it's time-stamped, with lots of good post-production features," explains David. "If anything really changed the way this composition setup works it would have to be digital video. In the newest version of Pro Tools there's a new feature called 'Send DV out of FireWire port' meaning that you can plug in a Canopus box, composite video will come out of it, and you can put it up on a monitor. It has to go on a monitor — we can't use a little QuickTime window.

"Though the Pro Tools video is compressed, it looks just as good as the video they send you to work with, which is deliberately degraded to prevent piracy. We've been working this way since *Galaxy Quest* three years ago and I really don't understand why we're still the only ones working this way, because it's so fast. I have the video on a big plasma monitor and you wouldn't know it wasn't a video tape — but when I move *Logic* to bar 20, the video goes to bar 20. Having worked this way, I can't imagine going back to a system where the music slaves to the video.

"It's not as though there are standards for doing this kind of work. If the film companies would send us pre-digitised video on a drive ready to go, that would be great, but they still send the video tapes and we have to digitise them ourselves. Now that Apple have bought Emagic, I'm hoping that not only will they improve the scoring side of the package but also include serious video support. The DV-to-output thing that Pro Tools does and that *Final Cut Pro* can do should be included in *Logic*, but so far they haven't done it. I emailed Gerhard Lengeling at Emagic a month ago and he told me it was on a wish-list, but perhaps film composers and TV guys are too small in number for it to be a priority..."

An Apple laptop for mobile work and an Emagic Logic Control fader surface occupy the left-hand part of the desk. Visible behind the laptop is another rack containing a Roland XV5080 module, Akai Z8 and S5000 samplers, Lexicon PCM91 reverb, Yamaha FS1R FM synth module, MOTU 828 FireWire interface and Denon CD player.

step-enter them. It's also impossible to have different parts playing the same bars in different time signatures, which is sometimes necessary for *avant garde* things. However, since Apple bought Emagic, I'm hoping that they will continue to improve the scoring aspects of the program to at least make it good enough for academic and commercial use, something session players can work from. If they did that, I probably wouldn't use an orchestrator. I have to orchestrate everything anyway, insomuch as I have to mock up every cue using samples so that I can sell it to the director with the video going."

Orchestral Samples

Although the orchestral elements in a David Newman score will ultimately be recorded by real musicians, it's important to demo them with a realistic sampled orchestral representation so that the director has a good idea how the finished thing will sound. I asked David to describe his sample library: "I've got just about every orchestral library there is, and I mix and match samples to get what I think sounds best for different situations. My legato strings, for example, are made up of four different layers from four different libraries. I think we've bought almost everything — all of Dan Dean's stuff, tons of Ilio and Spectrasonics, but it took several months to put together the orchestral samples that sound good and then layer them so they were easy to play. I use the expression pedal to go from very dark to very bright and the volume pedal to add dynamics.

"The setup is liable to change every few months as new libraries come along. For example, this new *Vienna* orchestral library looks very interesting, but I haven't heard it yet. Apparently it includes all the legato intervals as separate samples, which is a pretty cool thing to do. For example, if you go from an A to an F sharp on the D string on a violin, that's a different sound from using your fourth finger on the A string. If they've got it right and the voices can really speak that fast, I will be really interested because it's hard to do staccato and other fast things like that."

When the time comes to have a real orchestra replace David's sequenced orchestral parts, he uses his own mobile Pro Tools rig, which he brings down to the film sound stage. "I always have lots of electronic tracks, so once the orchestral side is complete, I'll make a stereo mix of all my synth elements as an AIFF file," explains David. "I can't time-stamp this, which is another bugaboo for us right now — we haven't got the OMF thing sorted out yet — so Marty has to take the file and place it at the correct SMPTE location in Pro Tools. Then he puts it into our mobile Pro Tools HD system, which goes to the sound stage where we record the orchestra. While they play, my synth tracks play along. If something changes at that stage, then either we'll edit it there and then, redo the orchestra stuff, or we'll just go back and do it another day. Things get changed all the way through the dub, and actually things change to an almost ridiculous degree. It's not the fault of the directors so much, but rather the system itself and the process."

"One of the biggest advantages of taking the Pro Tools rig down to the stage is that although the music is recorded in one piece, we may do a couple of takes, so we can edit together a best final take right there in front of the director," adds Marty.

"I don't really understand why other composers don't work this way," continues David. "Because everything is non-linear, we can jump to any section of the recording to replace a section or do a pick-up. It's so easy

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Doing The Splits

A major advantage of mixing almost entirely within Pro Tools is the ability to recall any session completely and instantly. "You'll set up for a certain mix, and then they'll want various parts split out at the dubbing stage," says David Newman. "The technology is much more prevalent in post-production where Pro Tools is almost ubiquitous, so they ask for individual tracks splitting out in all kinds of bizarre ways. It can get really weird, but it's easier to do with our present system and we've learned as we've gone along that it pays to remain as flexible as possible for as long as possible."

"We would prefer to send just a five-channel mix — we don't do the point one here, that's left up to the dubbing stage — but if we only sent the five-channel mix, they wouldn't be able to split out any of the separate elements," continues Marty. "In the past we have spent days going back in and splitting out mixes, but fortunately now, the individual elements are there as well as the mix so it's just a matter of reassigning outputs and running it again. We use mainly plug-ins so we can instantly get back to where we were — every effect and its settings is saved. The only outboard we use now is a TC System 6000 which is used for surround hall reverb. We use the Sony *Oxford EQ* plug-in for EQ, all the compressors are plug-ins — pretty much anything you might want to reset is all there and saved, so to go back and change things is pretty straightforward."

"The only issue I have is whether the sonic quality of some of these plug-ins is as good as the best hardware outboard, but Marty thinks that the mixes are now sounding better than ever — even when compared to stuff that we mixed on really good boards," concludes David.

and so fast, and as Marty said, we use the AVI option in Pro Tools so the picture is always there, and if you mess up a take, you go back and in 20 seconds you're done rather than waiting minutes for separate machines to lock up. It doesn't look professional when you're waiting two minutes every time for the audio and video to lock up, and of course wasted time with an orchestra is extremely expensive. Add up the wasted time over the course of a day and it could be 45 minutes — which equates to around 20 or 30 grand!"

Moving Targets

The 'mobility' of David's Pro Tools setup is strictly relative — it resembles a very large wardrobe, and you can't just pop it in the back of the car. "We get these big cartage guys — they show up, they push everyone out of the way, they roll it into the studio and it's the same thing on the way back!" laughs David. "The system we had before that was a little more conventional — we had a Euphonix desk, racks of outboard gear, we'd rent a tape machine and it took an entire day to set up. I remember being absolutely exhausted, but with this rack, we can hook up the audio with a couple of ELCOs, plug the power into the wall and I'm away."

Marty adds: "A lot of it comes down to intellectual planning. Everything is Pro Tools — we have a Pro Control control surface when we're mixing here, but down on the sound stage, the Pro Tools rig is just working as a tape recorder. They have a huge SSL console on the Fox Studios Newman sound stage — there's only four or five places you go to record anyway and we can hook into their systems easily. We have been talking about using some out-of-town facilities, in which case we're going to have to talk about ways we can do that.

"Some people are still reluctant to use hard disk recorders because they think they're less reliable than tape, but we've worked at the Newman sound stage a lot and the Sony 3348 digital tape machine they had was always breaking down. As a backup, we take along a couple of Tascam 24-track HD recorders, so in an emergency, if anything went horribly wrong, we could pull the drive out of the Pro Tools system and drop it into the Tascam machine and keep on working. We've never had to do it yet but I've tested it to see if it works and it's OK.

"A lot of the smooth running has to do with file management and backing up — it's a whole different paradigm to tape. I've already talked about the unmanageability of doing it the old way, and as you rightly pointed out, it's a moving target. This is the only we we know to manage everything in a way that doesn't send us crazy!"

The Electronic Element

One of the characteristic features of David Newman's work is its juxtaposition of classical, orchestral elements with synths and non-orchestral samples. "To me, every score is a hybrid score because I try to use some electronic elements in everything," he explains. "They may be electronic but

The right-hand rack in the composition area, including Rocktron Hush noise suppressor, Behringer Composer compressor, Rane preamp/mixer, professional VHS machine, Joemeek TwinQcs voice channel and Yamaha A100 power amp.

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I just think of them as other sounds — as an extension of the orchestral sound set. If you sat down and listened to something I've done, you might not notice the electronic parts that much, but there's usually more going on than there appears. If I pulled out the electronic elements, it would probably sound as though something was missing, but when they are in, it's not always obvious that I'm using sampled or synthesized elements. This is the advantage of working the way I do — the reality is that I orchestrate and listen to all the electronic parts as I go. If I need something in a certain range or with a certain texture or colour, I might solve that issue by using an electronic instrument. In a typical movie, maybe 90 percent of my cues will include electronic elements, but usually their contribution will be subtle unless the movie demands something more electronic-sounding. There was a movie I did recently called *Brokedown Palace* which was set in Thailand, and that needed some more exotic sounds — and there were quite a lot of electronic elements in *Scooby-Doo*. Because that's essentially a kids movie, the score included a lot of beats and rhythm elements.

"I did a film very early on called *Heathers*, which was a very popular American film with an all-electronic score, and I did approach it completely differently to my orchestral compositions. I approached it really minimally, but in the main it's not what I get to do. However, I do often start doing orchestral cues with electronic sounds and there was one — a Danny DeVito film I did recently called *Death To Smoochy*, which did really poorly at the box office, even though I think it is a terrific movie — that appears to be all orchestral, but there are lots of sounds that are not orchestral, like growling, mean and toy-like sounds. I built the orchestral parts around that.

"I'm a violinist and received an undergraduate degree from USC in Los Angeles, and I vividly remember rehearsing Stravinsky's *Petroushka* when I was at college where the bass clarinet wasn't there because he was sick or something, and it was as if the bottom was gone. And that really stuck with me — each sound has its own place, and if there's an electronic element, it means you don't necessarily need to have an orchestral element."

Beat Browsing

If a composer writes with sounds he knows, such as the orchestra, then the need to audition samples is relatively limited. However, when working with a large library of electronic sounds, it's vital to have them organised in such a way that they can easily be auditioned and incorporated into a session. "Because I have so many sample libraries, it would take an age to try them all, so Marty has put all my sample libraries into *iTunes* as MP3 files and then categorised them so I can audition the different sounds very quickly using what we call our 'beat browser' to search," explains David. "It's like a musical database that you can cross-reference from your laptop without actually having to load any samples. You find something inspiring that leads to something else and it grows, then you get to a point where you know where you're going with it.

"I don't have all my hardware synth sounds in *iTunes*, but I think all this hardware is going away at some point. I have my setup arranged so all the synth patches come back when I open a song, but it's easier with plug-in instruments — with hardware, you have to keep track of whether you've edited a patch or not, then decide how to save it. I can pull up any of the software instruments we have and you get a great user interface — you're not wandering though menus wondering where the filter settings are. There's a case for having hardware synths with a plug-in style interface so you can drive them from your monitor and mouse.

"Having said that about hardware, we are using the Roland VP9000 and we still use our Akai samplers — which are good for working where all the elements of a Spectrasonics Groove Control loop are split out separately. I particularly like the way the Groove Control loops leave space for you to put your other instruments and sounds. Some of the stuff out there is so busy that there's no room to add anything else. *Noise Box* and *Stark Raving Beats* work really well with the elements split out. As well as those two, we used *Skippy's Big Bad Beats* all

Newman's portable Pro Tools HD recording rig.

Key Issues

It's of paramount importance for a film composer to be able to work fast, and David Newman is always on the lookout for features and products that can help to streamline his working process. "A great feature of *Logic* is that you can Screenset various setups and then just call them up with key commands," he says. "I use the Powerkeys system that Daniel Hamuy, a composer and orchestrator from LA, has come up with [*check out* www.powerkeys.com *for more — Ed*]. With Powerkeys, there's a little printed thing stuck on the keyboard, like a little cheat sheet listing the main commands. Daniel spent a lot of time with *Logic* and tried to figure out a logical way to organise the keyboard commands — I spent time trying to do my own when I first got *Logic* but his setup is good. Obviously there are other things too, but you just learn them as you go. A lot of people in town use the same key command set so it's become something of a standard.

"There's also a product on their web site that my orchestrator designed, called the Cue Log Manager — it's the only way we can all stay organised. It is a *Filemaker* database which we all use — the composer, orchestator, Marty, the scoring engineer, music editor and so on — that lives on my server. Since we use the Server version of *Filemaker*, we can all use it at the same time and it updates instantly."

through *Scooby-Doo*. *Stylus* is also good for variable-tempo things — all that elastic tempo stuff is great. It wonderful to be able to take something at one tempo and use it at a very different tempo, and I've also used the VP9000 a lot — for example, I did a movie called *Bedazzled*, which had a whole section of flamenco guitar, and I had to accelerate it to match the tempo of all the foot-stomping on the video."

When it comes to software instruments, David also has his favourites: "I'll tell you what I'm in love with — that Emagic *Clavinet*. It sounds so cool. I just got the OS X version and it's inspiring. Their electric piano is also very nice and I think the Native Instruments *B4* is great. My great concern at the moment is that when I start piling up all these virtual instrument and plug-ins as well as the video, the computer is going to reach its limits. Hopefully they will let you chain up a bunch of those XServe rackmount Macs to get around this. I'd like the whole system to be scalable. OK, you have to learn how to use the software, but beyond that, the technology should just disappear — the technology should be transparent. I don't want to have to think about anything other than my musical ideas."

To The Mix Room

Both the composition and mixing rooms at David's studio are equipped with surround monitoring systems. The mix room is again based around a big Pro Tools system, but this time controlled from a large Pro Control work surface. The removable drives from the mobile system can be slotted in here, whereupon the orchestral recordings plus the synth tracks (saved as audio tracks) can be mixed into five-channel surround plus any discrete tracks that may be needed for break-outs. The recording system can output up to 64 discrete tracks at once.

"Before we had this, a cue would take me an hour to burn to audio," says David. "Now, we put the whole cue in a *Logic* folder, spread it over a few drives and do everything in one pass with all the plug-ins and everything. I need to print everything with the plug-ins active, which is something I'm a little on the fence about because ultimately, I think I'd prefer not to print with plug-in effects, but there's no way to get the plug-ins from here to the mix. You could print each track twice, once with plug-ins and once without, but then you have to explain to the engineer what the plug-in was that you used and what it was doing. I'm sure this issue is not unique to me. Perhaps there should be some form of read-only plug-in that you could send along with your projects allowing the engineer to make final adjustments at the other end — or at least something that saves the plug-in screen graphics so the engineer has some idea of what you used and what settings you had. We can't do that so I print everything except the reverb. It's important — if you move a project from one Pro Tools studio to another and the second studio doesn't have the same plug-in, what do you do?

"When I'm done with a couple of cues, I burn a CD of the audio files and give it to Marty. This is where the OMF thing comes in. We still haven't got it to work exactly the way we'd like it, but ideally, we'd OMF it into our Pro Tools Session."

High Drama

David Newman already has one of the most impressive track records in Hollywood, but he shows no sign of relaxing just yet. "As you've probably noticed, most of the films I've done are pretty light-hearted and it would be nice to do more of a variety of styles," he says. "However, in this business, one does tend to be asked to compose for one particular genre over another. You do tend to get typecast. About 20 percent of the films I have done have been dramatic or art movies, but the films that have been the most successful are romantic comedies or just outright comedies. I would like to do more films where I have a bit more freedom to experiment with this synthesis of orchestral and electronic melding. I find that element to be one of the most interesting aspects of scoring for films." SOS

Marty Frasu at the large Pro Control control surface in the mixing room.

Samson C01 Condenser Microphone

Samson seek a share of the budget microphone market with their highly competitive new large-diaphragm condenser.

Photo: Mark Ewing

Paul White

The Samson C01 is the latest in a long line of Chinese-built, low-cost studio capacitor microphones, but, rather than simply badge an off-the-shelf model, Samson seem to have had this one built specially for them. The overall case style is not dissimilar to the Superlux and Red5 Audio mics we reviewed earlier this year, but here the cardioid capsule is 19mm in diameter rather than one-inch (25mm), though it still features the same three-micron thick, gold-sputtered diaphragm construction. There are no pad or low-cut slide switches on the mic, though there is a LED that illuminates when phantom power is applied, indicating which side you should sing into. With the main body finished in matt silver, the mic's basket section has a dark grey metallic finish, as has the included swivel mount. Externally, the standard of engineering is impressively classy and the mic comes in a nicely designed, rigid, foam-lined plastic case. An optional SP01 shockmount is also available.

The frequency response of the mic shows a gentle drop-off below 80Hz, plus a gentle presence/air boost centred around 10kHz. The response is quoted at 40Hz to 18kHz (the graph indicates that levels are down by around 6dB at these points), which is more like the Rode NT1 than the models mentioned earlier. Sensitivity is quoted at 33dB/Pa and, in practice, this was comparable with the other capacitor mics I tested it against and, indeed, a little higher than some. The maximum SPL handling is 136dB, which simply means loud sounds won't upset it.

In Use

Tonally, the C01 has the bright, open sound associated with this type of microphone and, in direct comparison with my Rode NT1, it sounded slightly more airy at the top (as the frequency response curve suggested it might), but less solid at the low end. However, when I checked the ambient noise level, (at similar levels measured at the preamp output), the Samson seemed to generate several dBs more noise than the mics I compared it with, including my Rode NT1. In a typical close-miking situation, this proved not to be a problem, but it means the C01 would be less suitable for singers with quieter voices or for any sounds recorded at a distance.

Overall, the C01 has almost everything going for it, from UK price to quality of finish and sound, with only slightly higher background noise than expected betraying its budget nature. To be able to buy a good-sounding capacitor microphone for anything like this price is astonishing, but, in critical applications where slightly higher self-noise may be problematic, it may be worth spending a little more on something quieter. SOS

SOUND ON SOUND

Samson C01 £79

pros
- Affordable.
- Nicely engineered and styled.

cons
- Noisier than some competitors.

summary
A stylish and nice-sounding budget capacitor microphone suitable for project studio close-miking applications.

information

£	C01 condenser microphone, £79; SP01 shockmount, £29; C01 & SP01 set, £99.
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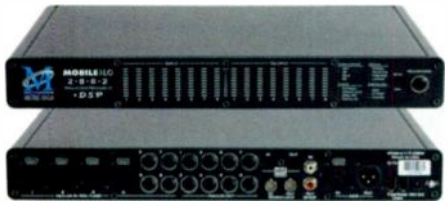

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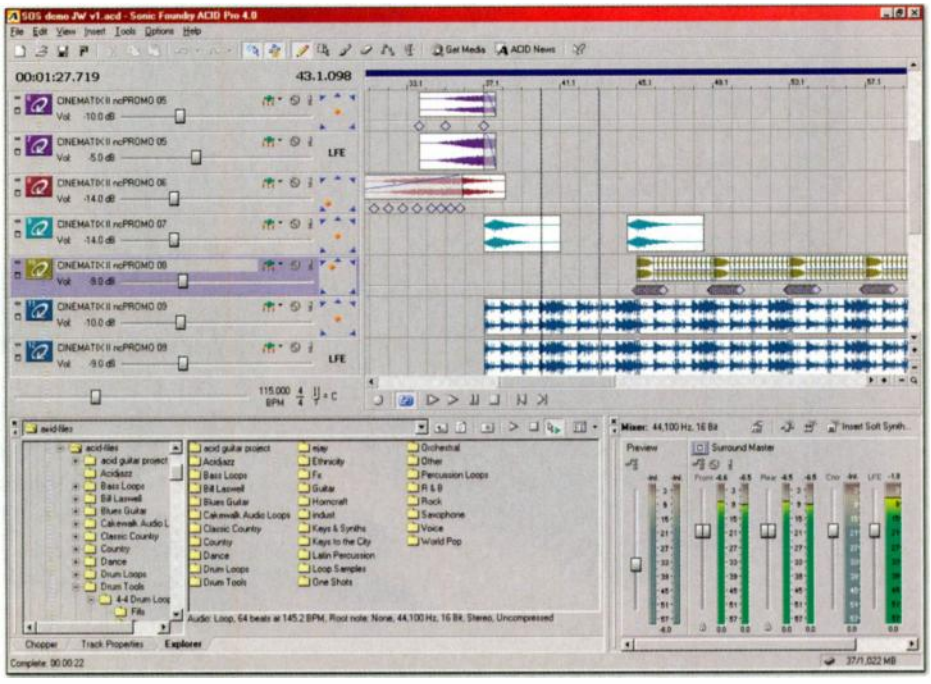
Sonic Foundry Acid Pro v4

Audio & MIDI Loop Sequencer For Windows

With the addition in version 4 of surround sound mixing, ASIO and VST Instrument support and an expanding MIDI functionality, Sonic Foundry are attempting to move *Acid* beyond its original role in loop-based music creation.

John Walden



The user interface of *Acid Pro* v4 contains all the elements familiar from earlier versions of the software.

SOS last looked at Sonic Foundry's *Acid Pro* in January 2002 when, in addition to the core functionality based around pitch- and time-stretching of audio loops, new features included MIDI tracks, a Video window and two new tools: the Beatmapper and the Chopper. While the MIDI features of version 3 could perhaps best be described as 'basic', all the new features were certainly very usable and, despite obvious competition from the likes of *Sonar*, *Acid* 3 is an excellent creative tool, either used on its own or sync'ed to a MIDI + Audio sequencer.

A year later, *Acid Pro* v4 is upon us. It's still a loop-based music creation tool first and foremost, but, aware of both increasing competition and new developments in computer audio (such as an increased interest in surround mixing), Sonic Foundry are continuing to develop the program further. Version 4 therefore includes an impressive array of new features. Topping the list of new capabilities are 5.1 surround sound mixing, step, piano-roll and event-list MIDI editing, ASIO driver support, VST Instrument support and plug-in automation.

Acid Basics

As with most modern music applications, installation of *Acid Pro* v4 is a largely automated process. The install application also offers the user the option to register the software via the Internet. On the test system this all worked without a hitch. Sonic Foundry's system requirements are pretty basic, a 300MHz processor and 128MB RAM being the key elements. Windows 98SE, ME, 2000 and XP are supported.

Given there are so many new features to consider in this release, it would be a shame to spend too much time here going over the basics of *Acid*. For those totally new to the software, the reviews of earlier versions are available via the *SOS* web site at www.sospubs.co.uk/sos/nov98/articles/sonicfoundry.htm and www.sospubs.co.uk/sos/jan02/articles/acidpro3.asp. In essence, however, *Acid Pro*vides a means of adjusting

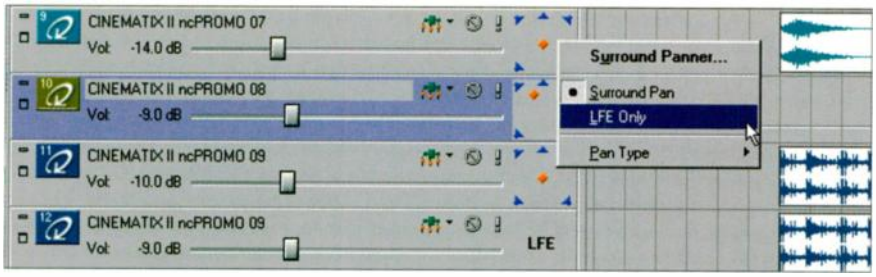
SOUND ON SOUND

Sonic Foundry *Acid Pro* v4
£299

pros
- Still a first-class environment for working with audio loops.
- Excellent new features including 5.1 surround mixing, VSTi and ASIO support.
- Considerable improvements in MIDI support.

cons
- MIDI quantise functions limited.

summary
Version 4 brings some significant new features to *Acid Pro*. For those whose music production is dominated by audio loops, *Acid Pro* v4 offers a first-class working environment with enough MIDI functionality to cope with many tasks. Surround, VSTi and ASIO support are also very welcome additions.



In a surround Project, track panning can be switched between the five surround speakers or to the LFE (subwoofer).

the tempo and pitch of the audio loops in real time. For example, a drum loop recorded at 120bpm can be automatically time-stretched to play back at 100bpm while maintaining the original pitch. Conversely, a bass line recorded with a root note of A can be pitch-shifted to play back with a root of G but without altering its tempo. As described in the earlier reviews, the end result is a system that allows quite complex arrangements of audio loops to be constructed, all with the flexibility of instant pitch or tempo adjustment.

In addition, *Acid* includes the ability to record audio or MIDI tracks and, while the software's capabilities in these areas are not perhaps as strong as that of a dedicated MIDI + Audio sequencer, they are certainly good enough for more than just occasional use. Add to this an excellent user interface and a host of other features including DirectX effects, video playback and a versatile range of output options, and it is not difficult to see why *Acid* has carved itself a significant market with musicians and multimedia audio producers. Of course, all these features are still present in version 4... so what about all the new stuff?

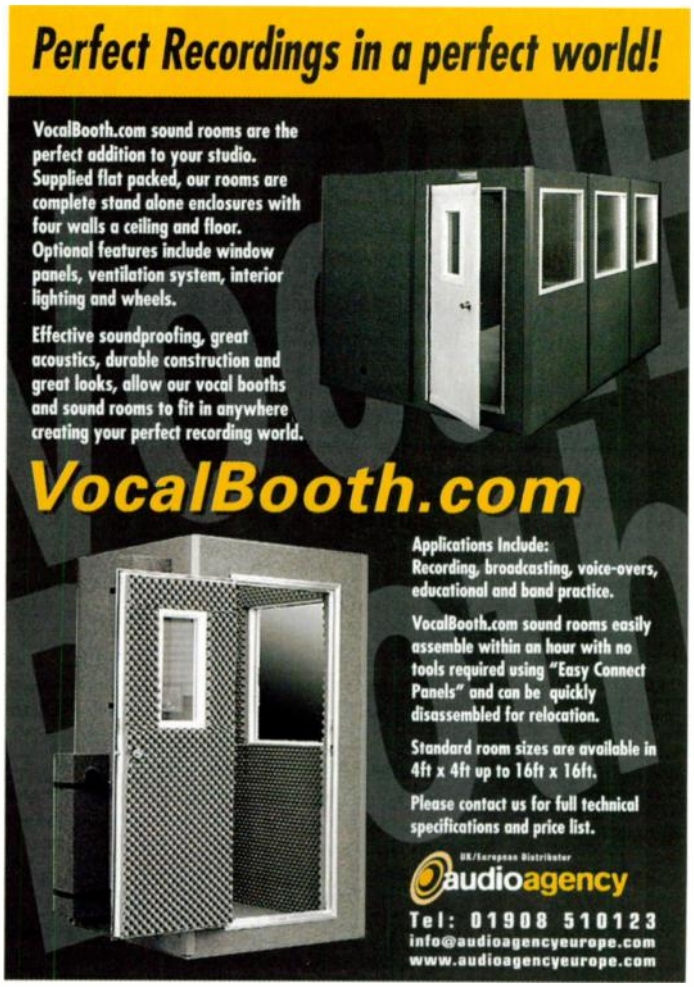
You Are Surrounded

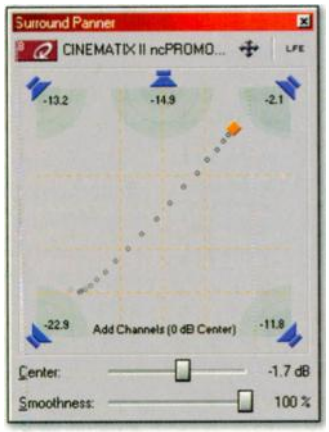
Surround sound mixing is becoming increasingly interesting to project and home studio owners. *Acid* now supports 5.1 surround sound, and new Projects can be specified as either stereo or 5.1 — although obviously the audio hardware in the host PC will need at least six physical outputs to feed whatever 5.1 playback system is in use. For 5.1 Projects, a low-pass filter can be enabled (with a selection of suitable cutoff frequencies) for tracks assigned to the subwoofer '.1' or LFE channel.

In a surround Project, the pan control in each track in the Project can be assigned to either the '5' or to the '.1' (LFE) but not both. This might be considered a restriction if you just want to send the bottom end of your bass or drum track to the subwoofer as well as all of its frequencies to the surround speakers. In the surround Project demos supplied with *Acid*, Sonic Foundry simply overcome this by having two identical tracks — one panned to the surround channels and the other to the LFE channel — with the ▶

Test Spec

- Sonic Foundry *Acid Pro* version 4.0a build 237.
- Pentium 4 1.6GHz PC with 1GB RAM, dual-booting into Windows 98SE and Windows XP Professional.
- Echo Mia 24, Yamaha DSP Factory and Yamaha SW1000XG soundcards.





The surround sound panner, with the Centre volume fader and Smoothness fader used in pan automation.

volume sliders for each track used to balance them. An alternative approach is to insert a buss and assign the buss output to the LFE. Send levels to the buss from any of the tracks panned to the surround speakers can then be used to control the levels going to the LFE channel.

Double-clicking on the surround pan control for a particular track in the Track List opens a larger version of the surround panner for more detailed control. Individual speakers can be muted if required and, for more control over the use of the front centre speaker, a separate volume slider is provided (so there's plenty of scope for real or phantom centre placement of sounds). Pan position can be automated by using a key-frame system for individual tracks, for either creating smooth movements of sounds or bouncing material around from speaker to speaker. The panner also offers balance and constant-power options.

The whole panning system for 5.1 projects seems to be well implemented and is certainly very easy to use. When a 5.1 project is rendered, *Acid* can create six mono WAV (or AIFF) files. These could then be incorporated into whatever authoring application is being used to create the finished project, where the audio could be data-reduced if necessary using something like Dolby Digital AC3 encoding. By default, *Acid* does not provide any further encoding but, as we were going to press, Sonic Foundry announced a multi-channel encoding and DVD burning plug-in for *Acid*. Further details are provided in the *Acid* Burns box below, and the plug-in should be available by the time you read this.

Going Soft

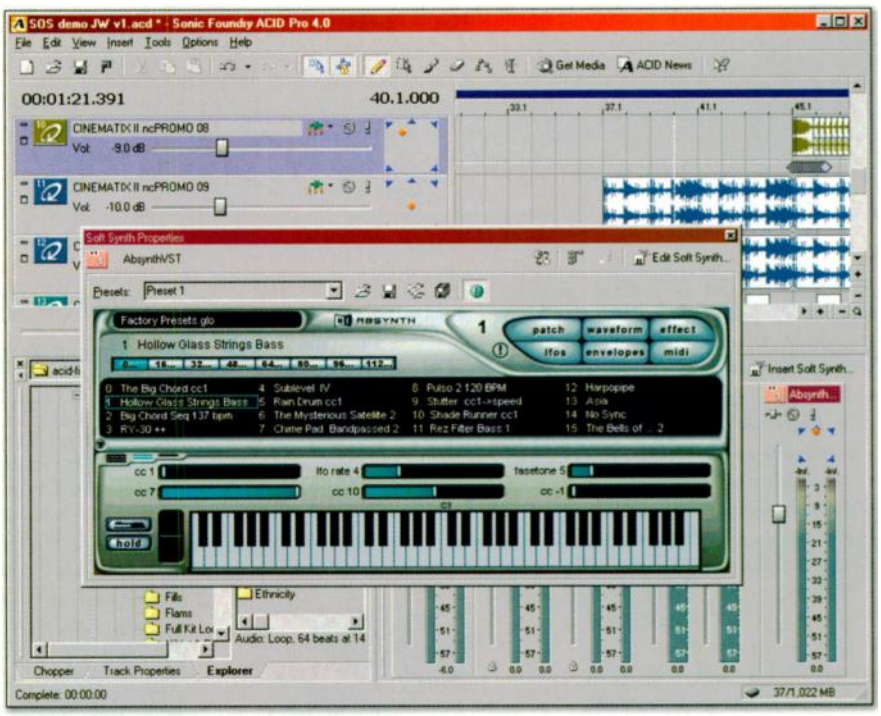
A further significant new feature is support for VST Instrument plug-ins, and demos from Native Instruments and TC Works are provided with *Acid Pro* 4. A new VST Instruments dialogue (available via the Options / Preferences menu) allows the user to specify up to three drive locations where plug-ins are stored. Choosing Insert / Soft Synth allows a virtual instrument to be added to the project and creates a new channel strip for the instrument within the Mixer window. A MIDI track can then have its output assigned to the soft synth via the Track List. On the test PC, both under Windows 98SE and XP, I had no problems running the various demo instruments supplied with *Acid*.

As a further new feature of *Acid* is its ability to work with ASIO drivers, it is also possible to achieve the sort of low latency values required for real-time playing/recording of soft synths. I tested this using the *Absynth* demo in combination with the ASIO drivers for my Echo Mia 24 card. Two buttons at the top of the window *Acid* places around the VSTi can be used the enable real-time MIDI playback and select the required MIDI input. I was able select the smallest buffer size (128 bytes) and play *Absynth* live without glitching while *Acid* was playing back about a dozen stereo audio tracks. The synth felt both very responsive and solid in operation.

More MIDI Please

Although MIDI made a welcome entry into the *Acid* feature list in v3, what was on offer was pretty limited. Things have certainly improved in this release. While MIDI tracks can, of course, be recorded and played back as before, step recording and both piano-roll and event-list editing are provided. The latter two are achieved via Yamaha's new OPT (Open Plug-in Technology) standard, so it is conceivable that further improvements to *Acid*'s MIDI facilities could be added in between major version updates.

The piano-roll editor, in particular, is a welcome addition; as well as for editing parts created in real time, it's great for the creation of new parts such as bass lines. As with audio tracks, once a MIDI phrase has been created, it can be looped as required along the timeline. Perhaps the most significant shortcoming of this editor is the quantise function. MIDI events can be quantised to a range of resolutions, but at present, there are no options for groove quantising or 'humanising' a MIDI part — this would be an obvious candidate for



A demo of NI's *Absynth* running happily within *Acid* under Windows 98SE.

Acid Burns

As we went to press, Sonic Foundry announced a 5.1 Surround plug-in pack for *Acid Pro* v4, which will provide two functions. First it will implement Dolby Digital AC3 encoding with many user-customisable options over settings such as data rate, sample rate and dialogue normalisation. Second, it will provide DVD burning allowing users to burn 5.1 or stereo AC3 files to DVD (given suitable DVD-R, DVD+R, DVD-RW or DVD+RW hardware). The plug-in pack will be available during November as a downloadable product only, at a suggested selling price of US$399.

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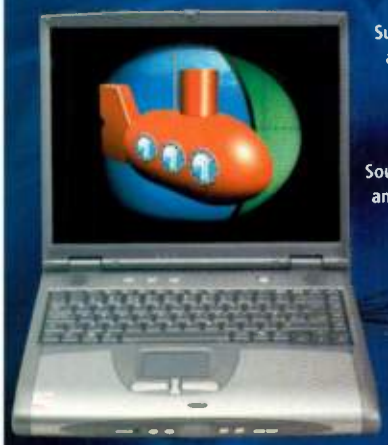

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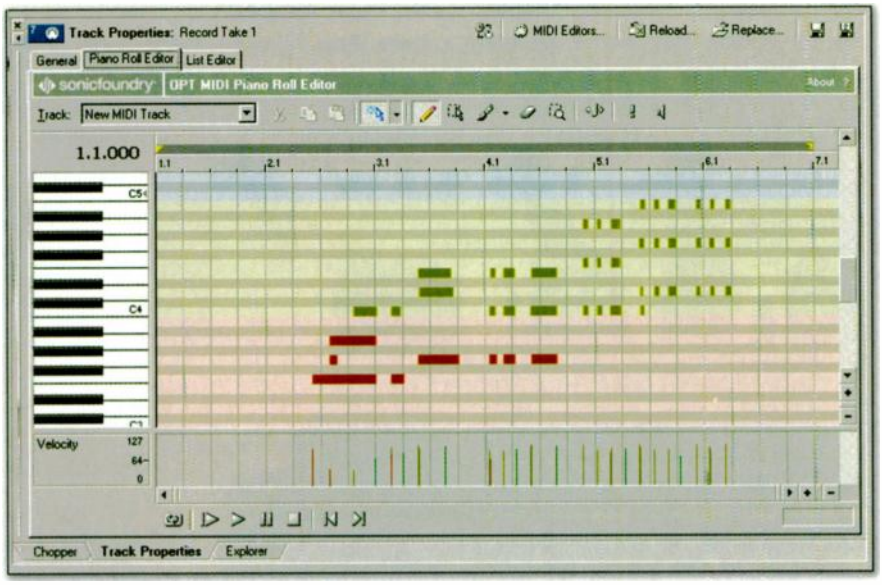
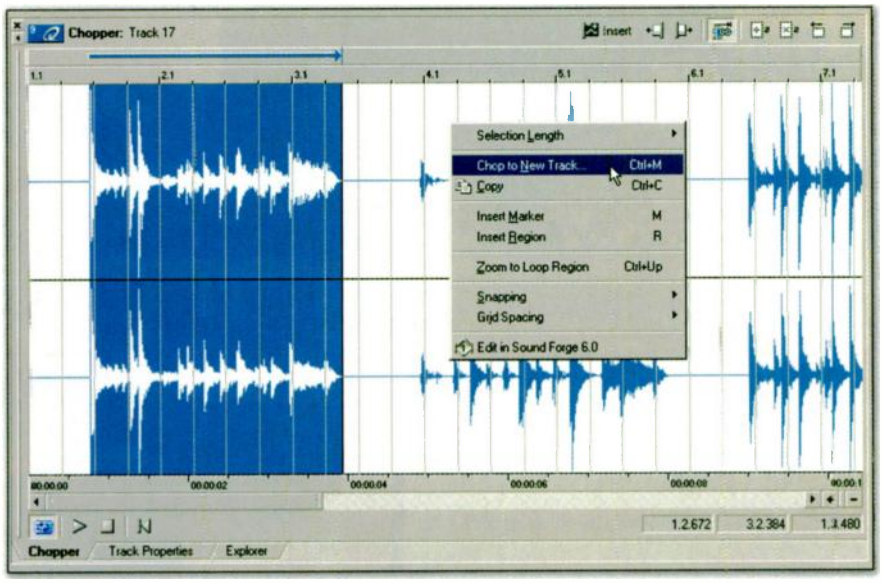


Piano-roll editing is provided courtesy of Yamaha's OPT support, and is great for editing and creation of new parts in true 'tracker' sequencer style.



The Chopper now allows loops selected from larger audio files to be saved as a new audio file. This is an excellent tool for extracting drum loops from all those audio sample CDs!

▶ enhancement, via OPT or otherwise.

This comment aside, while *Acid*'s MIDI specification is not going to challenge the likes of *Cubase*, *Logic* or *Sonar*, it is very easy to use and there is enough MIDI functionality to avoid having to sync up a full-blown MIDI sequencer on every occasion a MIDI part is needed. Add a couple of decent soft synths to your setup and *Acid* 4 will now allow you to easily mix and match these with your palette of audio loops.

What Else?

Amongst a range of other additions and improvements, four are worth a brief mention here. While *Acid* already provided automation of parameters such as track volume, pan and send levels, version 4 introduces plug-in effects automation. This is not available for all DirectX audio effects, but the v4 package includes a resonant filter, track EQ and flanger/wah/phaser that can be automated. The automation is achieved via the usual envelopes drawn into the Track View. Between them, these three new effects provide some excellent creative options, including a few filter-sweep cliches if required!

Another very useful addition is the option for loop cloning within the Chopper. This allows any selected loop region to be 'Chopped to a New Track' and, as part of this process, the loop is saved as a new audio file. This has a number of applications, but one thing it proved very useful for during testing was isolating each drum loop within a track ripped from an audio sample CD. While this could be done in any decent audio editor (including *Sound Forge*), it is very convenient to have this functionality within *Acid* itself.

The Video window was an excellent addition to v3, and has undergone some further improvements in v4. Support is now provided for WMV files, while two new rendering options are provided for projects that include video: stretch to fill frame and fast video resizing. The former automatically adapts the frame size of the original video if it is different from the selected output size, while the latter produces faster rendering times for video resizing when top-quality output is not critical.

Acid Pro v4 now also includes support for time signatures other than 4/4, and time-signature changes can be added in the same way as tempo or key changes using markers. While there are a few loop libraries out there that include 3/4 loops, if you are a fond of a little syncopated jazz, you may well have to roll your own. This said, the feature is a welcome addition and very easy to use.

Conclusions

I've always liked *Acid* as a tool for rapidly kick-starting the creative process even if, on occasion, I then sync up *Logic* for straight audio or MIDI work. The new MIDI and VSTi support in v4 makes *Acid* much more self-contained — indeed, during the period of the review I completed a couple of small projects using just *Acid*, where previously I'd have had to use a combination of *Acid* and *Logic*. If you are already an *Acid* user, then version 4 is a very worthy upgrade.

If you don't currently own *Acid*, is it a 'must-have' product? This is a more difficult question to answer, as there are now a number of alternative products offering real-time pitch- and tempo-matching of loops. If you also need a well-specified MIDI + Audio sequencer, Cakewalk's *Sonar* is the obvious competition here, but Bitshift's *pHATmatik Pro* VST plug-in (reviewed in *SOS* September 2002) is another possibility for those using *Logic* or *Cubase*. This is a real case of 'horses for courses' but if the majority of your music production is done with audio loops, *Acid Pro* 4 offers a first-class working environment — powerful, easy to use and, in the right hands, very creative. SOS

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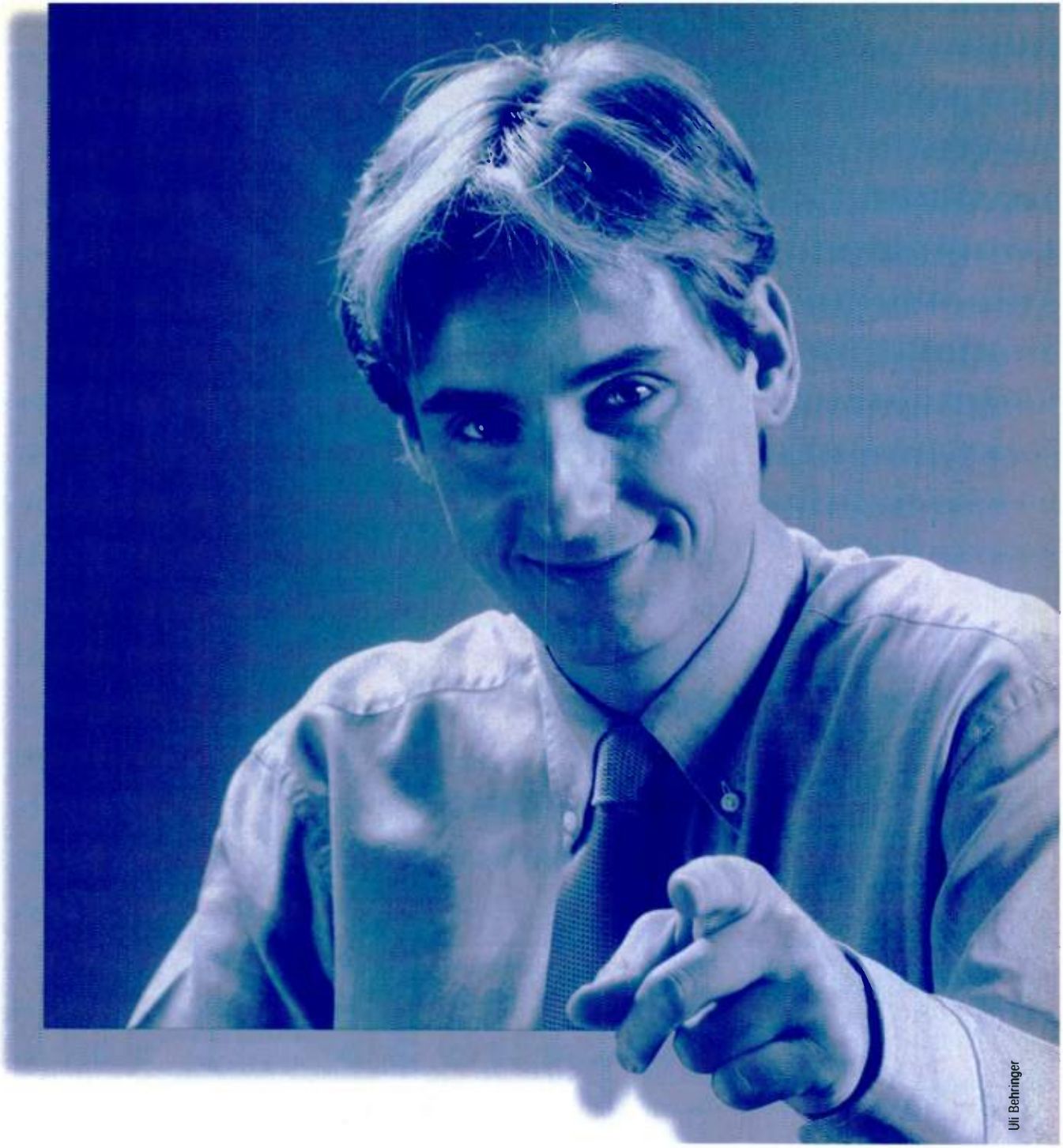

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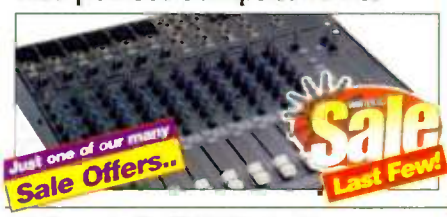

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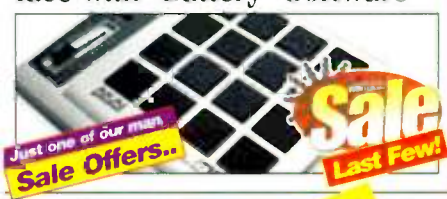

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Synth Secrets

Synthesizing Acoustic Pianos On The Roland JX10

Gordon Reid

When trying to copy a real piano with an analogue synth, if one patch doesn't quite do it, two just might...

For the past three instalments of Synth Secrets, I've been discussing the nature of the piano and looking at the ways in which we can attempt to recreate its sound. But even after all this, the best I have yet been able to manage is something that sounds similar to an electro-mechanical piano. (Of course, synthesizing the Fender Rhodes or Wurlitzer EP200 is no bad thing...) Numerous analogue pianos were released between 1970 and 1985, peaking with the superb Roland MKS10 rackmount module.

But even this survived just two years before the introduction of samploid synths, and Roland's own 'SAS' piano synthesis swept the analogue piano genre away as if it had never existed.

The demise of analogue piano synthesis is, in some ways, a shame. Although it never achieved the authenticity that early synth programmers had anticipated, it led to the creation of a family of new, piano-like sounds, the best of which exuded a character of their own, and which have now been all-but lost. So, to conclude this discussion of piano synthesis using analogue, subtractive techniques, I'll finish describing the Roland Super JX10 performance that I used as a stage piano in 1986 and 1987, prior to purchasing the first of a pair of SAS-based Roland MKS20s that I still use today.

PARAMETER NO.	PARAMETER	PIANO 1B	PIANO 1A
DCO1			
11	Range	8'	8'
12	Waveform	Square	Sawtooth
13	Tune	0	0
14	LFO Depth	0	0
15	Envelope Depth	0	0
DCO2			
21	Range	4'	2'
22	Waveform	Sawtooth	Pulse
23	Cross Modulation	SNC (Sync) 1	SNC (Sync) 2
24	Tune	+2	+9
25	Fine Tune	+10	-07
26	LFO Depth	0	0
27	Envelope Depth	99	0
DCO-MOD			
31	Dynamics	OFF	OFF
32	Envelope Mode	^1	v1
MIXER			
41	DCO1	24	99
42	DCO2	99	44
43	Envelope Depth	99	45
44	Dynamics	1	1
45	Envelope Mode	^2	^1
VCF			
51	HPF	0	0
52	LPF Frequency	53	52
53	LPF Resonance	02	01

PARAMETER NO.	PARAMETER	PIANO 1B	PIANO 1A
VCF continued			
54	LFO Amount	0	0
55	ENV Amount	14	19
56	Key Follow	24	17
57	Dynamics	1	1
58	Envelope Mode	^2	^1
VCA/CHORUS	Parameter	Value	
61	Level	95	92
62	Env Mode	E2	E2
63	Dynamics	2	2
64	Chorus	OFF	OFF
LFO			
71	Waveform	Rand	Sine
72	Delay	0	0
73	Rate	76	80
ENV1			
81	A	00	00
82	D	01	65
83	S	06	35
84	R	35	45
85	Key Follow	01	01
ENV2			
91	A	00	00
92	D	70	60
93	S	00	00
94	R	40	36
95	Key Follow	02	01

The combined parameter table for Piano 1B and Piano 1A.

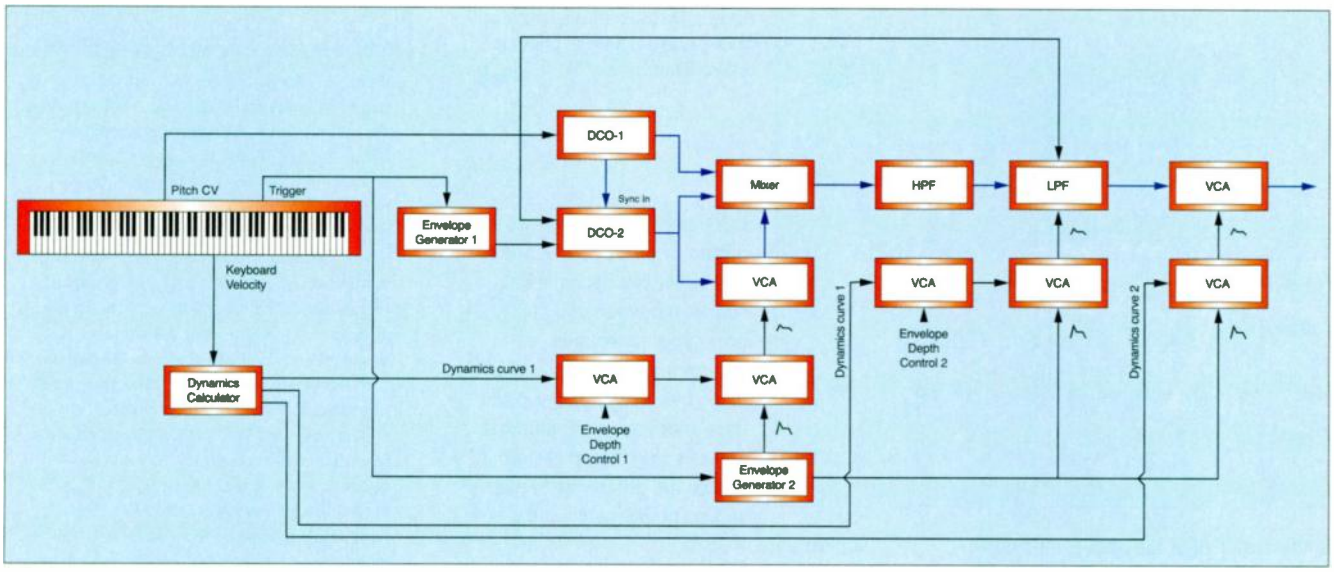

Figure 1: The Piano 1B block diagram.

A Second JX10 Piano

The table below left again shows the Piano 1B patch with which I concluded last month's Synth Secrets, and Figure 1, above, shows the architecture that this describes. However, as you can see, the table also includes the values for another JX10 electric piano patch that — for reasons that will soon become clear — is called Piano 1A.

Superficially, the columns for Piano 1A and Piano 1B might look similar, but this is misleading. It's a bit like saying that all Minimoog patches must sound similar because a photograph of the same control panel patched to produce the sound of a piccolo looks pretty much the same as a photograph of the control panel set up to produce a rumbling bass. In other words, the JX10 has an architecture which, when represented in table form, always looks the same. But this too is misleading. The JX10's architecture is not entirely fixed; some parameters allow you to alter the way in which its sections interact with one another. If you think that this sounds suspiciously like a description of a modular synth, you are — to some extent — correct. Although the degree of flexibility involved is a fraction of that offered by a true modular, the Super JX10, like most powerful synthesizers, allows you to 'patch' certain elements to create different architectures.

To see how this works, let's consider parameters 23, 32, 45, 58, and 62. The first of these, parameter 23, 'Cross Modulation', allows you to patch the oscillators in three quite different ways. As we discussed two months ago, SNC1 is hard synchronisation of DCO2 (the slave) by DCO1 (the master). In contrast, XMOD is frequency modulation of DCO2 (now acting as the carrier) by DCO1 (the modulator). The third option, named SNC2, is hard synchronisation of DCO2 (the slave) by DCO1 (the master) where DCO2 is also acting as the FM carrier for DCO1 as modulator. As you would expect, SNC1 and XMOD create very different sounds but, because the effect of hard sync is the dominant factor in SNC2, this option sounds similar to SNC1, if somewhat richer in the mid and high frequencies.

Got all that? No? Well, maybe figures 2, 3 and 4 (next page) will help, because these illustrate the same options using two patchable analogue oscillators. A picture may not always be worth a thousand words, but in this case, three pictures are worth a few hundred.

The remaining four parameters from the list above (numbers 32, 45, 58 and 62) are all Envelope Mode selectors that allow you to determine which envelope generator affects the pitches of DCO1 and DCO2, the contribution of DCO2 to the mix, the LPF cut-off frequency, and the VCA Gain (respectively) and with which polarity they do so. This is a far cry from the facilities offered by a true modular synth, but it still extends the range of sounds that the JX10 can produce. So, having ▶

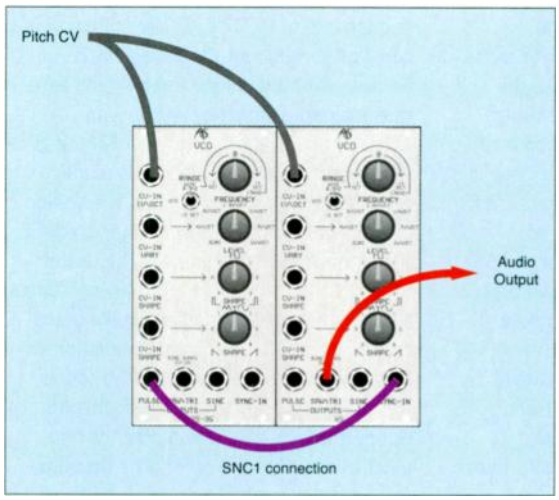

Figure 2: Two oscillators linked to produce hard sync (JX10 option: SNC1).

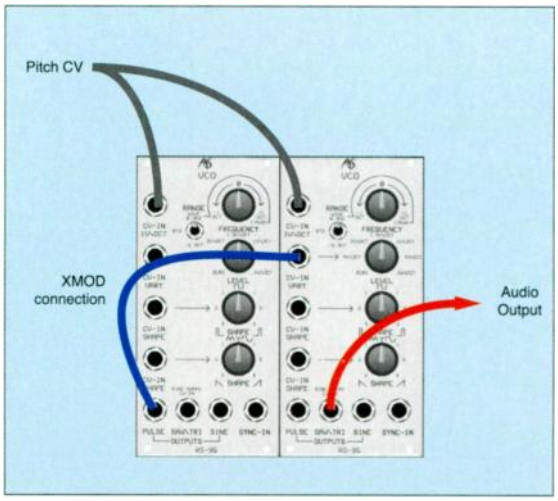

Figure 3: The same two oscillators linked as an FM pair (JX10 option: XMOD).

Nomenclature

Please note that throughout this article I shall use the conventional term 'Patch' to refer to what Roland calls a Super JX10 'Tone', and 'Performance' to refer to what Roland calls a Super JX10 'Patch'. I could stick to the company's usage, but I suspect that this would be more confusing for everybody.

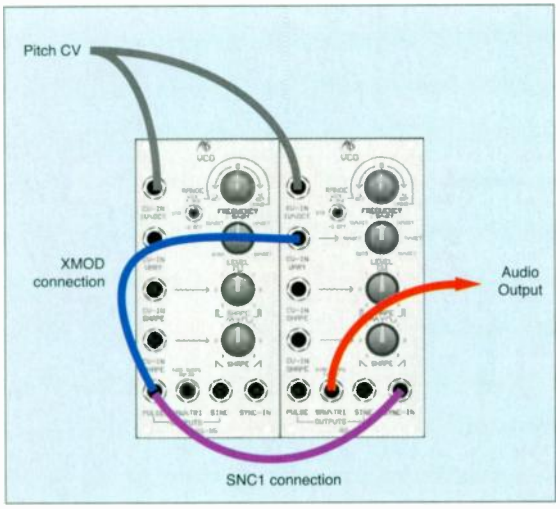

Figure 4: The two oscillators linked as an FM pair and as a sync'd pair (JX10 option: SNC2)

understood all of the above, let's now inspect the differences between Piano 1A and Piano 1B.

The Piano 1A Oscillators

Starting with the oscillators, the relationships between DCO1 and DCO2 are quite different in the two patches. Whereas last month's patch used a square-wave master and a sawtooth slave, this month's starts with a sawtooth master and a pulse-wave slave. In previous Synth Secrets, I have stated that, when hard sync'd, the waveform of the master oscillator should make no difference to the sound produced. On the other hand, the shape of the slave is extremely relevant to the output, because it changes the harmonic content of the resulting waveform. (See Figures 5a and 5b, below.) As is intuitively obvious from these figures, the tones of these waves will be quite different from one another.

So is the shape of DCO1 irrelevant? No. Because Piano 1A uses SNC2, DCO1 and DCO2 are also acting as a pair of FM operators. This means that the waveform of DCO1 will have an effect on the output of DCO2. To be honest, this effect can be somewhat subtle, but when you are programming sounds deterministically (rather than using blind serendipity in the hope that you might stumble across something pleasing) it can be the difference between an acceptable patch and a superb one.

Even more significant is the change of the pitch relationship between DCO1 and DCO2. Piano 1B had an offset of a little over 14 semitones. Piano 1A has an offset of a little under 33 semitones. This makes a huge difference to the output waveform and its harmonic content. What's more, whereas the pitch of the slave in Piano 1B is swept by ENV1 (parameters 27 and 32) the frequency relationship of DCO1 to DCO2 in Piano 1A is constant throughout the note. This is because the value of parameter 27 is zero, thus making parameter 32 irrelevant.

Hang on... if there is no sync sweep at the start of the sound, does this render redundant the last two months' discussion of sync and its importance to the attack of the piano sound? It seems to. The use of both hard sync and FM in SNC2 is creating a complex new waveform but, unlike in the case of Piano 1B, the 'Cross Modulation' in Piano 1A is not imparting any blip to the front of the sound. You can hear this (or, rather, the lack of it) if you play the two patches one after the other. The first few milliseconds of Piano 1B exhibit a definite clunk, especially in the middle and lower octaves. Piano 1A lacks this and, as a result, its attack is less defined.

Moving on, you can see that Piano 1A's DCO1 is contributing its full amplitude in the Mixer, whereas DCO2 is contributing just 44 percent of maximum, plus an amount shaped by ENV1. Having discussed the relevant issues in depth over the past couple of months, I'll leave it to you to work out the effects of the ADSR, Key Follow (parameter 85), and Dynamics (parameter 44). Why should I do all the work?

Digital Parameter Access

If you're a regular reader of Synth Secrets, it can't have escaped your notice that I've used the last two parts as a bit of a tutorial on understanding Digital Parameter Access programming systems. In the past, these have attracted a great deal of criticism, almost to the point of hysteria, and no doubt some analogue anoraks will continue to heap opprobrium upon synths that use DPA. But I hope that I have shown that this is simply a different way to represent the same sound-making facilities that you will find on the knobbiest of analogue synthesizers, and to control the sounds thus produced.

Certainly, the Roland PG800 programmer, with its knobs and sliders, makes it altogether easier to program the JX10, but even this controls fewer than half of the parameters offered by the instrument. You might wish for things to be otherwise, and for all synths to be festooned with dedicated knobs and sliders. But when you consider that the JX10's DPA tables contain 147 parameters (that's 44 for each patch, and 59 for the performance and MIDI system) — and that's not including the synth's physical performance controls, nor the parameters that control these controls, nor the 'Chase Play', nor the fledgling sequencer — you'll soon realise that it ain't gonna happen.

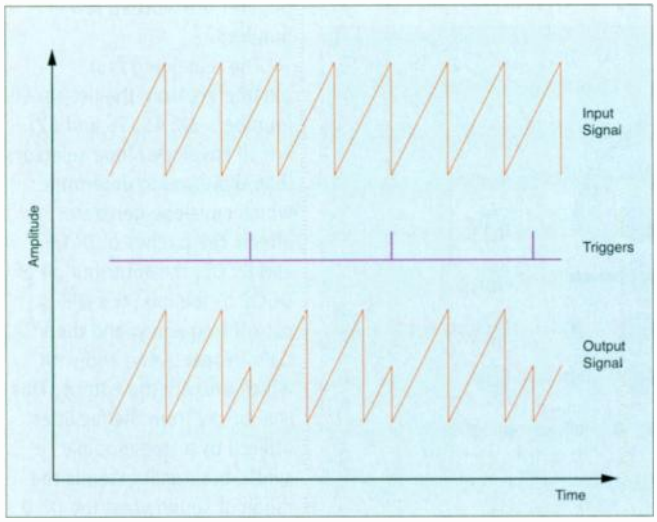

Figure 5a: A sawtooth slave of frequency F sync'd by a master with frequency 0.4F.

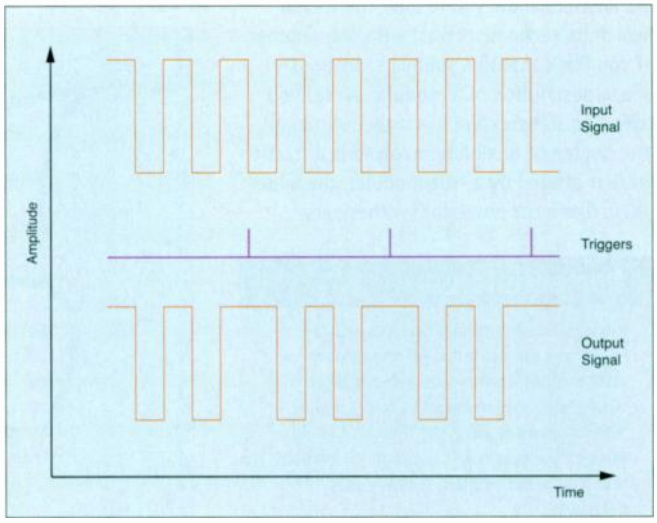

Figure 5b: A square wave slave of frequency F sync'd by a master with frequency 0.4F

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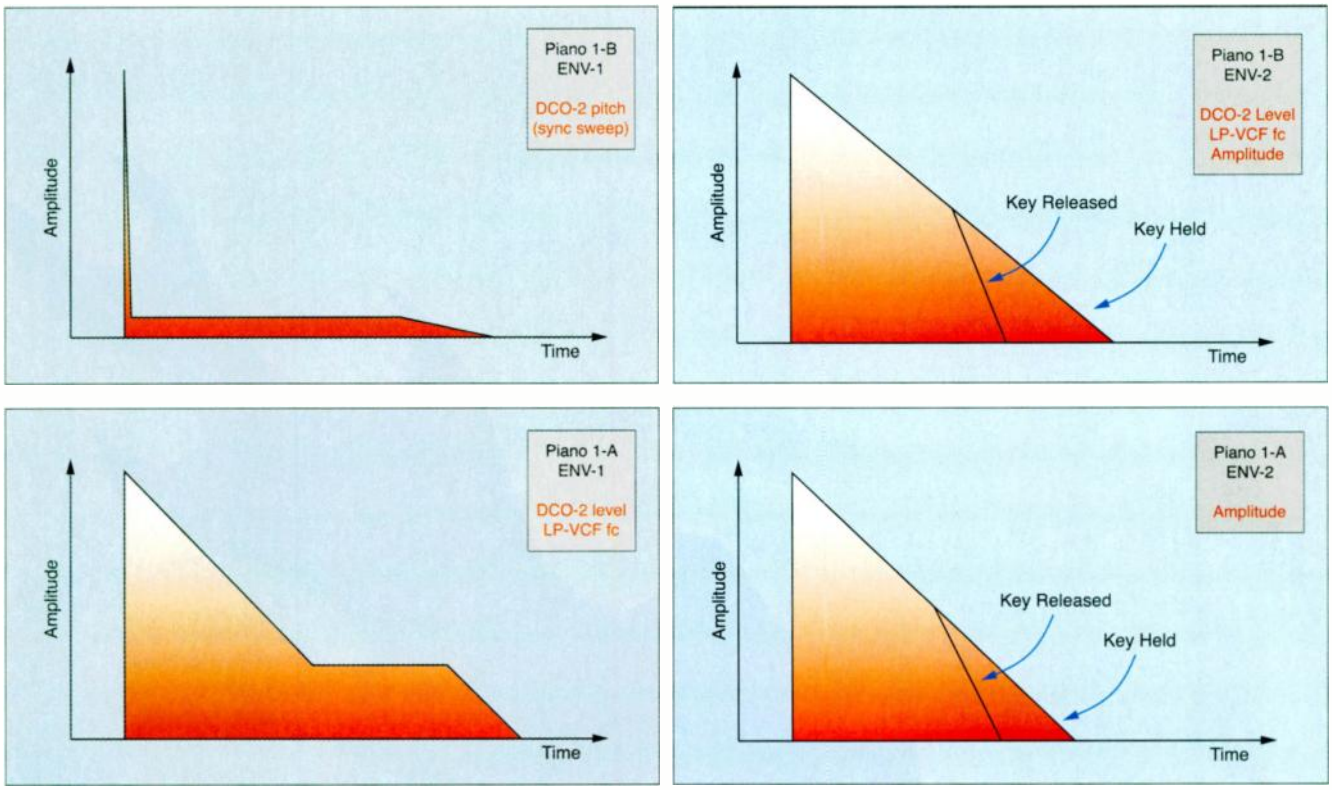

Figures 6a-6d: The four ADSR envelopes used in Piano 1A and Piano 1B.

Filters, Amplifiers And Envelopes

Looking at the rest of the table on page 136, we can see that there is a great deal of similarity between Piano 1A and Piano 1B. The filter settings are similar, the VCA/Chorus is almost identical, and the LFO remains irrelevant.

The greatest difference lies in the envelope shapes, and the patching of them. Figures 6a to 6d, above, represent the ENV1 and ENV2 contours for each patch, and show the assignment for each.

At first sight, these seem quite similar, but the only common shape/destination is that of the two ENV2s, which control the total amplitude of their respective sounds. This means that the sweep of the filter and the contribution of DCO2 are quite different in each case.

To conclude this analysis of Piano 1A, I'll draw your attention to the block diagram equivalent to Figure 1. (See Figure 7, below.)

If you compare this to Figure 1, you can see the differences discussed above; the additional FM connection between DCO1 and DCO2, and the altered assignments for ENV1 and ENV2.

As I did last month, I'm now going to ask: how does it sound? Well, there's the lack of the clunk, which disappeared when the sync sweep was removed from Piano 1A. But a more significant difference is that Piano 1A is brighter, with more body in the mid frequencies. Overall, it sounds like a good 'analogue' piano patch, but one that makes little attempt to recreate the nuances of a real piano, or even a real electric piano

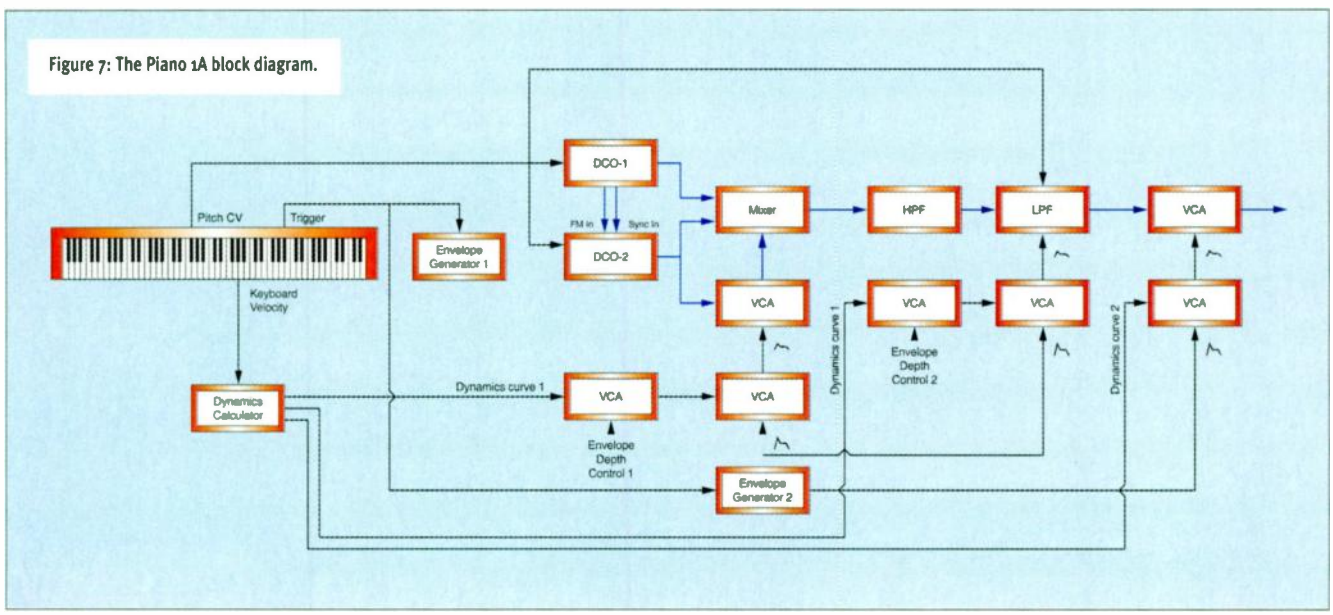

Figure 7: The Piano 1A block diagram.

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SYSTEM		
11	Upper/Lower Balance	50
12	Dual Detune	+13
13	Upper Split Point	
14	Lower Split Point	
15	Portamento Time	
16	Bend Range	2
17	Key Mode	Dual
18	Total Volume	82
AFTERTOUCH		
21	Vibrato	0
22	Brilliance	0
23	Volume	0
UPPER MODULE		
31	Tone Number	22 (Piano 1B)
32	Chromatic Shift	-12
33	Key Assign	Poly 1
34	Unison Detune	
35	Hold	On
36	LFO Mod Depth	01
37	Portamento On/Off	OFF
38	Bend On/Off	On
LOWER MODULE		
41	Tone Number	21 (Piano 1A)
42	Chromatic Shift	-12
43	Key Assign	Poly 1
44	Unison Detune	
45	Hold	On
46	LFO Mod Depth	0
47	Portamento On/Off	Off
48	Bend On/Off	On

Layering Piano 1A and Piano 1B into 'H1: Acoustic Piano'.

▶ such as a Wurlitzer or Rhodes. So what use is it?

An Introduction To Layering

In isolation, neither Piano 1A nor Piano 1B have a great deal to recommend them. Sure, they're usable in a '1985' sort of way, but they offer little that makes them cry out "Use Me". Fortunately, the Super JX10 is not just the 12-voice analogue synthesizer that we have been considering for the past three months. It is also two independent six-voice synthesizers.

You control the two halves of the JX10 using a second table of parameter values, divided into Patch (which we would normally call 'Performance') and MIDI. Called the Edit Map, this table offers no fewer than 59 parameters, and it is larger than the patch table used to edit the patches themselves. I have, therefore, confined the next part of this discussion to the parameters used to layer two patches into a single, composite sound.

The table on the left shows the parameters and values used in the Roland factory Performance 'H1: Acoustic Piano' which, as you might already have guessed, comprises Piano 1A and Piano 1B.

Starting with the System parameters, the first to consider is number 17, which states that the JX10 is in Dual mode, meaning that the two patches are layered one upon the other across the entire width of the keyboard. This, for reasons that I hope are obvious, makes parameters 13 and 14 irrelevant. Because portamento is Off in parameters 37 and 47, the portamento value is also irrelevant, and there is no slew between notes. However, for some unfathomable reason, Roland saw fit to program a pitch-bend range of two semitones for this Performance — not just weird, actually wrong. This then leaves the balance between the Upper and Lower patches, which is set to 50/50, and the detune between them. The detune value of +13 (on some arbitrary Roland scale) is a subtle difference, but proves to be important, and we shall return to this later.

The next bunch of parameters refers to aftertouch and these, as they must be, are set to zero. Remember, it's not possible to affect the nature of a piano note (other than to curtail it) once it has sounded. Any parameters that let you change the brightness, the loudness, or add vibrato by bearing down on a depressed key must be set to zero.

We now come to the two sounds comprising the Performance, and parameters 31 and 41 allow us to insert Piano 1B and Piano 1A into their appropriate slots. Next, parameters 32 and 42 shift the two patches down an octave (this may be a modification of my own, not Roland's original programming... I forget), while numbers 33 and 43 tell the JX10 that they respond in 'Poly 1' mode, which means that a new voice is assigned each time you press a key. (This also makes parameters 34 and 44 irrelevant, because you cannot be in a polyphonic mode and a Unison mode

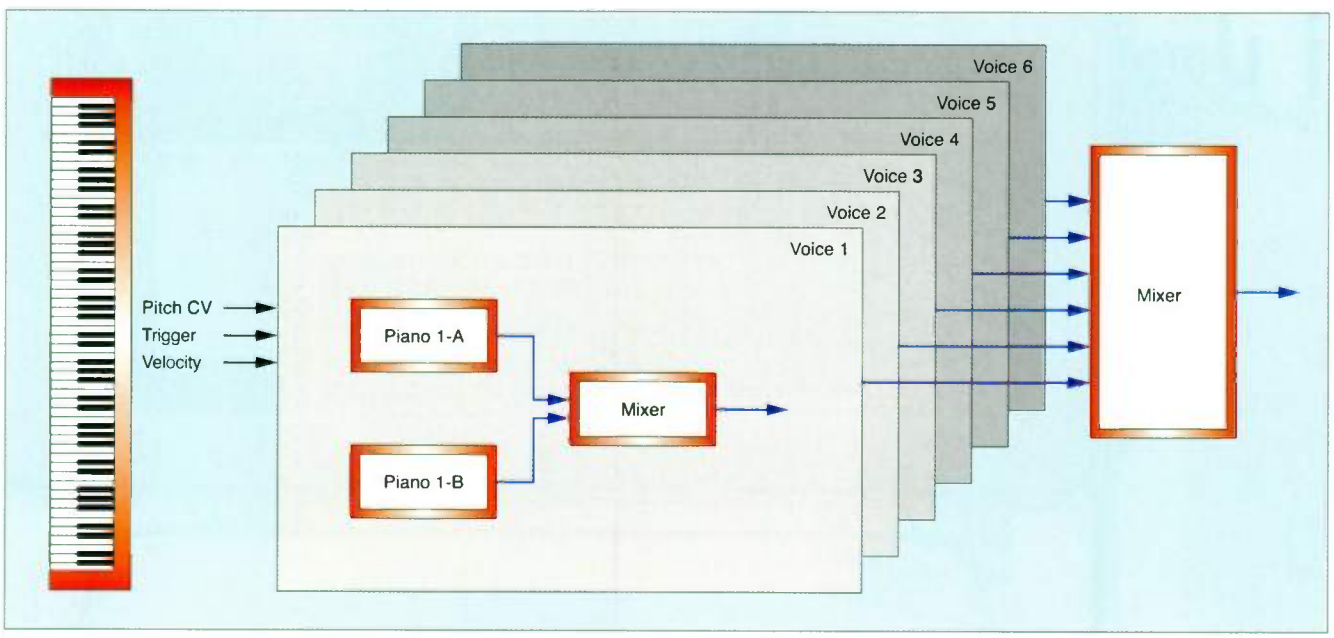


Figure 8: Layering two patches in 'Dual' mode.

simultaneously.) Next, we find that 'Hold' — the response to the sustain pedal — is On for both patches, Portamento (as stated above) is Off, and Bend (I still don't understand this) is On. That leaves LFO Mod Depth, which is the Performance's response to the modulation direction of the combined pitch-bend/modulation joystick. Again, this should be zero for both patches, but for Piano 1B it is set to 01. In truth, I find this imperceptible, but it should be zero nonetheless.

The End Result

So what does this tell us? Stripping away all the superfluous bits and pieces, we have simply taken two similar, but not identical, six-voice patches and layered them at the same loudness across the keyboard, but with a small tuning offset. (See Figure 8.)

There's nothing particularly clever happening here; you could do the same thing by taking a MIDI synthesizer and connecting it to an equivalent module, playing the two simultaneously and mixing their outputs into a single sound. Given this, it's time to ask once again, "how does it sound?". The answer may surprise you. 'H1: Acoustic Piano' sounds more rich, more vibrant, more expressive, more like a real instrument. But why?

The secret — and it's an important one — lies in the combination of two sounds that are similar enough to be indistinguishable within the composite, but different enough to create a sound that is more interesting than either of the components in isolation. Look at it like this: if you layered and detuned the piccolo and Minimoog bass that I mentioned near the start of this article, the composite would sound like an out-of-tune piccolo and Minimoog bass. On the other hand, if you layered two detuned but otherwise identical sounds, the result would sound like the original, but chorused.

On the other hand (which I realise is only possible if you have three hands) the two components in 'H1: Acoustic Piano' complement each other in superb fashion. Piano 1B supplies the initial thunk, while Piano 1A has the richer spectrum and provides more of the body of the sound. Furthermore, the detuned harmonics of the complex, sync'd waveforms sweep in and out of phase with one another, reinforcing and then interfering with one another destructively, to imitate the energy interactions within an acoustic piano. Then, towards the end of the note, Piano 1B dominates again (thanks to the longer Decay and Release in ENV2, which drives the Gain of the audio VCA) and the filter closes to leave just the fundamental and a few low harmonics in the tail.

All of this conforms closely to the principles we derived for the piano in the October instalment of Synth Secrets. What's more, if you consider things such as the filter scaling and dynamics responses of the component patches, you'll see that Roland's programmers were not blindly groping for their piano sound: this performance was crafted with a great deal of thought.

So I'll ask one final time, "How does it sound?" The answer is that 'H1: Acoustic Piano' has many of the characteristics of an acoustic or electro-mechanical piano, without sounding anything like the former, or even quite like the latter. It's responsive, it's expressive and, for many purposes, it's every bit as usable as a Fender Rhodes 73 or a Wurlitzer EP200. In fact, there are times when I would still use it today, in preference to any of the 'real' things. SOS

PMC DB1S

Introducing the world's smallest transmission-line speaker.

Miniature Nearfield Monitor

Hugh Robjohns

The product nomenclatures of the PMC range are nothing if not descriptive. The biggest speaker, the BB5, was the fifth iteration of a 'big box'. This was followed by a little box (LB1), then an average box (AB1, but recently enhanced to the AB2). A larger, medium box three-way was derived from the BB5 and called the MB1 (now upgraded to the MB2), and was followed by a tiny box (all things being relative, you understand) in the form of the TB1, again recently upgraded to the TB2. A further modification of the TB2 lead to the floor-standing box, the FB1. Having gone through almost the entire product range, you will hopefully have grasped the highly sophisticated and technical approach to product identifications, so have a stab at what the newly launched DB1 stands for.

Move straight to the front of the class if you guessed 'diddy box'! No, I didn't guess it either, but the newest and smallest product in the PMC range is, indeed, diddy, measuring a compact 290 x 155 x 240mm (hwd). However, despite its relatively diminutive size, this is still a proper transmission-line design, just like all its bigger brothers, and is claimed to be the world's smallest. It wasn't easy though — Pete Thomas, the owner and technical guru of PMC, spent almost a year designing and fine-tuning the line dimensions and damping to achieve the results required of a professional product carrying the PMC badge.

SOUND ON SOUND

PMC DB1S £500

pros

- Diminutive size, but big sound.
- PMC build and component quality.
- Acoustic matching with other PMC products.
- Reliable, accurate monitoring.

cons

- If you try it, you'll buy it!

summary

A mini-monitor that thinks its a maxi! Remarkable bass extension from a compact cabinet which claims to be the world's smallest transmission-line monitor, with accurate, reliable mid-range and detailed highs.

The Goods

The DB1 is a passive two-way miniature monitor with four 4mm binding posts to facilitate bi-wiring or bi-amping. The one-inch aluminium-alloy, ferrofluid-cooled tweeter is the same as that used in the TB2 and FB1, while the 140mm doped bass/mid-range unit is supported in a cast magnesium chassis. The two units are integrated with a crossover tuned to 3kHz. The transmission line is created from four internal folds and vents to the top of the rear panel. One of the mechanical advantages of the transmission-line design is that the MDF cabinet becomes extremely solid and well damped — a useful side-effect of all that internal woodwork to make the line folds. It is also quite heavy, with each DB1 weighing 4.5kg.

The review models were the DB1S variant, a painted black studio version with the PMC logo engraved on the side panels. However, a range of wood veneers is also available, as are magnetically shielded versions (DB1M) and a dedicated centre channel unit (DB1MC). Although not fitted to the review models, all production speakers have bolts fitted to facilitate mounting onto PMC's own design of cost-effective wall brackets, and matching floor stands are also available.

The sonic advantages of the transmission line concept are claimed to include accurate dynamics, very low distortion, and phenomenal bass extension (for a given

cabinet size) without compromising linearity. The industry likes to debate the merits of different speaker designs and there are those who argue vehemently against transmission lines. It is certainly true that it is difficult to design a good transmission-line monitor speaker, and they are expensive to manufacture — hence PMC being the only manufacturer of professional transmission-line monitors at present. However, a large number of esteemed mastering engineers, recording studios, and film dubbing theatres are all repeat PMC customers, and an increasing number of well-heeled hi-fi buffs also rate the PMC designs very highly — as I do myself, it should be said.

Listening

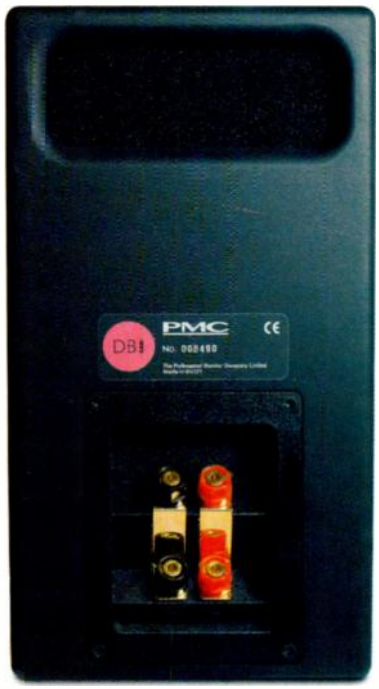
So, what does the DB1 have to offer? Obviously we are talking about a very compact speaker, roughly the same size as that venerable old classic monitor, the BBC's LS3/5A. However, the frequency response of the DB1 is substantially flat between 50Hz and 25kHz. With a sensitivity of 87dB/W at one metre, the DB1 is also easy to drive, although PMC recommend amplifiers of around 100-150W on the grounds that a powerful amp under-used is far better than an under-powered amp over-used into clipping.

Driving the DB1s from a massively over-rated Bryston 4B, the first thing that struck me was the remarkable similarity to the sonic characteristics of the TB2 monitors. Hardly surprising, given the same tweeter, but the mid-range also sounded very open and neutral, with supportive but well-controlled and dynamic bass. The stereo imaging was also found to be much as the TB2s — very wide, with good depth, precise positioning and a broad, stable sweet spot. The mid-range and high end are detailed and revealing, and appear tonally accurate on voices, but the speaker isn't fatiguing at all, even after prolonged listening. With sensible positioning, the bass is smooth and extended without any hint of that 80Hz peak, characteristic of many reflex ported designs.

Some people find it takes a while to re-educate themselves to the accuracy of a transmission line design after years of reflex port abuse — but the cold turkey is well worth it for the much greater clarity around the low mids and that musically important bottom octave which so many people seem content to live without. The DB1 doesn't have the ultimate extension of bigger boxes, obviously, but the bass it produces is certainly very natural, fast, dynamic, and tuneful — and is far deeper than any comparably sized box. Essentially, the DB1s sound far bigger than they physically are, and will fare well in comparison with more conventional monitors of twice their size.

With its rear vent, the DB1 has to be positioned carefully, and needs to be kept away from walls. In fact, the console meter bridge is ideal — but don't be tempted to put these on their sides. The imaging works far better with them in the correct vertical orientation (as it does with most nearfield speakers, actually).

The DB1 is intended to satisfy the requirements of small editing suites and DVD authoring rooms, OB vehicles, machine rooms and project studios, as well as the high-end domestic hi-fi market. It also offers the advantage of forming the first step on a clear upgrade path through the PMC product line, which avoids having to discard this starter model as your requirements grow. For example, adding the passive XB1P or the active TLE1 subwoofer will increase the system's bass extension and dynamics. Further upgrades might see the DB1s becoming the rear speakers in a surround system based on TB2s or FB1s — an attractive idea to anyone already addicted to the PMC mantra. If money is tight and space is limited, the DB1 should certainly be added to your auditioning list in the UK — this is a quality miniature monitor, worthy of the name. SOS



The transmission line vents at the top of the rear panel, so placement of the speaker near walls should be avoided. Four binding posts allow bi-wiring and bi-amping.

Here you can see how PMC have managed to squeeze a 1.5m transmission line into such a small cabinet. Saw sold separately...

information

£ DB1S £500 per pair; DB1 (wood veneer) £555 per pair. DB5.1S 5.1 surround set including TLE1 active subwoofer, £2350; DB5.1 surround set (wood veneer) including TLE1 active subwoofer, £2599. DB1SMC centre-channel speaker, £300 each; DB1MC centre-channel speaker (wood veneer) £327.50 each. For magnetic shielding, add £50 per stereo system or £100 per surround system. Prices include VAT.

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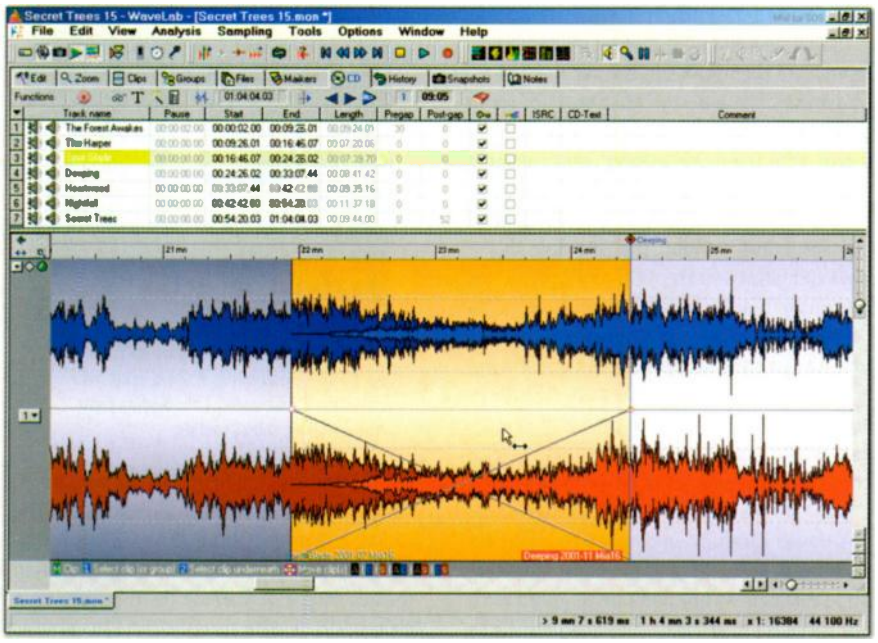
Burning Questions

Getting Better Performance From Your CD Drives



For burning audio CDs on a PC, the more advanced pre-mastering applications like Steinberg's *Wavelab* not only provide a huge number of editing and track-indexing functions for adding the final polish to your tracks, but also graphic real-time track fades and drag-and-drop crossfading of tracks.

Cheap, writable optical media have revolutionised the way PC users store audio and back up their data. However, setting up your CD-R/W drives and persuading them to work at their best can be more complicated than it seems...

Martin Walker

Compact discs in their various formats are now ubiquitous for storing both data and audio. However, there are still problems that can emerge when you try to get CD writers to work properly on a PC. Windows in its various incarnations has thrown up various issues to trick the unwary, while the BIOS may need adjusting, and even the way you connect your CD recorder to your motherboard may seriously affect performance.

Years ago, SCSI CD burners were seen as the only way to go if you wanted reliable performance, since they offered better multitasking capabilities than EIDE/ATAPI-based ones. Many mastering engineers still seem to use SCSI drives (often Plextor models, since these have an enviable reputation for reliability and low Block Error Rates, or BLER), and they are still extremely useful if you want to use lots of drives for CD duplication purposes. However, nowadays, with much larger internal buffers of 4MB or more, as well as buffer under-run protection, IDE burners tend to be just as reliable and slightly cheaper, and avoid the added complications of installing SCSI in your PC.

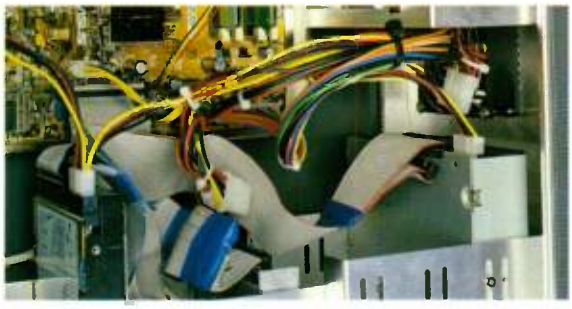
Setting Up An EIDE Writer

Like any device, a CD drive will need connecting to an appropriate IDE channel on your motherboard. While installing two dissimilar devices on the same IDE channel won't force them both to the speed of the slower one, as is still popularly thought, only one can be accessed at a time. So, if you intend to use your PC to burn a lot of audio CDs, make sure you install the CD-R/W drive on the other IDE channel from the hard drive you use to store image files, so that both source and destination can each have unrestricted access to the IDE buss. If you only have a single hard drive, the easiest way to do this is to designate this as Primary Master, and the CD as Secondary Master. This arrangement is often strongly recommended in CD-R/W drive manuals, but isn't mandatory with most drives. Similarly, if you have both a CD-ROM and CD-R/W drive, make sure that they are on different IDE channels if you intend to copy CDs directly from one to the other.

Anyone with additional IDE controllers, either integral to the motherboard or on PCI expansion cards, will be able to configure each device as a Master on its own channel. This is the perfect no-compromise solution, although this approach will take more IRQs, which may be an issue if you're already short. You can find plenty more general information on IDE connections in my article on Optimising PC Hard Drives For Audio in *SOS* April 2002 (www.sound-on-sound.com/sos/Apr02/articles/pcmusician0402.asp).

Remember that the Master device should be connected to the end connector on an IDE cable, and the slave to the one near the middle. I've also come across various people reporting slower CD burn rates, more 'coasters', and more hard drive problems when using those expensive rounded drive cables. It wouldn't surprise me if there were an element of truth in this, since while aerodynamic performance is improved, benefitting cooling airflow through the PC interior, the conductors are obviously squashed together, which is bound to increase crosstalk — the very reason that the 80-way cables were introduced in the first place!

Once you've decided which IDE cable and



Although rounded IDE cables facilitate a smoother airflow through your PC, flat 80-way cables such as these can give more reliable CD burning performance.

plug your CD drive is going to be connected to, make sure any jumpers on its back panel have been suitably set for Master or Slave operation before you install it, as otherwise you may run into configuration problems later on. In the BIOS, select the Auto option for drive type if there is one, let the BIOS detect the capabilities of your CD drive, and then reboot and set it to the dedicated CD-ROM setting to retain these capabilities without wasting time redetecting every time you boot up.

If there are only manual BIOS settings, you'll need to select the most appropriate PIO or Ultra DMA Mode — be guided by your drive's manual for the most appropriate setting, but PIO4 is apparently still the most common one for CD-ROM, CD-R/W, and DVD drives, with some using UDMA Mode 2 (ATA33), and a few newer ones at UDMA Mode 4 (ATA66).

Windows And CDs

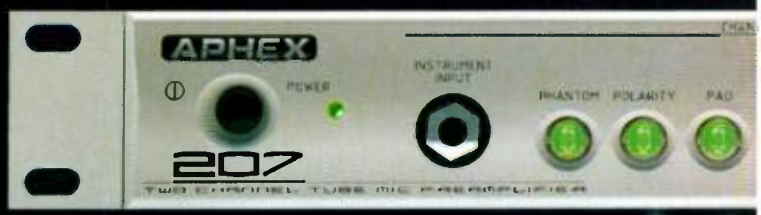
As soon as you've installed a new CD drive, it's worth considering changing its Windows drive letter from its default setting to one further on in the alphabet, such as 'R'. You can do this inside Device Manager from the Properties page of your CD drive, using the Start and End drive letter boxes. While this is totally cosmetic, it does ensure that the letter

CD Firmware Updates

Most modern CD drives incorporate flash ROM firmware, so the most common advice when dealing with CD problems is to download and install the latest firmware update. While this is sound in theory, in practice many updates deal with very specific and sometimes minor issues. Other updates are identical to previous releases, simply to keep the revision number the same across SCSI and EIDE versions, and sometimes drives from one manufacturer are simply firmware-altered versions of other models.

If you decide to install the latest firmware revision, make absolutely sure you download the files for your specific make and model of drive, and that you follow any instructions to the letter. Up until recently, updates were carried out exactly like BIOS flashing: with a DOS-based utility and a separate image file of the new firmware. Nowadays, you are more likely to be presented with a Windows-based utility, and in this case the process may involve disabling Window's Auto Insert Notification and DMA, to make sure that no activity takes place while the update is being downloaded to the hardware. However, whether running from DOS or Windows, it's always safer to download the utility and update at the same time to guarantee compatibility, and you should always take care to avoid any interruptions while the firmware transfer process is taking place, since this may result in permanent damage to your recorder.

The PURE Front End



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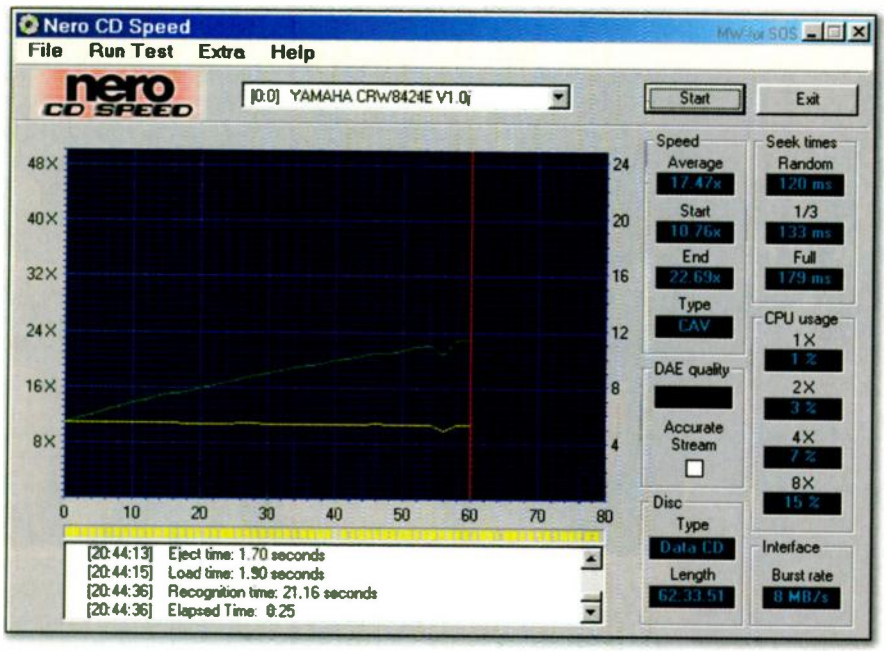
SETTING UP CD DRIVES



Utilities like *Nero CD Speed* (bundled with Ahead's *Nero*) let you check various aspects of the performance of your CD drive, including whether or not it's using DMA — mine obviously is, as you can see by the low CPU usage figures.

won't get moved on after you install further hard drives. I've noticed that some applications periodically demand the original CD-ROM to be inserted in the drive that it was originally installed from, which can be frustrating when Windows has decided that this letter now refers to a hard drive!

Enabling DMA for each one of your CD-ROM or CD-R/W drives can make a huge difference to performance, particularly with motherboards featuring Intel chipsets. In the case of Windows 98 and ME, you can find the DMA tick box in the Settings page for your CD hardware, inside Device Manager, while Windows XP users should expand the Device Manager entry labeled 'IDE ATA/ATAPI controllers', right-click on both Primary IDE Channel and Secondary IDE Channel in turn, select Properties, and move to the Advanced Settings page. Make sure here that the Transfer Modes for both Master and Slave device have been set to 'DMA if available'.

Some Via chipsets have been known to cause problems with DMA: you should make sure you have the latest motherboard Busmaster and 4in1 drivers installed, while moving your CD to another IDE channel may occasionally solve problems. You can also download Via's *IDE Tool*, which may help you configure the drive. It's always worth checking CD drive performance before and after enabling DMA using a suitable utility like *Nero CD Speed* (see screen shot above).

Windows Auto-Insert Notification is disabled by most musicians, since it regularly polls the drive to see if a new CD has been inserted, which can block the PCI buss, causing a click in any audio recording under way. AIN also used to be a big problem with CD-burning software for the same reason — the last thing you want during a burn is Windows deciding to check if there's a new CD in the drive! Some CD-burning applications still recommend that you permanently disable this function, but others, including Roxio's *Easy CD Creator*, now disable AIN when needed, and then re-enable it afterwards, so that it can't interfere with the burning process. However, others, such as Roxio's *DirectCD* packet-writing application, definitely require AIN to be enabled, which somewhat clouds the issue for musicians. You'll have to weigh up the pros and cons depending on what CD-burning software you run.

If you want to disable AIN in Windows 98 and ME, you need to untick the appropriate box in the Settings page of your CD-ROM and/or CD-R/W drives Properties, which you'll find in Device Manager. It's also worth periodically checking the DMA and Auto Insert Notification settings for your various CD and DVD drives, as they sometimes get altered in some systems after hardware reconfiguration or using Safe Mode, or sometimes by misguided CD-burning applications (more on this later).

The Autoplay functions for both audio and data CDs can be disabled manually via the Registry, but it's far easier and safer to do this using *TweakUI*, from its Paranoia page. In all three cases you'll need to reboot before the new settings take effect. Windows XP is a special case which I'll come to shortly.

Another possible cause of interruptions to CD-burning is resizing of the cache RAM, which acts as an intermediate buffer when Windows reads and writes data to storage devices including hard drives and DVD drives. Here we can use exactly the same tweak that prevents interruptions to audio recording and playback: setting a fixed size for Vcache, by adding a few lines to the System.ini file. You can either do this by hand, or more easily by running the handy *Cacheman* shareware utility from www.outertech.com, which suggests suitable settings for Windows 98 and ME. It does the same for the additional CDFS Cache — a supplemental cache for the CD-ROM drive — and its read-ahead optimisation, based on the speed of the drive. The data here may get moved to the swap file on your hard drive if you use one, but if a reread is required it's still considerably faster to retrieve from disk than from the CD drive. Windows NT4, 2000 and XP have significantly better cache handling, so you are far less likely to have problems, and

Long Filenames & CD-ROMs

The most common CD file system is ISO 9660 Level 1, which only supports filenames in the old DOS-style format of 8+3 (up to eight characters chosen from A-Z, 0-9, and _ [underscore], followed by a dot, with an optional extender of up to three characters). As with DOS, any files that you burn onto a CD-ROM with a longer name will become truncated, so that for instance the Program Files folder will be displayed as 'PROGRA~1'.

Thankfully, there are extensions to this basic standard, allowing you to save and retrieve longer filenames. For PC users Microsoft's Joliet extension allows filenames of up to 64 mixed lower and uppercase characters, and is supported from Windows 95 onwards. Most PC CD-burning packages add the Joliet filesystem to the ISO one, so that if you read them under DOS you'll only see the 8+3 format, while from Windows you'll see the full-length filenames. However, you may still come across some limitations when backing up Windows folders onto CD-ROM, since in addition to the 8+3 filename restrictions, the ISO 9660 standard only supports path depths up to eight levels and a total path name of up to 255 characters.

The UDF (Universal Disk Format) file system specification is optimised to handle huge data sizes and to minimise changes if a file needs to be added or deleted, and was developed for CD-R and CD-R/W media. It's used by DVD-ROM and some packet writing software including Roxio's *DirectCD*, and is supported by Windows 98 onwards (as well as by Mac OS 8.1 onwards). Without suitable drivers you can only read UDF format CD-ROMs on a CD recorder, so when you close a session to read it on other players, most packet-writing software adds an ISO 9660 file system to make its contents universally visible.

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they normally don't use a CDFS cache at all (although I have seen a Registry tweak that creates one for XP).

XP-specific Issues

Windows XP incorporates CD-writing functions as standard, using burning routines developed under licence from Roxio, whose stable of software includes *Easy CD Creator* (and also *Toast* for the Mac). You can now drag any file or files directly to the CD-R/W drive, and they will be copied by default into a special folder deep inside the Documents and Settings folder, although if you want to change its location you can do so using *TweakUI*.

If you then select your CD drive inside Explorer it will display 'Files Ready to Be Written to the CD', above any 'Files Currently on the CD' if you already have a disc in the drive. Right-clicking on the CD drive will offer 'Write the files to CD' and 'Delete temporary files' options, and if you select the former, the CD Writing Wizard will appear to guide you through the process. An image of the CD to be written is created, and you can also select its location, as well as the default write speed, in the Recording page of the CD-R/W drive's Properties page inside Device Manager.

These integral functions mean that anyone upgrading an existing Windows installation to XP would be well advised to first uninstall any existing CD-burning applications before they start, to ensure that there are no driver conflicts between the two. This is also the ideal time to check the software developer's web site to see if there are any issues running under Windows XP.

However, many users prefer to stick with the somewhat more versatile functions provided by their existing CD-burning software, and to do this it's safest to disable those of Windows XP once it's fully installed. To do this, follow the Services shortcut from the Administrative Tools section of Control Panel, and locate the Service labeled 'IMAPI CD-burning COM Service'. Right-click on this, select Properties, and then set the Startup type to Disabled.

Anyone installing the XP Service Pack 1 should also double-check that their CD-burning software isn't affected afterwards — *Easy CD Creator* 5.1, for instance, has an update to cure a crash when running its Direct CD functions under Windows XP SP1. Even if you don't want to download and install the full Service Pack, it's worth installing all XP updates relating to CD operation, since these do seem to solve various issues when burning CDs.

The Autoplay function of Windows XP seems to be less invasive than the one used in Windows 98/ME, and as long as you don't insert a new CD during an audio recording, it doesn't normally cause any problems. However, many musicians (including me) are so used to exploring CDs by hand that they dislike Windows taking over. You can customise these functions by right-clicking

Using CD-R/W For PC Backup

Hopefully most people realise that unless they have their data stored in at least two places, they're asking for trouble. If you've ever accidentally deleted a song you've been working on for weeks, you'll know how sick it make you feel. It's easy to decide just how often to update your backups — just think how much work you'd be prepared to redo from scratch, and back up as often as this.

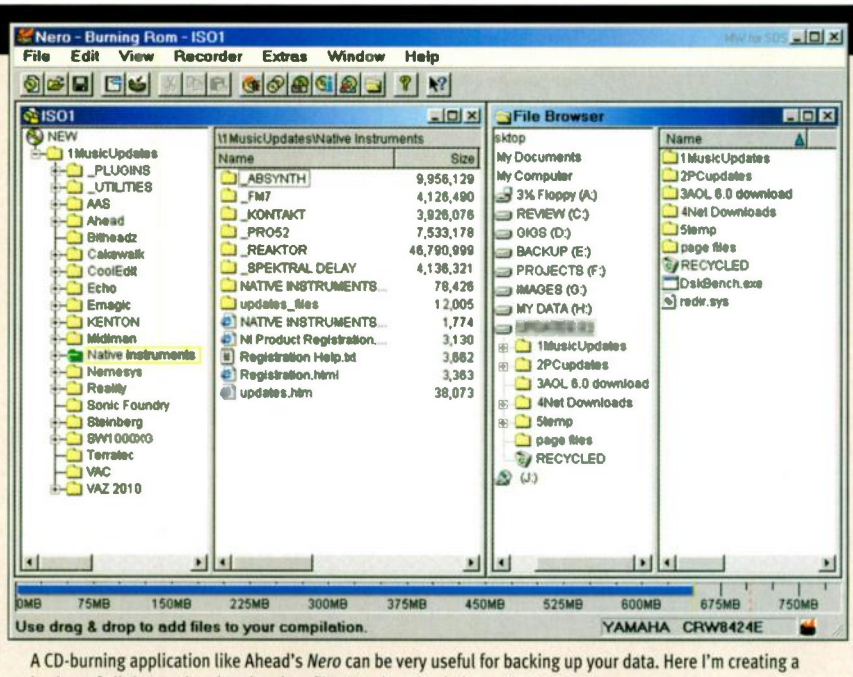
The quickest way to back up is to drag copies of the files into another hard disk partition, although unless this is on another drive, this won't protect you if that drive ever goes faulty. Far better is a second drive, but using a CD-R or CD-RW disc is better still, since this will protect you even if someone breaks into your studio and steals your PC. If you store these backups in another location, your data (and perhaps that of your studio's clients) will even be protected in the unlikely event that your studio burns down. Although this is an almost unthinkable scenario, remember that PCs are relatively easy to replace, whereas your data isn't.

Both the CD-ROM and audio CD formats contain a single data 'session', but most PC CD burning software also offers the multi-session CD format, which is an ideal candidate for backup purposes, since once the first batch of files have been recorded in a session, you can write further sessions on the same disc. Your CD-R/W disc will be scanned, and then your software will offer to burn another session containing only those files and folders that have been created or updated since the last session.

When it first appeared I was also very keen on packet writing, since this allows you to use a CD-RW disc like a slow hard drive, adding files or deleting them whenever you liked. There are now two major PC packet-writing packages: *DirectCD* from Roxio and *InCD* from Ahead Software, and I've used them both. However, after experiencing various problems and incompatibilities between the two, I found it far easier and more reliable to rely on multi-session burning for file copying — although you can't delete individual files, you can still erase your CD-RW discs altogether and reuse them.

Another alternative is dedicated backup software, which combines your selected files and folders into a single backup file with optional compression. I used Microsoft's Backup (bundled with Windows) for several years, but eventually found it far quicker and easier to split my drives into various smaller partitions, so that I could store each of them as a compressed image file. PowerQuest's *Drive Image* and Norton's *Ghost* are ideal for such backup purposes, and in the case of CD-R/W drives they will happily split saved partitions larger than 650MB across several discs, and let you view and extract individual files from each image. Ahead's *Nero* provides a similar sector-based HD Backup feature, but this saves both used and unused sectors, resulting in far larger file sizes, and you can't extract individual files.

One final tip: if you use your CD-R/W drive to back up completed song or album projects, remember that they become marked as Read Only once on a CD. If you copy them back onto your hard drive later on, your audio application will refuse to save such songs once edited, or give error messages when you try to do so. The solution is to right-click on the files in question, select Properties, and then untick the Read Only attribute box, or to save them using a different name.



A CD-burning application like Ahead's *Nero* can be very useful for backing up your data. Here I'm creating a backup of all the music-related update files I've downloaded over the Internet.

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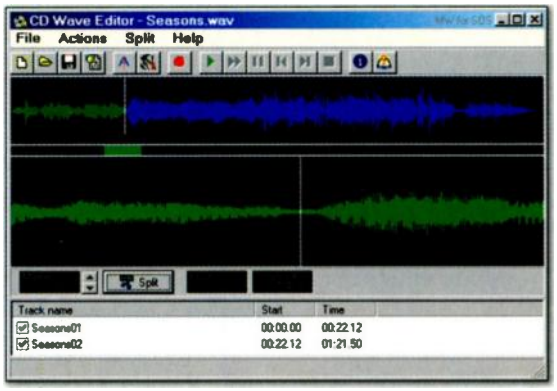
▶ the CD drive or drives inside My Computer, selecting Properties, and then the AutoPlay page. Here you can select what action is performed by Windows when it finds each type of file — either automatically launching an application like Media Player, or ignoring that particular file type. The quickest ways to disable Autoplay altogether is to use *TweakUI*, which has a special Autoplay area in its My Computer section with a tick box labeled 'Enable Autoplay for CD and DVD drives'.



For just $15, *CDWave* will split your continuous live gig recordings at suitable points to create 'seamless' CD audio albums with no gaps or clicks between tracks.

CD Editing & Burning Software

There are now quite a few CD-burning applications available to PC users. For routine burning of data and simple Red Book audio CDs, the applications bundled with CD-R/W drives, such as Roxio's *Easy CD Creator* and Ahead Software's *Nero*, are perfectly adequate, and of course you are guaranteed that they are compatible with your drive.

Dedicated CD audio applications tend to offer more flexibility when it comes to altering the gap length between tracks, or avoiding gaps altogether, which is perfect for continuous recordings of live gigs where you just want to leave the applause between each song but be able to place track markers where each new song starts. The problem is that CDs are recorded in 'frames' of 588 stereo 16-bit samples (or 2532 bytes), and each new track must start on a frame boundary. Unless your software is aware of this, you may end up with slight gaps between the sections.

However, you don't have to pay a lot for suitable software — *CDWave* (www.cdwave.com) is a simple-to-use utility that lets you record audio or load in existing WAV files, split them exactly on CD frame boundaries, edit out silent sections, and then save them for burning elsewhere, and is just $15. Another suitable low-cost application is Ahead's more comprehensive *Feurio* at only $29, which also includes a graphic Track Editor and CD-burning functions, and was reviewed in *SOS* May 2001 (www.sound-on-sound.com/sos/may01/articles/aheadfeurio.asp).

Fully fledged audio pre-mastering applications such as Sonic Foundry's *CD Architect* and Steinberg's *Wavelab* (as well as the recently released, cheaper *Wavelab Essential*) come into their own when you want to be more creative, providing options to crossfade from one WAV audio file to the next and process your audio using real-time plug-ins, as well as giving you a very easy-to-use drag-and-drop graphic interface. However, always check before buying any application that includes a CD-burning function that your drive is included in its support list — I know that sounds obvious, but it hasn't stopped musicians making expensive mistakes.

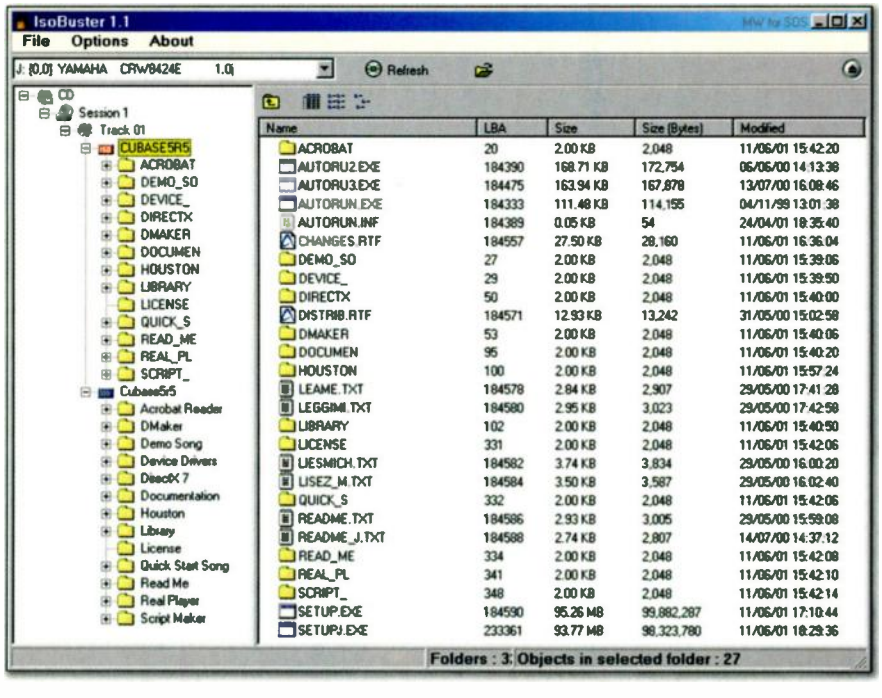
Don't be tempted to install several CD-burning applications on one PC. Although some like *Feurio* and *CDRWin* don't install their own drivers, and others like *Nero* are well-behaved, some do assume that they will be in charge, and add or alter existing Windows drivers — the now-discontinued *WinOnCD* used to cause problems, for instance. You can normally find these drivers in the Windows/System/Iosubsys folder: just sort its contents by date and any newer ones will be more obvious.

Some applications, such as *Nero* and *DirectCD*, are simply incompatible with one another — Ahead provide a bootmenu utility to enable Windows 98 users to choose at bootup which CD-burning software they wish to use. This is yet another reason to install your music software in a separate partition.

Recovering Data From CDs

When a rogue disc refuses to be read by your CD drive, the cause can simply be dust or dirt, either on the CD lens or the disc itself. In the former case a suitable cleaning disc can occasionally be used, while you can clean CDs using a lint-free cloth; always wipe in a radial direction, since error correction is better at dealing with such marks. You can also use cleaning fluids on proper pressed discs, but it's safer to use a dry cloth on the more delicate CD-Rs and CD-RW discs. The next step is to try another CD player, since different models may have more (or less) success in reading a borderline CD.

Failing this, the PC owner also has access to plenty of useful utilities to help recover scrambled CD data. One of the best I've come across is *IsoBuster*, written by Peter Van Hove of Smart Projects (www.smart-projects.net). This is designed to extract data from CD, DVD and image files, and often succeeds where Windows Explorer and packet-writing software such as *DirectCD* and *InCD* give up. It's also better at retrieving



The handy freeware *IsoBuster* utility from Smart Projects can extract files, tracks, and sessions from many CDs and DVDs where Windows fails. This screenshot also shows how the ISO 9660 filenames (highlighted in the left-hand pane) are duplicated by Microsoft's Joliet extension to provide PC CD-ROMs with the longer and more versatile filenames we enjoy inside Windows.

data from CDs that have suffered from 'buffer under-runs'. Part of the reason for its success is that it apparently uses better error handling and several retry mechanisms to get at the data from borderline CDs.

IsoBuster runs on Windows 95, 98, ME, NT 4.0, 2000 and XP, is already supported in 35 languages, and can read and extract files, tracks, and sessions from formats including CD-i, VCD, SVCD, CD-ROM, CD-ROM XA, DVD and DVCD. Currently at version 1.1, the vast majority of its features are freeware, although registration to the *Pro* version is just $20. This unlocks added high-end recovery features for UDF File System CDs created by packet-writing software such as *DirectCD*, *InCD* and *Packet CD*.

Although there are plenty of options for engineering boffins to extract data in various raw formats and by block number, it's essentially really easy to use: you just insert the desired CD or DVD disc into your drive and *IsoBuster* will scan its contents and offer various extraction methods. If any errors are found, it will offer to retry the read, ignore it, or quit, and when creating data in an image file will offer to retry, omit the offending sector, or replace it with zeros or dummy data (the latter may be less obvious in some cases). Although the latter two options are largely pointless for data, they may let you extract audio files with a great degree of success.

I tested it out with a double-CD-R set I'd received for review in Sample Shop, when Windows Explorer insisted both CDs were blank. I'd already tried to use Ahead's *Nero* to access the data, but although it correctly showed a single 422MB Data (mode 2) track on the first CD, and its View Track function showed the presence of data and filenames, all I could do was use its Save Track option to create a hard drive image file.

IsoBuster showed exactly the same data on the original CDs. However, when I used it to open the NRG image file created by *Nero*, it found the file system information, and I was able to extract the individual files perfectly. I also subsequently used *IsoBuster* to create an image file from the CD, and it read this perfectly as well. It can also read CD image files created by *CDRWin*, *CloneCD*, *Creator*, *DiskJuggler*, *Duplicator*, *Optimage*, *Prassi* and *Prassi Primo DVD*, *Toast* and *WinOnCD*. It can't recover information from blanked CD-R/W discs, since this process overwrites the data, although if they have only been quick-formatted, Smart Projects do offer a service to extract the data using special hardware and tools. SOS

Further Information

The Bible for all things to do with recordable CDs is Andy McFadden's CD Recordable FAQ at www.cdrfaq.org, which contains the most detailed answers to a host of questions ranging from basic ones about the technology, encoding, formats, problems, hardware and software, and media.

Although it's primarily a retail outlet, www.cd-writer.com is a handy information resource too: it maintains comprehensive details of all the CD hardware it sells, as well as a comprehensive list of links to third-party CD hardware reviews, and hosts its own forum dedicated to CD matters. There are also lots of other web sites covering all aspects of CD hardware and software. Most have extensive sections covering the latest news, CD software updates, articles and forums, as well as plenty of reviews of CD hardware and software. Here are a few of the best ones I've found:

- W www.cdfreaks.com
- W www.cdrinfo.com
- W www.cdrlabs.com
- W www.cdrwcentral.com

Cue Monitoring Techniques

One of the secrets of overdubbing is setting up good cue monitoring for the performer. There are, however, a number of different approaches and it is important to choose the most appropriate for the task at hand.

Paul White

The word monitor is much overworked in recording studio circles — as a noun, it can be a monitor loudspeaker or a computer monitor screen, whereas, in its guise as a verb, it can mean 'keeping an eye on things', it can mean listening to a mix via the monitor speakers or it can relate to the performer who's listening to the backing track over headphones while overdubbing a vocal or instrumental part. It's this last meaning I'd like to explore in this article, because the way in which a performer monitors what else is going on in the track can be critical to extracting a good performance.

Setting Up Headphone Monitoring

In full-scale commercial studios, the usual solution is to provide multiple headphone feeds for the different performers, each derived from a separate pre-fade mix buss on the studio console. The clear benefit here is that you can set up as many different monitor mixes as you have pre-fade sends (pre-fade sends are used so that the monitor mix doesn't change if the main mix faders are moved). In a typical project studio, though, the number of free pre-fade sends may be very limited — or even non-existent if the system is entirely computer-based. That means devising a different strategy, and in many cases a simple solution is all that's needed.

In the typical project studio, audio tracks tend to be overdubbed one at a time, so the simplest possible setup is to use the headphone output on the recorder, workstation or mixer to feed a pair of enclosed headphones. Inexpensive extension cables are available for when you need to work at a distance from the recorder/mixer (as you may wish to do to avoid mechanical noise) and the reason for choosing enclosed phones is to prevent the backing track from spilling into the recording mic. The amount of leakage you get from headphones might seem to be small, but high pitched sounds in particular can leak quite noticeably, so the greater the isolation the phones give you the better. Open-backed phones tend to leak very badly, and, while this may not matter to a guitar player where the amp is close-miked, it presents real problems when recording vocals.

In this scenario, the mix that is set up during overdubbing should be one the performer wants to hear, not necessarily the ideal balance, and, in the case of vocals, setting up a temporary reverb usually helps inspire a more confident performance and can help with pitching. Again the amount of reverb you feed into the mix should be agreed with the performer, and it's wise to double-check your mixer routing to ensure that you aren't actually recording the reverb, just the dry vocal, as you may wish to use an entirely different reverb treatment during the mix proper.

An interesting point to note is that the perceived sound of your own voice over headphones can be very different depending on the phase of the headphones. The reason for this is that the natural 'acoustic' sound of the voice heard after being conducted through the head combines with that of the headphones, and if the phase of the headphones is inverted, the perceived result can be dramatically different, as the two sounds combine in different ways. Usually the singer will feel more comfortable with one setting than the other, but, unfortunately, most mixers don't have

Monitoring For Bands

Setting up effective monitoring for complete bands can be quite problematic, as drums and amplifiers can be very loud, which means the headphone monitoring system might also need to be quite powerful to overcome whatever sound is leaking into the headphones from the rest of the band. While you can buy frighteningly powerful headphone amplifiers, there's always the worry of inflicting hearing damage when working at high SPLs, so it's usually more effective (and safer) to try to separate the performers to some extent. In the smaller studio, this might mean having the drums set up in the control room, with the guitar amp out in a corridor or in a cupboard and the guitarist playing in the control room while monitoring the track via the control room monitors. In a larger studio, acoustic screens can be introduced between the drum kit and the various amplifiers, which not only makes monitoring less of a problem, but also helps provide better separation when miking.

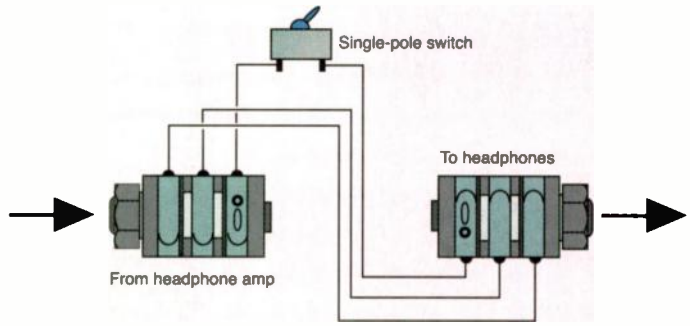


Figure 1. How to connect a switch and a couple of stereo headphone sockets if you want to silence one earphone — useful if your singer/player likes to perform with one phone off. Note, though, that if the switch is turning off the wrong phone, the performer will need to wear their headphones the opposite way round.

a phase switch on the headphone output. Nevertheless, there's no reason not to invert the phase of the vocal channel's mic preamp (provided that you are only recording one part at a time), as this will produce exactly the same result from the singer's point of view.

Once you have a suitable mix, a viable reverb setting and the best phase setting for the singer, you still have the overall level to consider, and again this can make quite a difference, both to the quality of performance and to the singer's ability to pitch accurately. In the situation where you're feeding the phones directly from the headphone socket on the mixer, the ideal level will have to be arrived at by trial and error, but a better solution is to use a headphone amplifier, fed from the mixer's headphone output or from its two-track tape out connectors. This can be located close to the singer so that he or she can make their own level adjustments.

Headphone amplifiers with four or five separately adjustable outputs can be bought for as little as £60 in the UK, and having multiple outputs is useful for when two or more singers need to record at the same time. It also allows the engineer to monitor the proceedings when the main monitor speakers are switched off — something that is necessary if you're recording in the control room.

You'll find that some singers work better with one phone on and one phone off, because this allows them to hear their natural voice directly rather than via the phones. This is fine, provided that you have the means to mute the phone that's not being used, otherwise you're inviting spill problems. Some of the more serious headphone amplifiers may provide a switch for this purpose, but if you don't have the option, it's easy to make up an adaptor for yourself (using two stereo jack sockets and a switch, as shown in Figure 1) to do the same job.

Latency

Nothing throws a singer more than hearing their own voice coming back through the headphones with a delay, yet that's exactly what happens with many computer-based recording systems. Even a latency value that's too small to upset a guitarist may be perceived by a sensitive singer, so the only satisfactory solution is to allow them to monitor their vocal signal at source rather than at the output of the computer.

To do this, you need to route an output from the mic preamp (if there's only one output, you can use a split lead) or mixer channel into the monitor mix and, at the same time, mute the output of the computer track you're recording onto so that you don't get the delayed sound as well. Some recording preamps include a zero-latency monitoring facility, whereby the stereo output from the soundcard is routed though the output

Photos Mark Ewing

The SPL Channel One is an example of a preamp which incorporates zero-latency monitoring facilities and in-built headphone amplifier.

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section of the preamp before it goes to the monitor speakers or to the headphone amplifier. The direct vocal signal from the preamp is added to the soundcard signal at this point, and a front-panel control allows the balance of vocal and backing track to be set. Some units, such as the new Focusrite Voicemaster Pro, even have connections for plumbing in an external reverb unit, so that reverb can be added to the monitor mix without it being recorded.

If you only ever record one track at a time, the systems described already may be all you need, but things get more complicated when two or more musicians need to sing and play at the same time. The problem here is that, for example, the rhythm section probably wants to hear a different balance to the vocalists, so the best way to deal with this is to use two pre-fade aux sends to feed either two separate headphone amplifier units or one that can be switched to function as two separate groups of amplifiers.

In order to set up the two monitor mixes, you'll need to use your mixer's monitor switching function to allow you to listen in on the pre-fade sends rather than the main mix output while you're setting up the cue mixes. Once again, if the amplifiers themselves are set up close to the performers, they can adjust the overall levels of their headphone feeds for themselves.

More esoteric headphone amplifiers allow individual headphone mixes to be set up by combining the main mix output and two or more pre-fade sends in different ways, where the mix balance is under the control of the musician. This entails connecting both the stereo mix and the pre-fade aux send outputs to the headphone amplifier, then deciding what to feed into the aux sends. For example, if aux one carries only vocal and aux two only the drums and bass guitar, each player can adjust their individual mix to be vocal heavy or rhythm heavy depending on what they need.

Monitoring With Speakers

There are some performers who just can't get on with headphones, in which case there is a dodge using loudspeakers that can be made to work adequately. The basic principle is that the singer's mic is set up exactly midway between two loudspeakers, each of which carries a mono mix of the monitoring signal, but with one of the speakers deliberately wired out of phase — you can do this by simply swapping over the two wires connecting one of the amplifier's outputs to one of the speakers, as illustrated in Figure 2.

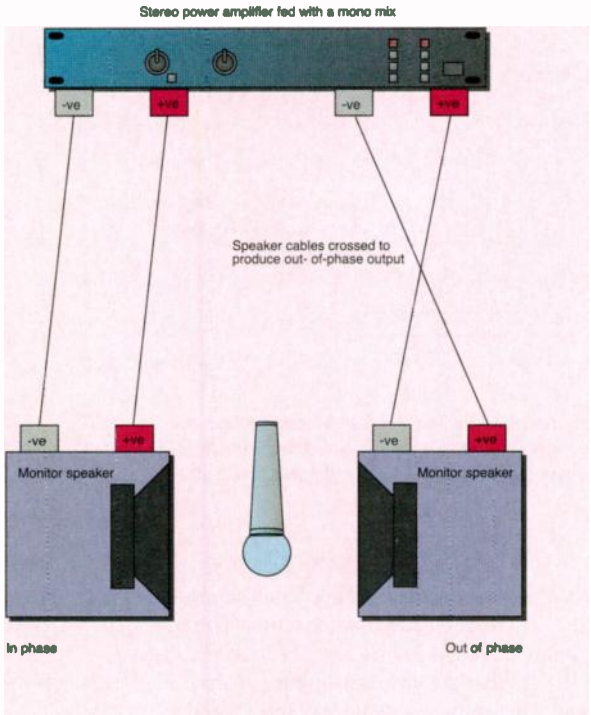

Figure 2. A setup for monitoring over loudspeakers while recording.

If you monitor the output from the mic with the backing track playing, you should be able to further fine-tune its position so as to get a reasonable amount of cancellation, but, because of room reflections and the fact that no room is absolutely symmetrical in acoustic terms, the degree of cancellation will never be perfect. Nevertheless, this technique has been used many times and generally keeps the level of spill down to manageable proportions. Small passive hi-fi speakers or monitors are best for this application.

Effective monitoring need not be complicated or expensive, but it is deserving of attention, as it can significantly affect the quality of a performance. A good pair of enclosed headphones that can work at reasonably high SPLs (sound pressure levels) without distortion is essential, and a multi-output headphone distribution amplifier is also essential if two or more performers need to record at the same time.

It is also important to take account of latency in computer-based systems, as some singers and players find that even small amounts of latency are very distracting. Zero-latency monitoring is usually very easy to arrange, and is made even easier if you have one of those mic preamps that include zero-latency monitoring facilities and a built-in headphone amp as standard.

The final word must be this: listen to the performer when they tell you what they need to hear in their phones, as only they know what they are comfortable with. Ask them if the monitoring is OK, just in case they're too polite to mention that it isn't, and also make sure they have the right amount of reverb in the cans to keep them happy. When you're after a good performance, putting the performer at ease is more than half the battle, so it's worth going the extra mile if you want the best recorded results. SOS

Monitoring With Punch

Where you're doing punch-ins on parts in order to patch up tracks you've already recorded, it is essential to select the correct monitor mode so that the performer hears the 'off-tape' sound right up until the punch-in point, at which time the monitoring for that track switches to input mode for the duration of the punch-in — any tracks not set to record will, of course, continue to play into the monitor mix as normal. Using a hardware recorder, setting the monitoring to Auto Input (or simply Auto) will normally put you in the correct mode for punching-in or overdubbing.

Most music software handles punch-ins and punch-outs using a variation on a hardware recorder's Auto Input mode, but you may find that your sequencer or audio package allows you to set different levels for record monitoring than for playback. If this is the case then you need to ensure they're set the same, otherwise the performer's headphone balance will change at the punch-in point. You may also notice that the transition from 'off-tape' monitoring to input monitoring is less than smooth on some software if you try to punch in manually, so it's usually better to use the auto punch-in/out mode. Where you're recording and performing in the same room, take care not to record the sound of transport buttons or footswitches when performing punch-ins.

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Primacoustic London Systems

Acoustic Treatment Kits

Applying adhesive to a Scandia Scatter Block, and installing an Australis Corner Trap.

Paul White

Integrated kit solutions to room-acoustic problems in the project studio.

Acoustic treatment can be as simple as a couple of a foam tiles and a duvet, or it can entail the ground-up design and construction of a studio interior, including bass traps, diffusers, absorbers and so on. Fortunately, while large commercial studios with thick, dense walls and large monitors can be expensive to treat effectively, home-based project studios can usually be treated fairly cost effectively, partly because they are smaller, but also because there are fewer bass problems due to the use of nearfield monitors. The main elements of minimal acoustic treatment comprise absorption panels at either side of the listening position (to kill flutter echoes and to reduce early reflection from the speakers) augmented by some rear wall absorption, and perhaps some further absorption on the ceiling above the mixing console and behind the monitors. Additionally, a degree of bass trapping may be desirable, though where there are large areas of windows and doors, this may not be necessary where smaller nearfield monitors are being used, as windows and domestic doors reflect very little low frequency energy — it goes through instead!

Many studio owners go for a 'suck it and see' approach to acoustic treatment using off-the-shelf foam panels, and this can work well enough in small rooms, but foam panels alone are only effective down to somewhere between 250 and 400Hz, which means they are of little help where bass trapping is required. Canadian company Primacoustic have come up with a modular acoustic treatment system based on pre-cut blocks and wedges of high-density, open-cell polyurethane foam that includes corner-mounting bass traps. This takes a lot of the guesswork out of acoustics, as detailed instructions are included, yet the design of the individual panels allows plenty of flexibility when dealing with non-standard rooms. The installation guide and technical notes tied in with what I've learnt about project studio acoustics over the past few years, which made me feel fairly comfortable about installing the kit in my own studio for the purpose of this review. Though the UK cost is a little higher than

SOUND ON SOUND

Primacoustic London Systems

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- Attractive and easy to install.
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- Kits to suit all sizes of studio.
- You can buy individual panels as well as kits.
- Almost any room can be treated so that it's possible to monitor more accurately.
- Extremely clear and well-illustrated instructions.

cons

- Fixing is permanent unless you attach plywood or MDF to the walls first.

summary

Primacoustic have come up with a pragmatic and versatile solution to small studio acoustics that is affordable, effective and visually attractive.

buying general-purpose foam tiles, the end result looks very professional and the higher density of the foam makes them more effective than lighter foam panels.

The London 14 System

The system comprises a series of panels that can be assembled to form mid-range and high-frequency absorbers to deal with side-to-side and front-to-back flutter echoes, plus a number of smaller 'scatter blocks' that can be used on the ceiling, rear wall or elsewhere to increase absorption. Bass trapping is accomplished by large foam corner wedges and the kit includes sufficient adhesive (tubes of No Nails) to fix everything to the walls — all you need is a regular mastic gun to apply it.

I don't know if it's because the guys behind this are Canadian, but everything in the system has rather a strange name. The kits for various size studios are named after cities, which is fair enough, and I chose the London 14 kit as it is designed to treat a room about the size of a single garage. This contains something called the Europa Flutter Wall to provide absorption at the front of the studio, a pair of Orientique Washboards (I told you the names were weird!) for treating the side walls, four Australis Corner Traps and 24 Scandia Scatter Blocks. Both the flutter wall and side walls comprise foam panels of varying thicknesses up to around 2.5 inches, some parallel-faced and some wedge shaped, which when combined look rather neat. Numerous design examples are shown in the installation guide, based on arranging the panels in a different order, and all the patterns are given interesting names.

The side wall panels (washboards) end up being three feet square while the flutter wall is three feet by six feet. Of course you can assemble the panels into smaller sections if you need to, and in my case I didn't even use the front-of-room flutter wall kit as I have little free space there and, in any event, the existing treatment works fairly well in that area. Neither did I use any ceiling panels, as the ideal place to put them coincided exactly with my halogen light fitting. Furthermore, the installation instructions show one bass trap in each corner of the room, but, because of the way my room is set out, I opted to put all four in the rear corners instead. Each bass trap is three feet long and extends 12 inches from the corner in both directions, but if you feel this might take up too much valuable room, you could fit them into the corner between the wall and ceiling instead.

All the panels and traps are held in place using only adhesive, though the installation guide suggests that you can use plasterboard metal corner bead fixed to the wall at the bottom of each set of panels or traps to ensure a straight, horizontal edge and to prevent any slippage while the adhesive is setting. In practice, I didn't find this to be necessary, as the adhesive grabs straight away, but it is important to mark horizontal and vertical pencil lines as guides before you start. Also, because the bass traps are heavier than the panels, I supported these from beneath for a couple of hours to give the adhesive time to set.

The scatter blocks come as wedge shapes and are generally used in pairs to provide either a concave or convex 12-inch-square module. Rather than put them all in one place, the idea is to scatter them over the rear wall to provide alternating areas of absorption and reflection. In my room, the back wall of the studio includes a large pair of French windows, so clearly I couldn't stick ▶

the blocks to those. Instead, I used the scatter blocks to cover the space above the door for the full width of the room and decided to treat the reflections from the door using a heavy curtain. As luck would have it, the strip of wall above the door was slightly less deep than the depth of two scatter blocks so I had to cut several of them down by about an inch and a half (this stuff is Canadian so no metric measurements here!). I found that most useful of studio tools, the electric band-saw, did this beautifully, leaving a perfectly straight edge, but, if you happen not to have one, an electric carving knife does a neat job. A few scatter blocks were left over so I put a row of these above and below the side absorbers to hide the glue marks where I'd taken down my original home-made absorbers.

Because I know my studio room pretty well and have experimented with various acoustic treatment options over the years, I felt confident in not deploying the kit exactly as specified, but for the less experienced user, I think it would be wise to stick as closely to the plan in the installation guide as possible. The modular nature of the panels means there is plenty of flexibility to cope with non-standard rooms, and in studios that have a control-room window, the front flutter wall components can be split up and placed around it, provided that symmetry is maintained.

Fixing the kit turned out to be extremely simple and only took a couple of hours. You have to take care not to get glue on the face of the tiles or it spoils the appearance, but this isn't difficult, provided that you're reasonably careful. Of course once the kit is up, you can't get it down again without leaving glue all over your walls — where you may need to uninstall at some later date, the guide suggests fixing light ply panels to the wall and then tiling onto those.

Options & Pricing

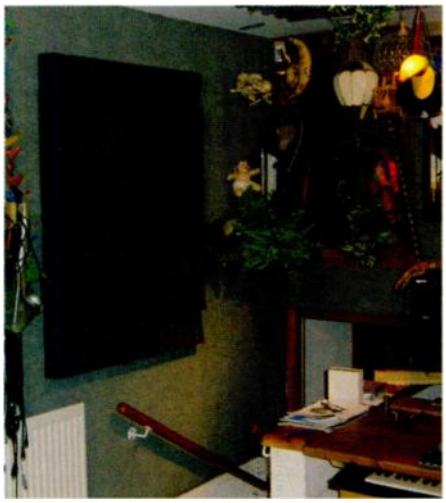
There are three available Primacoustic London systems. These are made up of combinations of the following elements: Australis Corner Trap bass trap; Orientique Washboard side wall diffuser; Europa Flutter Wall 63 (6 x 3 feet) or Europa Flutter Wall 83 (8 x 3 feet) front wall diffuser; and Scandia Scatter Blocks. The table below shows the price of each London system and what each offers.

	Australis	Orientique	Europa	Scandia	Price
London 12	2	2	1(63)	24	£599
London 14	4	2	1(63)	24	£799
London 16	6	4	1(83)	36	£1199

Individual system components are also available, and are priced as follows:

- Australis Corner Trap (set of two), £229.12
- Orientique Washboard (set of two), £176.25
- Europa Flutter Wall 63, £188
- Europa Flutter Wall 83, £229.13
- Scandia Scatter Blocks (set of 24), £129.25

All prices include VAT.



The two Orientique Washboard side wall diffusers installed in Paul White's control room.

Absorbing?

So far then, the kit is easy to install and it looks pretty smart too, but what does it sound like? Although I had treated my studio before (albeit fairly minimally) and was happy with the mixes I was getting, the Primacoustic system definitely dried up the room from the mixing position, reducing side reflections and improving the stereo imaging quite noticeably. My original bass traps were quite bulky and used a lot of messy Rockwool and roofing felt, so the extra space afforded by the foam replacements was welcome. I didn't notice any reduction in the level of perceived bass in the room, but felt the bass response to be more even and slightly tighter than before.

Primacoustic don't make any exaggerated claims for their system, and they certainly don't say that you will end up with a perfect room. What you will get is a room that is sufficiently well behaved on the acoustics front to do serious work in and where any deviations from the norm are small enough that you can adapt to them, provided that your speakers don't have too much bass extension. The bass traps are effective down to around 45Hz, while the wall panels absorb mainly above 400Hz, but are still quite absorbent at 200Hz. At very high frequencies, the tiles are slightly reflective, something the manufacturers describe as 'soft diffusion'.

The company also points out that all foam tiles are flammable to some extent, even those made of fire retardant materials (it seems the Canadian regulations on this are tougher than ours) so, while they are fire resistant to a reasonable extent, care must still be taken by the user to determine suitability. Apparently the foam may also be coloured by spraying it lightly with a latex-based paint.

Using this system, a typical project studio can be treated for between £600 and £1200 pounds, which is not a lot to pay for a tidy and effective solution. Kits are also available for treating vocal booths. I found the installation simple and was pleased with the results — there was a noticeable improvement in clarity, imaging and evenness of bass. I would agree with the manufacturers when they say that the only way to get a perfect room is to have it designed and built by studio professionals, but as a real-world solution for project studios, the Primacoustic approach certainly works and I look forward to doing more mixes using it. SOS

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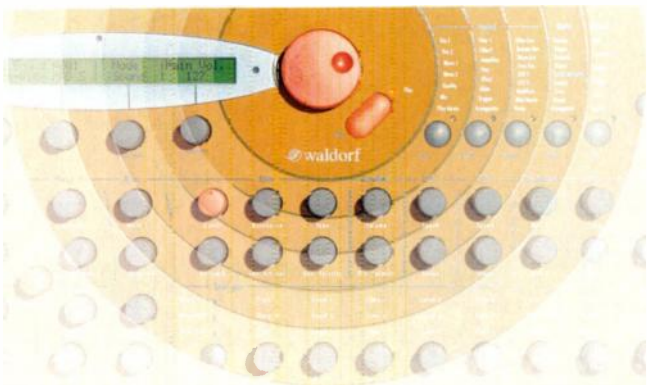
Waldorf Microwave Masterclass

The Microwave synths are complex beasts, so here are some hands-on tips to help you get the creative results you're after, without spending all your time programming.



Original photo: Mark Ewing

Richard Leon

Although the Microwave's specs may not look particularly special — two digital oscillators, a digital filter, a couple of LFOs, four envelopes, an arpeggiator, and some simple effects — these basics add up to far more potential for creative sound design than you might expect. Each of the elements has an interesting spin on it that makes the Microwave-series synths stand out from their virtual analogue counterparts. The standard ten-voice Polyphony may also seem low, but the sounds can be so ear-bendingly huge, detailed and brash that I find I don't often miss Waldorf's 20-voice expansion kit. Where other synths only start to shine when you pile on the notes, some sounds the Microwave makes are just too big for chords or complex Multis.

The secret behind the Microwave's sound is its oscillators. These use a wavetable system based on that pioneered by Wolfgang Palm in the PPG synths of the '80s. If you're expecting DX7-style clangs and weedy brass blarts from these digital oscillators then you'll be surprised to find that what you get instead is plenty of grunge and grit. This is lo-fi digital, 180 degrees away from the current fad for 24/96 quasi-perfection. The oscillators use eight-bit resolution instead of 12 or 16, and aliasing and other digital nasties are part and parcel of the Microwave's distinctive sound. Each oscillator keeps a wavetable — a sequence of 64 different but approximately related waves — in memory and can sweep through these tables manually using the knobs on the panel, or with the help of any of the internal modulation sources. These sweeps are another important element of the Microwave's unique timbres, and a big part of mastering the Microwave is working out exactly how to drive the wavetables to get the most out of them.

Getting Started

As a starting point, let's begin with something familiar — analogue simulation. The top three waves in each wavetable are set permanently to saw, square and triangle shapes. The analogue-like 24dB filter can take these and convert them into a good, if not quite perfect, rendition of those fat analogue brass, string and pad sounds everyone loves. If you use the Startwave knobs to skip to these top waveforms (they're the same in every wavetable), make sure no wave modulation is being applied, and add some outboard compression, the Microwave can do a good simulation of a Yamaha CS80 at its brassiest and most Vangelis-like.

But the Microwave is definitely at its best when the wave sequencing is at full tilt. This is where you find that these analogue waves can cause you problems. Once you start experimenting with wave modulation, you find it's easy for modulation sweeps to cross them, presenting the unwary programmer with unexpected results. The practical solution is to make sure that modulation control is always limited to a range between zero and 60, and this is easy enough to do. The Mod Matrix — about which more below — normalises inputs and outputs to a sensible range automatically. For wavetable sweeps, make sure that the total of the modulation amount and the Startwave knob is never more than 60, and you'll never have to listen to a sound that switches from a beautiful digital sparkle to a brassy blart when you least want it to. That said, you'll find that deliberately dipping into the sawtooth wave can sometimes be interesting when done with a random LFO source — you get a sound that starts digital, and turns analogue every once in a while. If you want to program a reverse sweep, offset the Startwave to +60 and then add modulation from zero to -60. Since there are two oscillators, you can create some wild and unlikely effects by modulating them in different directions from the same source.

The waves themselves are a mix of representative conventional synth techniques and sample-like waveforms. Many were imported wholesale from the original PPG Wave 2.x series. This may sound like a good thing, but the sound of the Microwave is only superficially similar to

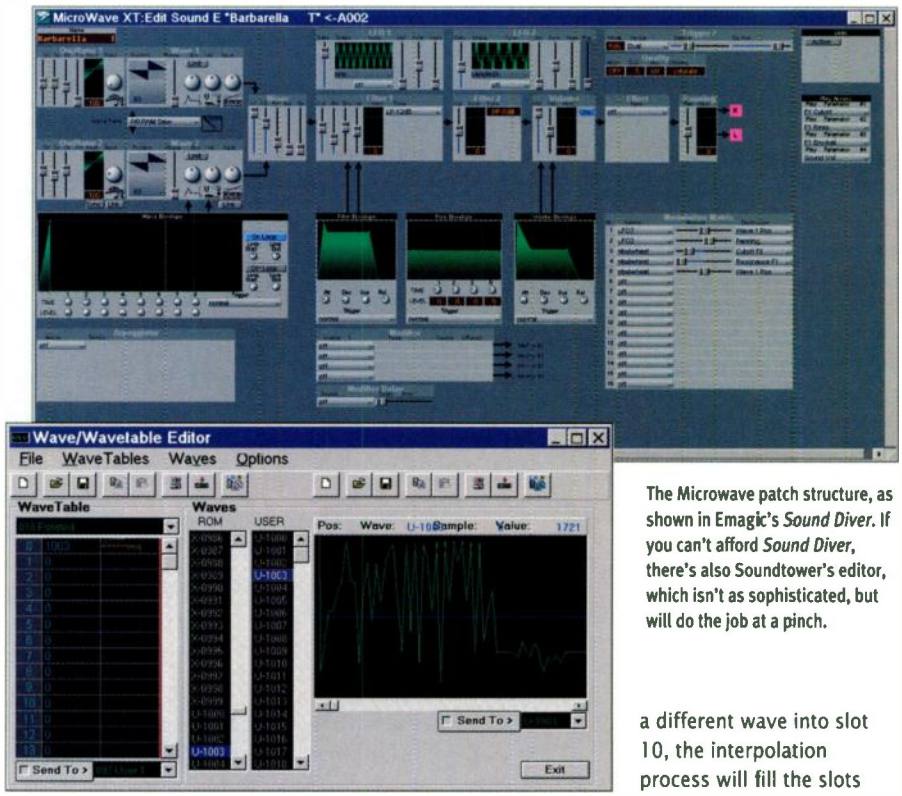
Because there are three standard analogue-style waves at the end of each wavetable, setting the Startwave control too high can cause sudden harsh timbral changes when wave modulation is used.

that of the PPG. The analogue filters in the latter make a big difference, and the sound of the PPG is generally much sharper and cleaner, with faster envelopes. The result is that the Microwave has some legacy waveforms that are perhaps less than essential. Worst space-wasters are the resonant filter simulations, which don't do anything you can't copy in other ways. You might think further filtering using the Microwave's own filter would create some nice double filter effects, but unfortunately that doesn't seem to be what you hear when you try it. Slightly more valuable are pulse-width sweeps, as there's no other easy way to create pulse-width modulation effects with the Microwave. The others provide a range of sound sources that vary between the subtle and the extreme. Describing all the waves in detail would fill most of this issue, so I'll just point you at the Carbon111 web site if you want that information (see 'Web Resources' box).

The easiest way to audition each wavetable is to set up an envelope — perhaps even the wave envelope — to sweep through the table fairly slowly. If you'd rather do it by hand, linking the mod wheel to the wave step can also be revealing. Don't forget that, while most wavetables include fairly smooth transitions between steps, the sound they create can be modified drastically by controlling them from a stepped modulation source. Because some waves have a weak fundamental under much stronger higher harmonic content, this can have the effect of stepping the pitch as well as the timbre.

Setting Up Custom Wavetables

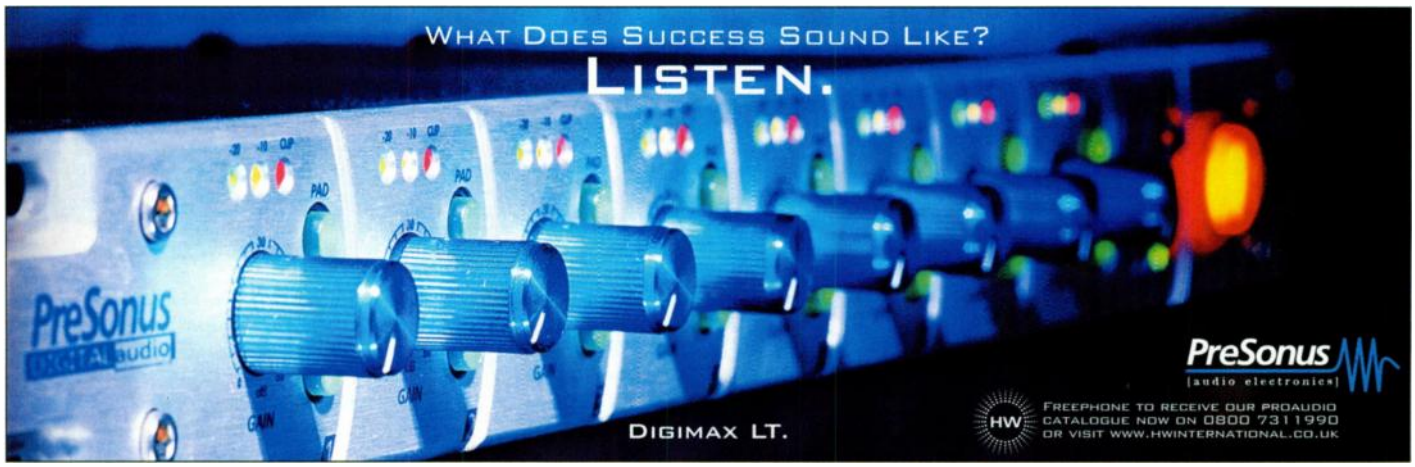
It's one of the quirks of the Microwave that both the factory presets and the built-in wavetables are relatively unadventurous — they don't really show off the machine's capabilities. Creating your own waves and wavetables requires some persistence, but the results are definitely worth it. Unfortunately there's no built-in tool for this, so you need external software. The best option is undoubtedly Emagic's *Sound Diver*. Apart from being a supremely useful editing tool and patch librarian for other synthesizers, it also happens to offer the most comprehensive wavetable creation and management utility available for the Microwave.

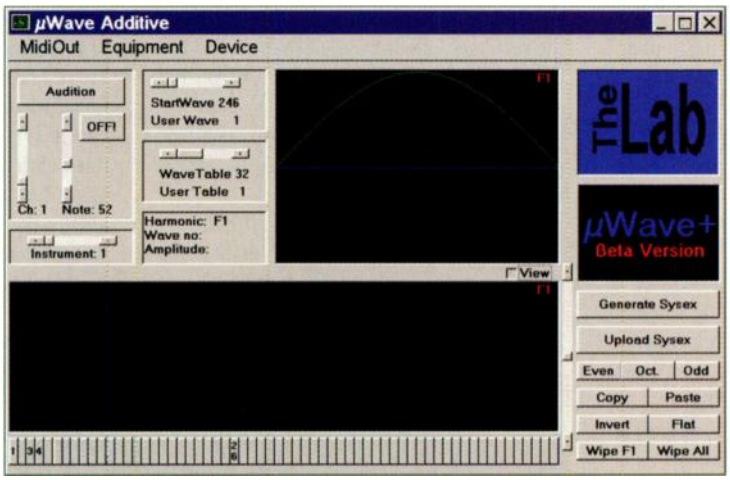


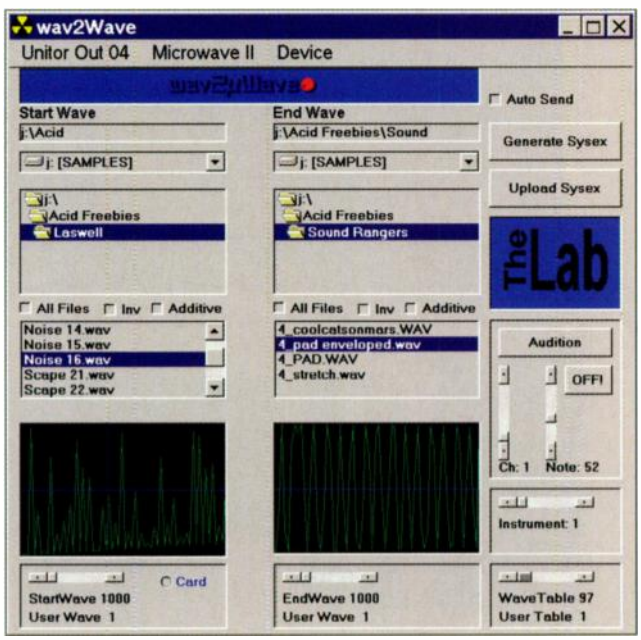
The Microwave patch structure, as shown in Emagic's *Sound Diver*. If you can't afford *Sound Diver*, there's also Soundtower's editor, which isn't as sophisticated, but will do the job at a pinch.

Sound Diver's editor gives you very simple and clear access to the hundred user wavetables and the waves that are used to put them together. Each wave is a single oscillator waveform, held in a special memory area that isn't accessible from the panel. To create a wavetable, you slot one or more waves into a wavetable buffer. There's no reason, apart from tedium, not to fill 60 wave locations with 60 waves of your choice. (Don't forget the top three waves are filled with analogue preset waves.) But it's easier and quicker to rely on the Microwave's built-in interpolation feature to smooth out your waves for you.

If you put a wave into slot zero, and a different wave into slot 10, the interpolation process will fill the slots one to nine in a 'join the dots' kind of way. You can repeat this for as many slots as you like until your table is full. You could even fill an entire table with just two waves, with the Microwave interpolating between them for all sixty steps. As a rule of thumb, the number of interpolation steps controls how smoothly, or not, the







The *µwave+* utility makes additive synthesis for wavetable creation easy, and *wav2µwave* creates interpolated waves from your favourite samples.

▶ waveforms change as you modulate them. The more steps, the smoother the changes. *Sound Diver* labels these steps with an interpolation tag, to distinguish them from real waves held in memory. One 'gotcha' is that, during performance, the interpolation process isn't instant. When you select a wavetable — which usually means when you select a new patch — the Microwave thinks about your request for a noticeable fraction of a second while it calculates the required interpolations and copies the resulting table to the active oscillator buffer.

It's yet another quirk of the Microwave that, if you naively expect this process to morph timbres (for example fading smoothly between a square and a sawtooth) you'll be in for a surprise. The interpolation actually works on wave shapes, and these are only indirectly related to timbre. To interpolate timbres smoothly, you'd really need to work out the spectrum of each wave and interpolate between those instead. That's a much bigger job, and one that would leave the Microwave's processor spinning its wheels for an hour or two instead of the fraction of a second that the simpler kind of interpolation needs. But this isn't a bad thing, because the result is that you get a serendipitous smooth-ish blend of new waveforms that bears some resemblance to the originals, rather than a predictable sweep. While it's not totally controllable, it also leaves some room for surprises.

Generate Your Own Waves

If you prefer to specify wave spectra, rather than wave shapes, *Sound Diver* includes an editor that lets you perform additive synthesis for each wave, using partials from the fundamental up to the painfully shrill 63rd harmonic. This sounds fun, but in practice anything beyond about the tenth harmonic will usually drive you and your dog insane, so it's better to make interesting changes with the lower harmonics than to literally pull out all the stops.

In any case, additive synthesis isn't the only option. There's also the UPAW (User Programmable Algorithmic Waveform) system, which can use FM, pulse-width modulation and other algorithms to create wavetables. With UPAW you can create a range of traditional clangy, buzzy and otherwise very digital wavetables, with interpolation controlled automatically. In practice, UPAW is an excellent digital synthesis tool kit and, although the learning curve isn't trivial, you'll find it's capable of truly original digital sound creation.

If you can't afford or don't want *Sound Diver*, Soundtower make a Microwave editor for $35. It's not quite up to *Sound Diver*'s standard, but it does give some degree of control over waves and wavetables. Waldorf's own web site also includes some handy downloadable wavetable hacking utilities. While these aren't in the same league, they give you an alternative way in. Anyone who always wanted a Fairlight, but could never afford one will enjoy playing with *µwave+*. This ▶

The Wave Series

It all started in the early '80s with a digital synth Wolfgang Palm created for synth rockers Tangerine Dream. This was based on an early version of the same wavetable system that's used today. As an instrument, the original experimental design was too unwieldy and expensive to sell, and was eventually packaged into the PPG 2.x series. This combined eight digital oscillators with digital envelopes, analogue filters and an arpeggiator. Although the PPG series is regarded as a classic, PPG as a company overstretched itself and disappeared, leaving the wavetable idea to languish in the studios of collectors and working musicians.

Then came new owners Waldorf, and the new wave series. Waldorf hired Wolfgang Palm to create an updated model, and the original Wave was born. It was, and still is, a hybrid monster, with a huge panel, digital oscillators, analogue filters and a sample analysis system that converts any given sample into a set of wavetables. Released in 1993, it was at least 10 years ahead of its time, although it took Waldorf at least half that time to iron out all the bugs! It also had a huge, professional price.

The Microwave was an attempt to repackage the technology in a more accessible form. The Microwave Mk I used digital parameter access, which made it almost impossible to program without a patch editor — although it did have a rather funky speech synthesizer built into it. The Mk II model replaced the Mk I's analogue filters with digital simulations, and unfortunately dropped the speech synth. Then came the XT, which added 44 knobs, and finally allowed proper hands-on programming. An XTk model added a keyboard. In terms of SysEx, the XT and the Microwave Mk II are functionally identical. (There was also a drivebay-sized Microwave system marketed by Terratec for a while. This had some drawbacks which made it less easy to work with than the hardware versions. But again, it was functionally identical.)

The differences between the Wave and the Microwave XT are smaller than you might expect. Apart from a smaller LCD and digital rather than analogue filters, the sound engine is very similar. The XT also lacks the Wave's resynthesis features. If you want those, you'll need external software.

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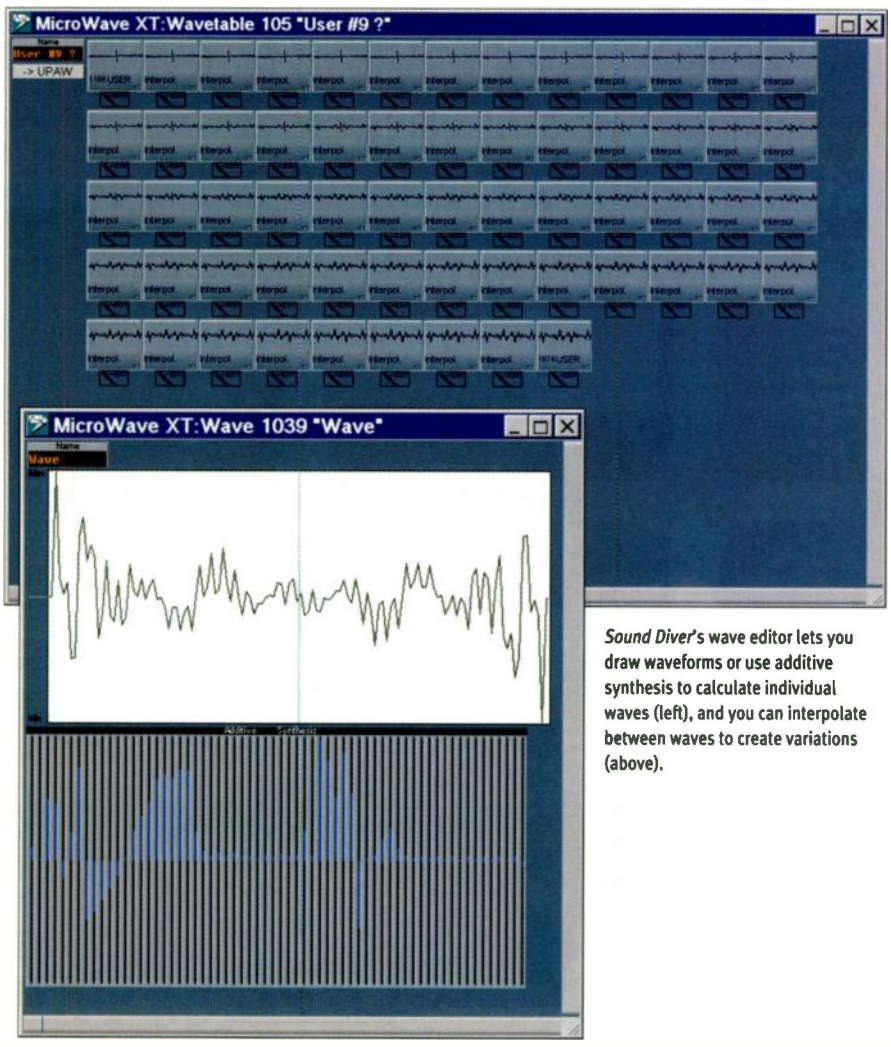
lets you control the level of each harmonic up to the 50th in each of the 60 waves in a table. It's fairly unwieldy in use, but capable of interesting results with a little practice. *wav2µwave* offers extreme interpolation, letting you pick small chunks of two real samples and interpolate between them. Again it's quite crude, and not at all intuitive, but can be fun to play with. *Raw2wave* is a slightly strange picture-to-wavetable conversion tool. You can use it to define harmonic content graphically — although this requires being able to draw with pixel accuracy, which is more than most people have patience for. It's much easier, and more creatively lateral, to use it to convert pictures of your friends, neighbours, pets, enemies, and so forth to wavetables. Finally, those with *über*-geek skills will appreciate having the UPAW C source code available to play with. The code compiles to a command line program which can create SysEx wavetable files ready for dumping via MIDI.

What about converting samples to wavetables? You can't sample directly into the Microwave — it doesn't have the memory for samples, and isn't designed for sample playback. You can create sample-like effects, but this is an incredibly tedious process. The least painful way to do it is to take representative screen grabs of single cycles throughout a sample (any sample editor will do the job here) and convert them to waves visually. You have to fade each wave to zero at the extremes to avoid nasty rasps and clicks at the zero crossings. There's no utility that can do this automatically. If you want the option, you'll either need to steel yourself for lots of late nights and coffee, or start saving for Waldorf's big Wave, which has resynthesis software for exactly this job built in.

Mixer & Filters

The Microwave's mixer seems conventional enough — you can add noise and a ring modulator output as well as the sounds of the oscillators themselves — but has an intriguing Quality page which can be used to add even more dirt and nastiness. Setting Aliasing to anything other than Off allows high frequencies to fold back audibly. It's a subtle effect that's most obvious with medium- to high-pitched notes, and sounds a little like extra ring modulation. Timequant sacrifices pitch accuracy for yet more digital grunge and fizz. Clipping can create insane digital shrieks by distorting waveforms into oblivion. Saturate is the polite option here, and should be chosen for analogue simulations. Overflow wraps saturating waveforms around the extremes, so where the waveform would usually clip it dips downwards instead, creating a spray of extra overtones. This one page on its own should be a favourite with every Microwave owner. It creates and enhances the Microwave's digital character at least as much as the oscillators themselves do. There's also an Accuracy setting here, which adds some pseudo-random detuning for extra analogue-style fatness.

Past the mixer are the filters. There's a lazy 6dB high pass, but it's not good for much beyond removing bass thumps and floppiness, and cleaning up the low end of pads so they don't dissolve into mush. The other filter is more useful. Its standard analogue LP/BP/HP modes sound as you'd expect them to, and the Dual LP/BP is good for Jarre-esque phasing — later OS versions have some notch and band-stop filters which are even better for this. The Sin(x)>LP, FM and Waveshaper filters are ideal for adding digital punch to sounds. They seem to be good at adding hollowness, body and controlled distortion, more or less in that order, and are excellent for spiky and chunky basses and shrill leads. The S&H filter provides the ultimate in digital destruction, and can reduce most sounds to a wall of distorted digital noise. It's too powerful for most musically recognisable sounds, but should be your first choice if you want something aggressively abstract.



Sound Diver's wave editor lets you draw waveforms or use additive synthesis to calculate individual waves (left), and you can interpolate between waves to create variations (above).

Creating New Patches

If fine control of all the main sound parameters sounds too much like hard work, there's an easy way to explore what the Microwave can do — the built-in patch randomiser. Hold down the big red Shift button, push the Utility switch, twirl the big red knob to the far right and then back a step, and hit Utility again. This will present you with some astounding sounds — monstrous wails, shrieks and screams, twittery aliased digital noise, carpet-wobbling throbs and drones, and tortured short-wave radios. You'll usually find that these sounds evolve over seconds and even minutes. They'll also change with every note you play, respond to your playing in unexpected ways, and generally sound like nothing you've ever heard coming from a synthesizer before.

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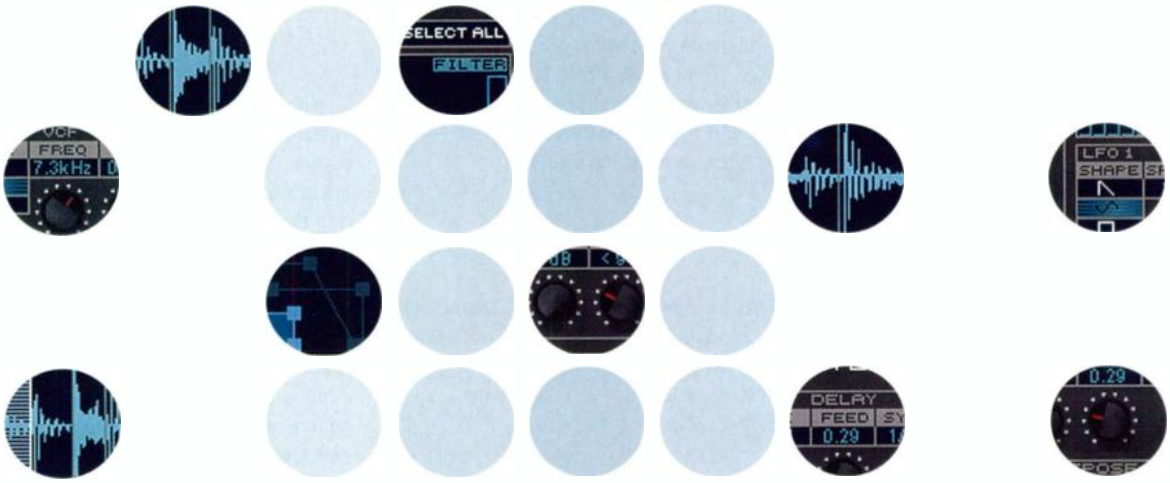

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Moving through different wavetables by hand while you're playing can produce really extreme effects.

random patch you get will be rather abstract — great for industrial experimentation, but not easy to place in the context of the kind of music most of us willingly listen to. But this is really a blessing in disguise. Once you understand your Microwave you can make some fairly simple changes to tone down the extremes and give yourself something more playable. A lot of the complication comes from the modulation matrix, which includes some creative innovations that you won't even find on a big modular. Understanding this matrix can go a long way towards unleashing the full power of the machine.

If you've ever used the modulation matrix on other machines, the source and destination settings will be obvious enough. There's the usual range of LFO, envelope and MIDI sources, with a couple of useful extras including MIDI clock, release velocity (your keyboards probably won't handle this, but your sequencer might) and a useful control delay. You also get the usual range of destinations, including pitch, filter cutoff, waveform, noise and ring modulation amount, and various envelope parameters.

Buried in the list of sources are four intriguing extras called modifiers, which are at the heart of the Microwave's creative possibilities. They let you process and combine any of the sources, and then route them back to the main matrix. The processing can use basic arithmetic and Boolean AND, OR and XOR operations. There are also max value, min value, lag (glide filter), a ramp generator, a differentiator and a sample and hold. If this sounds like rocket science, that's because it can be — at least when you're trying to think of creative applications for the first time. But it's not as bad as it looks, especially if you dip into it slowly. As a starting point, let's say you want to control the LFO2 amount so that it only kicks in when you step on the sustain pedal. Use the multiplier option to multiply LFO2 by the sustain pedal output as follows.

Source #1	Source #2	Type	Parameter
LFO2	Sust. Ctr	[*]	127

The sustain input will be zero or one, depending on whether or not the pedal is pressed. To hear the effect, take the output of modifier one through the modulation matrix and route it wherever you want — filter, pitch, or anything else.

Source	Amount	Destination
Modify #1	+60	Pitch

That's a very simple example. The power of the modulation matrix comes from being able to combine interesting sources in interesting ways. For example, try the following setup:

Source #1	Source #2	Type	Parameter
LFO1	LFO2	XOR	127

Set both LFOs to a fairly slow speed, and route this setup to the Osc 1 wavetable position. The XOR effect can produce a semi-sequenced S&H-like effect. What you hear is something that's clearly not totally random, but not totally predictable either. Setting Type to AND or OR will give variations on this theme. By syncing both LFOs to the clock and running them at different but related multiples, you can create a repeating and predictable step sequencer effect. (Given that the longest clock sync period is 128 bars, this can be a very big step sequencer indeed!) Changing wave shapes will give you different sequences, as will other Type settings. As is often the case, you can get a long way by experimenting at random here.

For a more complex example, let's create an effect for live use that sweeps the filter upwards when we stomp on the sustain pedal — useful for modifying sequenced dance music. Use the sustain pedal input and route it through the ramp processor.

Source #1	Source #2	Type	Parameter
Sust. Ctr	<ignored>	Ramp	<variable>

This will start a ramp whenever the sustain input changes from zero to one. The parameter controls the ramp time. Settings are arbitrary, so you'll need to experiment to find the time you want. You now have a filter sweep that acts just like a spare envelope, and can be triggered at will.

The Microwave's envelopes are straightforward enough. There are four of them — two ADSRs for the filter and amp, a four-stage envelope with sustain for general use, and a massive eight-stage envelope with programmable loop points for controlling wave sweeps. The big problem with the envelopes is that the attack is too slow. If you want sounds with an instant-on slap, you can fake this by sacrificing one of the LFOs for envelope use, setting it up as a slow square wave source synced to the keyboard, and using the modulation matrix to route it to the amplifier level. The results still tend to be disappointing, though, and it seems to be impossible to get the kind of analogue-style punch from the envelopes that some other machines can provide.

Still, the modulation possibilities go a long way to making up for this. You can use the modulation matrix to patch any envelope to any destination, although the wave and filter envelopes are hard-routed via panel knobs for convenience. You can also do clever stuff, such as routing the wave envelope through a differentiator to turn the ramps into constant steps — turn on looping, and again you have a programmable eight-way step sequencer, with time and amount individually variable. A useful trick here is to use this to control timbre through oscillator sync. Turn on the sync for oscillator two, feed the processed wave to oscillator two's pitch, mix in some ring modulation, and you have an extremely digital-sounding sequence. Because the Microwave's wavetables aren't analogue, sync tends to sound extremely harsh. For even more extreme effects use the red

The Microwave's Arpeggiator

Multi mode with arpeggiation is one of the coolest things you can do with a Microwave, creating mini songs and loops with a single key press. The arpeggiation isn't entirely obvious, so I'll explain it in detail here.

In Sound mode, the arpeggiator plays one of 16 fixed patterns, or a user programmable one. This can be driven either by internal tempo control, or external MIDI clock. The arpeggiator includes up/down/random modes, and MIDI sync includes useful tempo subdivisions, including triplets. Programming is a slightly tedious process of setting up a step count, then moving through each step in turn switching a trigger on or off. While it's fiddly, the display shows clearly what's happening.

In Multi mode you can layer sounds so that each is arpeggiated with its own settings, or you can create custom settings for that Multi. For the former, make sure Active is set to Sound Arp, and that the User option is selected under Pattern. For the latter, you can select independent patterns and clock subdivisions.

One obvious application is a four-on-the-floor kick and a jingly hi-hat. Use a two step sequence with a suitable subdivision ratio to get two kicks per bar. Then dial up one of the many hi-hat sounds for another instrument, and play with the patterns till you find something that works. From here it's easy to add a throbbing repeating bass. With larger clock ratios it's possible to create sequences where sounds cut in and out in a very complex pattern. A good creative tip is to try this with non-percussive sounds, to create unique repeating textures. You can even use pad sounds to flesh out the mix.

Web Resources

- The Carbon111 site is a supremely useful resource for all things Microwave related. Includes new wavetables, links, programming tips, and other information. It also has useful verbal descriptions of each table, with spectral and waveform plots for each of the waves.
  W www.carbon111.com/mwxt.html

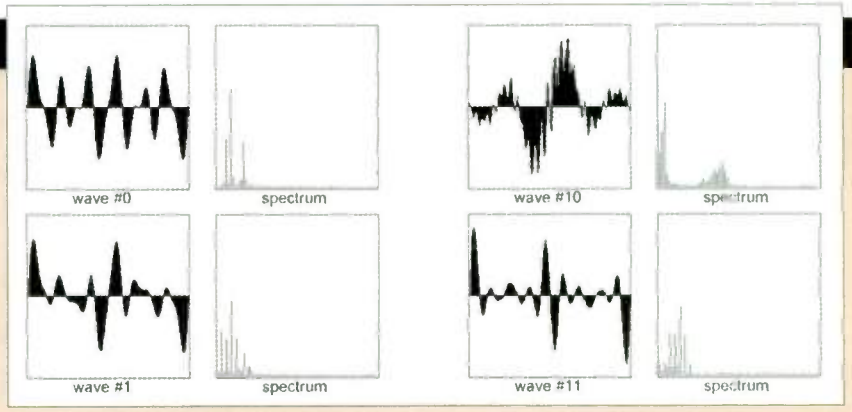
- Soundtower's site has a Microwave editor available for download.
  W www.soundtower.com/synth/microwave.htm

- The Consequence's Waldorf page has MP3s and programming information.
  W www.sequencer.de/waldorfme.html

- Here's are some useful and practical descriptions of the Microwave's wavetables.
  W www.xs4all.nl/~hkwad/waldorf/wavetables.html

- Yahoo's inevitable discussion group for all things Microwave XT-related.
  W groups.yahoo.com/group/xt

- Waldorf's own Microwave XT page has links to sounds, FAQs, and the FTP area.
  W www.waldorf-music.com/microwave_xt/



You won't find spectral plots of each wave in the manual, but they're available at the Carbon111 web site.

Wavetable selector knob to sweep through the wavetables by hand until you find one that sounds good. For more extreme effects still, you can use the wave envelope to sweep the wavetables while all this is happening — although you'll often find this dissolves into digital noise for all but the most mellow of wavetables.

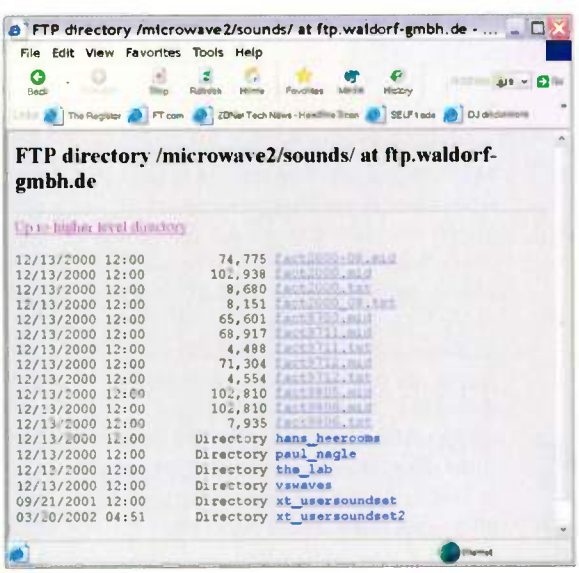
Patch Libraries

Not everyone wants to spend all their time programming. If you're looking for the easy but accessible option, Waldorf's site includes some patch sets, both for free and for the cost of a minor dent in your credit card. In the former group are all of the various factory sets that have been created over the years. As with many factory presets, these don't really show off the instrument at its best. Better options are the two free user-created sets on the site, which are much more creative. There isn't room here to pick out individual patches for praise, but if you own a Microwave these sounds are essential. It's also worth downloading the No Filter set, just to demonstrate the power of the wavetable system with minimal extra processing. All the above (and more) are free from Waldorf's FTP area.

Waldorf also offers a collection of commercial sound sets for 50 Euros plus shipping. The techno/dance and ambient sets are the ones to go for here, with the industrial set trailing not far behind. If you have the user sets, these commercial collections will expand the range of sounds available, rather than sending you off in new and completely unexpected directions. So don't expect any real surprises — just some very useful sounds with plenty of character. The rest of the commercial sets have perhaps less of an obvious immediate appeal, although if you're relying entirely on the Microwave for all your sound generation, they can still be worth considering. The production set offers some relatively polished patches, and the analogue simulation set will be useful for anyone looking for some relatively restrained and much more familiar sounds.

One thing to note here is that the Microwave has some SysEx problems. An attempt to update the entire memory can leave it chewing over part of what you sent while you look at a 'reorganising memory' message. The Microwave doesn't get confused about the patches it misses. It just diverts its attention to an internal garbage collection and defragmentation routine in the middle of a dump — sometimes more than once. Updating the system firmware doesn't seem to make a difference. In practice this means that you'll almost certainly have to send a dump from your sequencer or editor two or three times before all the patches appear as they should.

To get the best out of all these patches, it's worth feeding the Microwave's outputs to your outboard gear for further enhancement. Without post-processing, the Microwave's character can be a touch flat and remote, and, at its very worst, it's reminiscent of the digital blasts and zips from an old eight-bit microcomputer. But compression seems to add body and bring out the detail, and it also enhances any analogue simulations you're attempting, so much so that you might want to consider leaving it patched in permanently. I find that the multi-band compression on my Dbx Quantum seems to be particularly effective — there seems to be an unexpected synergy between this machine and the Microwave, more so than with other synths and other Finalizer-type tools, which seems to bring out extra depth and weight in the sound. Simpler and cheaper compression can be nearly as helpful too, especially if you use more extreme ratios — at least 4:1.



Want sounds? The Waldorf FTP site has plenty for free, including some from *SOS* contributor Paul Nagle.

Microwave Winner

It would easily have been possible to fill twice this space with information about the Microwave. Once you get past its cosmetic attractions, it turns out to be one of the deepest non-modular synthesizers you can buy, and it's possible (with some effort) to do almost anything with it that you can do with the much more expensive Wave. Now, if only it'd heat up slices of pizza as well... SOS

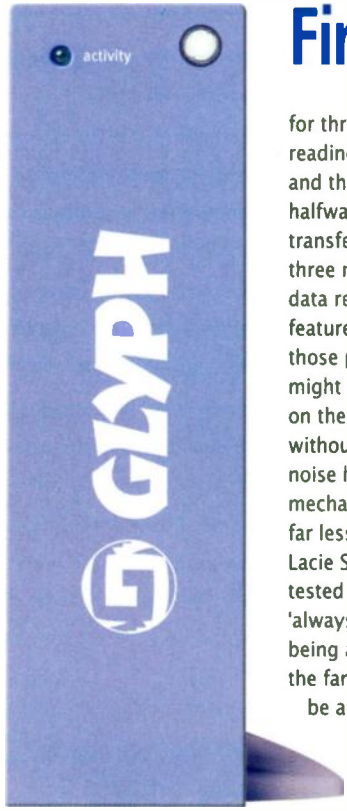
Glyph Companion

FireWire Hard Drive

Mike Watkinson

As well as matching the looks of Digidesign's M Box, Glyph's new desktop FireWire hard drive incorporates some innovative features designed to increase reliability and reduce acoustic noise.

Glyph have a history of producing hard drives whose enclosures sport case design which matches equipment by other manufacturers. The X Project for the Digi 001 and the M Project for the MOTU 828 are notable examples, and are endorsed by the respective manufacturers. The Companion drive reviewed here is designed to partner Digidesign's M Box (reviewed in *SOS* June 2002 — see www.sospubs.co.uk/sos/jun02/articles/digidesgnmbox.asp) but in terms of performance these two units are in different leagues, not least because the M Box is a USB device, with all the limitations that implies, and the Companion is FireWire. Both are 'low-end' in terms of their respective manufacturers' product ranges, but the Companion features several design enhancements not yet found on other Glyph drives.



Heavy Metal

The casing is constructed from a sandwich of two metals with a neoprene-like filling, which Glyph call QuietMetal. This is designed to reduce noise and dampen the vibration caused by the drive mechanism, which might interfere with its operation. This composite also conducts heat away from the mechanism, which has allowed Glyph to fit a thermostatically operated fan. When I tried it, this came on only after the drive had been switched on for three hours sporadically reading and writing data, and then only when it was halfway through a 10GB file transfer (ie. approximately three minutes of continuous data read/write). This feature should appeal to those potential users who might keep the Companion on the desktop, since without the fan on, the noise level of the drive mechanism is very low — far less than that of the Lacie Studio Drive it was tested against, whose fan is 'always on'. However, not being able to predict when the fan will switch on might be annoying to those who are recording in the same room as the drive.

The drive was supplied with a mains cable, FireWire cable, instruction booklet, software installation disc and warranty card. The three-year warranty (with 24-hour replacement in the first year) is one of Glyph's main selling points. A feature of the drive's firmware is 'self-monitoring, analysis and reporting technology' (SMART) — which, in Glyph's words, protects "your data with predictive failure analysis to warn you of issues with your storage subsystem before it's too late". Combining this with the warranty should mean that you will never suffer drive failure on a session, since you can predict failure and organise backup and drive replacement before that crucial session.

The instruction booklet is short on text and long on humour, since this device is truly 'plug and play' if you have Mac OS 9 (with FireWire Enabler 2.8.1 or later) or Mac OS X. The software disc contains the relevant extensions if you don't have them installed, although it would be advisable to check Apple's web site for the very latest versions. Also included is Glyph's *Audio Storage Toolkit* (a bespoke version of FWB's well-respected *Hard Disk Toolkit*) which is a set of utilities for maintaining and using the Companion. One part of this suite of utilities whose actions cannot be replicated by features which exist in Mac OS is the Mounter, which enables you to remount a drive which has been

Test Spec

- Apple Powerbook G4 800MHz with 133MHz system buss and 512MB RAM, running Mac OS 9.2.2.
- Tested with: Emagic *Logic Audio Platinum* 5.3.0, Atto *Express Tools* 2.6.

SOUND ON SOUND

Glyph Companion £410/£469

pros

- Cutting-edge performance.
- Styled to match Digidesign's M Box.
- Three-year warranty, with 24-hour replacement in first year.

cons

- Cooling fan cut-in is unpredictable.
- Styled to match Digidesign's M Box.
- Expensive.
- No Windows formatting utilities supplied.

summary

The Glyph Companion is a stylish, high-performance FireWire hard drive with state-of-the-art construction, an excellent warranty and a price to match.

Hard Drive	44.1kHz/ 16-bit 'large'	44.1kHz/ 16-bit 'small'	96kHz/ 24-bit 'large'	Average seek time (ms) 24-bit 'large'	Sustained read rate (MB/s)	Sustained write rate (MB/s)
Lacie Studio Drive	84	23	33	10	24.7	23.4
Powerbook internal drive	53	17	23	-	17.4	18.1
Glyph Companion	79	30	32	8.2	30.9	29.9

un-mounted, without physically removing then replacing the FireWire cable (both un-mounting and formatting can be achieved by Mac OS, if required).

Performance

I tested the Companion using the same techniques described in my article Firewire Drives For Music Part 2 in *SOS* April 2002 (www.sospubs. co.uk/sos/apr02/articles/firewire2.asp). Results were as the table above.

In both 'large' file tests, the Lacie outperforms the Glyph by a hair. The Glyph, however, trounces the competition when playing back short files. This confirms its better seek time; actual measured transfer rate is marginally worse on the Lacie, which runs counter to the real-world tests using continuous audio files. How a drive performs in practice is not necessarily something that can be predicted from benchmark testing. The same phenomenon was noted when the Lacie was tested against the Glyph M Project (see the above-mentioned article and also FireWire Drives For Music: 24-bit/96kHz Operation in *SOS* August 2002 and at www.sospubs.co.uk/sos/aug02/articles/firewire.asp), suggesting the use of a similar drive mechanism and bridge circuitry.

Perceptual performance benefits due to new technology are hard to gauge, and it's more likely that these will prove to be long-term gains in durability and reliability. The Glyph is highly priced for a hard drive but there are, as always, many ways to crack a nut. If a quiet, high-performance storage solution at desk level with a superb warranty is your requirement, then this is the drive for you. SOS

Supported Operating Systems

- Mac OS 9.x (FireWire Enabler 2.8.1 or later required).
- Mac OS X (10.2 recommended).
- Windows 98SE or later.

information

£ 80GB version £410; 120GB version £469. Prices include VAT.
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00030966	WINMAN 2X2 INTERFACE	49.99	79.99	30
00030973	YAMAHA CRW4416SYVK EXT CDR	199.99	299.99	100

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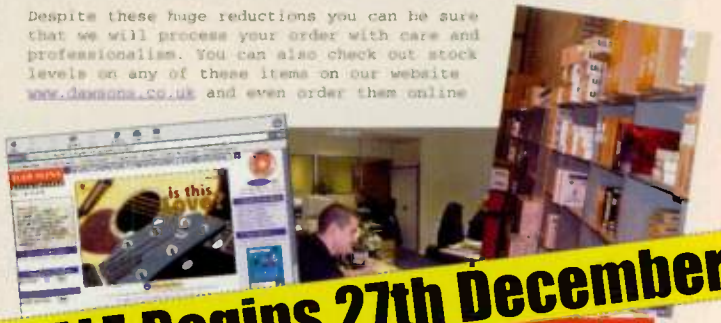

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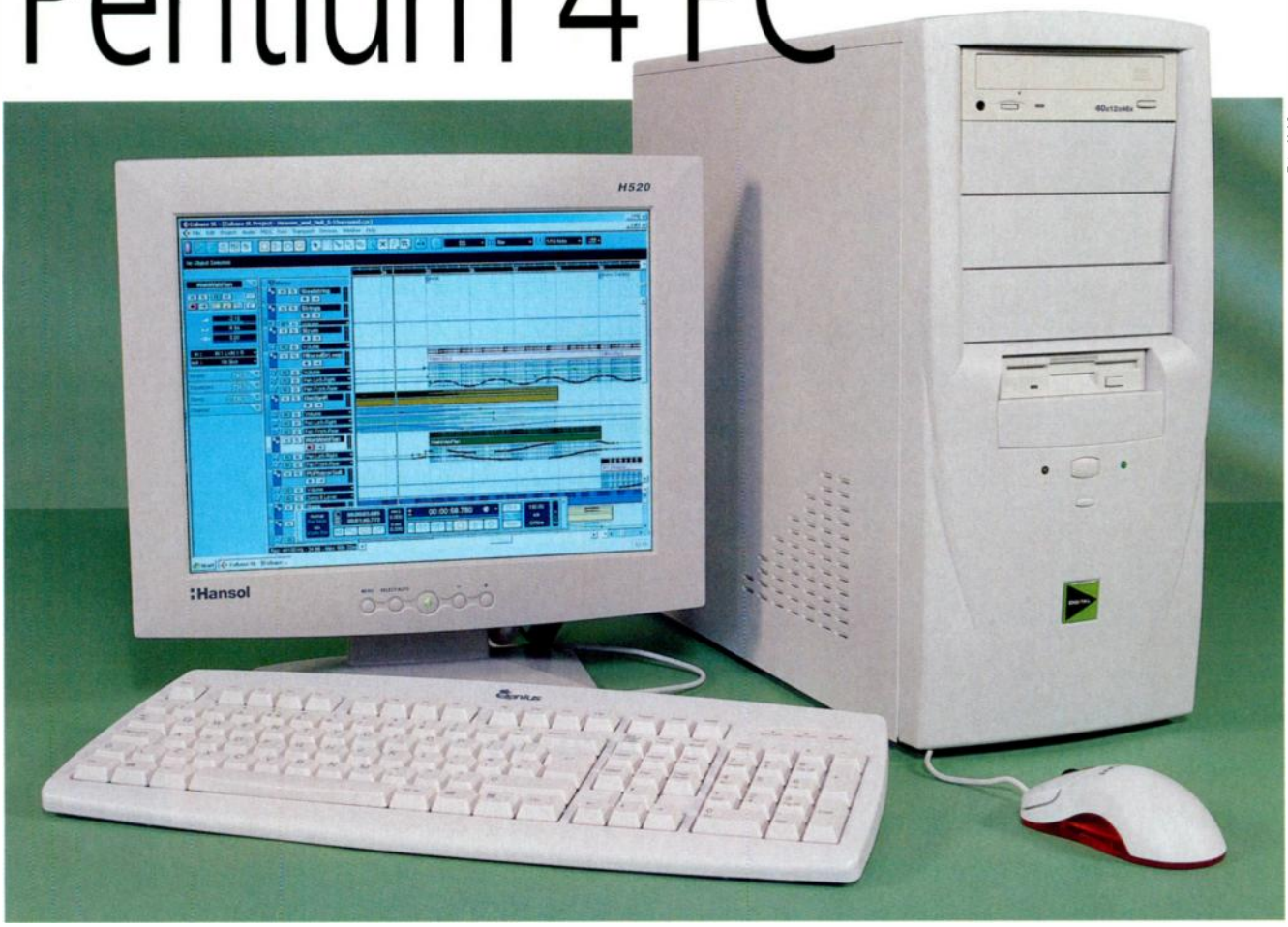
Digital Systems Pentium 4 PC



Photos: Mark Ewing

Digital Systems' PCs are claimed to offer low acoustic noise and excellent performance with music applications, without breaking the bank.

Martin Walker

Digital Systems may not be a familiar name to everyone, but for the last six years this Derby-based company has supplied leading music retailers with various PC systems built to the special requirements of musicians. With an impressive client list including Academy Of Sound, AMS Neve, Jigsaw Systems, Raper & Wayman, Sounds Live and Studiocare Pro Audio, there's a good chance that you've already seen one of their PC systems in a catalogue or *SOS* ad. However, from now on you can also buy them direct. Like all specialist music PCs, Digital Systems' machines are built to order, with the musician's choice of soundcard and music software along with any special custom requirements such as additional hard drives or DVD writer. Prices are likely to be similar whether you buy direct or through a DS client, and their PCs are always delivered by courier direct from Digital Systems, although display systems may be available to try out in music shops.

Digital Systems offer several completely different systems for the musician. All feature motherboards with the Intel 845E chipset along with an Intel Pentium 4

SOUND ON SOUND

Digital Systems PC £799

pros

- Excellent performance for the price.
- Low acoustic noise.
- A generous six USB 2.0 ports.
- Plenty of expansion potential.

cons

- System partition might benefit from a smaller cluster size.
- Keyboard's Power button might be a little risky for the ham-fisted.
- Some musicians might prefer to have a modem installed.

summary

The Digital Systems DS Tower System uses a clever combination of quality components and a standard beige case to produce a fast yet quiet PC at a bargain price.

Northwood processor, Zalman Flower cooler, 512MB of PC2100 DDR RAM, an 80GB Seagate Barracuda ATA100 hard drive enclosed in a SilentDrive sleeve, and Windows XP Home Edition. The DS Tower System reviewed here is intended for the 'price-conscious' musician, and uses a fairly inexpensive Midi Tower Case with a quiet 300 Watt power supply, along with a 2.0GHz CPU, for a bare-bones price of £799. For the 'professional and serious home user', the Whisper PC range is available either in a larger black Midi tower or 4U rackmounting case, complete with matching keyboards, mice and monitor screens. These cases are made of thicker material for even lower acoustic noise, while their PSU is a specially sourced 'Ultra Quiet' model. However, both ranges offer four 5.25-inch and four 3.5-inch drive bays in total, which should be ample for the vast majority of musicians.

The Whisper PC 2.0 is supplied with a 2.0GHz CPU like the review system, and the same ATI Rage 128 32MB graphics card, and costs £899 with the tower case or £999 for the rack version. As its name suggests, the Whisper PC 2.2 has a faster 2.2GHz CPU; it also boasts a Matrox G550 32MB dual-head graphics card for those with more ambitious display requirements. It costs £1099, while the rack version is again £100 dearer at £1199. All systems can be customised by adding additional hard drives, expansion cards and software, and all prices include VAT.

Review PC Specification

- Case: Advance Midi Tower case.
- PSU: 300 Watt, with temperature-controlled fan.
- Motherboard: Abit BD7II socket 478, with Intel 845E chipset running 400/533MHz system buss, and DDR266/200 SDRAM memory interface.
- Processor: Intel Pentium 4 2.0GHz 512kb cache (Northwood), 4 times 100MHz front side buss.
- CPU heatsink and fan: Zalman CNPS 6500B Pentium 4 Flower Cooler, 92mm Ultra Quiet fan with Fan Mate variable-speed controller.
- System RAM: 512MB PC2100 (DDR 266) CAS2 SDRAM.
- Hard drive: 80GB Seagate Barracuda ATA IV, model ST380021A, 7200rpm, Ultra ATA/100, mounted in Molex SilentDrive sleeve.
- Graphics card: ATI Rage 128 Pro Ultra GL AGP 32MB.
- Floppy drive: 1.4MB 3.5-inch.
- CD-ROM drive: Lite-On LTR-40125S, EIDE, 2MB buffer, 48x read, 40x write, 12x rewrite speed.
- Monitor: Hansol H520 15-inch diagonal, 1024x768-resolution TFT colour.
- Keyboard & mouse: Genius Comfy KB10X with optional palm rest, Samsung PS/2 optical wheel mouse.

- Installed operating system: Windows XP Home Edition.
- Installed soundcard: M Audio Audiophile 2496 with version 5.10.0.5026 drivers
- Installed audio software: Steinberg *Cubase SL* version 1.02.

Overview

Although the review system uses a low-cost Midi tower case from Advance, rather than an expensive aluminium or acrylic case, its internal components are of high quality: items such as the Zalman Flower heatsink/fan combination and Molex SilentDrive sleeve for the hard drive are popular with musicians who value low acoustic noise.

The motherboard in the review PC was the BD7II from Abit, one of the most respected manufacturers, which features an Intel 845E chipset along with Socket 478 CPU support to house a Pentium 4 processor. The BD7II is highly regarded for its stability and overclockability. Although most musicians won't be exploring this latter aspect, its Phoenix Award BIOS 'SoftMenu III' lets you fix the PCI and AGP buss frequencies at 33MHz and 66MHz respectively while you independently adjust the CPU speed, which can make for much safer overclocking, since many PCI expansion cards don't like the PCI buss going above 33MHz.

It's also notable for integrated features such as an on-board LAN connector from the 10/100MB Fast Ethernet controller, for linking to other machines in a network, and an ALC650 six-channel audio codec. However, these are unlikely to be required by musicians, and both had sensibly been disabled in the review machine's BIOS.

The BD7II provides a fairly standard two IDE sockets supporting up to four devices running Ultra ATA/33, 66 or 100 modes. The review model housed a roomy 80GB Seagate Barracuda hard drive as Primary Master, and a Lite-On CD-R/W drive as Secondary Master. This combination is perfectly adequate for most musicians, and exactly the same configuration was featured in both the Millennium and Digital Village PCs I reviewed recently. Only if you want to achieve a huge number of simultaneous audio tracks, or simultaneously run a powerful application like *GigaStudio*, would adding a second audio-only hard drive be advisable. In this case it might be preferable to use the more expensive Abit BD7II-RAID version of this motherboard (DS are happy to supply this as an alternative, with a slight price increase). This has four IDE sockets supporting up to eight IDE devices. Its additional IDE sockets use a Highpoint IDE Controller chip that supports Ultra ATA/133 mode, but as pointed in these pages many times before, musicians rarely benefit from the higher burst speed capability — it's the sustained transfer rate that's important for hard disk recording, so I don't see the lack of '133' support on the review motherboard as a limitation.

The BD7II supports Intel's socket 478 processor range, and the review model was fitted with an Intel 2.0GHz Northwood 'A' CPU, exactly like the Digital Village PC I reviewed recently. The Northwood 'A' front-side buss runs at 400MHz (100MHz quad-pumped), but the motherboard also supports the 533MHz system data buss required by the latest Northwood 'B' version, which is currently rather more expensive.

Sockets & Slots

Up to three 184-pin DDR DIMM modules can be fitted, supporting up to 2GB of either PC1600 or PC2100 RAM, and the review model was fitted with a single 512MB stick of the faster CAS2 PC2100 (DDR266) RAM. There are five PCI and one AGP expansion slots; some boards do offer six PCI slots, but few musicians will ever fill the five available, so I don't see this as a particular disadvantage either. In the AGP slot Digital Systems had fitted an ATI Rage 128 graphics card, which has a good compatibility record with music applications and hardware — I used one myself until I moved to a dual-head model. The only other filled slot in the review PC was occupied by one of M Audio's popular Audiophile 2496 soundcards, installed in slot four. No internal PCI modem was fitted, but I'm personally much happier buying an external USB one for around £30 and leaving another IRQ free.

Unlike the more typical USB 1.1 ports offered by the Digital Village PC, the Abit BD7II supports the latest USB 2.0 standard, although this won't benefit too many users at the moment, since according to the Abit web site, suitable motherboard drivers are only just becoming available. However, it's good to know that this support is built in at the hardware level, and that the motherboard supports a generous six ports — these are now needed more than ever as music software developers adopt USB dongle copy protection. Two USB ports are mounted on the motherboard itself, while two more pairs are each connected via Port Header sockets to dummy backplates. The case design incorporates an extra dummy slot beyond both PCI and AGP slots in the 'seventh' position, so only one PCI slot becomes obscured. However, even in the unlikely event that you need to fit more than three additional PCI cards, it would only take a few seconds to unplug and unbolt the ▶

second dummy backplate and revert to four USB ports.

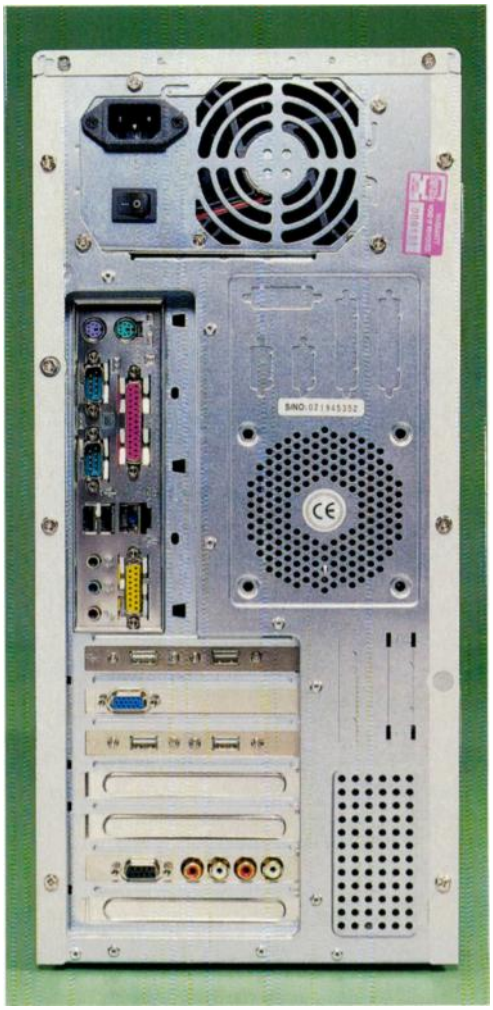
In fact, the motherboard provides quite an array of back-panel sockets. In addition to the usual two serial and one parallel ports, a pair of PS/2 sockets for keyboard and mouse, and the pair of USB ports mentioned previously, there are five further sockets that were all disabled in the review PC — four for the sound chip (Line In and Out, Mic In, and a MIDI/Gameport socket) and one LAN connector from the integral 10/100MB Fast Ethernet controller.

Cooling arrangements were impressive for such a modestly priced PC. The CPU had been fitted with one of the popular and effective Zalman Flower heatsinks, along with a Fan Mate Speed Controller. This provides a small rotary knob that can be used to raise or lower fan speed, which is the very best way to keep noise levels down — you start it at the slowest and therefore quietest setting, and then only raise the speed if temperatures rises too high, which hadn't had to be done for the review model. Meanwhile, the Seagate Barracuda hard drive had been fitted with a Molex SilentDrive sleeve, to drive its already low acoustic noise levels down even further.

Other Components

The Genius Comfy keyboard was comfortable enough to use, although I didn't personally get on with the optional palm-rest. It had the seemingly obligatory cluster of extra non-standard keys that often require special drivers to do anything useful, including three alongside the function keys labelled Power, Sleep and Wake. The first of these did exactly what it suggested: powered down the entire PC after first shutting Windows down correctly. This could be handy if you keep your PC in a cupboard, but disastrous if you press it by accident after a tiring session. However, it's easy enough to reconfigure in the Advanced page of the Power Options to ask for a confirmation if this makes you nervous, or to set up the Sleep key to automatically enter the safer Hibernation mode.

The Samsung optical wheel mouse worked beautifully on almost every surface I tried, including my knee, and is ideal for any musician who doesn't want to be restricted to a mouse mat. Digital Systems install Windows XP Home Edition as standard, and this is the obvious choice in any new system, as it's proving to be the most stable platform for multimedia work. Also supplied with the review system and soundcard were a Hansol H520 TFT colour monitor, which like my own 520F provided a pin-sharp picture with no distortion, and Steinberg's new *Cubase SL* version 1.02,



Dummy backplates bring four of the PC's six USB 2.0 ports to the back panel.

which is considerably cheaper than its *SX* stablemate but still has the majority of features that most musicians require.

Powering Up

Powering up for the first time, I was pleased by the Digital Systems PC's low level of acoustic noise. Its temperature-controlled PSU fan was commendably quiet for a standard device, and the Fan Mate-assisted Zalman CPU fan and SilentDrive-encased hard drive also helped. Even when I subsequently ran the PC with its side plate removed, it didn't make a huge difference to the noise level, since so little sound was being generated internally.

Before I explored Windows I had a peep into the BIOS to see what if any tweaks had been made at the hardware level. As is appropriate with many motherboards whose integral extras aren't always the most suitable for musicians, several features had been disabled in the Integrated Peripherals page, including the AC97 Audio, the LAN controller, Game port and MIDI port. The only one of these you might want to reinstate is the MIDI port, as onboard ports can provide low latency and reliable performance.

I wasn't expecting to find the SoftMenu III being used to overclock, and it had sensibly been left with standard settings of 2000/100 for CPU Operating Speed, while the Advanced Chipset Features page confirmed that the faster CAS2 RAM had been fitted. I also spotted an interesting 'Enhance DRAM Performance' function, but when I tried enabling this more aggressive RAM timing it only made a 0.3 percent improvement to memory bandwidth.

Windows Setup

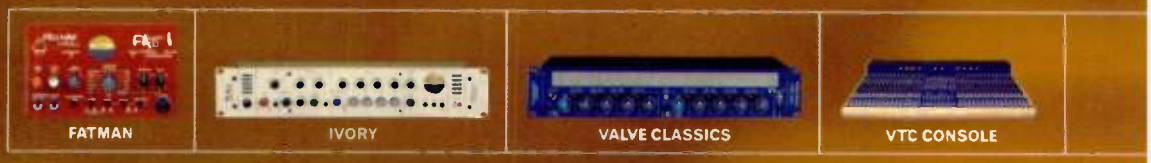
Like several other specialist music retailers, Digital Systems have installed Windows XP Home Edition in its Standard Mode, to avoid any possible complications with ACPI, such as audio stuttering with some makes of soundcard. However, this is the first time I've reviewed a PC that still manages automatic power-down in this mode — most (like the Digital Village model reviewed in *SOS* October 2002) need to be

Technical Support

One of the beauties of buying a system specially configured for music hardware and software is that you know it will work well from day one. However, this can only be guaranteed if the manufacturer also physically installs the soundcard, along with its drivers and a suitable MIDI + Audio application. To this end, you can either order these with your system, or, if you already have a suitable soundcard, you can send it to Digital Systems and have them install it and the latest drivers free of charge.

Each system has a unique serial number, and after it's been fully tested it gets the contents of its Windows partition backed up onto a total of three neatly-labelled CD-ROMS. You also get a bootable CD-ROM containing Norton's *Ghost* software, and a detailed A4 sheet with step-by-step instructions explaining how to restore the system to this pristine condition should you ever run into problems. There's also a one-year return-to-base warranty, but as always, make sure you keep your original packaging to keep your PC safe in transit.

Digital Systems told me that they are also happy to supply and install new soundcards and PC upgrades for their customers if they arrange to return the system to them, and that they can then provide new System Restore discs and continue any remaining guarantee. They are also happy to install the customer's own upgrades if they are suitable, but of course it would pay to give them a call first to talk through the options.



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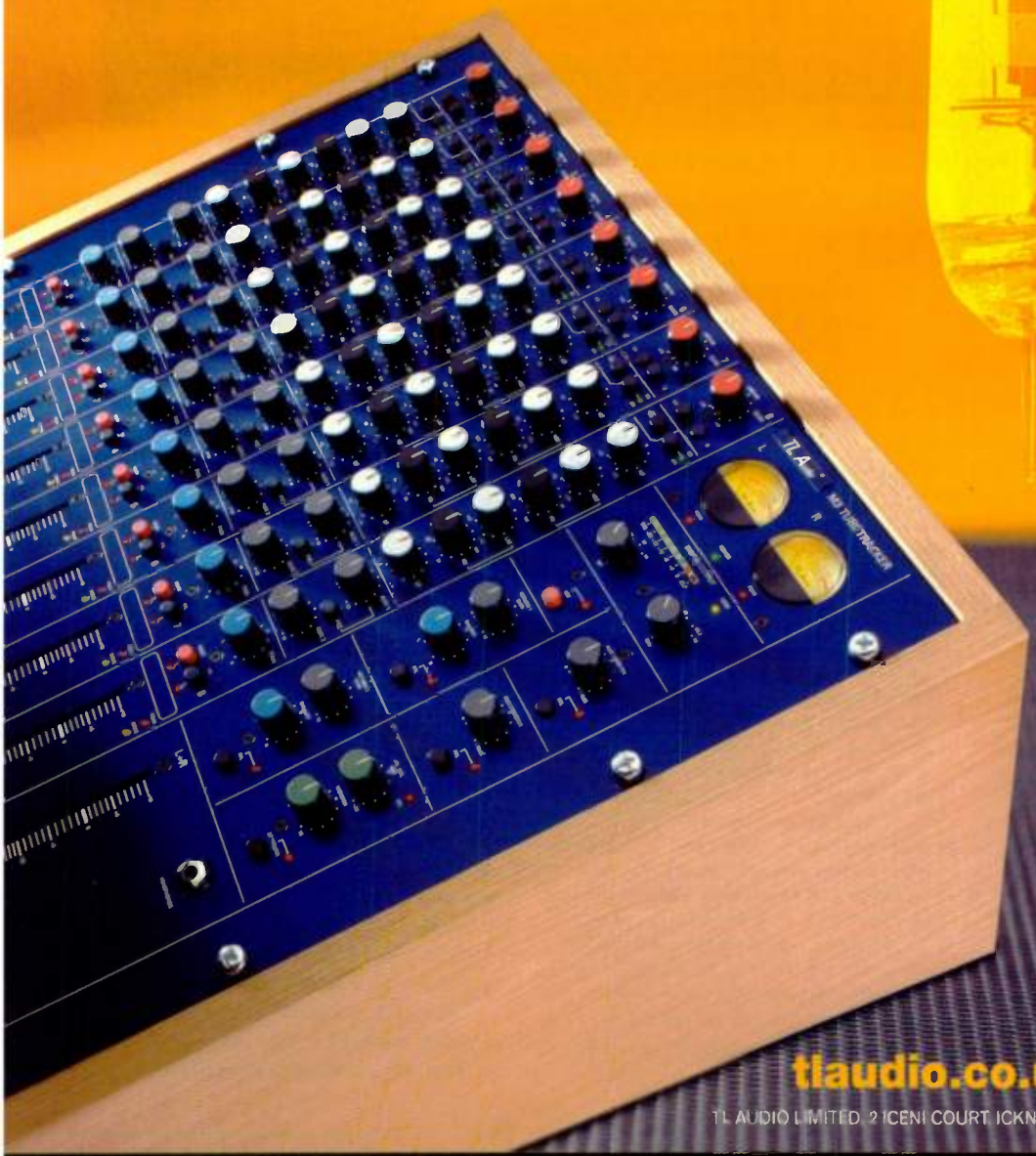

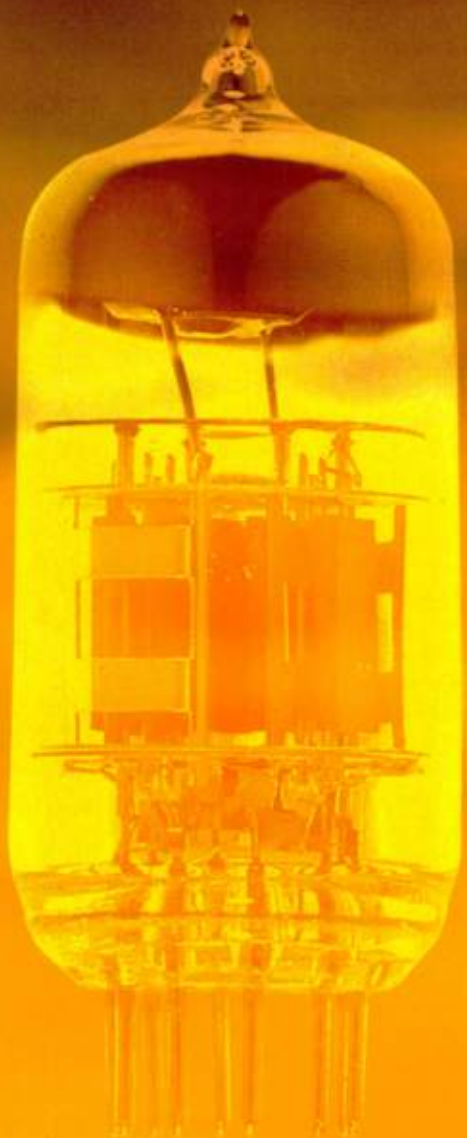

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switched off by hand using the front-panel power switch once Windows has declared the machine safe for power down. The secret is APM (Advanced Power Management), in which power management is controlled by the BIOS, and the implementation and amount of support varies from motherboard to motherboard. It certainly worked on this one.

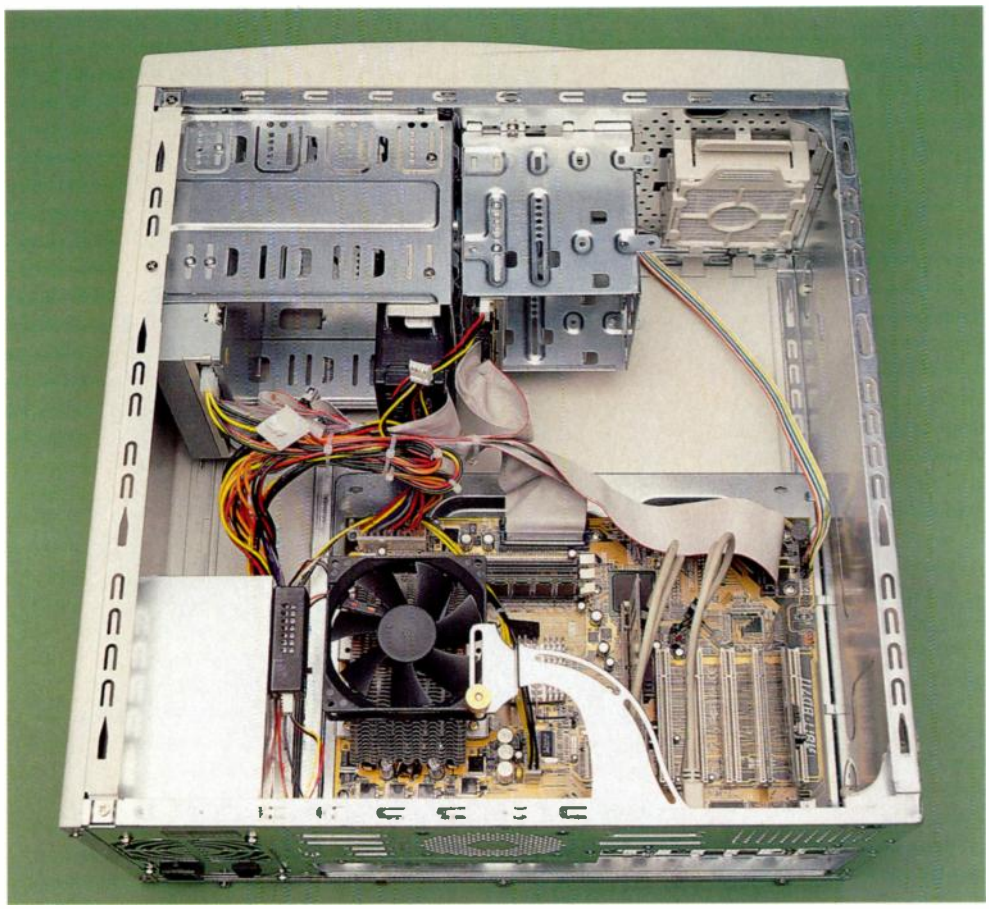
Hibernation had not been deactivated, but although various musicians have reported issues on awakening such as audio stuttering, as well as random clicks and pops, these tend to disappear when ACPI has been disabled, and no-one with a 80GB hard drive is likely to worry about the 512MB hard drive file created to accommodate the RAM contents while 'asleep'. I didn't have any problems using it, and it's certainly most convenient if you want to continue from where you left off.

General settings proved eminently suitable: System Restore, Automatic Updates, System Sounds and Task Scheduler had all been disabled to prevent untimely interruptions to an otherwise perfect musical take, while Processor Scheduling had been changed to favour Background Services to give audio the best chance of emerging unscathed with low soundcard buffer settings. Virtual Memory had been fixed at a generous 766MB, which is probably larger than needed except when running complex video applications, but then who knows what a musician is going to install after buying a PC? The System.ini file had been edited to provide a fixed Vcache size of 16384, along with a switch for conservative swap-file usage so that the system uses RAM more often than virtual memory. The first tweak is probably unnecessary when running under Windows XP, since its file I/O is a lot more efficient, and the latter switch is redundant, although neither will cause any problems.

On the visual side, the PC was set up to use Windows Classic theme with no desktop image or screensaver, while the custom settings for Visual Effects showed just two ticks for 'Show windows contents while dragging' and 'Smooth edges of screen fonts'. All of these help to minimise extra CPU overhead due to graphic fills. Graphic Hardware Acceleration had been left at Full, which seems the best setting for nearly all situations.

Plenty of Windows XP Hotfixes had been installed to keep the OS fully up to date, but as far as I could see the Services had been left well alone. This is probably the wisest approach, since disabling specific functions is only sensible if you know exactly what the customer is going to do with their PC.

I was initially disconcerted by the regular once-per-second flashing of the hard drive activity indicator, and after some investigation I discovered this to be due to the CD-ROM Autorun function, which had been left active. Although some users prefer to have their CDs automatically opened, I personally prefer this function to be disabled. However, since this DS Tower system only has a single CD-R/W drive connected to the Secondary IDE channel, leaving it enabled won't interrupt the hard drive.



All Digital Systems PCs use SilentDrive sleeves to minimise hard drive noise.

USB 2.0

The USB 2.0 standard ups the speed of the USB connection from the 12Mbps (megabits per second) of USB 1.1 up to 480Mbps — a 40-fold increase. This makes it far more suitable for peripherals such as external DVD burners, scanners, hard drives, digital cameras and video capture devices, but it's still compatible with older USB 1.1 devices.

USB 2.0 has been available on PCI expansion cards for about a year, but recent PC motherboards such as the one used here by Digital Systems incorporate USB 2.0 ports as standard, by using the latest Intel 845G, GL or E chipsets. Most high-street PCs are likely to do the same over the coming months, and other chipset manufacturers have also announced integral USB 2.0 support in forthcoming products.

Performance

Partition Magic showed that the single 80GB hard drive had been divided into a 20GB System partition with over 17GB still available, and a second 55GB partition labeled Audio. Both had been formatted as FAT32 with a 32k cluster size, but while this is ideal for the large files used for audio, I do think the system partition would have benefitted from a cluster size of 8k or 4k — with the current setting even the smallest file will occupy a minimum of 32k. There was already about 200MB of wasted space, although few would perhaps consider this important given the huge remaining drive acreage. However, DS told me that they routinely use 32k clusters to minimise any hit on swap-file access, so perhaps it's a case of swings and roundabouts again.

The Seagate Barracuda drive performed as well as expected — this is the third PC I've seen with one of these drives fitted, and

they never fail to impress with their combination of speed and low acoustic noise, on this occasion forced even lower by the SilentDrive sleeve. Sustained read speed measured with *DskBench* was once again about 40MB/second for both partitions, with 64k buffers managing around 13MB/second for 150 tracks of simultaneous 16-bit/44.1kHz audio, while write speed was lower at around 33MB/second.

SiSoftware's *Sandra 2002 Standard* measured a memory bandwidth of 2033MB/second for integer calculations, and 2032MB/second for the float version. These results were very similar to those I got for the Digital Village PC, which used a similar array of components.

Partnered with *Cubase SL* and the Audiophile card, this PC turned in a good performance, with no audio glitches, a high track count and plenty of processing power, which is exactly the combination that a musician wants.

Buying A Music PC

Probably the majority of specialist music PCs now partner a Pentium 4 2.0GHz processor with 512MB of RAM and the same spacious Seagate Barracuda hard drive, but they each provide a different balance of performance, low acoustic noise, looks, and competitive price. Carillon's stylish rackmount case, with its special attention to low acoustic noise, gave PCs a new respectability in professional studio circles, but such custom engineering is reflected in the price. Millennium Music Software's use of the aluminium ATC Coolermaster case, along with expensive RDRAM, also provides a system with an excellent technical and acoustic performance, but again has cost implications.

Red Submarine use DDR SDRAM in their machines, which helps to keep overall prices lower, although they still using relatively expensive components like the Lian-Li PC60 aluminium case, an Ultra Quiet PSU and Radial Fin CPU cooler, and a SilentDrive sleeve for the hard drive. However, the Digital Village machine I reviewed in *SOS* October 2001 proved that it's possible to sell a music PC for £799 without cutting too many corners, again by using DDR SDRAM, and with four FireWire Ports and a handy wireless keyboard and mouse, but this time partnered with an attractive acrylic case that masks much of the internal noise, allowing specialist fans and sleeves to be omitted.

When this machine arrived for review with an identical low price of £799, it proved that yet another approach exists for those with a more limited budget. The Digital Systems DS Tower System uses quality components throughout, including a Zalman radial fin cooler and SilentDrive sleeve, but manages to keep its overall price down by using a standard beige case. If you want a more stylish and expensive one, Digital Systems can oblige, but if not, this is one of the cheapest ways to buy a bespoke music PC. While it won't win any awards for its looks, this PC is built from the ground up to suit the musician who wants good performance, reliability, and low acoustic noise. SOS

information

£ Basic system without monitor, soundcard or music software £799; as reviewed but without monitor £1247; total system as reviewed £1576. Prices include VAT.
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Synthesizer One's editing window, with the Quick edit page on the left above the routing diagram. The main area of the plug-in window shows the Oscillator page: each 'VCO' can blend up to three waveforms, with powerful FM and ring-mod possibilities.

McDSP Synthesizer One

Virtual Analogue Synth For Pro Tools TDM & HD

McDSP's *Synthesizer One* plug-in for *Pro Tools* goes beyond basic analogue synth emulation, providing some sophisticated wavetable synthesis features and an impressive degree of MIDI controllability.

Sam Inglis

It seems that TDM-format soft synths are like buses: you wait ages for one, and then two come along at once. And so, hot on the heels of DUY's *SynthSpider* modular synth comes *Synthesizer One* from McDSP (who sound as though they ought to be Scottish, but are in fact from California).

Synthesizer One is perhaps best described as a semi-modular synth. Unlike *SynthSpider* and other fully configurable modulars, it provides a fixed array of oscillators, filters, envelope generators and other subtractive synthesis devices, and their signal routing is largely preset. Within these limitations, however, it's much more flexible than a typical analogue synth.

For example, where *SynthSpider* and other modulars provide an array of different oscillator types which you can mix and match to your own ends, *Synthesizer One* always gives you the same two VCO-style oscillators — but they're far more sophisticated than your everyday 'sine, square or sawtooth' models. Each is actually capable of blending three different waveforms chosen from a long list, or based on sampled waveforms, and there are PWM, FM, phase offset and saturation options galore. In total, *Synthesizer One* provides the synth programmer with over 400 parameters.

SOUND ON SOUND

McDSP *Synthesizer One* £633

pros

- A versatile synth with some unusual features and a well-designed interface.
- Excellent modulation options and MIDI spec.
- The pad sounds are a definite highlight.

cons

- Most parameters are calibrated arbitrarily.
- Some of the presets are a little uninspired.
- More DSP-intensive than *Virus TDM*.

summary

Synthesizer One is a very competent virtual analogue synth which offers a good deal of programming depth.

Getting Started

Happily, even the designers of TDM plug-ins are now starting to realise that floppy disk copy protection is past its sell-by date, and when the two-week demo period is up, *Synthesizer One* can be authorised either by challenge and response or using the iLok USB dongle. The response I got approached the length of a nineteenth-century novel, but once I'd typed it all in it worked fine.

Installation is straightforward, and *Synthesizer One* can be used as an insert in audio, aux and Master tracks within *Pro Tools*. The PDF-only manual warns that you may need to increase DAE's memory assignment in order to use *Synthesizer One* alongside a lot of other plug-ins, and it takes longer than most to load into a TDM slot. Each instance of *Synthesizer One* can deliver up to seven voices from one Mix card DSP chip, or eight from an HD card DSP. Rather than using a control within the plug-in to adjust the polyphony, however, McDSP provide additional versions of the plug-in that are restricted to two, four and six voices. There doesn't seem to be any way to link two instances of *S1* together to create one synth with greater polyphony, so big keyboard parts may fall victim to note-stealing.

The three LFOs are well-specified: each can combine up to two waveforms, with extensive options for phase and pulse width.

Once you've inserted it and routed a MIDI signal to it, you can begin to try out the presets, of which there are hundreds. Many of these are clearly designed to mimic patches from classic synths, both analogue and digital: as well as presets called things like 'Moog bass', there are also folders of Wavestation and PPG impersonations which make use of *Synthesizer One*'s wavetable synthesis features.

The presets provide a reasonably thorough overview of *Synthesizer One*'s capabilities, but quite a few fall into the 'nothing special' category. Browsing through them demonstrates that *Synthesizer One* excels at pad sounds, that it turns in a decent bass or lead monosynth, and that if you want Hammond organ sounds, you really need NI's *B4*. There are no percussion sounds to speak of.

Programming *Synthesizer One*

One of the problems confronting any plug-in developer is how to fit a complex editing interface into a plug-in window, and some compromise over usability is inevitable. DUY's *SynthSpider* makes the entire synth patch visible at once, at the expense of using tiny graphics. *Synthesizer One*'s interface, by contrast, is distributed over a number of pages. This has the benefit that all the controls are large enough to be easily visible, but does make it harder to visualise the overall signal flow and the way all the synth components interact. Deep-level programming involves some switching between pages, but I didn't find this annoying in practice.

Programming is aided by *Synthesizer One*'s Quick edit mode. Sometimes you don't want to wade through 400-plus parameters in order to darken a preset's filter response or lop ▶

Synthesizer One's two filters offer a good range of modulation options. The envelopes are rather more limited, although they do go beyond the standard ADSR template in offering a second attack phase, and are unhelpfully calibrated in arbitrary numbers.

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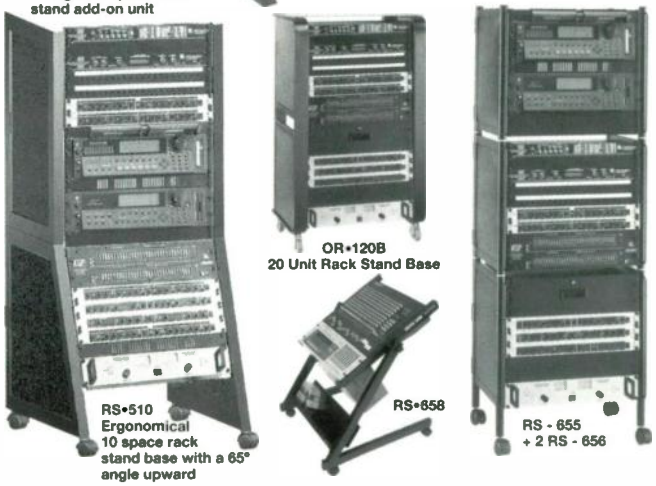

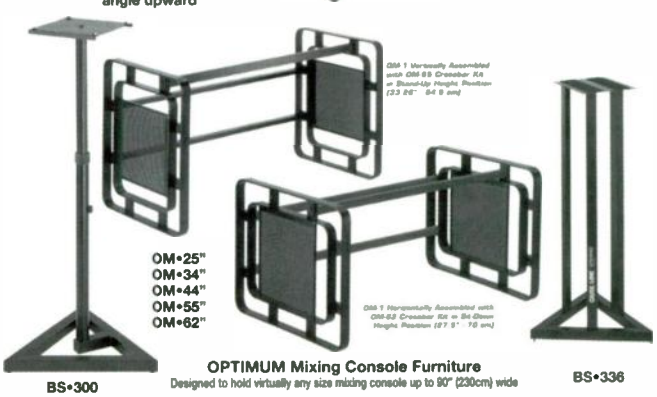

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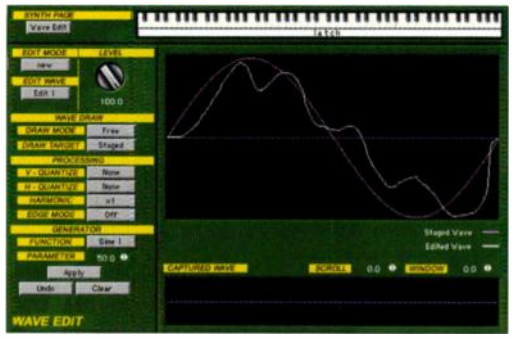
▶ half a second off its release time, and so McDSP have helpfully made a few key parameters available for instant tweaking. These include filter type, cutoff and resonance, VCA envelope parameters, oscillator detune and portamento, and they appear in four pages under the Quick Page heading at the left.

The bulk of *Synthesizer One*'s window, though, is devoted to in-depth editing. A total of eight editing pages is available through a drop-down menu under the heading Synth Page, but only four are directly concerned with the sound-generating aspects. Two of the other four provide a comprehensive MIDI Controller setup window, allowing you to assign up to 128 separate Controllers to different parameters within *Synthesizer One*; another offers access to system-wide and performance parameters such as pitch-bend range and the assignment of MIDI Controller numbers to physical controls such as the mod wheel, while the final Perform page provides a 16-voice step sequencer/arpeggiator.

Synthesizer One's actual synthesis parameters are divided across four pages: VCO, LFO, VCF/VCA and Wave Edit. I've already mentioned the luxurious specification of the oscillators, and most of the other elements are similarly well endowed with parameters and options. Three LFOs each offer a blend of two waveforms chosen from the same palette as the VCOs', with pulse width, phase offset, key follow, one-shot/loop and ASR envelope controls. Two multi-mode resonant filters offer all the options you'd expect (with the odd exception that they are fixed 12dB/octave devices), including modulation of cutoff frequency and resonance, key follow, a choice of routings, and the capacity to link cutoff and resonance controls.

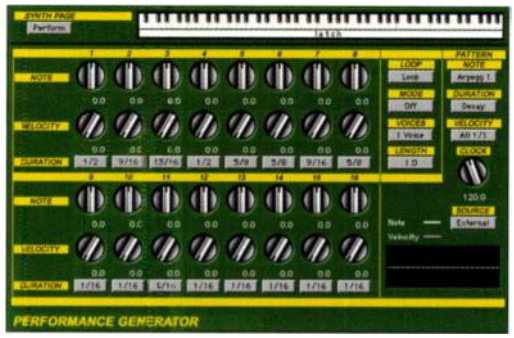
Three envelopes, one hard-wired to the VCA but all available as modulation sources, boast the usual attack, decay and sustain settings, but with an additional second attack prior to the release stage. Given how flexible the other modulation options are, however, I was a little surprised that the envelopes weren't more freely configurable, and there's no option to draw in your own shapes. Like most of *Synthesizer One*'s parameters, moreover, both the LFO rate and envelope controls are arbitrarily calibrated (from 0.1 to 10.0 and from 0 to 100, respectively), rather than displaying a useful value in milliseconds.

Synthesizer One's wave editing page allows you to draw your own oscillator waveforms, with a number of tools available to help you sculpt them; you can also work with waves 'captured' from an existing segment of audio. Up to eight user-defined waveforms can be stored as part of a patch, and they can be used by the LFOs as well as the VCOs. A healthy selection of conventional wave shapes is also available, and the standard sine and square waves come in several versions which respond differently to PWM. One version of the square wave is designed in such a way that PWM acts as a form of oscillator sync; to my ears, this sounded rather more extreme than conventional oscillator sync (which is not available), and it generated some distinctly digital-sounding noise.



As well as providing a good range of standard waveforms, *Synthesizer One* offers the option to capture additional waves from incoming audio or draw your own with the mouse. The results can be used both by VCOs and LFOs.

Two of *Synthesizer One*'s eight editing pages are devoted to MIDI control. Over 300 *S1* parameters can be controlled, using all 128 possible MIDI Controllers if need be.



To go with a virtual analogue synth, what else but an analogue-style step sequencer?

Other Options

For a long time, the only soft synth available for TDM platforms was Access's *Virus TDM*, and *Synthesizer One* seems to be pitched directly against the latest *Virus Indigo*. The architecture of both synths is very similar; both have multi-page editing interfaces, both are guilty of calibrating their parameters in arbitrary values, and both have a distinctly dodgy line in organ patches.

Where they differ, *Virus* has the advantage in some areas, two of which are particularly significant. Firstly, the presets supplied with *Virus* are much more consistent in quality than *Synthesizer One*'s, and include a decent range of percussion sounds. Secondly, *Virus* also scores in having a much lower DSP load: up to eight instances can be run from a single Mix card DSP chip.

In terms of synthesis features, *Virus*'s filter saturation and 'analogue boost' options give bass and lead sounds a punch that's harder to achieve with *Synthesizer One*. *Virus* also boasts built-in delay, chorus and a dedicated vocoder. In *Synthesizer One*'s favour, it has much more sophisticated wavetable and waveform drawing functions, there's the built-in step sequencer, and its freedom to be set up for MIDI control is hard to beat.

Sonically, there's a good deal of overlap between *Virus TDM* and *Synthesizer One*, and if you're looking to fit your Pro Tools system up with a virtual analogue synth, either will do the job nicely. They have slightly different strengths — I feel that *Virus* definitely has the edge for basses and punchy, dance-style sounds, while I'd turn to *Synthesizer One* first for pads and sci-fi madness — but both are perfectly capable of covering all the standard subtractive synthesis bases and more. If you already own the *Virus* plug-in, there are probably better ways to spend your money than on *Synthesizer One*. If you don't, you should definitely demo both before you decide! SOS

Test Spec

- McDSP *Synthesizer One* v1.0.
- Beige 300MHz G3 Apple Mac with 256MB Ram, running Mac OS 9.1.
- Digidesign Mix system running Pro Tools v5.1.3.

information

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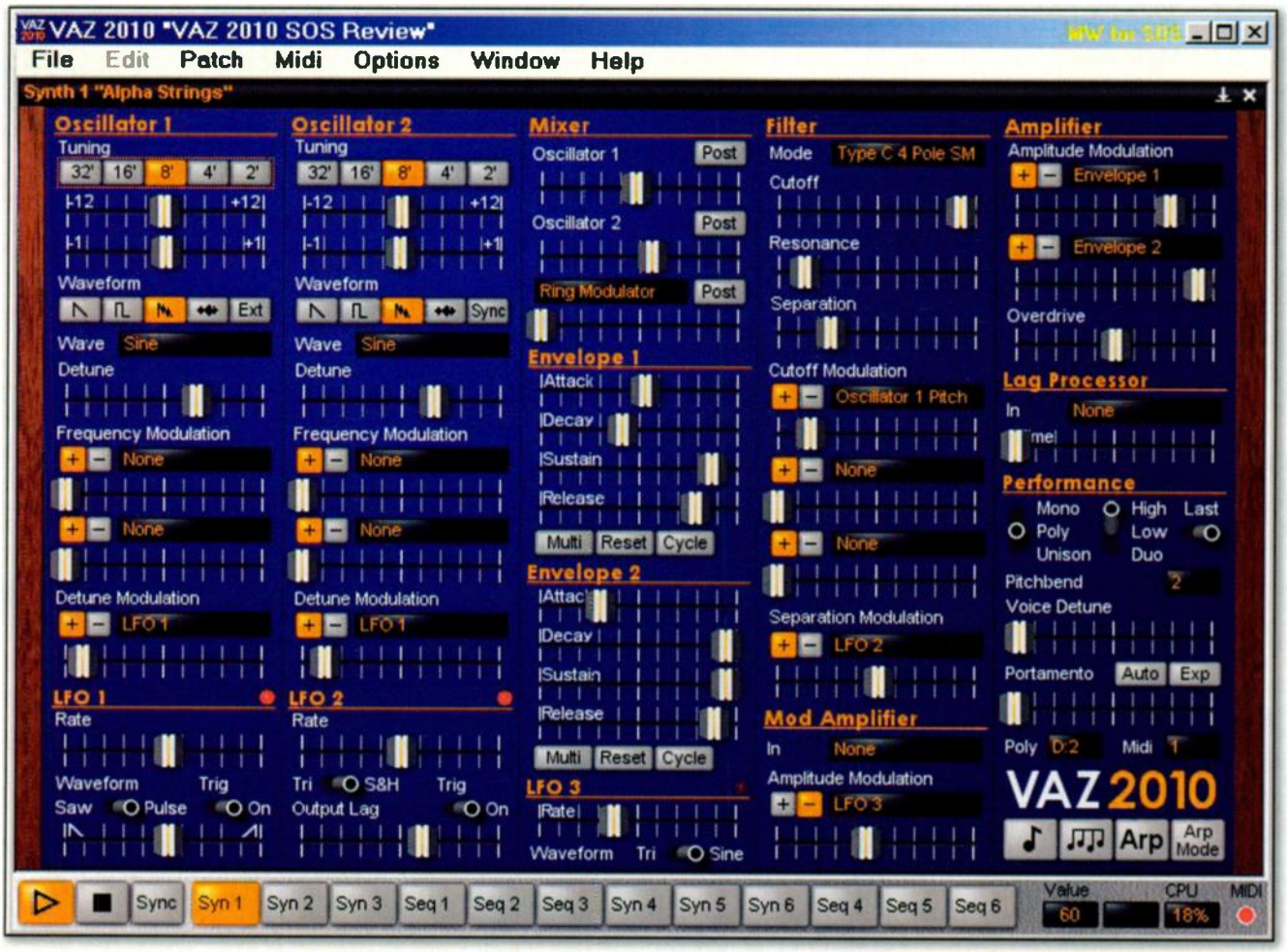


Each of the 16 possible synths provides a host of analogue modules and possibilities, including unusual options such as wavetable synthesis and vowel filtering.

Martin Walker

The latest version of the popular *VAZ* software synth combines the simplicity and low cost of a preset design with some advanced options from the full-fat *VAZ Modular*.

When Software Technology first released their stand-alone *VAZ+* soft synth, many musicians were impressed by how 'analogue' it sounded, particularly in the filter department. Based on classic two-oscillator/filter/amplifier monosynth designs such as the ARP Odyssey and Sequential Pro One, but with the added twist of an integral pattern-based sequencer inspired by that of Roland's TB303, its £29.99 price tag ensured healthy sales and many happy customers.

VAZ+ was followed by the somewhat more ambitious stand-alone *VAZ Modular 2* (reviewed in *SOS* March 2000), whose 66 versatile high-level modules could be assembled into the soft synth of your dreams. Up to 16 multitimbral synths were available, each with up to 16-note polyphony and its own sequencer, plus a mixer with its own plug-ins, and support for other plug-ins in both VST and DX formats. At £210, *VM2* provided fat sounds and wonderful filters, and by this time Software Technology were even providing 'is it/isn't it?' comparisons with classic hardware synths on their web site.

However, an open-ended design is never as CPU-efficient as a preset one, as you have to cater for every possible routing option, so with *VAZ 2010*, designer Martin Fay has combined the best from both products. Like *VAZ Modular*, *2010* allows you to launch up to 16 synths, each with its own sequencer, and mix their outputs together in the associated

mixer. In complexity, each synth falls somewhere between those offered by *VAZ+* and the ones that come with *VAZ Modular*, being a preset design, but with quite a few more options than *VAZ+*.

Moreover, *VAZ 2010* not only runs as a stand-alone synth, but also as a DX or VST Instrument, or even as a DX or VST plug-in for processing audio tracks. It has sample-accurate playback timing, and its new Intelligent Processing System claims to significantly reduce CPU overhead. At £129, this could prove ideal for the musician on a tight budget.

Overview

VAZ 2010 runs under Windows 95, 98, ME, NT, 2000 or XP, and has a hierarchy that is very easy to understand. The basic element is the Synth, whose various modules are laid out across five columns, and whose settings can be saved as a Patch. Up to 16 synths can be simultaneously loaded, and each one has an associated step sequencer. Their combined output is fed into a 16-channel Mixer, complete with insert and send effects, and this entire multitimbral setup can be saved as a Bank.

The main window has a menu strip at top and a status bar across the bottom, and contains whatever synth, sequencer and mixer windows you've opened. Most users will start in the Options menu, which has manual Mute/Unmute and automatic Background Mute functions for stopping and starting sound generation, and also lets you launch the Preferences dialogue, which provides access to the 'engine' controls.

The Audio page lets you choose MME, DirectSound, or ASIO drivers for the program's main audio output, as well as multiple sub outputs if you have a multi-port soundcard.

SOUND ON SOUND

Software Technology *VAZ 2010*
£129

pros

- Up to 16 synths and pattern sequencers can be run simultaneously.
- Fat 'analogue' sound.
- Far more versatile than its preset design suggests.
- Can be run in stand-alone, VSTi, or DXi modes.
- Dynamic voice allocation.

cons

- Higher than average CPU overhead.
- Main window soon gets cluttered.

summary

VAZ 2010 generates quality sounds with surprising versatility, and its built-in arpeggiators, pattern sequencers, mixer and effects add a great deal to the overall package. Highly recommended.

Modulation Options

To give some idea of the versatility of *VAZ 2010*, here's the full list of source options available to each modulation slider (in addition to 'none' — no modulation source):

- LFO1
- LFO2
- LFO3
- Envelope 1
- Envelope 2
- Mod Amplifier
- Lag Processor
- Oscillator 1
- Oscillator 1 Pitch
- Oscillator 2 Noise
- External Input
- Accent
- Sequencer A
- Sequencer B
- MIDI Velocity
- MIDI Pressure
- MIDI Control A
- MIDI Control B.

MIDI preferences include Input Port, an optional MIDI key to start/stop the sequencers, and the option to choose which two controller numbers will become the Controller A and B modulation sources (more on modulation options later).

The Synth page covers Master Tuning and optional Microtuning (a selection of tunings, including equal-tempered, just intonation, quarter-note and reversed equal temperament are supplied), as well as offering various other minor options. You can load *VAZ+* version 1.6 and 1.7 patches into *VAZ 2010*, and the Import page lets you tweak some import settings. The final page, Plugins, lets you point to your VST plug-ins folder, so that its contents appear in the *VAZ 2010* mixer.

Back in the main window, there are a few more menus to contend with:

- The MIDI menu has options for global transposition, an Auto Thru that routes all incoming MIDI data to the currently selected 'child' window, details of current MIDI controller mappings for automation purposes, and various arpeggio functions.
- The Patch menu launches a Patch List editor for the currently selected synth, where you can allocate and name patches to be accessed by MIDI program changes.
- The Edit menu is only currently used by the Sequencer windows, and offers copy, paste, clear and randomise functions.
- The File menu always provides Bank Open and Save (as well as New Bank and New Synth) options. However, it also has other options, which vary depending on which type of child window is currently selected. If you're working in a Synth window, various Patch management functions are offered, while the Sequencer page File menu lets you load and save sequences, and the Mixer window File menu options manage mixes.

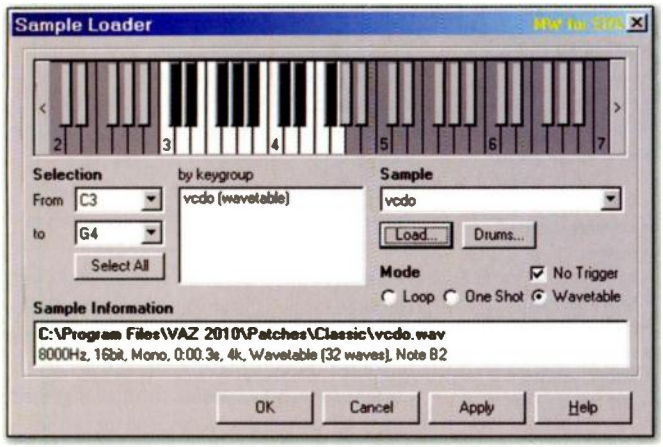
The status bar mentioned earlier has three sections. On the left are Play and Stop buttons that control all the sequencers, along with a Sync button that either locks the synths to an external MIDI clock in stand-alone mode, or to the host when run as a DXi or VSTi. On the right is a readout of the current parameter value and CPU overhead, plus a MIDI activity indicator, while the middle section provides quick-access buttons for the mixer, each active synth, and the associated sequencer for each synth.

Using the quick-access buttons makes zipping about fairly easy, although once you have half a dozen or more synths and sequencers open, the main window looks very cluttered — perhaps an extra option to display just one synth or sequencer window at a time might be useful? Moreover, the status-bar buttons eventually become so small that their labels are unreadable, although you can still use the Windows menu options to switch between them.

The Synth Page

This page (see screen shot, left) is the most important component of the whole design of *VAZ 2010*. When I first read that the new synth was to fall somewhere between the simpler *VAZ+* and the free-form *VAZ Modular* in complexity, I was a little concerned that it might be disappointing to existing users of the latter. With two oscillators, three LFOs, two envelopes, a single filter and a couple of amplifiers, you might expect plenty of 'analogue' sounds and little else — but you'd be wrong. Martin Fay has actually put together an extremely useful synth that is far more versatile than its initial appearance would suggest.

Each of the two oscillators has octave 'footage' buttons, coarse and fine pitch sliders, and two Frequency Modulation sliders, each with a wide choice of possible modulation sources, accessed from a drop-down menu (see 'Modulation Options' box). All modulation sliders also have +/- buttons to select direction. The oscillators can each generate one of five waveforms. The Sawtooth wave can be smoothly morphed through to a triangle shape using the Waveshape slider, and altered in real time using the Waveshape Modulation slider. Switching to the Pulse wave option changes the function of these two sliders to pulse width and pulse width modulation control. The Multi-Saw wave overcomes the limitations of the synth's two-oscillator format by providing a combination of four sawtooth waves (this time with variable Detune and Detune Modulation available via the two sliders), for some wonderfully fat sounds. The Sample waveform option is even more versatile — although it defaults to a sine wave, clicking on the Wave Source box launches the Sample Loader window, and using this you can allocate one or more multisamples across the keyboard range. Each multisample can be either one-shot, looped, or even a wavetable. If the last option is



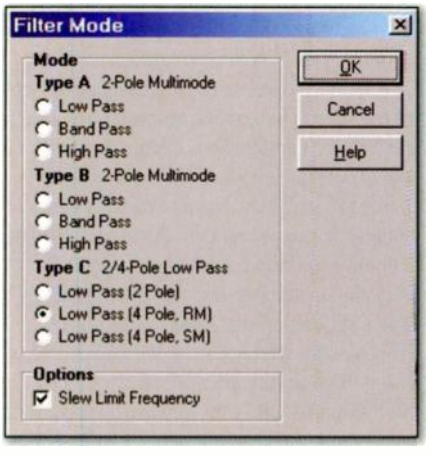
Each oscillator has a sampling option that can be used to load multisamples or a wavetable.

chosen, you can sweep through the wavetable's contents using the Wave Position and Wavetable Modulation sliders.

If you select multiple samples in the 'Load' dialogue, using the Ctrl key, their tuning information is used to map them to suitable key ranges, while a special Drum loading option leaves the pitch alone, and maps each sample to the next available key, starting from the bottom of the selected range. Full details are provided on how to make your own waveshape or wavetable files, as are a few sample files, and Software Technology already have various other free wavetable downloads on their web site.

The fifth and final waveform option is different for each oscillator. The 'Ext' option of Oscillator 1 lets you treat an external audio input through *VAZ 2010*, and this can be ring-modulated with Oscillator 2, while the Sync option of Oscillator 2 causes its phase to be reset whenever Oscillator 1 starts its wave cycle, for effective lead synth sounds.

The two oscillators pass into a simple mixer with three sliders, the third having five possible sources for its input. You can mix in the ring-modulated version of Osc 1 and 2, white noise, a keyboard-tracking version of LFO1 (which is then renamed as Oscillator 3), the Mod Amplifier, or an External input signal. The Mixer output passes into the Filter module, which has Cutoff, Resonance and Bandwidth sliders, along with three identical ones for Cutoff Modulation. However, the Mode dialogue hides various other filtering options — two-pole filters are available in low-pass, high-pass and band-pass types, with both variable resonance (Type A) and variable resonance bandwidth (Type B) versions. The Bandwidth slider is only active with the latter choice. The Type C filter again has three options, but this time they're all low-pass. These comprise yet another two-pole variation, with a broad resonant peak but passing less of the other frequencies, and two four-pole algorithms, whose cascaded two-pole sections have a cutoff Separation slider to generate twin peaks, giving Resonance or Separation modulation options respectively. The latter is particularly effective for creating moving vowel sounds. There's also a Slew Limit Frequency option, which provides better cutoff control but changes the sound of FM patches.



VAZ 2010's filter modes.

The filtered output is then processed by the Amplifier which, in addition to two Amplitude Modulation sliders, also provides up to 48dB of extra gain to drive the associated soft-clipper into Overdrive. There are two identical ADSR Envelopes, with some versatile triggering and cycling options, but normally Envelope 1 will be routed to the Amplifier, since this is optionally in charge of the new IPS (Intelligent Processing System). Although each synth can be allocated a fixed number of voices (between one and 16), using the Poly control in the Performance section, IPS is an optional dynamic voice-allocation system that disables a voice whenever Envelope 1 is fully 'closed', and returns its CPU overhead to the system.

There are three low-frequency oscillators, which have accompanying Rate sliders with flashing 'LED' indicators. Although LFO1 and LFO2 appear directly below the two oscillators, they are not hard-wired to them. Instead, they can be chosen as sources by any Modulation control. LFO1 can generate a saw or pulse wave, and has its own waveshape slider, while LFO2 offers triangle and sample-and-hold options. A slider associated with LFO2 provides two handy functions, in triangle mode operating as a Delay control (particularly good for delayed vibrato), and in S/H mode as an Output Lag control, to convert the staircase waveform into a ramp. LFOs one and two each have a Trig option to restart the LFO cycle each time you trigger a new note. LFO3 is altogether simpler, with a single triangle/sine waveform switch.

The Mod Amplifier can control the output level of any modulation source, and has its own Amplitude Modulation slider. It's a useful way to control the depth of other effects, especially as there are various external control options, such as velocity, pressure, and MIDI controllers. You could, for instance, select an LFO as source and MIDI Pressure as modulation, and then select the Mod Amplifier for Frequency Modulation, to vary vibrato depth using aftertouch.

The final part of *VAZ 2010*'s synth architecture is the Performance section, which provides Mono, Poly and Unison voice modes, High, Low and Duo triggering options for the Mono or Unison modes, and global control of pitch-bend range, voice detuning, portamento, polyphony and MIDI channel adjustment. Four buttons at the bottom play a Note, display the associated Sequencer, activate the Arpeggiator, and select arpeggiator mode and range.

The Sequencer

Each synth has an associated sequencer in a separate window. These will look familiar to existing *VAZ* users, but there have been various enhancements for the new version, as well as a graphic makeover, with more colours, smarter knobs and switches, and careful regrouping of some controls for an easier-to-understand layout.

Up to 16 chained patterns are available from the sequencer, each with between one and 16 steps. Each pattern has a note slider, variable over the 128-note MIDI range, for setting pitches, plus buttons for Double-length steps, Rests, Slides (no retrigger between notes) and Accents. Beneath the note sliders are two further rows labelled Control A and B, whose output can be routed to any modulation slider. One popular use of these will be to sync filter cutoff and resonance with note patterns. Each slider row also has a 'Gang' toggle switch that lets you move all controls together (very useful for key changes).

The Pattern Mode area now has a Voice Select section, where you can choose which of the available voices is being edited, and

Test Spec

- Software Technology *VAZ 2010* v1.02.
- 1GHz Pentium III PC, Asus TUSL2-C motherboard, 512MB RAM, Matrox G450 DualHead, Windows 98SE.

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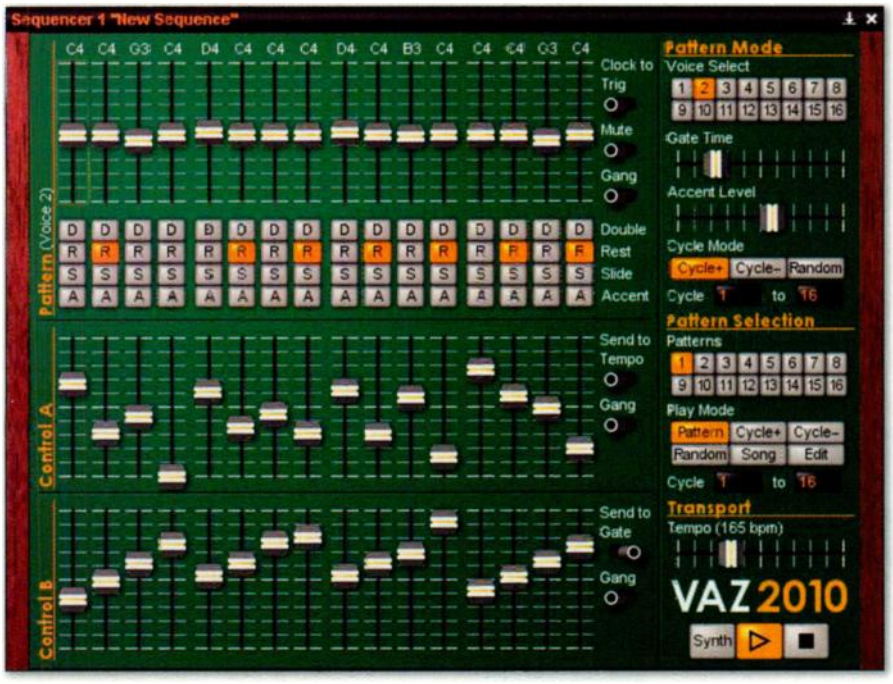

The pattern sequencers associated with each synth can be sync'ed to a VSTi or DXi host application.

there's a new Mute button alongside the note sliders, to silence every step for the currently selected voice. Two drop-down boxes let you choose first and last steps for pattern playback (for instance, 1-4 or 3-11), while playback order can be forward or backward Cycle, or Random. Global controls are available for Gate Time (momentary to legato), and Accent Level.

The 16 buttons in the Pattern Selection area let you choose which pattern is being edited, and also indicate the current pattern during playback. You can choose the first and last patterns in the sequence, and select various play modes — a single Pattern only, Cycle (forward or backward), Random, or the rather more ambitious Song. A sequence of up to 255 patterns can be created in the Song Editor window, launched by clicking on the Edit button, and every step can have its own transposition value.

Each sequencer has its own Tempo slider, but all are started and stopped in perfect sync from any of the Play buttons, although once the status bar Sync button is active they all lock to an external or host clock as explained earlier.

The 16:2 Mixer has also had a makeover since *VAZ Modular*, and now has much clearer graphics, although its functions remain largely unchanged. Each of the 16 input (Synth) channel strips has an insert point, overall level fader, On/off button (all synth processing is disabled when this is in its 'off' position), Pan control, and two Aux sends, although (unusually) signal flow is from the bottom upwards.

The Master section is now on the right rather than in the middle, and has two insert points (one pre-fader, one post-fader), master faders (plus associated 'Link' button), and the master controls for the two Auxes. As is the case with both channel and master insert effects, the Aux effects are chosen by clicking on their selector boxes, whereupon a list of options appears. The contents of this list include the eight bundled *VAZ* plug-ins, followed by whatever VST plug-ins you have installed on your computer, then all those in DirectX format. Even VST and DX Instruments appear in the list, and can be chosen and launched, although I can't quite see the point of this.

Each insert or aux effect slot has its own Bypass and Edit buttons; clicking the latter launches the plug-in window itself. Happily, *VAZ 2010* not only provides a generic interface for those VST plug-ins that don't have dedicated front panels, but also lets you access both presets and banks.

Five of the bundled plug-ins were also seen in *VAZ Modular*, namely a three-voice *Chorus*, stereo *Delay*, *Flange* (with positive or negative feedback), *Phase* (with between two and 12 filter stages), and a *Reverb* that's surprisingly usable in the context of synth sounds. New to this package is auto-pan, with shape and position limit controls. Also new are two additional entries to the plug-in list, although neither modifies sounds in any way. The *Chained* plug-in allows up to four plug-ins to be chained together, and you can change their order at any time. This not only allows more complex insert chains to be assembled, but also more refined global Aux effects — reverb followed by EQ or chorus, for example. The second of the two is the *Sub Output* plug-in. As I mentioned earlier, the Preferences dialogue lets you choose multiple sub outputs if your soundcard has spare ones available, and the *Sub Output* plug-in is used to route individual synth channels to these. It has its own level faders, and a Thru switch lets you decide whether or not the signal also appears at the main output. You could, for instance use *Sub Output* plug-ins with inserts, to patch individual instruments into rack effects or an external mixer, or with one of the Aux sends, to patch in an external reverb for global use.

Sounds

The five sound banks supplied with *VAZ 2010* include an impressive *Brandenburg Concerto* snippet in the style of Wendy Carlos, and an effective Depeche Mode pastiche. However, given the almost total compatibility with *VAZ+* sounds, it's hardly surprising that there's plenty on offer in the bundled patch library. The 561 patches are neatly sorted into 18 folders, and range from synth leads, pads, classics and atmospheres, to drums, guitars and basses, plus strings, brass and many other categories.

The Open Patch dialogue can optionally load in associated sequences and insert effects, and has an incredibly useful Audition option that either automatically plays the associated sequence (making wading through dozens of patches much quicker and easier), or lets you play the currently selected patch, using the computer or MIDI keyboard, before you open it. Quite a few different sound authors are credited for their contributions — some of which are very impressive — to the sound library. Here are a few favourites of mine:

- **'Wholelotgoingon', by Ian Webster, in three variations, provides complex and evolving sound sequences, created with slowly-changing pulse width modulation and rhythmic variation of filter cutoff by the sequencer, an LFO, and oscillator pitch.**
- **'Ghoxts' (sic) is a spooky sound that would be ideal for heightening the tension in a Doctor Who episode. It features parallel tuned oscillators with noise and waveshape modulation mixed in with their ring-modulated product.**
- **'Bypass' is a resonant distorted bass sound from developer Martin Fay, surprisingly created by high-pass filtering followed by plenty of overdrive. This proves that lateral thinking can often generate completely new sounds.**
- **'TranceArp' is another Martin Fay creation, starting with a fat, dual-oscillator, detuned sawtooth sound. He's made it even fatter by selecting two voices and setting them to unison mode, animating them using the built-in arpeggiator, and then thickening to taste with stereo delays.**
- **'Ja!' generates the Germanic affirmative very effectively, using the special features of filter separation modulation, in yet another Fay creation.**

The 16:2 mixer provides aux and insert effect slots, accepts both VST and DX plug-ins, and is supplied with eight bundled plug-ins of its own.

In Use

After a thorough reading of the excellent on-line help file, I found all aspects of *VAZ 2010* very easy to use, as well as quick to set up, and was just as impressed with its sound quality as I was with that of *VAZ Modular*. The filters really are rich and creamy, and being able to keep chained insert effects associated with a synth really helps in creating polished results.

Perhaps understandably, this rich sound comes at a cost. Running 32 voices on my Pentium III 1GHz PC took 58 percent of my CPU overhead, compared with 45 percent for Steinberg's *Model E* and 32 percent for NI's *Pro 52* soft synths. However, I still managed to run a hefty 52 voices simultaneously on my PIII 1GHz PC, with my Echo Mia running at 4ms ASIO latency, when the *VAZ* CPU meter was reading 90 percent.

The label 'D:16' in the polyphony display signifies that 16 voices are under the control of the new dynamic voice-allocation mode.

The VSTi version of *VAZ 2010* conked out at about 43 voices on my PC, running inside *Cubase* 5.1, again with 4ms latency, and I managed 32 voices inside *Sonar* 2.0, with 20ms latency, using my MME drivers. However, the IPS voice-allocation function worked well, so I'm sure you'd manage more voices in a typical song, without obvious note-robbing, if you wanted to, although many analogue sounds don't need huge polyphony anyway, especially when pattern-sequenced or arpeggiated.

There are plenty of options for external automation — both the Synth/Sequencer/Insert Effect chain and the Mixer have their own MIDI Controller Mapping windows where you can allocate any controller number to each parameter. Alternatively, use the MIDI Learn function, by right-clicking a control and then moving the desired hardware knob. You can also use *VAZ 2010* as an effect plug-in, either by patching in the External oscillator waveform option, or selecting External Input for the third Mixer input, setting polyphony to one, and triggering the synth engine from a MIDI track.

Final Thoughts

Like that of *VAZ+*, the preset design of *VAZ 2010* is extremely well thought out, but it offers more options at almost every stage, and provides far greater opportunities for creative patch creation than is at first apparent. While some of the advanced features of *VAZ Modular* (such as the Granular Oscillator and triple Vowel Filter) are missing, *VAZ 2010* still provides a vast array of possibilites. This time around, the External Input options also make more sense, as you can use them to treat audio tracks when *VAZ* is running inside a suitable host application.

There are loads of commercial 'analogue' soft synths available these days, but *VAZ 2010* provides many more options than most, without being any more expensive, and it has that highly regarded *VAZ* 'sound'. It's still more processor-hungry than many of its competitors, but we can't have everything. SOS

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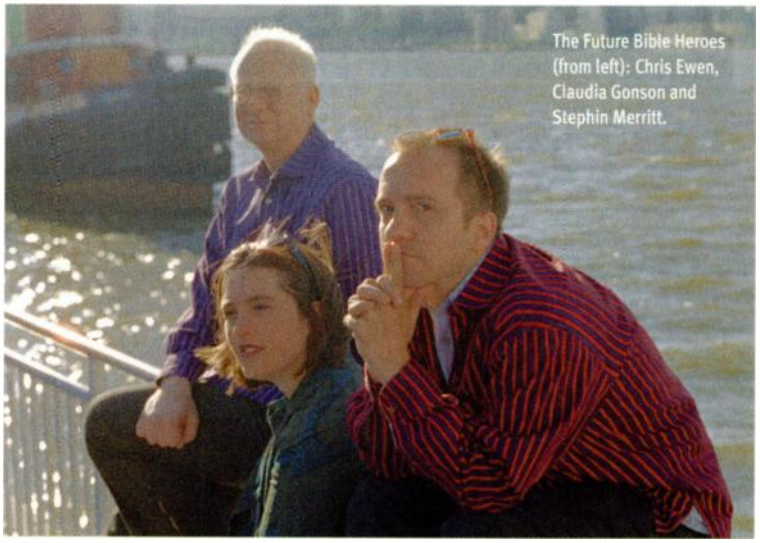
No More Love Songs?

Stephin Merritt, Chris Ewen & Claudia Gonson: Future Bible Heroes

With the cult triple album *69 Love Songs*, Stephin Merritt established himself as one of the most remarkable songwriters around. The Future Bible Heroes' new album sees his trademark lyrical cleverness paired with Chris Ewen's distinctive, organic electronica.



The Future Bible Heroes (from left): Chris Ewen, Claudia Gonson and Stephin Merritt.

Sam Inglis

New York songwriter Stephin Merritt must be a strong contender for the title of 'most prolific man in music'. Not only does he divide his time and his songs between four different bands, but his best-known album is a triple-CD set: 1999's *69 Love Songs*, recorded by The Magnetic Fields. All 69 tracks on this absurdly ambitious album were penned by Merritt, and its unique fusion of Cole Porter-style sophistication and lo-fi production values struck a chord with critics and public alike.

Collaborators on *69 Love Songs* included singer/drummer/manager Claudia Gonson and programmer/producer Chris Ewen. Together, they make up another one of the bands on Merritt's list: the Future Bible Heroes. Despite the similarity in personnel, it's pretty obvious why a different name is needed for this project, as Stephin explains. "The Future Bible Heroes material is completely different from *69 Love Songs*, in that the arrangements are entirely electronic, the music is not by me it's by Chris Ewen, and Claudia Gonson sings the entire record. And it isn't three hours long."

Anklungs & Theremins

Their new album *Eternal Youth* retains The Magnetic Fields' lyrical sharpness, but love songs are conspicuous by their absence, as are conventional instruments such as guitars and drums. Instead, Chris Ewen's lush electronic soundtracks blend analogue synth textures with unusual samples, many of them derived from ethnic percussion instruments: "I don't really use drum loops. I create all my own drum patterns, and if I do loop them they're loops of stuff that I've done myself, so it's not the same drum loop that was on an EMF record 10 years ago or something like that — they're unique to the song. I made a very conscious effort to use things that weren't your standard '80s-sounding drum machine, to try to go beyond that. On a song like 'Doris Daytheearthstoodstill', the sounds of the rhythm track dictated how the rest of the instruments sounded, which then of course dictated how the entire track sounded and gave it this swampy, sci-fi feel that Stephin used to write the lyrics for it. So it was a very conscious effort not to use drum machines or drum machine sounds in the way that they're used every day.

"Instead, they generally were things that I created on a synthesizer. I blended some things, and I tend to like sounds of wood and bamboo a lot too, so I used the anklung, which is one of my favourite instruments. It's a Balinese tuned bamboo rattle. There are series of them, in scales, and you shake them, there's one for each pitch. I have two sets of them and Stephin has a couple of sets of them, and I sampled my anklungs and looped them and retuned them, and then played them. If I'm using gongs or thumb pianos or whatever, I don't tend to be so exact with the tuning, but with the anklungs, which make an appearance on 'Doris Daytheearthstoodstill' and they're behind a Stylophone melody, they really have to be in key with each other, since they're both playing the same melody. Otherwise it's going to sound like a complete mess, so in that case I had to sample them and loop them and precisely pitch them. It's a really unique sound that's not really heard in a lot of Western pop songs."

"It's not traditional electro-pop in the sense that it's all synthesizers and then the

human element is the voice," adds Claudia. "We try to incorporate some more warm instruments in as a bridge. There's also something great about using instruments that have been used in things like Tiki music, things that are traditionally played in an analogue way, and making them have that edge that makes you realise that they have been put into a sampler or into a loop or something. I'm thinking of that Madonna song with the acoustic guitar that's so obviously been edited, and I think that's such an enjoyable thing to do with modern music, to not just take identifiable drum tracks, or things that are identifiable as drum machine tracks, but to take things like Theremin or anklung, or little finger cymbals — things that are so almost ephemerally un-electronic, which have trails and resonances that are hard to play with — and then really cut them or loop them or stutter them in ways that are disturbing."

"Part of the fun of the anklung and the finger cymbals and such is that it creates a bridge between the electronic sounds and the vocal," explains Stephin. "Otherwise, if it's all synthesizers versus vocals, the vocal's just going to float on top of the synthesizers and it'll sound like two different things happening."

Past Futurism

In these days of all-singing, all-dancing MIDI + Audio sequencers, it's a surprise to learn that Chris used his Apple Mac only for editing and processing stereo mixes. "I have *Performer* and Mark Of The Unicorn hardware, but I really haven't had time to learn how to use it yet," he admits. "For sequencing I used a Roland MC500 MkII old-school hardware sequencer, and I ran all my instruments from that. There were no soft synths, no plug-ins, it was all genuine equipment on this record at my end in the actual recording of the instrumental tracks. There's no computer sounds."

"Stephin has really been involved in collecting and using exotic and interesting and weird instruments," explains Claudia. "Chris, too, has not only collected cool instruments, but become sort of a connoisseur of '50s and '60s technology from the earliest days of electronic production. So when you hear the beginning of a song like 'Doris Daytheearthstoodstill', which is like a looped bubble, basically, you think about Enoch Light, or Martin Denny and the earliest stages of making music with electronic things, and there's a kind of integrity. There's a real artistry to it."

Chris Ewen's Boston studio.

"A lot of it's effects, too," continues Chris. "I was doing a lot of live two-track recordings, sequencing everything and doing live mixes onto DAT, or else I had a little Korg 16-track hard disk recorder, and I would lay down some MIDI tracks and then I'd play some Theremin, or some Stylophone on a song, and did some hand playing of stuff as well. 'Kiss Me Only With Your Eyes' has hand-played Stylophone on it. Then I dumped that into my computer. There were so many different methods of recording that we used over the couple of years we were recording the record — lots of songs were done in completely different ways. We didn't sit down over a month and record everything and then record all the vocals right after that."

It would be wrong to characterise them as Luddites, but Chris and his bandmates seem to share the view that electronic music production should involve hard work, rather than simply cobbling together a few presets and drum loops. "I know that I get really bored with hearing a lot of the samey-sounding things in a lot of records, especially with electronic music," says Chris. "A lot of dance records tend to have the same kind of sounds or the same drum loops showing up here, there and everywhere. In order not to bore ourselves, we do start from the ground up — every hi-hat hit is programmed, it's ▶

Chris Ewen's Gear

Recording & Sequencing

- Alesis RA100 power amp.
- Apple Mac G4 450MHz.
- Encore Electronics Expressionist eight-channel MIDI-CV converter.
- Harman Kardon stick speakers.
- Korg D16 multitracker.
- Mackie 1604 mixer.
- Midiman CO3 format converter.
- MOTU 1224 interface, 24i, and MTP AV synchroniser.
- Oberheim Strummer MIDI processor.
- Rode Classic mic.
- Roland MC500 MkII sequencer.
- Tascam DA45HR DAT recorder.
- Yamaha NS10M monitors.
- Yamaha six-channel powered submixer ("with analogue reverb and built-in pattern drum machine").

Effects & Processors

- BBE 462 Sonic Maximizer.
- Behringer Edison stereo image processor.
- Big Briar Moogerfooger low-pass filter, ring modulator and 12 stage phaser.
- Boss SE70 multi-effects.
- DOD 866 Series II gated compressor/limiter.
- Electrix Warp Factory, Mo FX and Filter Factory.
- Lexicon Alex, MPX100 and MPX1 reverbs.
- Peavey Spectrum filter.
- TC Electronic M3000 reverb.
- Yamaha E1010 analogue delay.

Instruments & Sound Modules

- Akai XR10 drum machine.
- Akai S900, S950 and S5000 samplers.
- Akai VX90 analogue synth.
- Alesis Andromeda synth.
- Altair 231 ("a Russian three-oscillator analogue synth").
- Anklung (x2).
- ARP Odyssey synth.
- Big Briar Theremin.
- Boss DR660 drum machine.
- EML 200 and Electrocomp 101 semi-modular synths.
- Emu Proformance 1+, Proteus 2 and Vintage Keys sound modules.
- In Line Effects Drumfire drum machine.
- Korg Poly Ensemble string synth.
- Oberheim Matrix 6R synth.
- RMI Kee Bass keyboard.
- Roland CR8000 and TR909 drum machines.
- Roland JD800, D50, Jupiter 4, SH101 and Juno 60 synths.
- Roland MKS80 analogue synth module with MPG80 programmer.
- Sequential Circuits Six Trak synth.
- Stylophone.
- Syndrum.
- Yamaha DX7 synth.
- Yamaha RX5 drum machine.

not your standard loop stuff at all. On a song like 'Find An Open Window', for example, the percussion track on it consists of analogue synths doing random sounds in particular patterns, quantised to the eighth notes. Then there are ring-modulated melodic synthesizers and ring-modulated tortoise sounds — from my holiday in the Galapagos," he laughs, "ring-modulated to play 16th notes in time with the random synthesizers doing the percussion. So it really isn't a press and play drum machine!"

"So if you'd had another take of that song, it would have sounded radically different?" enquires Stephin.

"Yes. The rhythms were programmed to happen when they did, but they wouldn't sonically be exactly the same, because they would all be doing different random things."

Long Distance Writing

The Future Bible Heroes' writing process is complicated by the fact that its members live in different US cities — Chris in Boston, Stephin and Claudia in New York. Although the details vary from track to track, most songs begin with Chris producing a more or less complete electronic, instrumental backing track. Stephin then writes a song to fit, often editing or pitch-shifting the backing to suit, and occasionally sending it back to Chris to be reworked. Finally, Claudia records her vocal. "We haven't used the Internet really — it's collaboration by post, a lot of phone conversations, a lot of me delivering finished tracks to Stephin when I go to New York from Boston for a couple of days," explains Chris. "We'll listen to things and he'll say 'That's really nice, I can do something with that,' or 'I don't know about that yet,' or 'Gee, this would be great if it was two minutes long instead of eight.'"

"What is great about working with Chris is that almost everything he does is something I would never, ever do," insists Stephin. "Not that we're opposites, but we're complementary personalities. Taking more than 30 seconds to get to the chorus is very alien to me. I have a very different way of setting up song structures than Chris, and a completely different chordal sense. I'm liberated from having to make the music, but I'm constrained by these absurdly complicated chord progressions that I would never write, and overly long, not sufficiently repetitive order.

"Usually I write the melody and the lyrics at the same time, but not so much with Future Bible Heroes, because then I'm more constrained. I start with the backing tracks and I try to squeeze in a melody, and then write the lyrics. I may have a title which has to be accounted for in the meter somewhere, but generally I'll start with the melody, write the whole melody, and struggle to fit in some words. If I have to start five different times, I kind of expect that. I wrote each of the songs on *Eternal Youth* at least twice."

Chris Ewen's sequencing is done not using the Mac but the Roland MC500 MkII next to it. The bamboo object to the right of the Mac is the smaller of his two anklungs.

Pitch Imperfect

The need to accommodate melodies and lyrics, and the requirement that the songs be in a suitable key for Claudia's voice, meant that some of Chris's instrumental tracks were radically butchered. "We recorded some of the songs and then threw them out and started all over again, with different lyrics and melodies," explains Claudia. "There's actually one [*'Losing Your Affection'*] we did with different lyrics, different melodies and at a different speed. When we slowed the song down and started again with a whole new melody and a whole new lyric. We played the final recording to Chris, we were driving him in the car and I brought a cassette of some of the final mixes, which poor Chris hadn't even begun

Private Vocals

Unlike most of the albums produced by Stephin Merritt's many bands, *Eternal Youth* features only one singing voice, that of Claudia Gonson. The first problem this posed was how Stephin could teach his songs to her: "There was a couple of songs that Stephin just sang to me and I was like 'OK, I've got it.' Half of the time, at the beginning, I was recording a lot of it alone, and then towards the latter half of this album recording for some reason Stephin and I started working more together. Sometimes he'd just sing the song to me and I would get it, but a lot of them he would do a little scratch vocal to get a sense of where things started and stopped."

"The problem with doing a scratch vocal is that you don't always want the singer to be imitating you," says Stephin. "Claudia's voice is so different from mine that it would probably be a wretched idea to present her with something to copy."

"It's really good to not listen to the scratch vocal too much," agrees Claudia. "You listen to it once or twice, you get to know how the song goes, and then you go for a long drive in a car and sing it to yourself so that you really learn it in your own head voice, and then you ignore the scratch vocal."

Although the vocals were recorded in Stephin's New York studio, she found it easiest to develop and record her parts alone: "Stephin has an ADAT recording system that I have grown familiar with over the years — I actually worked with it also on the last Future Bible Heroes album. I'm not really a technical person but I understand punching and I understand how to operate the compressor and whatever in the simplest way, so he would just leave, and for weeks on end I would let myself into his studio. That way I could sit there in that private space and neurotically rerecord one word if I didn't like it. If you're working with an engineer, it is their job to not get annoyed, but there's always that feeling of 'I'm performing for this guy who's listening to me and might be getting bored,' so it eliminates that anxiety. It really helps you be in an almost theatrical creative space.

"Also there's some songs, specifically 'Doris Daytheearthstoodstill', where I wanted to come up with a lot of background ideas, so I sat there pretending to be the Martin Denny Singers, Polynesian mermaid goddesses, doing this really operatic singing. I did that for a long time until I came up with weird ideas and then created parts out of them — but there's no way I would have done that in front of anyone else!"

The technique Claudia evolved for recording her vocals relied more on punching in than compiling a finished take from several candidates: "There were some songs where I had fully executed takes, and then I would A/B them and take the first verse from one and the second from another; but there were some songs where there was just so much that had to be done, and breath was limited, so I had to retake and retake and retake until I'd got it. It's interesting with ADAT punching, you sort of learn what you can get away with and what you can't with that digital medium. I think you can get away with really, really tight punches that you probably couldn't have imagined. It's really helpful that I was a drummer for 15 years! But it really is very tight in terms of when it goes on and off. As much as ADAT gets picked on, especially now in the world of Pro Tools and other digital media, I find it a very comfortable medium as long as you don't get the famous error light."

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Future Bible Heroes: Live & Unplugged

With a short tour to promote the album, the Future Bible Heroes have had to face up to the problem that confronts all electronic acts: how to translate sequenced recordings into an interesting live show. To this end, they've decided to remove the bulk of the electronica and allow the songs to stand on their own. "The Magnetic Fields decided to do this years ago," explains Claudia. "We made the decision that there was no way we were going to be able to do Stephin's recordings live, so we got all these acoustic musicians together, who are still currently the members of The Magnetic Fields, and they play 'cello and banjo, and piano, and there's very little prerecorded or synth stuff. For this tours for this album, we decided to follow that Magnetic Fields example, the idea being that the music that sounds good synthetically on the album will sound interesting and different and equally good but in a completely different way if we play it with acoustic instruments. So now we're doing acoustic piano, ukelele and electric guitar, spotted with little MIDI accents, but not major backing tracks."

"We're using a Novation K Station synth that I recreated some of the sounds from the album on," adds Chris. "It's perfect, we can take it everywhere. We've got some nice textures that work well with the piano and the ukelele, but basically the three of us are playing virtually every note except for a couple of percussion tracks. I've had a problem for a long time with seeing people who play electronic music by not playing it. They go on stage and they have a DAT or a CD that has nine-tenths of everything that they're doing, and they might play one or two things or pretend to turn a filter knob. We decided that if we're going to be playing 'live', we might as well try to play *live*."

▶ to hear yet. We were driving along and he was listening with a furrowed brow, trying to figure out what the hell was going on, because it was playing 300 cents down on the ADAT, and I remembered that we'd turned it down and forgot to tell him!

"We did lots of little things to change the material around. We do a little bit with editing, but mostly it's a full, complete edit — not telling Chris to redo something, but more taking what he's done and shortening or lengthening ideas, chopping, and creatively working with these soundscapes that come in. The reason that there's some instrumental tracks on the album is that he's so prolific. He made all these soundscapes and some of them Stephin had good songs to, and some just sounded better as little instrumental ideas, so we mixed and matched."

Some of the more unusual instruments in this photo include the Russian Altair synth (top left) and RMI Kee Bass (bottom left).

"Then there are things like 'Find An Open Window' where they actually said 'There's no way we are going to do it in this key. Make it happen in another key,'" laughs Chris.

"'And, by the way, lop off the three-minute instrumental section,'" adds Stephin.

"It didn't work pitch-wise with what Claudia wanted to do, so they said 'Do it in a different pitch.' As I was saying earlier, that song is all these random-pitch generated sounds, and there was no way I could get it even remotely to sound like it did originally by recreating the recording environment. That's when I did use the computer — I threw it into *Peak* and repitched it."

"Ah, so that's why it has that shrill, distorted quality?" asks Stephin.

"No, it had that in the original."

"We had some interesting results from changing the pitch," says Claudia. "There were things that took on new overtones when we repitched them, so that they sounded like they were slightly in a different key. I can't understand how that happened. 'Kiss Me Only With Your Eyes' sounded slightly out of tune, and we ended up playing with it to make it sound more in tune. We got these overtones which came in, and it was like 'Where did those come from?'"

"We added another out-of-key xylophone part, and together they sounded right," says Stephin.

"The first one had a tone that was in its weird illusory way slightly sharp, I believe, and so we found an instrument and made it slightly flat so that together they sounded like the right note. It's something I didn't believe would work until Stephin saw it would," continues Claudia.

"It makes the combination sound like it's in the right key, but with chorus," concludes Stephin. "So, if it's out of tune, make it more out of tune, and it sounds better!"

A Labour Of Love?

As an album, *Eternal Youth* probably will surprise those who know Stephin Merritt's work only from *69 Love Songs*. In many ways it's closer to '80s electronica than to lo-fi indie music, and his lyrics have taken a sharp turn towards the dark side. Meanwhile, the wild diversity of The Magnetic Fields' masterpiece has given way to a more consistent sound.

"The means of production were unified, thank God," concludes Claudia. "With *69 Love Songs* it was like 'Here's a song that's electronic, here's a song that'll be played on the onimercksophone, or whatever.' The means of production were all over the map, we had songs with all sorts of instruments, all sorts of ways of producing instruments, all sorts of recording studios, all sorts of musicians. This one really is Chris doing the backing tracks, Stephin writing the lyrics and melodies, and me singing the songs."

"And," Stephin Merrit laughs, "it took four times longer to make than *69 Love Songs*." SOS

More uncommon synths, including two EML semi-modulars and a Korg Poly Ensemble string synth (bottom left).

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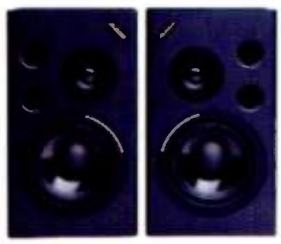

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RRP ~~£200~~ £595

ROLAND EXPANSION CARDS

Over 100 in stock. Ring before 5.00pm for next day delivery. New SRX: Boards £179 JV Boards: RRP ~~£349~~ £149 Remember We don't price match - We Beat Prices. NEW HOUSE BOARD NOW IN STOCK

NEW FANTOM

The Product of the Month 76 note expandable synth with the 5080 synth engine

£1399 = 6 x £233.17 0% NO DEPOSIT

NEW RS9 & RS5

88 note weighted & 64 note polyphonic synths

RS9 RRP ~~£899~~ £699 0% NO DEPOSIT

RS5 RRP ~~£599~~ £465 0% NO DEPOSIT

BOSS SP505

Ultimate loop sampling workstation RRP £449

24 x £18.70

= 0% NO DEPOSIT

XV88

88 note hammer action D-beam equipped synth

RRP ~~£3299~~ £1499 - 0% 24 x £62.45

NEW BOSS BR1180

10trk hd recorder 20gig drive + F/x

RRP ~~£670~~

12 x £48.25 = 0% NO DEPOSIT

NEW BOSS BR532

Digital 4 trk workstation with f/x - 32 virtual tracks

RRP ~~£349~~ £269

0% NO DEPOSIT

NEW DS50A

Digital monitors. Monitor your VS recorder with these 24 bit digital reference monitors.

RRP ~~£449~~ 24 x £18.70 = 0% NO DEPOSIT

NEW BOSS DR670

New Dr Rythmn drum machine with 255 sounds

RRP ~~£306~~ £199 = 0%

NEW BOSS SP303

Fantastic mini Groovestation

RRP £299 24 x £12.45

= 0% NO DEPOSIT

CDX1

Digital recording, sampling, remixing, plus f/x. You name it, this machine has got it.

RRP ~~£1199~~ Mega Deal £999 12 x £83.25 = 0% NO DEPOSIT

NEW MC09

New version of classic TR909 drum machine

RRP ~~£329~~ 24 x £13.71 = 0% NO DEPOSIT

MC307

Groovebox with all new patterns and turntable control RRP ~~£649~~ £CALL

NEW RD150

Digital Piano

RP ~~£749~~

£639

RD700 NEW

Ultimate digital piano

RRP ~~£1699~~

36 x £47.19 = 0% NO DEPOSIT

XP30

1500 Patches and two new expansion slots

RRP ~~£1199~~ £799 = 0%24 x £33.29

NEW D2

Compact groove music workstation with D-beam and touch sensitive pads!

RRP ~~£449~~ £139 0% NO DEPOSIT

MC505

Intelligent 64 Voice 53 Arpeggiator Patterns + 714 Dance Groove patterns 3 FX processors + integrated D Beam Controller RRP ~~£1049~~ £749 0% NO DEPOSIT

SPECIAL OFFERS

Roland VK7	£899
Roland EF303	£199
Roland PC180	£89
Roland SP808EX	£679
Boss VF1	£289
Roland VK8 Organ	£1275
Boss DR660	£199
Roland GR33	£299
Roland VG7 Mod Amp	£499
Roland VG88 +GK2A Pickup	£899
	£729

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YAMAHA

We Stock Every Yamaha Product

NEW **AW2816**

New 16 track digital workstation with automated faders and dual f/x processors. 20gig hd and CD-R

£1299 6 x £216.5 = 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~~ ~~£329~~ 6 x £54.83 0% NO

AW4416

New 16 trk digital recorder. Incorporating O2R mixer.

AMAZING!! RRP ~~£2799~~

£1749 6 x £291.50 = 0%

Includes CDR !

CS2X

Stunning Dance Sounds 64 voice polyphony Plus 2 extra realtime control knobs

RRP ~~£649~~ £365 0% NO DEPOSIT

RS7000 NEW

Complete desktop studio with 1000 synth voices & 65 drum kits. Numerous features for modern dance production, integrating sampling and advanced MIDI sequencing

RRP ~~£1299~~ £From 8[illegible] 0%

AN200 / **DX200** NEW

New analogue modelling & FM synthesis

RRP ~~£449~~ £299

0% NO DEPOSIT

P80 Piano NEW

88 note graded hammer action. 64 note poly. Very lightweight (16KG).

RRP ~~£899~~ £679 = 0% NO DEPOSIT

03D MIXER

24 channel, 4 buss motorised faders & F/X

RRP ~~£1999~~ £1879 = 0%

NEW MOTIF WORKSTATIONS

Motif 6 £1299 0% NO DEPOSIT

Motif 7 £1499 0% NO DEPOSIT

Motif 8 £1749 0% NO DEPOSIT

O2R

The classic industry digital mixer at an amazing breakthrough price

GAK Price from ~~£2999~~

= 0% NO DEPOSIT

MY8AD £189
MY8AT £179
UX256 £175
AX44 £105
DS2416 £439

NEW **S03**

Powerful New Synth £419

SPECIAL OFFER **S30** ~~£499~~

S90 NEW

88 note weighted action performance synth. Great sounds based on new Motiv series. Expandable.

RRP ~~£1699~~ £1399 AVAILABLE 0% FINANCE

SW1000XG

Our biggest ever selling Audio recording card! Now available for both Mac and PC platforms.

RRP ~~£499~~ £319 UK LOW

01V

DIGITAL MIXER. 24 inputs, Automated faders. Onboard FX processors. Plus loads more.

Prices From £849

LOWEST UK PRICE PRICE = 0%

DSP FACTORY

The complete 02R Digital Mixer in your PC or Mac! RRP ~~£599~~

NOW £479 - 0% NO DEPOSIT

AX16 £179 **AX44** £105

RM1X

Massive sequence remixer. Incredible machine at an unbeatable price!

£299 = 0% NO DEPOSIT

We Stock Every Yamaha Product

AW16G NEW

THE PRODUCT OF 2002!

This incredible new 16 trk recorder incorporates the O1V mixer and AW series HD recording engine. Inc. 2 onboard multi-fx busses, 47 sec loop sampler, and CD-R drive.

RRP ~~£899~~ 24x£37.46 = 0%

VERY SPECIAL YAMAHA OFFERS OF THE MONTH

New SU700 Sampler	RRP £799	£599
MT4D 4 track	RRP £199	£149
P80	RRP £[illegible]	£[illegible]
C6R	RRP £899	£599
MU15	RRP £199	£169
Q7 80 sequencer	RRP £849	£599
MP3 monitor	RRP £349	£229
C1X synth	RRP £599	£299
MSP5 Monitors	RRP £499	£299
C6X Synth	RRP £1299	£[illegible]
MDF3 data filter	RRP £529	£269
VL70 module	RRP £699	£MEGA

KORG

AMAZING DEALS

OUR KORG PRICES ARE THE LOWEST YOU WILL FIND IN EUROPE! IF THIS IS NOT ENOUGH, WE ARE ABLE TO OFFER YOU EVERY KORG PRODUCT ON VARIOUS 0% FINANCE PACKAGES.

NEW TRITON STUDIO

AT LAST - Incorporating hard disk recording, CD mastering, sampling with the world's greatest keyboard workstation

88 NOTE VERSION £2599 0% NO DEPOSIT

72 NOTE VERSION £2199 0% NO DEPOSIT

61 NOTE VERSION £1999 0% NO DEPOSIT

TRITON LE NEW

New version of the Mighty Triton

From £899 =6 x £149.83 = 0% NO DEPOSIT

MS2000

Fantastic New 44 note analogue modelling keyboard with sequencer

RRP ~~£749~~ £549 = 0% NO DEPOSIT

MS2000R

Fantastic New Rack analogue monster RRP ~~£649~~ £449 = 0% NO DEPOSIT

TRITON

Probably the only keyboard you will ever need to buy. Integrating sampling, sequencing and killer performance. Features with optional expansion boards!

From £1499 AVAILABLE 0% FINANCE

D1600 INC. CD-R Mega deal on the classic 16 track digital recorder

RRP ~~£1699~~ £999 AVAILABLE 0% FINANCE

KORG ELECTRIBE ES1 SAMPLER NEW

Slice and resample capabilities with great filters. Reads WAV and AIFF files.

RRP ~~£439~~ £325 - 12x £27.08 = 0% NO

ELECTRIBE

Desktop analogue synth & rhythm machine. Incredible new sounds, the result of some stunning new analogue technology.

RRP ~~£279~~ £189 = 0% NO DEPOSIT

KAOSS

Realtime Dynamic effects controller. A must for all DJs incorporating the touch pad of the Z1, 60 programmable FX & a five second sampler.

RRP ~~£269~~ £139

NEW **KARMA**

Revolutionary technology & sounds with 16 track sequencer

£1299 6 x £216.5 = 0% NO DEPOSIT

MICROKORG/VOCODER NEW

Affordable new Microsynth/ Vocoder from the masters. State of the art modelling.

~~£399~~ 24 x £16.63 = 0% NO DEPOSIT

D1200 NEW

New 12 track digital recording workstation

From ~~£695~~ 6 x £116.50 0% NO DEPOSIT

KAOSS 2 MIXER

Combines Kaoss pads unique control with pro 2-channel mixer

RRP ~~£499~~ £399 0% NO DEPOSIT

NEW EM1 NEW

Music Production Station

£255 0% FINANCE

CX3 Digital Organ

Amazing digital synth RRP £1699

GAK Price £1299

0% Finance available with NO DEPOSIT

SP200 Digital Piano

Amazing digital piano RRP ~~£849~~

GAK Price £499

0% Finance available with NO DEPOSIT

SP300 £699 0% NO DEPOSIT

SP500 £1049 0% NO DEPOSIT

PRX4 Incredible 4 track digital studio

RRP ~~£349~~ 24 x £14.54 0%

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 ~~£1699~~ £1049 = 0% NO DEPOSIT

TASCAM

TASCAM DEALS!

US428 £315
US224 £234
DA302 £499
MD350 £329
DAP1 £call
MX2424 £2959
CDRW4U £379
CDR700 £289

424 MKIII

Portastudio. 6 inputs with mid sweep EQ

RRP ~~£349~~ GAK Price £[illegible]

PORTA 02 £109 **PORTA MEP01** £85

Multitracker

788 24 bit 8 Track RRP ~~£619~~ £525 = 0% Finance

GAK Price £199

NEW **POCKET STUDIO 5**

The worlds first MP3 multitracker. Includes internal synth, 100 f/x, removable card storage, plus USB port for download to computer!

RRP ~~£449~~ 24 x £18.70 = 0%

CDRW700

New Professional mastering CD recorder.

RRP £499 GAK Price £289 = 0% NO DEPOSIT

DM24

24 ch, 8 bus digital mixer with on board DSP effects

£2199 = 0% No Deposit

novation

IN STOCK NOW New K-Station

Price ~~£449~~ 12 x £37.42 = 0%

0% NO DEPOSIT FINANCE

PRODUCT OF THE MONTH **KS SYNTHS**

4 part multitimbral, 16 voice, 4 outs, new liquid analogue technology from the K Stables. Incredible hypersonic editing

SUPERBASSTATION & DRUMSTATION

Number 1 selling bass module at great discounted price.

RRP ~~£449~~ NOW ~~£329~~

KS4 RRP ~~£249~~ GAK 24 x £31.21 = 0% NO DEPOSIT FINANCE

KS5 RRP ~~£349~~ GAK 24 x £35.38 = 0% NO DEPOSIT FINANCE

SUPERNOVA

Voted best synth of '98. Now 24 note polyphonic, 8 part multitimbral. Amazing analogue modelling

RRP ~~£1299~~ GAK Price £899 = 0% NO DEPOSIT FINANCE

44 voice version now available at RRP ~~£1399~~ £1099 = 0%

New A-Station RRP ~~£249~~

GAK Price £279 0%

nord

MODULAR

Incredible Keyboard

RRP ~~£1449~~

£999 = 0% NO DEPOSIT

MICRO MODULAR

Pocket-Sized Modular Rack

RRP ~~£449~~

£329 0% NO DEPOSIT

LEAD 2

Fattest Sounding Synth Available

RRP ~~£999~~ £779 0% NO DEPOSIT

LEAD 2 RACK £579

MODULAR RACK

The Industry's Best Kept Secret RRP £1299

£949 0% NO DEPOSIT

LEAD 3

£1379 6x229.83= 0% NO DEPOSIT

LEAD 3 RACK

£1249 6x £215.83 0% NO DEPOSIT

ELECTRO 2

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RRP ~~£399~~ £499 - 12 X £41.58 = 0% NO DEPOSIT

PROTEUS 1000 *New version of the mighty Proteus*
£349 -12 X £29.08 = 0% NO DEPOSIT

XTREME LEAD 1 *64 voice techno synth rack*
£359 - 12 X £29.92 = 0% NO DEPOSIT

XTREME LEAD TURBO
£549 = 0% NO DEPOSIT

B3 *64 voice tone wheel organ*
£359 12 X £29.92 = 0% NO DEPOSIT

MO PHATT *Urban Dance Module*
£359 - 12X £29.92 = 0% NO DEPOSIT

MO PHATT TURBO
£649 = 0% NO DEPOSIT

E5000 SAMPLER *Awesome,*
£699
12 X £58.25
0% Finance with NO DEPOSIT

VINTAGE KEYS *Mega new sound module*
£499 12 X £41.58
Available 0% Finance with NO DEPOSIT

E6400 SAMPLER
£1079 6 X £179.83 0% Finance

MP-7 & XL7 *The power of Proteus AND Mo Phatt PLUS powerful multitrack sequencer*
RRP ~~£1000~~ £599
12 X £49.92
= 0% NO DEPOSIT
Free Proteus Board

ORBIT 3
£569 - 12 X £47.42

PROTEUS 2500
£599 - 12 X £49.92 = 0%

VIRTUOSO *128 voice virtual orchestra*
£549 - 12 X £45.75

E4XT ULTRA *128 note poly, 64 Meg Ram 8 outs. 32 channel + f/x + more*
£1699 = 12 X £141.58 0%

PROTEUS 2000 *128 note poly + 3 additional ROM slots for 128 Mb of sounds.*
£499 12X £41.58 0% Finance with NO DEPOSIT

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RRP £1899 = 12 x £158.25 = 0%

Special Offers!

MPC2000	£595
MPC2000 ZIP+ 32mb	£795
MPC2000 SLE	£699
EB16 F/X Card	£269
208 8 output board	£195
MFC42 Filter	£299

Fostex

VF-160 *New digital 16 track with built in effects.*
RRP ~~£999~~ £649

SPECIAL OFFERS

VF08 £389 *Remarkable new digital 8 track.*
6 x £66.5 = 0%

MR8 *8 track digital recorder with f/x & 128mb storage card.* £349
24 x £14.54 = 0%

D160 £895
VM04 £85
VC8 £179

LEXICON

MPX550 FX RRP ~~£360~~ 24 x £14.96 *Incredible new 24 bit digital FX unit from the masters*
MPX200 FX *Incredible new 24 bit dual FX unit from the masters*
RRP ~~£300~~ £189 0% FINANCE
MPX110 *Get the amazing Lexicon reverb/FX amazing new price* RRP ~~£300~~
MPX1 *Top quality reverb & multi fx. Mega deal. Save over 40%*
RRP ~~£999~~ GAK PRICE £519 - 0%
MPX200 FX *Incredible new 24 bit dual FX unit from the masters*
RRP ~~£300~~ £189 0% FINANCE
PCM81 GAK £1399 0% FINANCE
PCM91 GAK £1579 0% FINANCE

Steinberg

SPECIAL OFFERS...
VST SPECIAL EDITION
£299 6x £49.83 = 0%
NO Deposit
HOUSTON CONTROLLER
£595 0% NO Deposit

CUBASE SX £459
6 x £76.50 = 0%
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6 x £48.17 = 0%

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LM4v2 *virtual drums*	£81
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LOGIC PLATINUM V5.1 £529 6 x £88.17 0%
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Big Box includes: Logic Audio V5, EVP73, ES-1, EXSP23, EXS Sampler.

ES 2 *Synth*	£199
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EVP 88	£149
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AMT 8 *8 MIDI in/out*	£275
MT 4 *4 MIDI in/out*	£95
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WAVEBURNER	£149
EVP73	£CALL
EVB3	£169
EVD6	£129
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2408 MK11	£732
1296	£1969
828 *Audio Interface*	£686
MTP AV	£569
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896	£996
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C03	£119
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DMP2	£59
MAC MAN 1X3	£39
MERGE 2X2	£34
MIDISPORT 2X2	£54
MIDISPORT 4X4	£90
MIDISPORT 8X8	£209
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PORTMAN 2X4 PC	£79
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Classic all-tube outboard MEGA DEAL £129 !!!

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New version of this classical digital EQ

UNBELIEVABLE PRICE £149 !!!

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MAGICIAN	£159
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MX1804X 14 channel + f/x	£189
MX2642 16 channel / 4 bus	£189
MX3282 32 inputs	£549
MX3242 32 inputs	£479
MX1604 12 inputs	£99
MX2442 20 inputs	£439

MX9000A EURODESK

24 input 8 buss 8 aux sends, meter bridge & mid sweep make this the best value desk ever made

GAK PRICE £1199

HOT NEW PRODUCTS

DDX3216 Fantastic 32 channel digital mixer at an incredible price

GAK PRICE £999 12x£83.25=0%

The "Truth" Powered 150 w monitors

GAK PRICE £299 0%

V AMP Mega!! £99

MACKIE Mixers

MACKIE d8b

56 channel, 96 moving faders. Numerous world wide No. 1 hits!! Includes FREE software worth £3334

RRP ~~£9999~~ - GAK £9999

36x277.75=0%

NEW

MACKIE HDR24\96

This incredible computer independant 24 track digital recorder is now in stock and on demo. Forget complex computerised systems with conflicting drivers, simply plug in direct to a PC monitor and begin editing and laying down tracks

RRP ~~£3999~~ -GAK £3499 24 x £145.79 = 0%

NEW

SDR24

24 track hard disk recorders Price £1995

0% No Deposit Finance

MACKIE 24/8

The classic 8 bus analogue desk, in stock and on demo

Price £2099 0% No Deposit Finance

MACKIE 32/8/2 £2959

VLZ MIXERS

Complete range of Mackie VLZ mixers in stock

1604 VLZ Pro	£CALL UK LOW!
1642 VLZ Pro NEW	£695
1402 VLZ Pro	£425
VLZ 1202	£319
SR24	£CALL

NEW CFX LIVE MIXERS with onboard digital effects

CFX 12 £469 CFX 16 £655 CFX 20 795

ALESIS

NEW

ANDROMEDA

NOW IN STOCK

The most powerful real analogue synth ever made! RRP £2399

24 x £99.96 = 0%

AirFX

£139 - In Stock

MASTERLINK

Professional mini stereo mastering unit

RRP ~~£1499~~ £749

0% Finance Available

NEW

ADAT HD24

SPECIAL

New 24 track ADAT

£1499 6x£249.83= 0%

SR16

Highest selling drum machine anywhere. Industry Standard £149

ADATLX20

~~£1499~~ £899 0% NO DEPOSIT

MEGA DEALS

DM5 Drum Module	£269
Nano Compressor	£69
Midiverb IV	£195
Microverb IV	£149
Nanoverb	£79
MEQ230 Graphic	£169
DM Pro	£549

ADAT XT20 £1499

3630 COMPRESSOR

Best value compressor

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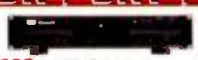

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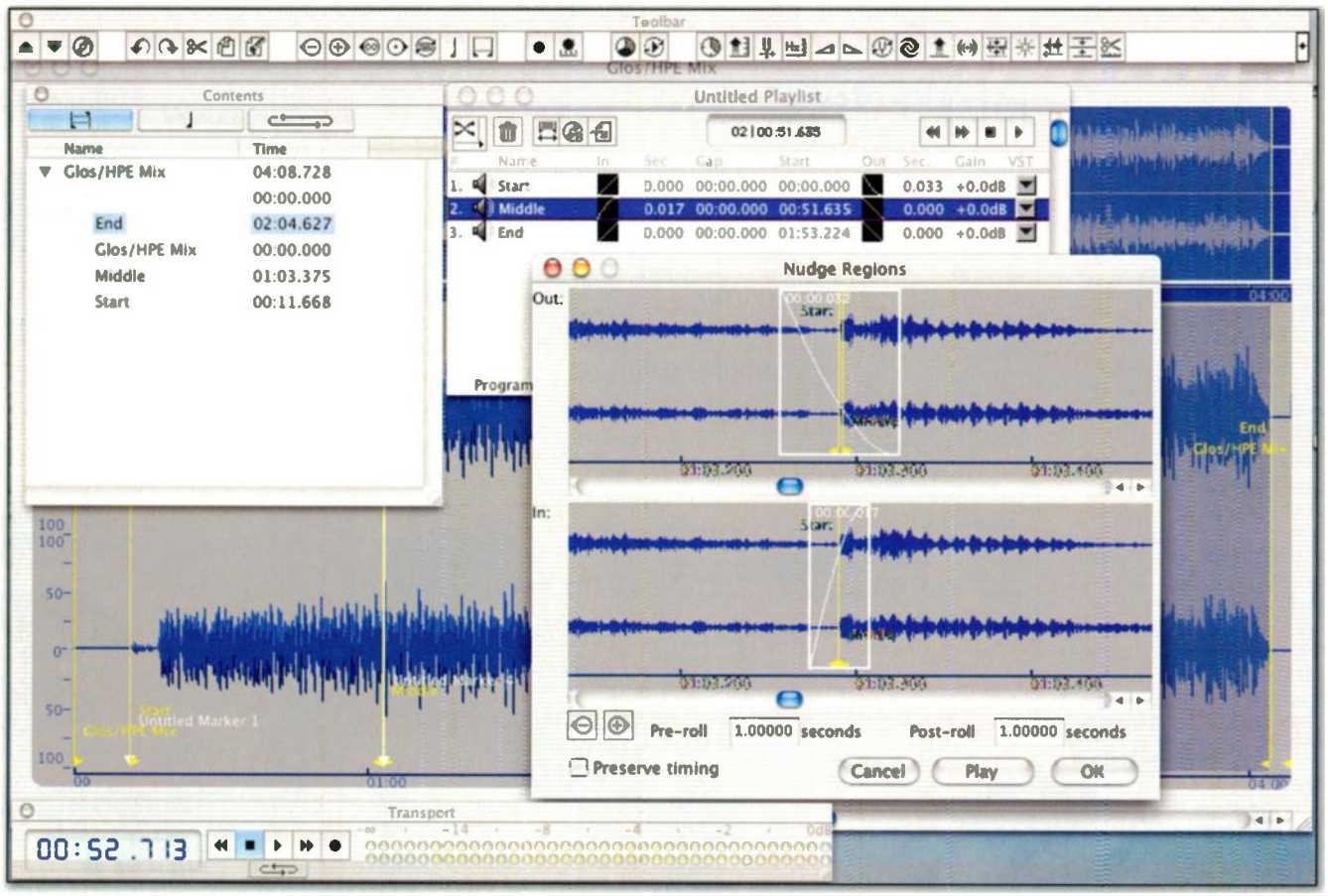


BIAS Peak 3.1 Audio Editor For Mac

Paul White

BIAS *Peak* for the Mac is no longer just a well-specified stereo editor: it's also a powerful sound design tool and effects routing package.

BIAS *Peak* is a very well-established stereo audio editing package for the Macintosh computer platform. The last version reviewed in *SOS* was v2.02, which we covered in June 1999 (www.sound-on-sound.com/sos/jun99/articles/biaspeak.htm), and it's now evolved to version 3.1. This latest incarnation supports all Apple operating systems from OS 8.6 upwards, including OS X.

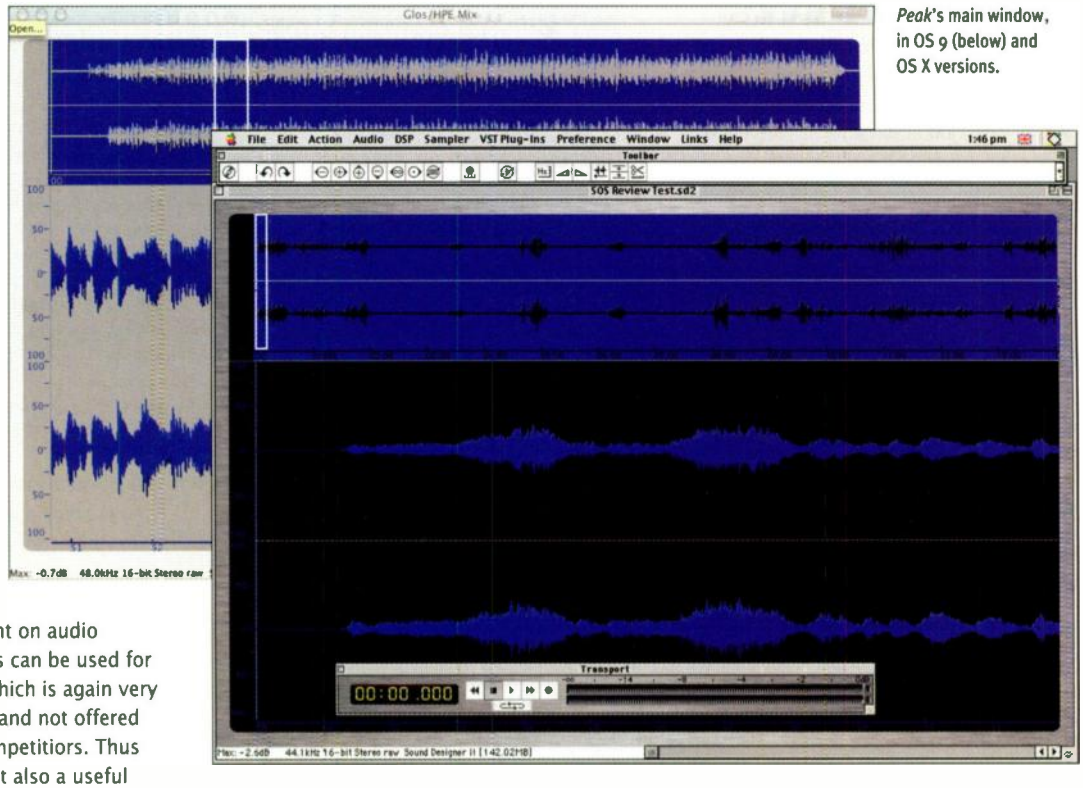
An Overview Of *Peak*

Peak can be used to edit and process final stereo mixes in various audio file formats, including AIFF, WAV and *SDII* (Regions are supported for *SDII* and AIFF files and may be exported as separate files where needed), it can be used to prepare an album playlist from which a Red Book-compatible CD may be burnt using Roxio's *Toast* or *Jam* programs (a *Lite* version of *Toast* is included with *Peak*) or it may be used as an advanced waveform editor, integrating with other audio recording programs or for editing/creating sampler files. For those working with video, there's also QuickTime Movie and DV (Digital Video) clip support with better than frame-accurate sync of video to audio — when selecting an audio waveform relating to a QuickTime movie or DV clip, the video follows automatically.

Multiple audio documents can be displayed at the same time and there's unlimited undo/redo with a full undo history. SMIDI support is included for transferring samples to and from SMIDI-compatible samplers, which can be used via SCSI (or FireWire-to-SCSI adaptors), and there are also some neat tools unique to *Peak* for working with loops, such as Loop Surfer, Loop Tuner, Crossfade Loop and Guess Tempo. As with earlier versions of *Peak*, there's VST plug-in support, but there's also a new effects matrix known as Vbox (see box), and 25 OS X-compatible plug-ins are bundled with *Peak* from v3.1 onwards. Vbox enables multiple VST plug-ins to be connected in various series/parallel combinations for mastering or multi-effect processing so you get plenty of opportunity to check out the included VST effect and processor plug-ins.

To augment the VST effects, there are also DSP processes for handling fades and other edit functions that are only 'destructive' when saved. Also available in the DSP section are sample-rate conversion, normalisation, audio reverse, gain changes and so on. In addition to these familiar processes, there's the well-specified Pow-R

dithering system, a very decent four-band paragraphic EQ, automatic click repair, a few off-the-wall effect-style processes (including Rappify and Reverse Boomerang!) and Convolve, a wonderful sound-design tool that can be used to apply the frequency spectrum of one sound onto another. Tools are also available for high-quality time and pitch manipulation, and to make life easier when creating multisamples and suchlike, *Peak* can automatically divide files into regions dependent on audio threshold levels. Envelopes can be used for VST plug-in automation, which is again very unusual for stereo editors and not offered by any of *Peak*'s direct competitors. Thus *Peak* isn't just an editor but also a useful toolkit for those designing sound effects or sample libraries.



Peak's main window, in OS 9 (below) and OS X versions.

By way of future-proofing, *Peak* can handle audio bit depths up to 32-bit and sample rates way beyond even the most esoteric rates used in commercial audio production today (up to 10MHz!) — the only real limit is your audio hardware. *Peak* also offers AAC (MP4) encoding, and for multimedia applications, a powerful batch processor is built in, with the ability to handle high-quality MP3 encoding as well as numerous uncompressed file formats. All the standard editing tasks are performed non-destructively, and any destructive edits are not made permanent until the project is saved.

Many of *Peak*'s main features are paralleled by the somewhat younger *Spark/Spark XL* from TC Works — particularly the matrix-like Vbox effects routing system, which is quite similar to *Spark*'s FX Machine, and the batch processor — but some of the newer features are unique to *Peak*. Additions since version 3.0 are full support for Mac OS X (which *Spark* now also has), a newly designed visual interface that matches Apple's Aqua styling, a new cursor palette, a newly designed and resizable floating Transport window with huge level meters, and functional enhancements to the Contents window. With OS X support has come compatibility with Apple's CoreAudio. *Peak*'s sample-rate conversion quality has been improved and it's now possible to specify which windows float above the screens and which behave normally.

The *Peak* Ethos

The first stage in working with *Peak* is to create a new *Peak* Document, where you can either record an audio stream via your audio interface or import an existing file in AIFF, *Sound Designer II*, AAC, WAV, Broadcast WAV, QuickTime, Raw, System 7 Sound, Sonic AIFF, Paris, *Jam* Image, AU and MP3 formats. Any of these may be opened directly by dragging and dropping the file (or a folder containing audio files) onto the *Peak* application icon. Compressed Audio Documents such as AIFF/AIFC and QuickTime files compressed with MACE 3:1, MACE 6:1, IMA 4:1, QDesign, or Alaw can also be opened in *Peak*, so there's very little you can't get it to work with. *Peak* can also open files saved in programs that use split files as opposed to interleaved stereo files, in which case *Peak* saves new interleaved stereo audio files to disk. Once edited, files may also be saved at a different bit depth, and where the bit depth is being reduced, the Pow-R dithering may be used to preserve as much dynamic range as possible.

The User Interface

Like *Spark XL*, *Wavelab* and other stereo editors, *Peak* is loosely based on the original *Sound Designer* paradigm where the main window presents an overview of the entire audio file plus a zoomed-in section where editing and region selection is carried out, though the ability to open multiple audio documents at the same time (each with its own undo history) is as as far as I know unique to *Peak*. Up to 10 audio documents may be triggered and cued for playback by using the number keys 1 to 0 on the Mac keyboard. A further nicety is that you can start playback of each of these using the numeric keypad on the computer keyboard, which could be useful for applications like semi-improvisational live performance or theatre sound effects.

Sections of audio can be selected and then converted to regions, which appear in the Contents window, and it's also easy to silence, delete or insert sections of audio as ▶

SOUND ON SOUND

BIAS *Peak* v3.1 £349

pros
- Mature product with well-developed user interface.
- Stable and quick to use.
- Includes lots of useful tools, both practical and creative.
- Runs on OS X as well as OS 8.6 to 9.2.

cons
- Toolbar icons could be clearer.
- Nudge editor could be improved.
- No paper manual.

summary
Peak is one of the top stereo editors available for the Mac, and though it has many conceptual similarities to the younger *Spark* from TC Works, it also includes a number of unique and powerful features not found elsewhere.

well as to apply any of the DSP functions including fade-ins, fade-outs and normalisation. Auto Snap to Zero in the Preferences menu forces *Peak* to move your region selection boundaries to the nearest zero crossing points in the waveform. *Peak* facilitates the independent processing of left and right channels, but edits can only be made to both parts of a stereo file, so as to keep the two channels in perfect sync.

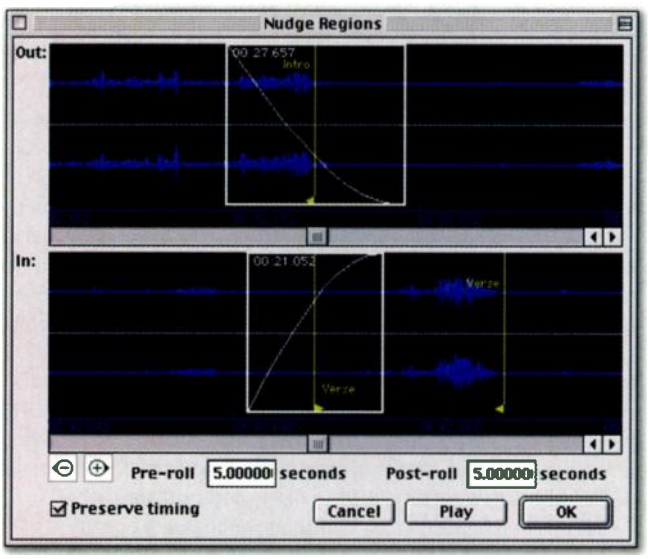
Clicking in the waveform overview starts playback from that point, with the cursor in the lower zoomed waveform selection reflecting the playback position. Optionally, the overview may be turned off to maximise the viewing size of the waveform. Scroll During Playback must be active in order for the zoomed-in audio waveform to scroll along with the audio playback as the cursor reaches the right-hand edge of the screen. Alternatively, Move Waveform During Play moves the waveform under a stationary cursor during playback. An auditioning feature may also be engaged to apply pre-and post-roll when playing back a selection. Markers can be placed anywhere in an audio file and *Peak* allows the user to 'tab' through these for easy navigation, while selection boundaries may be modified by Shift-dragging.

When editing a track from one or more takes, the necessary sections are identified as regions and then assembled in a playlist window, as with most other programs of this type. Numerous playlists can be created using the same audio material, and when a project is stored, the audio file and playlist files are saved separately. A finished playlist comprising the individual songs in an album may be exported as a *Toast* or *Jam* file for CD burning.

Hardware Requirements & Installation

Those not yet running OS X will need a G3 or G4 Mac running OS 8.6 to 9.2 with at least 96MB of RAM, Sound Manager version 3.4 or later and QuickTime version 4 or later (the QuickTime PowerPlug extension must also be installed). Also needed is CarbonLib 1.4 or later. The G4-optimised version of *Peak* exploits the G4's Altivec Velocity Engine, but at the other end of the computer scale, Nubus machines are no longer supported since v3.0. The OS X.1 system requirements are a little higher, as at least 128MB RAM is needed, and of course any audio hardware will need an OS X driver that supports CoreAudio. CoreAudio offers lower latency than OS 9.x and supports high bit depths and sample rates directly. The program looks slightly different under OS X and includes more Aqua-like styling than the OS 9.x version.

Peak will run for 14 days after installation before it needs to be authorised, which can be done via the BIAS web site or by post. Once you send in your serial number and authorisation code, you get a code back that unlocks the program. As the OS 9 and OS X versions are effectively separate programs, however, you need to authorise them separately. Preferences, such as key commands, are also not shared between the two versions, which means you'll need to set them up twice if you plan to use both.



The Nudge editor allows you to fine-tune the transitions between regions.

Tools Of The Trade

One of the main jobs once you get into playlist editing is to ensure the transitions between the regions work both musically and technically. To facilitate this, there's a Nudge Regions window that shows the waveform either side of the edit and enables the crossfade duration to be manipulated graphically. In this window you can also adjust the region start and end times at the transition as the audio loops around by using scroll bars, though I still prefer the system used in both *Sound Designer II* and *Spark*, where you can set up nudge buttons to shift by specific time increments. Moreover, there's no scrolling cursor to enable you to tie up what you hear with what you see, and unlike the two programs already mentioned, you can only audition a single transition. Having the ability to hear the region before and after the one being worked on is immensely helpful where the region is very short, as might be the case if you're adding in a single note or beat. You can set pre-roll and post-roll for auditioning the edit, while a Preserve Timing tick box is available to keep the time between region markers fixed. When Preserve Timing is off, both region markers can be moved independently and the waveform display may be zoomed horizontally down to single-sample resolution.

Further windows are available for the Transport, Toolbar, Cursor Palette, Contents Palette and Movie Window. The Contents Palette shows the audio files being worked on plus all regions, markers and loops. A great many aspects of *Peak*'s appearance can be configured as user preferences, including defining custom keyboard commands and determining which icons are displayed in the toolbar — a feature I very much approve of. The colours used in the waveform display can also be changed, though some options are alarmingly lurid so it may be better to define your own colours using the standard 'colour wheel'.

During the review, I set up most of the key commands I got used to with *Sound Designer II*, though the extent to which this can be done is limited as *Peak* has many more functions than *Sound Designer II*. The number of commands, and hence icons, is huge, but by choosing only the ones you use most regularly to appear in the toolbar, you can keep the program looking uncluttered.

The small Cursor Palette houses four different icons depicting different cursor functions, the default being the ubiquitous arrow. As with many graphics programs, the hand cursor is used for moving things, there's a pencil tool (with various smoothing options) for redrawing sections of the waveform — for example, to smooth out a glitch or click that the automatic click-removal function doesn't recognise — and a magnifying tool for zooming the waveform display resolution. The Esc key on the computer keyboard toggles between these modes. Blending can also be turned on here, forcing a user-definable crossfade to be applied automatically wherever an audio file is edited, so as to avoid audible glitches. The cursor time and amplitude coordinates are displayed in this window as well as certain marker information, tempo in bpm where that's applicable, plus the duration of the current audio selection. Time can be displayed in samples, minutes/seconds/milliseconds, SMPTE, or Bars and Beats, as set in the preferences. The user can also type in selection lengths in the cursor window as well as a tempo value, to automatically select a complete bar length.

Midge Ure, m-powered.

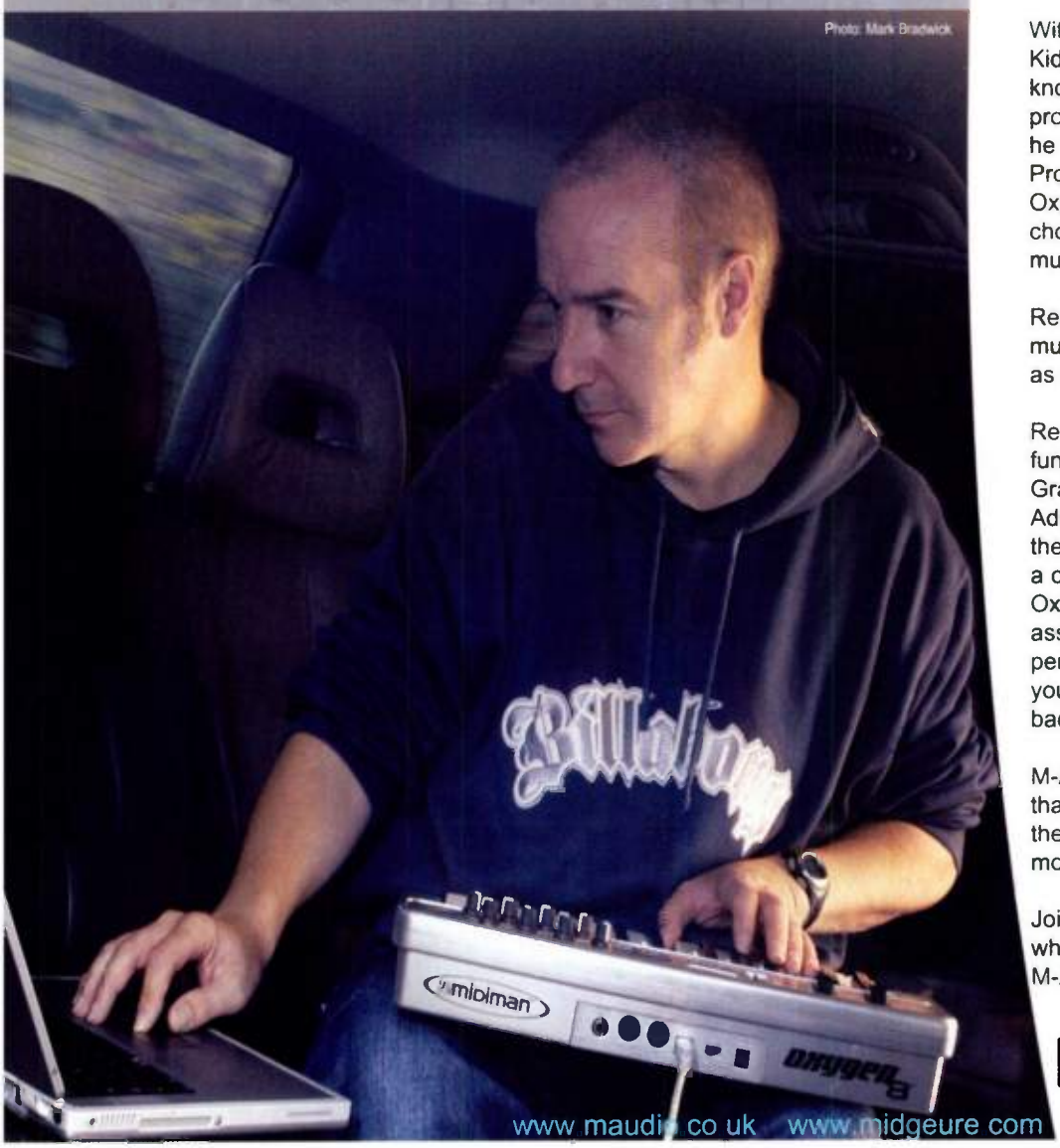


Photo: Mark Bradwick

With credentials including Ultravox, Rich Kids, Thin Lizzie and Visage, Midge Ure knows a thing or two about music production. A self confessed 'tech-head' he has his pick of techno toys. With Propellerhead's Reason 2.0, the Midiman Oxygen8 and a laptop, Midge's studio of choice is anywhere and everywhere the music strikes. Including the back of a car...

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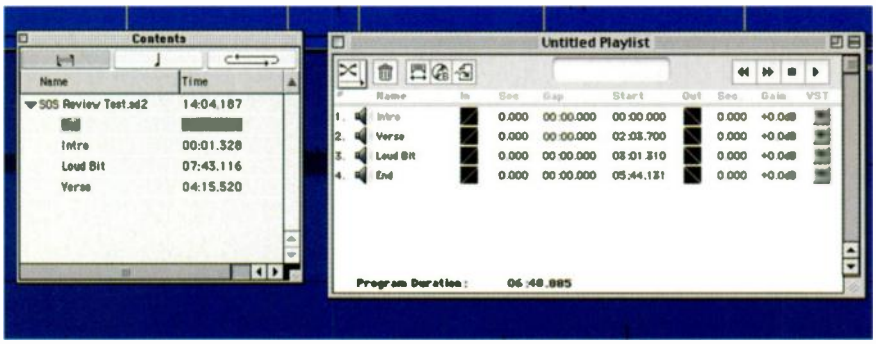
Peak includes dynamic scrubbing where you can move the mouse forwards or backwards within the waveform display while the program loops around a short section of audio (which can be set between 10 and 600 milliseconds long) at the cursor position. Tape-style scrubbing is also available when using Mac AV playback, which I personally prefer as it's similar to rocking the tape back and forth over the heads to find a specific event. Unfortunately, tape-style scrubbing is not available when using ASIO hardware.

Special loop markers are available for marking a section (just one per audio file) that is to be repeated or for defining the loop points in a section of audio destined to be used in a sampler. The loop length may be fine-tuned by dragging its start or end markers during loop playback. There's also a new feature called Loop Surfer, which is a pretty clever addition. Loop Surfer is designed to work with music that has a recognisable beat, to help find the correct length of audio to form a perfect loop — and it can work surprisingly well. Not only is this useful for setting up loops to be transferred to a sampler, but if you want to insert or delete a riff or two from a song, Loop Surfer can help you identify the right length of section to edit. In order to avoid abrupt transitions at the loop start/end points, *Peak* supports crossfade looping, again with user variable time and shape. Where you already know the tempo of the song, Loop Surfer can work directly from that, but if you're not sure, a Tempo Calculator can be used to work it out for you providing the music has a detectable beat. All you have to do is to select a chunk of audio and type in how many beats occur within that selection. Alternatively, Guess Tempo can be used to try to figure out the tempo of a selected section of audio. The estimated tempo in bpm can than be entered directly into the Loop Surfer. The Loop Tuner helps line up the start and end points of a loop (based on the visual waveform display) to produce a glitch-free transition and, because it can be used during playback, you can hear the results of any changes as you make them.



Peak's playlist is completely non-destructive, and boasts excellent integration with CD-burning software such as Roxio's *Jam*.

Burning Issues

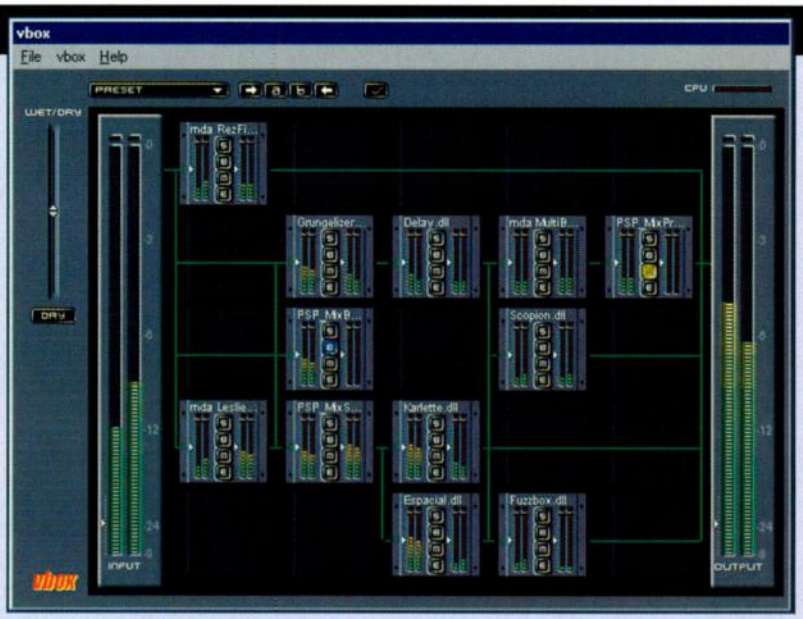
Peak's playlist is completely non-destructive, so gaps between songs can be applied, fades can be tweaked and song starts and ends can be trimmed without doing anything irrevocable. One you have a playlist you'd like to transfer to CD, *Peak* will let you burn in either Track At Once or Disc At Once mode using the included version of *Toast Lite* or the optional *Jam*. I always use *Jam* for creating my own Red Book masters; apparently *Jam* now uses the same burning engine as *Toast*, but *Jam* is still required in order to write the necessary ISRC and PQ sub-codes for creating a Red Book master for duplication. Note that *Peak* may be set up as the designated external waveform editor for *Jam* via *Jam*'s preferences. *Peak*'s playlist editor can also create a ready-to-burn *Jam* image file for burning using *Jam*, and it's possible to save a playlist as a *Sound Designer II* file for import into Digidesign's *Masterlist CD* burning software or Emagic's *Waveburner/ Waveburner Pro*.

Yet another very powerful aspect of *Peak* is that it not only supports VST plug-ins, but also that it enables them to be used within the playlist to provide a form of snapshot effect automation. To do this, the Vbox effects matrix must be set up with the desired VST plug-ins, whereupon a snapshot of the settings relating to a particular playlist entry can be saved. The manual rightly points out, however, that audio

Vbox

Vbox, which is also available as a separate VST plug-in in its own right (for Mac OS and Windows), is a matrix of electronic pigeonholes into which can be slotted VST effects. Once an effect is loaded, it is represented by a box with buttons for Solo, Bypass, Mute and Edit, the latter opening the actual plug-in editing window. There are also meters and gain controls for the input and output levels plus the ability to view multiple plug-in edit windows simultaneously.

Assigning plug-ins to the window is very intuitive and to evict one you don't want, you simply click on the plug-in name, then select 'no effect' from the plug-in list in the usual way. Plug-ins may be moved from one box to another, and as new plug-ins are added, appropriate 'wiring' appears, though this can be changed to some extent to create different configurations by clicking on the green input indicator on the left of the plug-in box. However, as in *Spark*'s FX Machine, there is no facility to pan the outputs of different parallel effects chains to different locations in the stereo field unless you insert a panner plug-in. A complete Vbox matrix can be saved as a user preset, and if the matrix isn't big enough, it can be resized to as large as 99 x 99 boxes.



The Vbox plug-in effects matrix is also available as a separate product: unlike *Peak*, it's available for both Windows (as shown here) and Mac OS.

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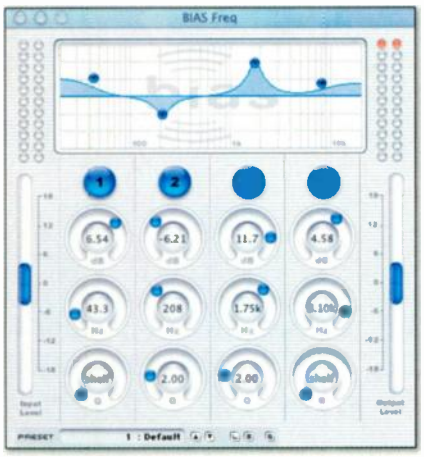

Peak 3.1 comes with 25 OS X-compatible plug-ins, including the "mastering quality" four-band *Freq* EQ.

glitching can occur if plug-ins are added or removed during playback, so it's usually best to load all the plug-ins you need into Vbox, then use their Mix or Amount controls to determine whether or not they are contributing to a particular snapshot. A Bounce function is available to write the processed playlist to a new audio file.

When using the playlist to set up an album's running order ready for burning via *Toast* or *Jam*, it should contain only complete songs, as each region is interpreted as a separate song ID at this stage of the game. That means that any songs requiring edits are best burned to new single audio files before any CD burning takes place. Similarly, if any real-time VST effect processing is being used in the playlist, *Peak* will automatically bounce the results to a new audio file before burning a CD. Also be aware that any markers you create in a playlist prior to creating a *Jam* image file will become index points in *Jam*. Many users need this feature, but from my own experience (I don't use indices, as few players recognise them), markers can get left in by accident after editing operations, resulting in the creation of unwanted indices. For this reason, a Delete or Ignore All Markers button in the playlist window might have made life easier for those not wanting to use indices.

Peak Of Perfection?

Before I start to get judgemental, I have to say that it's very hard to evaluate a software package fairly if it's not the one you generally use for the job, as all your expectations are influenced by what you're used to. For most serious editing work, I still use an antiquated version of *Sound Designer II*, simply because I find it very fast to work with. Like relative newcomer *Spark XL*, BIAS *Peak* is now a very sophisticated program with a host of features augmenting its core audio editing capabilities, but its success or otherwise must still rest on the quality and usability of that editing core. I tested *Peak* on both OS 9.2 and OS X and found both versions to be very stable, which is of course the first essential for any program with professional aspirations.

The only apparent bug I found was a very weird graphic anomaly under OS 9, which I've yet to explain. When I used the Contents palette on my main monitor, it worked perfectly — when the triangle by the file name is clicked, the selected regions fall down beneath it in traditional 'folder' style. However, if I tried to do the same thing with Contents dragged over to my second monitor, the regions could not be displayed. This is the only time I have ever experienced this kind of weirdness when using a second monitor. On an ergonomic note, I found that many of the icons were too small and too vague in their meaning for my liking (and the lack of icon colour doesn't help), but being able to customise which icons appear in the toolbar and which key combinations activate the various function helps a lot. I couldn't see an obvious way of creating and storing different toolbars for different tasks as the toolbar settings are stored as preferences, but this could be a useful future addition.

The business of selecting regions and positioning markers is fast and largely intuitive, though I prefer the simpler method of marker deletion where you just drag unwanted markers off the page or into a bin as it means you don't have to remember another key combination (it's funny how you buy computers to remember stuff for you, but all too often you end up remembering stuff for them!). Similarly, the way you can start and stop audio anywhere in the overview window is well implemented, but having no tape-style scrubbing when working with an ASIO audio interface is a bit restrictive given that most serious users running under OS 9 will be using ASIO.

Deleting sections of audio where you want the cut ends to be joined up is handled very effectively without clicks or glitches, and because nothing is made permanent until the file is saved, multiple levels of undo are available if you need them. This 'delete and join' mode is extremely useful for dialogue editing, and is one thing *Sound Designer II* handles very badly as it insists on saving the edited file after every edit!

Dragging regions from the Contents

Different DSP Functions

Many of *Peak*'s DSP functions will be familiar to anyone who's made much use of software editors before, but some are unique and many are worthy of special mention. One such is Convolve, which is used to apply the dynamically changing spectral characteristics of one sound onto another by multiplying the frequency spectrum of the clipboard audio with that of the audio you're processing — rather like a vocoder, but with many more frequency bands. Convolution is very handy as a means of creating new sounds by combining existing sounds, but it can also be used in a fairly basic way to apply the sonic characteristics of an audio space onto an audio file. The manual suggests copying a small amount of room noise to the clipboard and using Convolve to process your audio.

Gain Envelope is another function seldom seen in editors other than perhaps *Waveburner*. Here you draw in a gain envelope in the way most sequencer users will already be familiar with, in order to apply dynamically automated gain changes within a piece of audio. Envelopes can also be used for VST plug-in parameter control — which, again, is something a bit special for a software editor.

Mix causes audio saved to the clipboard to be mixed into the main audio file (handy for adding sound effects) while Modulate multiplies the clipboard audio with the main audio files to produce a ring-modulator like effect — not recommended while mastering! Yet another esoteric function is the Phase Vocoder, where it's possible to change the pitch of a selected section of audio. Phase vocoding is somewhat different to conventional pitch-shifting and involves FFTs (Fast Fourier Transforms). As I understand the process, it works by analysing the frequency content of the audio selection and then effectively resynthesizing it using a vast number of oscillators, which means pitch changes can be made without the usual pitch-shifter warbling, though relatively non-complex sounds fare better than complex mixes. Phase vocoding only appears to be available when using 16-bit audio files — there's no option to convert 24-bit files to 16-bit automatically when phase vocoding, so this would have to be done manually.

While most of *Peak*'s features are there to optimise audio quality, Rappify uses heavy dynamic filtering to create the impression of a nightclub sound system heard through a wall! Again, this is not often used in mastering. Reverse Boomerang mixes a reversed copy of an audio selection with itself, producing exactly the result you'd expect.

Returning rapidly to the subject of quality, Repair Click attempts to identify sharp spikes or clicks and replace them with data 'guessed' from what's going on either side of the click. When fixing individual clicks, the selection can be no more than 100 samples long, but there's also a semi-automatic process that works through the file locating each successive click — almost like a manual search-and-replace function in a word processor. Repair Clicks is particularly good at fixing short digital clicks but needs more care when used with vinyl records and suchlike, because vinyl clicks aren't as easy to identify as digital clicks.

Batch Processing

***Peak*'s Batch File Processor allows several processes or conversions to be applied to a number of different audio files without the user having to be in attendance. This includes the application of plug-ins — as far as *Peak* is concerned, a VST plug-in is simply one more operation to apply.**

The Batch File Processor has three main sections: Input, Process and Save Changes, where Process looks after the sequence of processes to be applied. Once configured, audio files (or folders of audio files) may be dragged to *Peak*'s icon for automatic processing. The Batch Processor includes support for Apple Events, allowing large libraries of audio files to be managed using database programs such as *Filemaker Pro*.

The batch processing facilities in *Peak* allow you to apply the same processing chain to multiple audio files without having to load them all in individually, by hand.

palette into a new playlist is easy, as is setting up pre- and post-roll times to audition transitions. As with *Sound Designer II* and *Spark XL*, there's a crossfade audition window for fine-tuning transitions between regions, but I found the lack of discrete nudge values to be a little frustrating (perhaps because it's what I'm used to) and would have also preferred a moving time cursor. I've also mentioned that the ability to audition two consecutive transitions at the same time could be useful when editing in very small sections, but to be fair, *Peak*'s adopted system will produce quick and accurate results in most situations. I found there to be more than enough control over fade time and shape, both for crossfades and fade-in, fade-out operations, so as a general-purpose editing tool, *Peak* comes out extremely well on most counts.

All the familiar DSP functions work as expected, but the more ambitious sound-design functions such as Convolve are very welcome additions when you're using *Peak* to bend and shape new sounds rather than for song editing. For me, the most fun to be had with Convolve is when melding disparate sounds to create something abstract and new. Even convolving one vocal phrase with another in the same song produces fascinating and quite unworldly results. It's also worth noting that the declicking function can work extremely well, though in some instances it will simply not recognise a click, in which case you still have the option to draw it out manually as in many other editing programs. The drawing tool has its own smoothing options so in most cases short 'problem areas' can be removed without leaving an audible glitch.

The inclusion of looping tools will be welcomed by anyone preparing rhythm loops for use in samplers, but tools such as the Loop Surfer can also be useful in traditional editing roles, for example, to identify a piece of audio to be cut or copied without breaking the rhythmic flow of the music. In most cases, these tools work extraordinarily well and indeed, it's surprising to see tools this effective included in what is really a general-purpose audio package. On the whole I was impressed with the way *Peak* handled VST plug-ins, though I witnessed some glitching and playback stutters when trying to configure effects as the audio was playing. I was also unsuccessful in getting Vbox to load a *Spark* FX Machine plug-in — even an empty one. This was the only thing I found guaranteed to crash *Peak*.

In concept, Vbox is in fact very similar to *Spark*'s FX Machine and shares the same limitation in that there's no way to pan parallel sound streams other than by inserting a dedicated panner plug-in. Having a pan control in each output stream would have been easier. Being able to set up snapshots of VST plug-in settings for each item in a playlist is also potentially very useful for mastering and remixing. Apparently so many users lobbied BIAS for this feature that they had to put it in!

Peak's Batch File Processor is pretty comprehensive and is designed to be as easy to use as possible, at least when carrying out routine tasks. Once again, as I use this type of program mainly for track and album editing, batch conversion is not something I need a lot, but there are some jobs, such as preparing audio for the Internet, where it could save a lot of time and frustration.

Conclusions

As a stereo editor, *Peak* checks out very well in most departments. I feel the Nudge editor could do with a few minor improvements and I'd like to see the option of larger, coloured icons in the toolbar, but in most respects, the program operates in a smooth and workmanlike way. More importantly, although some aspects of the program work slightly differently to the way I'm used to, I found I could do all the basic editing I needed without having to consult the manual. This is just as well, as BIAS supply it as a PDF file rather than on paper. PDF manuals are all well and good, but you need to print them out for them to be of any real use, and that can take up to four times as much paper (single-sided using A4 sheets) than a proper printed manual would have done in the first place.

SMDI support is one function I wouldn't use as I have abandoned all my hardware samplers in favour of software sampling, but although SMDI is slow via MIDI, it is quite fast when using SCSI. Potential OS X users should note that relatively few plug-ins yet work with OS X though 25 OS X-compatible VST plug-ins are included with *Peak* 3.1. However, for the purpose of this review, I updated to version 3.1 from version 3.0 via the BIAS web site and at the time, the updated plug-ins weren't included on the on-line updater so I couldn't try them all under OS X. I also asked BIAS what their take was on Apple Audio Units as a plug-in format. Their reply was: "Audio Unit support in *Peak* will certainly make sense when there are commercially available Audio Unit plug-ins and Apple have resolved some of the acknowledged technical issues that still remain with respect to Audio Units with custom GUIs (graphic user interfaces)."

Outside the core editing framework, the Vbox effects matrix and the additional 'creative' DSP processes stand out most for me, closely followed by the looping tools, but everywhere you look, there are more tools tucked away in corners just waiting for you to come up with a need to use them. *Peak* really is a king-size stereo toolkit, not just an editor, but I'm glad to say that the functionality of the stereo editor hasn't been compromised by the addition of all these extra features — most of which stay politely out of the way unless their services are called upon.

I'm not going to tell you *Peak* is perfect because there are still areas that could be improved, but it is a powerful, stable and largely intuitive editing program with a lot of additional useful features, many of which are unique. SOS

information

£ *Peak* £349; Vbox £89. Prices include VAT.
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Focusrite Platinum Voicemaster Pro

Photos: Mark Ewing

Paul White

With so many areas of the traditional recording market being encroached upon by software, manufacturers are turning to 'safer' products such as voice channels, microphones and loudspeakers, none of which are likely to be replaced by plug-ins in the near future! Focusrite have a long tradition of building high-end mic preamps and analogue processors, and of course in recent years they've made a big impact in the home recording world with their Platinum series. But, as the Platinum range already includes a number of recording channel products, you might reasonably ask what a new model might offer that the existing ones don't. Nevertheless, the Voicemaster Pro does have some new tricks up its sleeve, not least a selection of creative 'flavour enhancers' in the form of its Tube Sound and Vintage Harmonics sections. Some of the features will be familiar from other devices in the range and, indeed, some share common circuit design, but, in this particular incarnation, the Platinum offers just about everything you could ask for in a channel strip, plus a zero-latency monitoring section for working with soundcard systems. It is interesting to note that only the Class-A preamp circuit used in the original Voicemaster remains unchanged.

The Platinum Voicemaster Pro updates the original Voicemaster concept, adding new features as well as design improvements.

The 2U Voicemaster Pro can accommodate line, instrument and mic signals and features seven stages, the first of which is a Class-A preamp built using discrete components as opposed to off-the-shelf ICs. This incorporates a variable-frequency low-cut filter, a phase switch and mic/line switching. When an instrument jack is inserted, the mic preamp is overridden. Standard 48V phantom powering can be enabled from the front panel, but there's no phantom power warning LED, which I'm not entirely comfortable about. All sections other than the preamp (for obvious reasons!) have bypass buttons with integral status LEDs. Improved input level metering now has six LEDs, though users should note that it is calibrated in dBFS (digital full scale) as it relates to the maximum input level of the optional internal A-D converter, which is around +22dBu not the usual +4dBu of the analogue world. To work at a nominal +4dBu, preserving headroom for EQ'ing and so on, a suitable meter setting would be around -20dBFS, which means only one or two LEDs on the meter will be illuminated.

A key feature of earlier Platinum devices has been the use of high-performance optical gain control devices in the dynamics processing sections, and here there's an optical expander following the mic preamp, as well as an optical compressor. The expander functions as a 'soft' noise gate to remove low-level noise or spill during pauses in the wanted program material, but sitting between this and the compressor is a completely new stage called Vintage Harmonics. This is quite

SOUND ON SOUND

Focusrite Voicemaster Pro £399

pros

- Comprehensive range of processing sections.
- Good audio quality.
- Cost effective.

cons

- Expander compromises sound quality in some situations.
- Vintage Harmonics section could use a variable Depth control.

summary

Any criticisms of this unit are minor compared to its advantages, especially when its price is taken into consideration. The new creative processing sections are particularly interesting.

different to the tube harmonic simulator and can be switched before or after compression. As the manual describes it, the aim is to capture some of the effect achieved by playing back a Dolby encoded tape with no decoding, which results in an artificially bright, compressed high end, especially on lower-level sounds. To achieve this, the circuit splits the audio into three frequency bands, then applies variable amounts of compression to the mid-range and high end while leaving the low band untouched. Only two threshold controls, one for the mid-band and one for the high band, are needed to set up this section. The compressor works to increase the gain when the audio signal falls below the threshold so there is no gain drop when compression is applied and no processing when the signal exceeds the threshold. This way only low-level mid-range and high frequencies are affected. A Depth switch allows for two intensities of processing.

The compressor is designed to be simple to operate and so has no ratio or attack time constant knobs. Instead, it has switchable Hard Ratio and Slow Attack, along with a pre/post-EQ switch. The only variable controls are for Threshold, Release and Make-up Gain. Opto circuitry in a Class A configuration is used for gain control, offering lower distortion than most VCAs. Next in line is the Tube Sound circuit, which has appeared before in the Platinum range and uses FET circuitry to introduce harmonics dependent on drive level, simulating the way a valve works when driven hard. As the drive increases, second harmonic is added, followed by second and third harmonic and finally, at higher drive levels, fifth harmonic as well. Excessive use of harmonic generation can result in the sound becoming rough or aggressive, so a Tone control is used to confine the harmonic generation process to frequencies below its setting (variable between 4.5kHz to 30kHz).

Also familiar to Platinum fans will be the Voice Optimised EQ, which comprises four rather unorthodox bands. Breath acts as an 'air' control, applying a wide cut or boost quite high up the audio spectrum (switchable from 10kHz to 16kHz). The Mid control is fixed at 1.3kHz, but unusually has a narrow response (high Q) when used in its cut position and a wider, more gentle response when used for boosting. Also affecting the mid-range is the cut-only Absence control which, predictably, functions as a kind of 'anti-presence' EQ by digging a notch at 3.9kHz, where vocal harshness often resides. Like the Mid EQ, the Warmth control features a wide boost/narrow cut response, but is also tunable over the range 120Hz to 600Hz.

The Voicemaster Pro's zero-latency monitoring facilities include a useful effects loop for incorporating, say, a monitor reverb unit.

After the EQ comes a de-esser, which, rather than ducking the whole signal when sibilance is detected, simply notches out a narrow band of frequencies between 2.2kHz and 10kHz, as dialled in by the user. A Listen button enables the side-chain to be monitored so that the sibilance frequency can be more readily identified, and a Threshold control sets the level of sibilance at which the process becomes active.

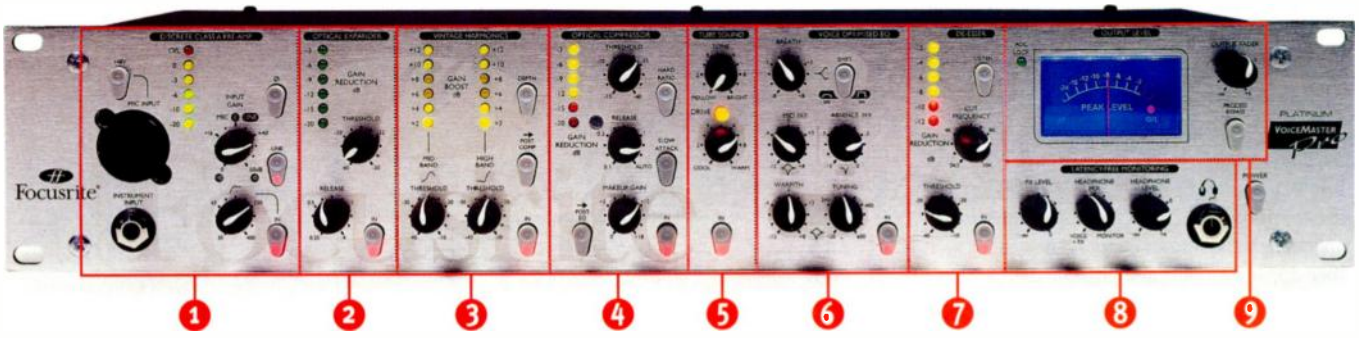
The output section features a large, moving-coil level meter and a level control knob, plus a master bypass that takes all processing off-line and turns off the status LEDs in the individual section bypass switches. Also in this section are the zero-latency monitoring facilities, which provide an easy way to listen to a mix of your soundcard's output and your vocal (or instrument) being recorded via the Voicemaster Pro at the same time. Furthermore, the output of an effects device, such as a reverb unit, can be fed into the Voicemaster Pro to add an effect to the headphone monitor signal without it actually being recorded. A balance control sets the relative voice/backing track balance and a headphone level knob is provided next to the headphone jack.

Ins & Outs

The rear panel includes an expansion slot for the optional digital output card, which works at 24-bit resolution and at sample rates of up to 96kHz. There are switches for 44.1kHz, 48kHz, 88.2kHz and 96kHz operation (as well as a word clock input) and the output is on a coaxial S/PDIF connector. A balanced jack on the rear panel, labelled ADC Ext Input, enables an external analogue signal to be routed through the spare channel of the stereo converter, so it's easy to use a pair of Voicemaster Pros sharing one converter. To make connection to a soundcard easier, both input and output jacks are provided (stereo) so that the Voicemaster Pro can sit in line between the soundcard's output and the monitor amplifier.

A mono effects send (unbalanced, before the master output level fader) and a stereo effects return (balanced) are included so that you can hook up that old reverb unit for monitoring. The main outputs are on both balanced jack (-10dBV) and XLR (+4dBu) with a further XLR providing an output from before the de-esser. Both mic and line inputs are available on the rear panel, with mic and instrument inputs located on the front panel, ▶

FOCUSRITE VOICEMASTER PRO



1: Class-A Preamp. This handles mic, line or instrument signals and offers variable gain, variable low-cut filter (30-400Hz) and switchable phase inversion. Phantom power is available, and the instrument input takes priority over the mic input when connected. There's up to 60dB of gain, and a six-section LED meter, calibrated for digital full scale, shows the input signal level, as well as providing a clip warning.

2: Optical Expander. This works like a soft noise gate, attenuating signals that fall below the threshold. It includes a six-section gain-reduction meter and controls for threshold and release time.

3: Vintage Harmonics. This section uses selective 2:1 compression below a user-defined threshold for both the mid-range and high frequencies. You can use this to add density and sparkle to a sound, rather like playing a Dolby A tape back with the Dolby switch turned off. Because the thresholds in the two frequency bands are variable, you can be as subtle (or otherwise) as you like, and the circuitry is designed so that no gain loss is suffered due to the use of compression — below-threshold signals are lifted rather than above-threshold signals being attenuated. Used with the Depth switch engaged, the degree of enhancement is more pronounced, and the effect may be switched before or after the compressor. Two meters show the gain boost in the two separate bands, and a bypass button is provided.

4: Optical Compressor. Unlike vintage optical compressor designs, this one has a very fast response time, but still appears to retain some of the control law non-linearities that make optical compressors sound musical. The control system has been simplified so that there are rotary controls only for threshold, release time and make-up gain. The compressor may be sited before or after the EQ and features two ratio settings and two attack time settings, both accessed by switches.

5: Tube Sound. This simulation of valve overdrive features variable drive and an indicator LED which shows how much drive is being applied to the harmonic generation circuitry. The Tone control allows the added harmonics to be progressively confined, down to 4.5kHz, when a warmer, smoother tonality is required.

6: Voice-optimised EQ: this is a four-section equaliser with two unorthodox mid-range controls. The Breath control affects the very high frequencies that create the sense of 'air' around a sound, while Warmth deals with the low range of the voice, rather than the traditional bass register. The Mid control is designed to address the part of the vocal spectrum associated with clarity, while Absence allows harshness in the 3.9kHz range to be notched out.

7: De-esser. A process for singers who suffer from overly emphasised 'S' and 'T' sounds. This version notches out only the offending frequencies and so has fewer side-effects than one that affects a wide band of frequencies. The only controls are for cut frequency and threshold. The Listen button monitors the de-esser side-chain, making it easy to use the Frequency control to home in on the problem sibilance.

8: Zero-latency Monitoring. These facilities allow the performer to hear the 'live' signal from the Voicemaster Pro mixed with the soundcard monitor out and with an optional vocal effect, such as reverb. This avoids the distraction of listening to your voice in the headphones delayed by the computer's latency.

9: Output Section. A large level meter reads peak levels and shows digital full scale at its maximum point. When working with +4dBu analogue equipment, 0dBFS corresponds to around +22dBu, as this is the highest level most serious audio interfaces and soundcards expect to see. A master bypass switch defeats all the processing sections, and an ADC Lock LED shows when the internal A-D converter is locking to an external word clock source.

▶ and there are also insert send and return jacks that enable other processors to be inserted directly after the preamp, before the rest of the processing chain.

On The Session

One of the most important tests of any processor, and one that tends to get overlooked, is how well it does nothing! In other words, with the processing switched in, but set so as not to respond to the input, the signal quality should be unchanged when the master bypass button is pressed. The Voicemaster Pro fares well in this respect, except of course for the Vintage Harmonics section where some low-level processing always takes place when the section is active.

The mic preamp is electrically quiet and clean sounding, yet I suspect it flatters slightly in some mysterious way (not that that's any bad thing!), and it also works well for DI'ing instruments such as guitars and basses where this is artistically appropriate. Moving along to the expander, this works predictably and smoothly in normal use, but I found that if I set it so that the sound spent any length of time in the middle of the gain-reduction range, the sound quality became rather gritty. This is to be expected at very short release times, as the expander can switch on and off very rapidly, giving the impression of distortion, but tested with a slowly decaying guitar chord at a medium release setting, the same grittiness could still be heard. In normal use with vocals this shouldn't be a problem and, in any event, it still works more smoothly than most gates, but it might just be audible at the tail end of a decaying guitar chord or similar sound where there's enough amp noise present to warrant a higher than usual threshold setting.

I wasn't quite sure what to expect from the Vintage Harmonics section, but I soon found out that it could be very flattering if applied carefully, especially in the high band. Low-level noise is exaggerated to some extent, because of the compression added to low-level signals, and this is more pronounced at the higher depth setting, which left me thinking a variable depth control would have been more useful. At the lower depth setting, the high band adds a pleasant breathiness to vocals and also adds shimmer to guitar parts, so it's definitely a feature worth having.

The compressor held few surprises, as I've met this design before, and, on the whole, it does a great job without burdening the user with too many controls to adjust. It works fine for general vocal control and can also be used to impart more attitude if the harder ratio setting is chosen. On guitar and bass, the slower attack setting creates a nice percussive character to the start of notes as well as evening out the overall level. As a compromise between flexibility and ease of use, I think Focusrite have got this dead right — though the compressor tends to flatter, it doesn't impose too much of its own character on the sound.

While the original Voicemaster had a fairly simple Tube Sound section, this Pro version uses a far more elaborate tube simulation

circuit, coupled with a Drive LED that changes from blue to green to red, depending on how hard this virtual tube is being driven. Used too extravagantly, the effect is a little like one of the new breed of valve preamps that exaggerates the effects of tube distortion, but at modest settings it can add a useful degree of low-end density — if the filter is used carefully to adjust the tone, the effects can be kept away from the upper mid-range and high frequencies. If you need enhancement up there, the Vintage Harmonics section works nicely in conjunction with the Tube Sound section.

I like the idea of an EQ designed specifically for vocals and, in most respects, this one works extremely well. It sounds musical, it's easy to adjust and it provides plenty of control range. In fact the only thing I disliked was the effect of the mid-range control used in boost mode, which seemed guaranteed to make any voice sound nasal and honky — though the designers say they added it because some dance music producers actually want this sound! Of course, in cut mode it removes these same characteristics, making the cut side of the control very useful indeed. Even so, I feel it would have been more useful to make the Absence control both cut and boost, so as to allow it to add presence where needed.

Also worthy of praise is the de-esser, where the side-chain Listen function makes it incredibly easy to tune into the frequency band where sibilance is causing problems. Once this has been located, you only need to adjust the threshold control to pull down the offending sounds, and this can be accomplished without trashing the overall vocal tone. Very nice indeed.

That leaves the master section, which is pretty straightforward, though adding a send and return to allow a digital reverb to be used on the headphone monitor mix is a neat touch. Zero-latency monitoring via hardware is nothing new, but it is well implemented here, with both input and output connections to save the user having to make up any special split cables. There's plenty of headphone level and the general quality of the headphone sound is good.

Pro Or No?

The Voicemaster Pro is capable of clean, quiet amplification, or it can be used to radically reshape a sound via its various processing sections. In the context of voice recording, this means you can create a useful range of vocal characters without having to switch microphones. In particular, there's plenty of control over low-end warmth and high-end air and sizzle, while the compressor evens things out and makes vocals sound more confident. The only section I have any reservations about is the expander, and then only when used with noisy sounds that might have a very slow decay, such as guitar. It works fine on vocals and is certainly a lot kinder to the sound than a regular gate.

Given its extremely attractive UK price, its diverse processing abilities and the option of fitting an affordable digital output card, the Voicemaster Pro has to be seen as great value. It's by no means the only good, affordable recording channel out there, but it certainly deserves its place on anyone's short list. SOS

information

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Man Of *Reason*

Ernst Nathorst-Böös Of Propellerhead Software

Ernst Nathorst Böös at the Propellerhead company HQ.

Propellerhead, makers of the unique *Reason* software studio, have come from nowhere to award-winning developer status in just eight years. We catch up with one of the key men behind this small but influential Swedish company.

Debbie Poyser & Derek Johnson

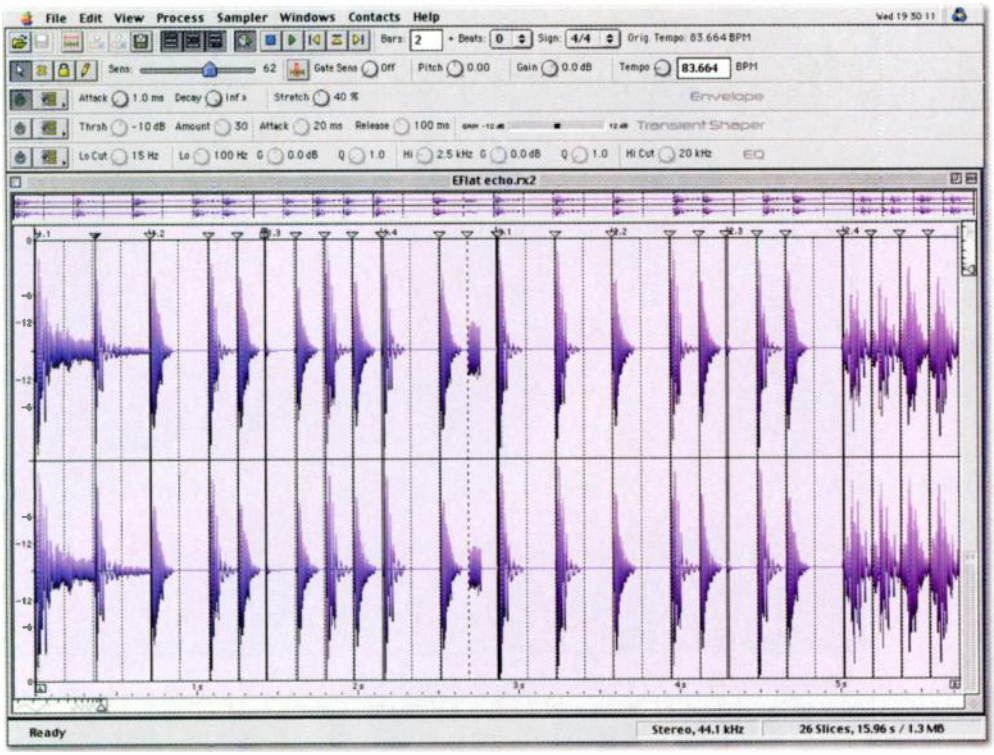
The past decade or so has been a dynamic and productive time in the history of music software, and the pace of change has become ever faster as virtual instruments have gained in number and popularity. One of the first software instruments to achieve widespread acceptance, and even cult status, was *Rebirth RB338*, a virtual recreation of the classic Roland TB303 Bassline synth and TR808 drum machine — both almost equally sought-after and expensive at the time of the 1997 debut of *Rebirth*, which offered a way to get those trendy sounds without the hassle and expense. The company behind this prescient launch was a small Swedish outfit called Propellerhead Music Software, previously known only for their innovative *Recycle* sample-manipulation software. *Rebirth* paved the way for their rapid rise to fame in the hi-tech music world.

Three's Company

'The Props', as they're casually known to users of the active forum/message boards at the company's web site, originally numbered just two, as founder member Ernst Nathorst-Böös explained when we met with him at the 2002 Frankfurt Musikmesse. Ernst himself has a long history in the MI business, starting back in the 1980s.

"I started out in music equipment distribution, working for a company that's now called the Fitzpatrick Import Group. We imported a lot of stuff into Sweden and some into Scandinavia — Linn, Simmons, Emu, Synergy, Sequential, and so on. In 1986 I left that company and worked as a technical editor for two Swedish music magazines for a while. Then I started a documentation company [*specialising in producing technical manuals, including the Steinberg* Cubase *documentation*]. Then, in 1991, I met Marcus Zetterquist, who is one-third of the company. We worked on some projects together before we formed Propellerhead in 1994."

That same year, *Recycle* was launched, initially in conjunction with Steinberg, who marketed the software as the ideal companion to *Cubase*, as it offered a simple and elegant way of gaining flexible control over the tempo of audio loops. Around two years later, the third piece of the Propellerhead jigsaw fell into place when synth and software designer Peter Jubel, who had created the software for Clavia's Nord Lead synth, joined Ernst and Marcus. *Rebirth RB338* was the result, and its success made possible the product that the Propellerhead team seems to have been born to create: 2000's *Reason*, a complete electronic music studio inside a computer that was received with strong critical and user acclaim and went on to win a 2002 MIPA (Musikmesse International Press Award).



The program that started it all: *Recycle*.

How Do They Do That?

Propellerhead is still a small software house, with a staff just 16 strong, and its products are still very much guided and directed by Ernst, Marcus and Peter, as Ernst explains. "It's not a formalised process, but it usually works like this. The three of us talk about what we want to do with an object or a new product. After that, when we have a really basic infrastructure, we bring in everybody for brainstorming meetings. Then the three of us take all that information, what everybody has said, and try to make it fit together and make sense. Then it goes back and forth from there. It's still very much the three of us that decide the products, although individual sections of the product can be done by many different people." Ernst himself is not a programmer, but uses his expertise in other areas. "I sometimes say it's like when you were a teenager and you want to form a band: there's someone who can play a guitar and there's someone who can sing, and then there's someone who can't do anything and he gets to play the bass! And that's me. I'm in the background, just making sure it all stays together, keeping the drummer under control! I'm taking care of the business side."

Design & Development

As long-term *Reason* users, we were keen to find out more about the background to the program, and Ernst is happy to oblige. "Actually, *Reason* is the product we wanted to do when we made *Rebirth*, and there were some prototypes of things that looked more like *Reason* than *Rebirth*. But we were only three people at the time, and there was no way we could pull it off. It's crazy that we later pulled *Reason* off with five or six

Faithful virtual recreations of TB303, TR808 and TR909 made *Rebirth* a success.

developers, as we did. Also, the computer technology at the time of *Rebirth* wasn't really there... it was too early. *Reason* is a bit like *Rebirth* on steroids. It's the same concept, but everything is much bigger."

One of the most interesting and fruitful aspects of *Reason* (which resembles a rack of hardware instruments, for anyone who hasn't seen it), is the use of the 'analogue' CV and gate interconnection and control system, and of virtual cables. We wondered who came up with these ideas, which have proved so popular with users. "CV and gate I think we had all along, as a concept. But the cables was Marcus' idea — that's a typically Marcus thing. He came to me and said 'You know what we've got to do? We've got to do cables!' And Peter and I said, 'No way, that's so stupid!' The rationale for doing it was actually down to three things. The first is that it's a familiar way of working and people understand it; the cable can only work in one way. Another thing is that it actually solves a lot of design problems. What do you do if you need to route something to multiple destinations? You need a cable splitter. Or if you want to merge signals, you need a mixer. For every problem that appears, there's a natural solution. And the third, of course, is that it's just totally cool."

Ernst's mention of cable splitters begged a question for us: where are they? We've been wanting a CV/gate splitter ever since *Reason* came out. Ernst's answer gives a bit of hope: "It's lacking. We're aware of it. I can't talk about the future updates, but it's one of the things that we know is missing!"

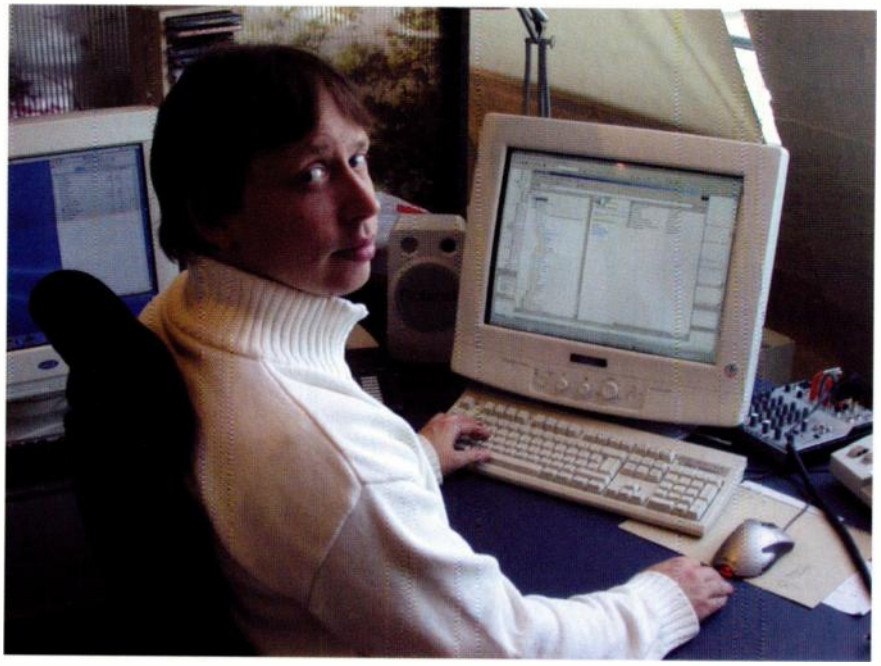
From the start, Propellerhead's products have been released simultaneously on Mac and PC, and the development inside the company occurs at the same time, as Ernst explains. "It's done totally in parallel. We have this framework — the technical term is a 'class library' — which we've built ourselves. At the lowest level there are the operating system-specific things, like 'how to save a file under Windows', 'how to save a file under Mac OS X', and so on. Then on top of that we have 'how to save a file the Propellerhead way'. So someone who wants to save a file only needs to know about that. On top of that ▶

there's the actual application, whether it's *Recycle* or *Reason*. So we have people working on features for the class library and when they submit their work it's instantly available on all platforms. Most of the programmers have both Windows and Mac machines on their desktops, and the program compiles continuously on both platforms."

As the company has grown, issues not directly related to their products arise: "One of our biggest problems is how to keep releasing interesting products, of high quality, at a decent rate, and grow as a company. Because every time you hire a new developer — it doesn't matter how talented or experienced — it's going to take at least six months before he's really productive, because he's got to get into our code base; it's a monstrous project. So during the first time period, he's not productive and he's dragging down someone else, who has to teach him. It's a paradox, because every time we hire someone our productivity goes down in the short term. It's a process that's really hard to manage. We look for general experience with programming, experience working with large software projects, using C++, coding for at least three years..."

Anyone who uses *Reason* as well as other music software should have noticed how moderate the program is in its demands on the host computer — not always the case for virtual instruments. Ernst puts it down to having people in the company with the right background. "Most of the DSP stuff is done by Peter Jubel, and he's got a very extensive background, starting with analogue electronics. He built vocoders and things, and then moved over to digital electronics hardware. Basically, he's the guy who designed [*the software for*] the Clavia Nord Lead. Then he moved on to applications software. So that means we have an understanding of the whole process. It's all about knowing where to spend your resources and where you can cut corners. And if you understand analogue electronics, you have that understanding when it comes to actually designing DSP electronics. I think some of the companies coming in now started up in computers. They went directly for that, which means that some of them might lack that depth which we are fortunate enough to have."

Though projects are controlled and co-ordinated by Ernst, Marcus and Peter, it seems that everyone on the Propellerhead team is welcome to have an input. At the time of our interviews, Niels Larsen was the company's marketing manager/press liaison, but as a musician and sound programmer himself (he's provided factory presets for *Reason*), he was obviously in a position to make comments during the software's development.



Propellerhead programmers Dan (above) and Kristoffer hard at work.

"The *Subtractor* synth filter I had some influence on, because when I heard it before the last betas [*of the original version of* Reason], I thought it didn't really bite. After a little bit of conversation, Pelle [*designer/programmer*] went back to it. I think what had happened was that he'd been tuning it too much. It's like mixing. After a while you don't hear that you've added too much bass, or whatever. So then we started looking at the Roland Juno 106, how that behaved. It was just a manual adjustment to get the 'behaviour curve' modified. It took him probably a couple of hours.

"The other thing I had an influence on was the stereo in *Malström* [*the new synth in* Reason *v2*]. *Malström* is very flexible in its routing. You can route the oscillators to the two filters in several different ways, and the filters can be used in parallel or serially. If you use them serially, the point is 'what happens to the stereo image?', and of course it's no longer there: the stereo image has to be a combination of the two filters in parallel, and maybe of the oscillators. So what we did was put a little Spread knob on it, so that the patch programmer can decide whether to use stereo or not, and actually it works very well."

The Future For *Reason*

The v2 update for *Reason* was pretty eagerly anticipated by what is a lively and vocal user base, some of which spent time in the

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▶ months preceding the release posting their thoughts on what it should include at the Propellerhead web-site user forum. Amongst the smaller items on various wish-lists, there are three major recurring requests common to many users: audio recording; MIDI output, so that *Reason*'s sequencers could control external instruments; and VST plug-in compatibility. At the risk of being immensely boring to Propellerhead personnel, who are well aware of what users ask for, we felt we had to ask what the official position on these issues was! First, on audio recording, Niels Larsen: "I think it's out of the question if we just said 'a little bit of audio'. That's the sort of thing that we just don't do. We have a lot of people saying: 'You could just put in a couple of tracks' or 'Why don't you do an ADAT-like device and call it *Recorder*?' A nice idea, but it's the wrong way to approach an issue like that. If you put an ADAT into the rack, it's like having a little 16-channel Mackie mixer and an ADAT connected to it. At what point do you become more frustrated and begin to say 'I want to do more than that, I want to do editing. Why don't I have editing?' That instantly becomes an issue. Then it becomes 'Oh, I need more mixing facilities...' And then *Reason* as a concept, as a product to make music, might change too much. That's why audio tracks at this time is really a no-no, because we feel we'd be ruining what we created rather than enhancing it."

Niels Larsen, who not only helped to market Propellerhead products, but also contributed sounds and design suggestions.

Ernst adds his thoughts. "People ask us 'What is your hang-up with audio, what is your hang-up with VST plug-ins? Why don't you just do it?' And I don't think there is a hang-up. We'd like to think that *Reason* is not a 'me too' product. There were certainly soft synthesizers before it, but something that we did — we're not exactly sure what it was — took it to another level. If we ever do hard disk recording, I'd like to try to pull off the same trick again! I don't want to just do a 'me too' thing for adding hard disk tracks to *Reason*; even though it would probably be practical, it's not what we are about. It's not right for us. We'd just be an inferior *Cubase*, and why would we want to be that?"

Perhaps, rather than incorporating the feature into *Reason*, a Propellerhead application could be purpose-developed to run in tandem with *Reason*? Niels doesn't rule out the possibility: "I think that's an interesting option, particularly with ReWire. I could see us having products that were the best for each recording task, rather than having one product that tries to do everything. Another thing about audio recording is that we have to be realistic about what we are capable of. If your expertise is synthesis and you have to start writing an audio editor, it would probably take several years, and then you have to question whether it would really be, after all that, so much better than anybody else's. But maybe we will."

MIDI output is next on our list of annoying questions — as Niels observes: "Ah... another one of those questions that are asked a lot. The thing with MIDI Out is that people say 'Oh, it's really easy', but it's not, actually. If you include MIDI Out, you have a host of other things you need to take into account. For example, do you need SysEx handling? We don't have that because we only need to control our own devices. The other thing is all the other tools you'll need if you are going outside to an environment that is uncontrollable and unpredictable. It would be a key strategic change for us, but also it involves a host of complications other than just making an output. For example, you'd probably need to have transpose on every track, certain other playback controls, probably a MIDI mixer as well..."

Finally, there's the issue of VST plug-ins, which certain users would like, perhaps principally to provide access to different effects. "Of course, a lot of people would love us to do it," says Niels. "But one reason is that we don't want to become a product that is a VST host, and particularly for VST plug-ins that might not be as efficient as *Reason*. We take pride in making reliable products, and in making them efficient, so that the user can do a lot on just one computer. One single plug-in could bring the whole thing down! And we don't want to do that. What we'd rather do is keep making instruments that can satisfy our users' appetite. We favour ReWire [*for accessing VST plug-ins*], not because it's our technology, but because it has become what we wanted an interface to be. Now we have *Sonar* on board [*with ReWire support*], and Cakewalk have done a great implementation, I have to say. Also Emagic, Ableton *Live*, *Cubase*, *Nuendo*... So it's getting there, bit by bit."

Knights Of The Graintable

Reason v2 and its new devices has been very well received by users. A common reaction amongst people getting their first look at the new *Malström* 'graintable' synth, where sounds are based on one of 82 preset graintables (or indeed, any single grain from one of the preset tables!), has been to wonder whether they can make their own graintables. We asked Propellerhead if there were any plans to allow users to do this, or to add more factory graintables to the current collection. Niels Larsen told us that "The process of creating graintables is too involved and academic for us to be able to create a sensible tool for users. So, sorry, no. We talked about the possibility of adding graintables in the future, but we currently feel that we tried all the material we could think of and selected what worked. At the moment we think it's probably best to leave it where it is — but who knows?"

We also noticed that (uniquely amongst *Reason* synths and samplers) the powerful *Malström* has a polyphony limit of just 16 notes, in contrast to the 99-note potential of other devices. Niels comments that "*Malström* is a more CPU-intensive device than, for instance, *Subtractor*, so every voice counts. By reducing the polyphony we make sure that even a sloppy synth programmer will not bring *Reason* 2.0 to its knees. It goes hand in hand with our philosophy of optimising the product so it works on even modest systems. Imagine a batch of *Malström* patches with a polyphony of 50 and a long release time. You wouldn't need to play too many chords before the computer couldn't handle it any more. Sixteen notes is the sensible setting for this device."

Now at V2, the *Reason* electronic music studio boasts a growing user base.

Pushed on the company's plans for *Reason* in the future, Ernst is circumspect: "The only thing I can say is that we will try to keep the program as focused as it is. A lot of people would like us to go into all territories and do everything that the big companies do. We're not sure that's a good idea, at least not for us. We can't do everything, so better for us to concentrate on what we do well and try to establish links — like, for example, with ReWire — to other products that provide the pieces that we can't. The future will be a natural evolution of what we have today."

Copy Wrongs

A big issue for any software house these days is software piracy. Companies come up with various ways of combating it, Propellerhead's being one of the least intrusive to the legitimate user. How big a problem is piracy for them? Niels: "It's hard to quantify. It's big, of course. But we're very pleased that so many people choose to do the right thing. We try also, rather than introducing copy protection that frustrates users and yet is instantly crackable, to make service and support easy for the people who have done the right thing and bought the program. We don't want to frustrate them with installation processes that are more convoluted than downloading a pirate version, if you know what I mean. It's almost a punishment with some software products to actually buy them. We really want our users to have an easy life. We try instead to add value to the process of registration. We have a very good registration database, and for our registered users we hope we will make our service much better.

"It's also about having the material that's included with the program. People will want the sounds. We have the Soundbank, that's 500MB, and the new version has the *Orkester* [*24-bit orchestral samples*] collection for the *NNXT* sampler. The sheer size of that will prevent some downloads. We get the occasional post on the board that says: "Oh, I've lost my Soundbank CD, can anyone do me a copy?" I usually write 'Official reply from Propellerhead: Just register your software, and we'll sort you out.' Of course, you never hear back. We can also check, based on the songs that are being posted, whether they've been made using a pirate copy. On our archive, there are no songs made with pirated programs."

"No one really knows what the software issue is all about", adds Ernst. "I can illustrate with a story. I have three children; the oldest is 16. When Napster arrived, he started downloading songs like crazy. And he got to find out about so many new bands that he never heard about, which also meant that he started buying CDs like a lunatic. Then Napster disappeared, and he stopped buying as many records as he used to, because where is his source now? There's the radio, but he's not interested in the music that's played in the radio. And MTV? No! I'm saying that I can understand what the record industry is saying, but I can also show examples of the opposite. I think it's the same thing with software piracy. It is a major problem for us, but no one actually knows the mechanisms behind it. No one knows how many of these people bought the program who wouldn't actually have been your customers otherwise."

Soft Options

It would have been difficult to predict, 10 years ago, just how fast and relentless the rise of software instruments would become once they reached the kind of critical mass that occurred a couple of years ago. Developers like Propellerhead must have reflected on the impact their products are having on the hardware instrument. Is hardware becoming obsolete? Niels sticks up for the traditional synth: "Just for generating sounds, maybe. But they have other advantages. When you have a hardware synth, it's much more intuitive. Even with the best controller surfaces today, there's still a lot of setting up that puts people off. But the main reason hardware synths should not become obsolete is for live work."

Ernst comments: "It's no secret that software sales are increasing and hardware penetration is going down. The balance is shifting really fast now. It seems like some of the big companies are almost in denial. They're facing some major changes. You still need hardware, but take one of these Oxygen8 controllers and hook it up to a Titanium Powerbook, and I don't think you can argue that it's a more powerful and fun solution than any normal 'workstation'.

"But If I take it on a world tour, on stage with Madonna, with a Powerbook, then I'm not so sure. There are still issues. We're still struggling with things like drivers and audio cards, and efficiency and latency, and all those things. We're still struggling with them, but we're getting there." SOS

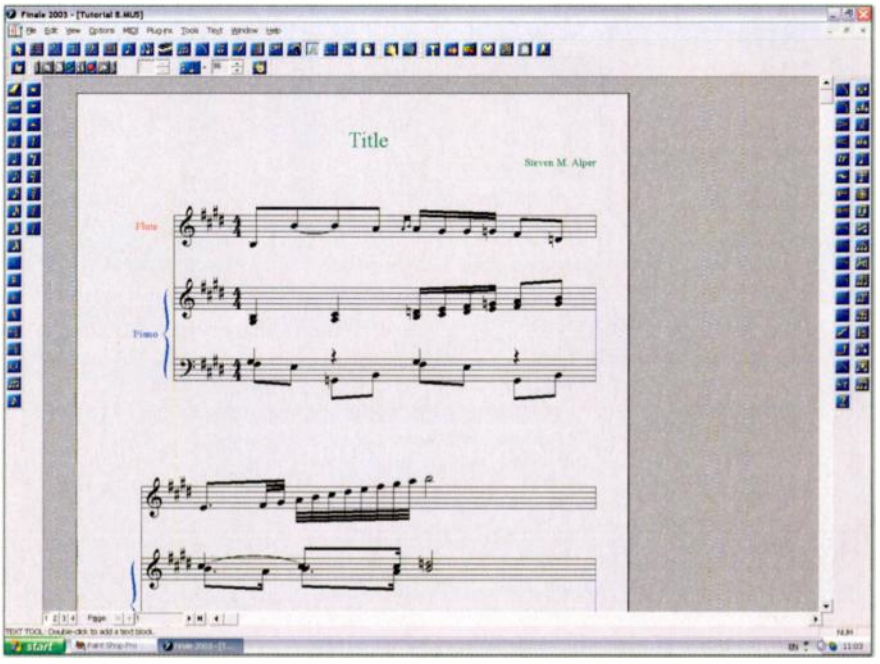
Boffin Corner

They're not called Propellerhead(s) for nothing, as a story Niels Larsen tells us illustrates: "Three of the programmers, Dan, Marcus and Magnus, had a band years ago where the rule of the band was that you could only be part of it if you were playing your own applications! It didn't really have much to do with music — they spent more time in the debugger than anything else! But a lot of Magnus's work was born at that stage, leading to where *Malström* is today."

Coda Finale 2003

Coda's *Finale* is one of the best-established notation editing packages for Mac OS and Windows, and has just undergone a thorough overhaul for 2003...

Richard Leon



Finale 2003 is highly customisable: all the toolbars are movable, and the on-screen colours can be freely selected by the user.

Notation Editing And Publishing Package

It's frightening to think that *Finale*, one of the first serious notation editors, has been around for the best part of a decade now. The *2003* tag attached to the latest version highlights the fact that this is a package with a long and respected pedigree. While Coda's claims that it's a world standard aren't quite true — at least not if you include those parts of the world outside the US — there's no arguing that *Finale* has managed to build a solid market for itself among both professional arrangers and educational users.

It's not hard to see why. While the notation facilities built into sequencers such as *Cubase* and *Logic* are competent, they lack some of the more advanced tools that *Finale* can offer, and their output doesn't look as appealing or as professional. Because *Finale* was designed to replace laborious traditional music engraving as well as provide a working environment for composers and arrangers, it has always gone that bit further with what it can produce on a printed page. Early versions weren't perhaps as easy to use as they could have been, but it's now possible to input music using a mouse, a QWERTY keyboard, a MIDI instrument, or any combination of the above. The current version can also notate directly from a monophonic sound recording.

What's New

The latest update has left most of the core of *Finale* unchanged, and it's still available for both Mac and PC. Visually the biggest change is a new look and feel — or rather, seven new looks and feels. (Coda claim there are 14, but this is a slight exaggeration: there's a basic set of seven, available in two sizes.) Although this change is cosmetic, it does make a real difference. The new sculpted 3D look of the buttons makes the interface clearer and easier to work with. You can even pick your own colours, albeit from a limited and mostly rather sober range, and there's also the option to customise the background with your own graphics. Stick-in-the-mud traditionalists can carry on using the original look.

One minor interface niggle hasn't been addressed, however. The various toolbars can be parked anywhere on the screen, but the process is fiddly and a couple of the toolbars seem to appear and disappear when they want to, rather than staying put as they should. The rationale may be to save space, but big monitors with resolutions of 1280 x 1024 and higher are becoming standard, so Coda should stop second-guessing what users do and don't want to see and just give people as much as they want.

On the subject of monitors, more is definitely better. I used a 1600 x 1200 monitor, which was big enough to show the various tools and palettes in their entirety, and 1024 x 768 is really the absolute bare minimum for *Finale*. Working with a smaller screen area means too many options disappear, and editing becomes very awkward and slow.

In Black And White

New customisation features include various program and document options. You can

SOUND ON SOUND

Coda *Finale 2003* £479

pros
- Outstanding, musically intelligent plug-ins.
- Useful sheet music scanning feature.
- Impressive MIDI guitar and fretted tab support.

cons
- Non-trivial learning curve.
- Playback could be more musical.

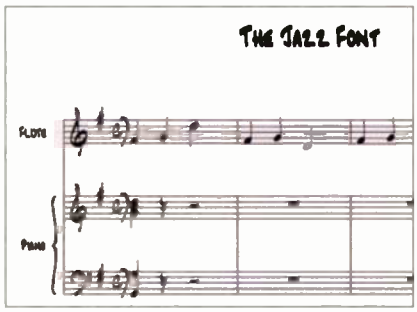
summary
While not quite the ultimate notation and preview tool for the very pickiest and most demanding composers, *Finale* is much more than just a competent alternative. It's ideal for both professional composers and arrangers, music students and anyone who wants to give their scores a professional finish.

change all the most important settings to create your own library of blank templates for various arranging jobs, using various paper sizes, looks, fonts and other details. This small change makes a big difference in practice, as there's no longer any need to keep defining your instrument palette every time you start a new project. Now you can switch between arranging for strings and composing for four-part choir just by loading a new preset.

The range of customisation options available here is huge, and includes almost every page layout detail you can imagine. You can control basics such as beaming and ties, how rests and accidentals are displayed, how to handle grace notes, tuplets and bar lines, and more than 20 other options. These bread-and-butter parts of the notation control are surprisingly comprehensive, and include various specialised beaming, accidental and other music printing options. Overall, if you need it, it's likely that *Finale* can do it.

Also included here are more advanced page-related features such as grids and guides, line spacing, fonts, and *Finale*'s layers feature, which comes into its own when writing four independent parts on two staves. Instead of being limited to a single symbol set on a page, you can choose different looks for repeats, piano braces, bar lines, and other musical essentials. You can even create your own staff definitions, with anywhere from one to 100 lines instead of the usual six, and you can add your own clef types to the impressive range that's already supplied. The overall picture here is one of depth and sophistication. You don't have to use these more esoteric features if you don't want to, but for those times when you need to create something out of the ordinary, it's reassuring to know that they're there.
A related improvement is improved pitch notation. You can now notate using Kodaly-style 'do re mi' notation, which hides the main staff and uses shorthand to show which pitch to sing or play. Rhythm notation has also been improved.

By default *Finale* includes two music fonts: the classical Maestro and a handwritten-look font called Jazz. You can



The alternative Jazz font is useful for a less formal handwritten look.

customise both music and the text on a page to an astounding degree, using different fonts for lyrics, expression marks, verses and choruses, and even using non-music fonts for music. Being able to save all these settings *en masse* for each kind of project you work on is a real Godsend.

Teachers will be impressed by the new Worksheet Wizard. This provides blank templates for literally thousands of different kinds of musical exercises, and all you have to do is fill in the blanks and print out the results.

A close-up of *Finale*'s toolbars. These include all the editing and MIDI playback features; more obscure options are buried in the menus.

Plugged In

One of the most impressive of all *Finale*'s features is a dizzying range of music processing plug-ins. These range from basic chores, such as checking for parallel fifths and octaves, to full automated harmony generation. The sophistication of the tools here is breathtaking, and they'll be appreciated by composers and arrangers of all skill levels. You can morph and process chords in various sophisticated ways, play with melody lines, create rhythm parts, and work with lyrics. There are almost endless creative possibilities here, especially in the Composer's Assistant section, which offers tools like the virtual fundamental generator, chord splitter, and frequency modulation generator. Counterpoint students will also appreciate the tools that allow easy retrogrades (ie. playing the music backwards) and inversions (playing it upside down). Taken together, these are rather like parts of a modular synthesizer that works with raw notes instead of sound, and are only bettered in scope by obscure and complicated academic tools like the fearsomely complex Lisp-based *CommonMusic*.

For those who aren't quite so experimentally minded, there are also auto-harmony and auto-rhythm options, which work in *Band In A Box* kind of way. While both the theory and practice are good, the supplied presets are a little limited, ranging from boom-chicka bossa nova to chunky bepop, standard ballad and middle-of-the-road swing varieties. They all work more or less as advertised, but some good rock, dub, indie and electronica styles would have brought the house down here.

If you prefer words to music, *Finale*'s lyric support is second to none. Not only is there a vast array of lyric positioning tools, but *Finale* also includes a built-in rhyming dictionary that is better than some shop-bought printed dictionaries. While some of the suggestions are a tad adventurous ('pain' with 'afterbrain'? — perhaps another time...) many are right on the nail. It's not an exaggeration to say that if you can't write a song with the help of this tool, you should think about giving up and putting more time into the day job.

Strings & Things

Another major plus in this new version is improved support for fretted instruments. This is also among the best available, and you can now create tablature for assorted kinds of guitars, banjos and ukeleles. *Finale* has always been a good choice for tab creation, but these new features really stand out, and if you have a MIDI guitar you can play in real time and the music will be tabbed immediately. There are all kinds of nice touches here which lift this section of the package out of the ordinary, making it easy to notate bends, hammer-offs, slides and other kinds of fretted expression. There's also a range of tab libraries so you ▶

System Requirements

PC

- **Windows 98 or later, 128MB RAM, 70MB disk space, scanner, printer and MIDI input device.**

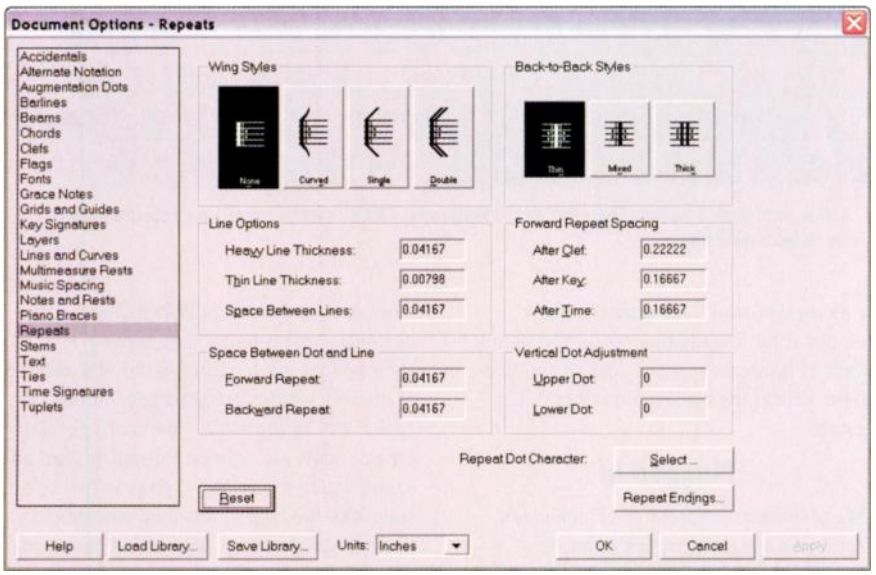
Mac

- **Mac OS 8.6 or higher (runs under OS X in Classic mode), 128MB RAM, 70MB disk space, scanner, printer and MIDI input device.**

can select the style and look that best suit your project.

Guitar input aside, it's worth noting that the rest of the MIDI support hasn't been updated in this release. Both step and real-time input are still available, the latter using a feature called Hyperscribe. *Finale* remains good enough for the basics, but its ability to make sense of very complicated playing is limited. You have to specify the time signature in advance, and tempo changes can only be tracked manually using a second recording pass where you tap out the tempo yourself. This is workable for arranging pop music, but classical players may have to resort to stitching different recorded sections together by hand if the music has varying time signatures. If you need to notate complicated tuplets, you'll have to enter those in step time. To be fair these are all advanced requirements, and *Finale* isn't any worse at them than most of the competition. Still, it would be good to have software that could transcribe music as well as a professionally trained transcriber. Perhaps in a future release?

the restriction may begin to pinch a little. Fortunately, there's a workaround that lets you switch between different playing styles on a given instrument, for instance arco, legato and pizzicato strings. *Finale* lets you insert program changes with custom text so you can easily configure playback performance to your own specifications. If your sampler responds fast enough, you can even highlight a single note. While it's possible to insert crescendos and other dynamic markings using both velocity and controller curves, the process is rather fiddly and takes more time than it should. Similarly, ornaments such as trills and shakes are easy to notate, but not so easy to play back. On the other side of the coin is *Finale*'s Shape Designer, a flexible environment for creating your own customised playback options. You can define shapes graphically, and then map them to various playback parameters such as tempo, velocity, pitch and so on. Anyone without programming experience or good IT skills may find this part of the package a little lateral, because the interface isn't particularly musical, but those who take the time to master it will find there's plenty of scope for creating expressive playback.



The look of each piece can be customised to a bewildering degree. Here are various repeats and brackets.

The other obvious limitation is that only 64 MIDI instruments are supported. This sounds like a lot, and is certainly enough for basic arranging and printing of scores from piano up to full 32-stave orchestra. But if you're a professional composer with two or more *Gigasampler* PCs stuffed to the floppy drive with hundreds of orchestral samples,

Test Spec

- Coda *Finale 2003*.
- Athlon XP 2100+ PC with 512MB RAM running Windows XP; 1600 x 1200 24-bit graphics.

Verdict

It remains true that *Finale*'s learning curve can still leave beginners feeling a little breathless, but while it still lacks the very advanced playback features of some of the competition, it leads in many other areas. Overall, most of its drawbacks are limited to esoteric and obscure shortcomings that many users won't notice. Those aside, it provides a solid, wide-ranging and comprehensive set of features that will suit almost anyone. If you're an experimental contemporary classical composer and need every last possible obscure notation option and the best available MIDI playback, you may find it just a touch limited, especially in the latter area. But anyone with less extreme and exacting requirements — and that means almost everyone else — will find that it should do more than enough to meet their needs. The fact that *Finale* remains the notation tool of choice for the Hollywood film set and for Broadway arrangers proves that it can cut it in a professional environment. It's also a fair bit cheaper than its main competitor, *Sibelius*.

So should you buy it? If you use *Cubase* or *Logic* for notation and aren't finding those frustrating or limiting, then the more sophisticated options in *Finale* may be overkill for you. But if you spend most of your time working with notation, would appreciate the extra possibilities offered by sheet music scanning, MIDI guitar tab and DTP-level control of the way music appears on a page, then *Finale* is an excellent musical all-rounder, and well worth considering seriously. Of course, it's still true that there's nothing quite like composing with a pencil and a big pad of manuscript. But for those less romantic times when you need to produce output that people can actually read without squinting painfully, *Finale* remains a great package. SOS

Scanning From Paper

***Finale*'s built-in sheet music scanning is among the best and most accurate at the price, and tests showed that it does a surprisingly good, if not quite perfect job of pulling piano music off paper. The package used is called *SmartScore Lite*, and is included as something of a very basic teaser for two upgrade options — the full-featured *SmartScore Pro* for $199, and *SmartScore Songbook* for $99. The former handles full 32-stave orchestral music, while the latter works with three-line piano-plus-vocal printed songs. Given that when you buy an album of printed music you'll often see drum parts and other extra lines, anyone who's planning to use scanning a lot should consider the *Pro* version. If you already have *SmartScore*, or its competitor *SharpEye*, you'll find that you can import directly into *Finale* without the problems that sometimes occurred with earlier versions.**

information

- £ £479; educational price £199. Crossgrades and upgrades from earlier versions available. Prices include VAT.
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MAM MLM62 Rackmount Mixer

Photo: Mike Cameron

This compact mixer could be a godsend if you've got more sound modules and effects units than soundcard inputs.

Paul White

How many times have you been in the situation where you need to mix a few signals, but you don't want the cost or complexity of a full-blown mixer? For example, you may have a computer-based studio and simply need to combine the outputs from your soundcard with those from one or two keyboard synths, or, as in my case, you may have a digital mixer with one stereo aux return but have two or more stereo effects units you want to bring into the mix. In this type of situation, the MAM MLM62 may be all you need.

Connectors & Controls

I knew I was going to like the MLM62 when I found the manual covered only one side of a piece of A4 paper! The unit itself is powered from the inevitable AC adaptor and comes as a 1U rackmount unit only around 2.5 inches deep. On the front panel are the controls for two mono mic/line channels plus two stereo line-only channels that may also be used as mono by connecting just to the right input. Technical information is sparse, but, as far as I can tell, all the line inputs and outputs are unbalanced on quarter-inch jacks while the mic inputs are balanced on XLRs, but without the benefit of phantom power. All the connections are on the rear panel, as are two gain trims for the mic inputs, which is a little inconvenient if you plan to rackmount the unit.

Interestingly, although the mixed output is stereo, the mixer may also be used in mono by connecting only to the right output. The left inputs on the stereo channels are also wired to accept stereo feeds on a single stereo jack, and the output works in a similar way, where the left jack carries an unbalanced stereo output, so it's clear some thought has gone into the design of this little box.

In addition to mixing the two mono and two stereo channels into a single stereo stream, the MLM62 also features a single post-fade effects send buss accessible by both the stereo and mono channels. A stereo return is provided on the rear panel, so if you don't need an effects unit you can use this as another stereo line input with a level control (the master Effect knob). A separate control sets the overall output level from the unit.

Looking more closely at the individual channels, the Mic/Line sections have knobs for Volume, Bass, Treble and Effect, in addition to the rear-panel mic gain trims, but, as stressed earlier, there's no phantom power option and there's also no visual level metering system of any kind. The stereo channels have Volume, Balance and Effect controls, but no EQ.

Impressions

Conceptually, then, the MLM62 is very simple, but how does it perform in practice? Despite the lack of overload metering, the mic amps turned in a surprisingly good performance, even with relatively low-sensitivity dynamic microphones, with no obvious noise or coloration. The musically sensitive EQ section is limited by having only two bands, but it worked fine for gently shaping sounds or adding high-end sparkle or warmth. Having the mic trims on the back panel is a bit of a pain, but panel space is somewhat limited in this format. The line inputs worked without seemingly adding noise or changing the essential tonality of the signal, so the MLM62 must get an overall thumbs up for delivering a simple and affordable solution that doesn't compromise on audio quality. I can think of many situations where a few extra mixer channels would be useful, and this solution certainly achieves its objective without taking up too much space. SOS

SOUND ON SOUND

MAM MLM62 £159

pros
- Good sound quality.
- Compact format.
- Flexible connection system.
- Affordable.

cons
- No phantom power.
- No metering.

summary
A useful and affordable problem solver that maintains audio quality at the expense of some features.

MAM SLE82 Line Mixer

The SLE82 line mixer also forms part of MAM's new mixer range, with similar dimensions and styling to the MLM82. You get eight pairs of line inputs (which also accept mono signals) mixed to a stereo master output. All level controls are on the front panel, and each channel has level and balance, as well as a single post-fader effects send. In addition to these, there is a Master level control an Effect knob to mix in signals arriving at a stereo effects return — with the effects return, that gives you a 10:2 mixer in a single rack space!

As with the MLM62, the lack of metering can be problematic. Even overload LEDs would have been better than nothing, and I found that it was quite easy to overload the channels and mix buss with three stereo sound modules and two stereo effects units going. Still, given that the channels seemed very quiet, I found that I could afford to keep the faders fairly low without things getting noticeably noisy. Overall, the sound is clear and this unit deals with small-scale mixing tasks in an absolutely straightforward way.
Mike Senior

information

£ MLM62, £159; SLE82, £139. Prices include VAT.
T Smart Sound Direct +44 (0)1883 346647.
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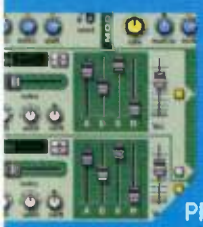

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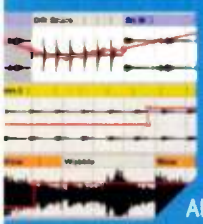

ABELTON LIVE

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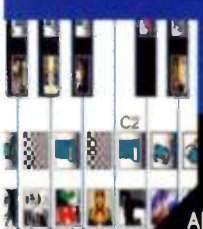
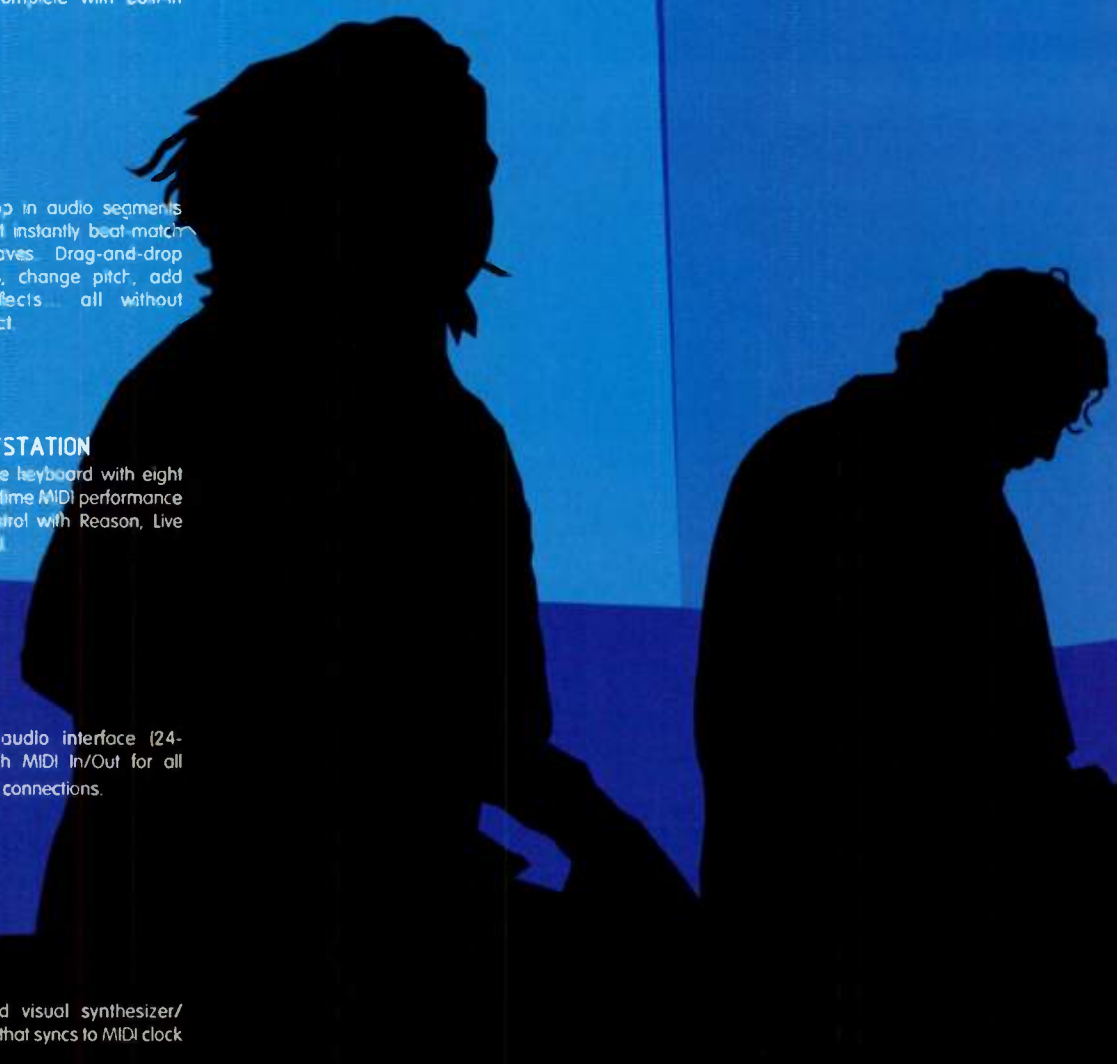


ARKAOS VJ

MIDI-controlled visual synthesizer/effects engine that syncs to MIDI clock or audio.



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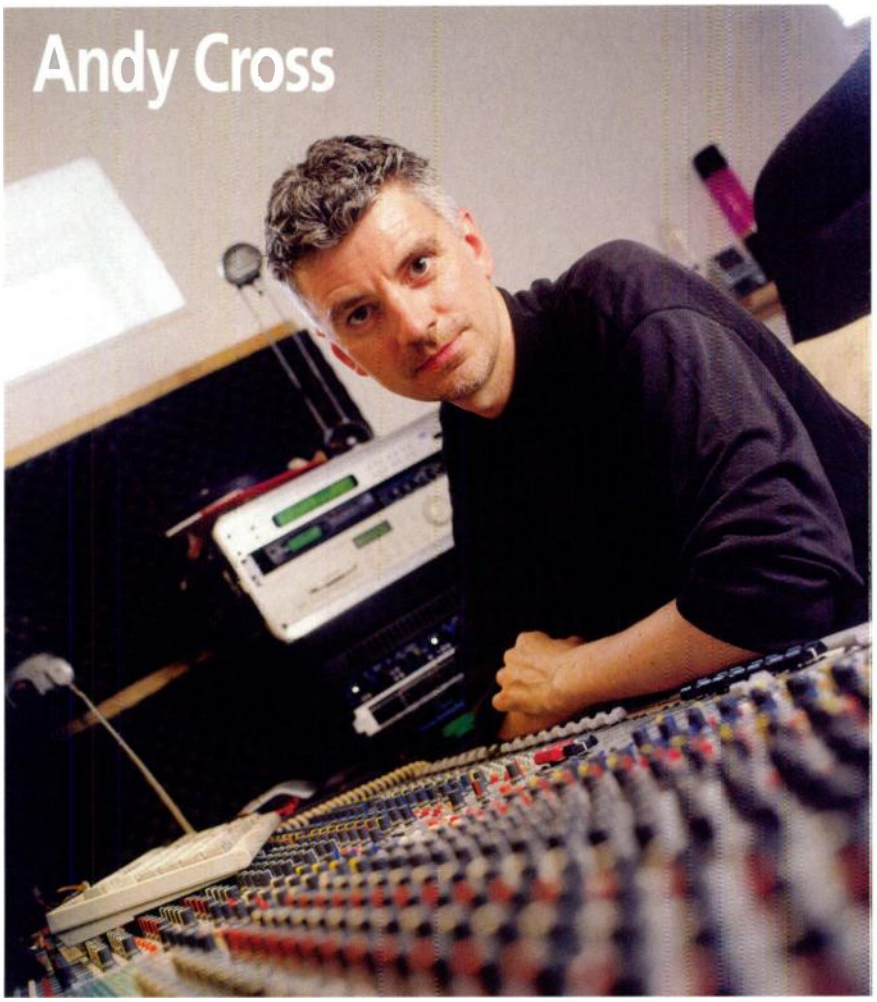

Mike Senior

Although we don't usually cover commercial studios in the Readerzone column, the small Zoo Audio studio of *SOS* reader Andy Cross, based in Cambridgeshire, has found its way here because it is one of the only studios in the country to contain an Esmono recording booth. I had seen these prefab soundproofed and acoustically-treated booths described in the catalogue of their UK distributors, Studiospares, so when Andy emailed to say that he was willing to let *SOS* have a look around his *in situ*, I was keen to find out how it performed in practice.

The Esmono Booth

Andy Cross: "Previously, my studio was based in the top floor of my house, and I used the spare bedroom whenever I needed a vocal booth. It worked OK, but obviously I was limited in what I could do, since there were houses on either side. Then I decided to move house and shift the studio to this place. Fairly soon after I got here, the Esmono booths appeared in the Studiospares catalogue. I got the tape measure out and found that the smallest one would fit in very snugly here.

"Even though it seems quite a lot of money to spend, the advantage of a prefab booth is that you get results more reliably than if you tried to soundproof a room yourself, and you can also take it with you when you move. I could easily have spent £3500 on something that didn't actually work when I'd finished it and was still leaking sound everywhere. It was also going to be a hassle to install a soundproof door, so I figured I'd just go for something which was 'off the shelf' and which I knew would work.

"The booth I got weighs about half a tonne, and it was delivered in bits by truck. I decided to get the taller version, because the girl who sings in my band is six foot three, so I thought I'd better take her and other tall people into account. It was also good to have a bit more height over the cymbals in a drum-kit, so it was worth the few extra quid. A friend and I put the thing up, and it took us the best part of a day to do it. The first time you use the booth, there are some holes you have to drill as you go, but once they're there the process becomes a little easier.

"The inside of the booth is perforated steel with Rockwool, and it really soaks up the sound, to give a very dry acoustic. The difference between recording in the spare bedroom and recording in the booth is incredible! Before, no matter what I did in terms of blankets draped over drying racks and whatever, you could always listen to a recording and tell exactly what size the room was. With the booth, you have no idea. The lack of room sound on the dry vocal is nice for recording music, and absolutely essential for doing voice-over work — you need to be able to put the voice convincingly into the correct acoustic space using reverb if it's required.

"In terms of soundproofing, when recording drums in the booth you can only

Esmono Booths: Pricing & Availability

Esmono Sound acoustic isolation rooms are available in the UK from Studiospares. Models are available in 2m and 2.2m heights, with internal floor dimensions between 1.2 x 1.2m and 4 x 3.7m. Prices for basic rooms (complete with ventilation system and one door) range from £2819 to £8636 excluding delivery. Optional double-glazed window panels and extra doors are available from £246. Prices include VAT.

T Studiospares +44 (0)845 644 1020.
F +44 (0)800 731 3767.
E sales@studiospares.com
W www.studiospares.com
W www.esmono.nl

This is the exterior of the Esmono recording booth, with part-glazed soundproof door.

Inside the booth (right) it's certainly cosy, but there is room to set up an entire drum kit if required.

hear a dull thud from the kick if you're standing next door, which is just the other side of this wall. You can't hear any of the other drums at all. If I really wanted to reduce the spill even more, I could layer some soundproofing on the wall, but I've not needed to yet.

"The booth is so dry that the separation you get on the individual drum mics is sometimes a little more than you'd like, making it a little tricky to knit together the sound. When I'm recording jazz stuff, I'll generally just use three mics — two overheads and kick, with maybe a snare as well — because you want the whole kit to sound like one instrument, rather than a collection of bits of percussion. To get that kind of sound in the booth is more difficult, and you have to think a bit more about your reverb choices."

A Booth With A View

"The only window in my booth is the narrow one in the door. In an ideal world, it would be nice to see through into the booth, but the expense of knocking a suitable hole in the wall between the control room and the booth, and of buying one of the Esmono window panels, would have added several hundred pounds to the cost. I've got quite used to working without visual contact, and I've never found the lack of a window to be a real problem. Even when I've been recording bands, it's not really been a problem. If you think about it, when you're recording live, you don't actually turn around and look at the drummer that often to see what he's doing. Some people actually quite like a bit more privacy. Some of the people I've had in doing voice-overs like to gesticulate while they're speaking, and might feel slightly self-conscious if we could all point and laugh at them from the control room! Obviously, in some instances, it can be important to have eye contact, and I have once had the bass player standing outside the door so that he could see in. I've also got a cheap webcam in there, which I can use if I really need to see them, although the time-lag can be a problem.

"The booth has an in-built extractor fan which draws fresh air in at the bottom and expels the old air from one of the top corners. I have to say that when I'm doing stuff where you really don't want any background noise, the fan is slightly too loud. So I have it switched off when I'm doing voice-overs, for instance. The noise is quite a low-frequency hum, though, so you could probably filter it out without losing too much tone from the voice. For drummers and guitars you can happily have the fan on and it's not too intrusive. It would be fairly straightforward to rig up an external fan unit, with a hose on the outlet pipe on the roof, and I imagine that would reduce the noise. It can get quite stuffy in there on a hot day if the fan is switched off, though, so on those rare occasions you have to keep letting the person out every once in a while, to get some fresh air!"

From Amateur To Pro

Many *SOS* readers dream of making a living from their home studios, but Andy has managed to make a success of it, and outside London too. I asked how he got to this stage. "I first got into recording when I used to work in London as a guitarist, making not very much money," he laughs. "It wasn't a deliberate decision to move into recording; just by virtue of what I was doing I found that I was hanging around in studios and got interested in that side of it. Then I started recording bands I was playing with, ▶

Loudness Wars

"Inevitably, when people leave the studio they compare the results with albums they own which have more spent on them in five minutes than they have spent on the entire project, so my TC Finalizer comes in really handy. People immediately notice if their mix is quieter, so that's the first thing you have to overcome — it's got to sound as loud, never mind whether it actually sounds as good! It's a shame. The albums I really like are the ones which aren't compressed to death, and there are others which I think would be better if they hadn't been. The last James album before they split up just seems to have been flattened, which rather surprised me, because Brian Eno was involved in the production.

"My favourite producer is probably Daniel Lanois, and his albums are noticeably quieter than other people's when you put them on — so you just turn it up! I can understand it for radio, but for CDs I can't understand why everything needs to be so loud when the volume control will get it to the level you want while still allowing some dynamic range. I try to be a bit conservative with the Finalizer, and at least it's a good piece of kit, rather than some dodgy plug-in, so that you can get a decent level without it sounding like you've crushed the audio to death."

Andy's Studiomaster P7 32-channel analogue desk makes an impressive centrepiece for the studio, and is still used extensively for some projects. However, much recording and mixing is also done within the *SAWStudio* software, which runs on his dual-monitor PC setup.

▶ and eventually shifted from playing to recording.

"I started with a small six-channel mixing desk which I already had, and then bought a second-hand four-track reel-to-reel machine, an old TEAC A3440. I figured I could get better quality out of quarter-inch tape at 15ips than I would have been able to get out of a cassette portastudio. From that I upgraded first to a Fostex R8 reel-to-reel, and then to a couple of Alesis ADATs with a BRC. I still have the ADATs, but they don't see much action nowadays, except when I need to do location recording — I did a live album for a jazz big band with them recently, and they were fine for that.

"For audio work I now use a PC running an application called *SAWStudio*, from RML Labs (www.sawstudio.com). It's an extremely good program, and people who use it will tell you that it's the best pure audio recording system available for the PC, a sort of non-clunky Pro Tools. It supports VST and DirectX plug-ins, and there are some native effects as well, including a decent reverb and some nice EQs. I only know one other person in this country who uses it, and it was because of him that I got into it. I've got 24 outputs from the computer, although I only use 16 of them normally — to access the other eight outputs I have to use one of the ADATs as a D-A converter.

RML Lab's *SAWStudio*, which Andy swears by for his audio recording.

"I use *Cubase VST* as well, for more MIDI-oriented stuff, and I can sync it up if I need to. I'm on version 5.1 at the moment, but I'll upgrade to *Cubase SX* when I have the time. However, I find that I tend mostly to do audio-only stuff, and even when I'm doing things that you might normally consider doing with MIDI, I've got rather into the habit of working with audio instead. That way you don't get any timing discrepancies.

"A problem I have with *Cubase* is that when you hit the Record button it just sits there for a second or so before starting. And if you've been recording a 12-track take for a band, you have to wait for five minutes while it calculates all the waveforms. *SAWStudio* starts immediately, and the waveforms are all there the moment you

Mix References

"I try to encourage people to bring in their own reference CDs when I'm mixing, because it makes my life a lot easier, but most people seem reluctant to say 'We want to sound just like this,' because it's almost like saying 'We are a cheap version of this!' However, if I listen to a band's takes and I find that it's in the same ballpark as something else I know, I have a whole load of CDs which I can put on and ask whether any is the kind of thing they're after. If nothing else, it gives me some idea of how to set up the Finalizer!

stop recording. This has been particularly important for the voice-over stuff I've been doing recently, where you need the recorder to respond straight away.

"Another thing about *Cubase* is that, now that so many people have it at home, it's hard to impress anyone with it! In fact, something I have to watch is that I'm not trying to compete on the same level as the kinds of setups people have in their homes. I have to be able to offer something you can't do at home, and the booth is obviously quite a big deal in that respect. I've done projects with people running *Cubase*, where they've recorded the drums here, taken the file away to work on their guitar parts, and then brought it back to do more work on the vocals."

Selected Gear List

- 800MHz Pentium III PC with 512Mb RAM, running RML Labs' *SAWStudio*, Steinberg *Cubase VST* 5.1, *Cakewalk Pro Audio*, Digidesign *Pro Tools*, and Syntrillium *Cool Edit 2000*. Plug-ins include Antares *Autotune*.
- AKG C1000 (x2), C391B (x2) and D112 microphones
- Alesis 3630 compressor
- Alesis ADAT recorders (x2) with BRC remote
- Alesis Microverb II multi-effects
- Alesis Nanopiano sound module
- Alesis Quadraverb (x2) multi-effects
- Behringer Composer dynamics
- Behringer Intelligate dynamics
- Behringer Multicom dynamics
- Behringer Ultrafex enhancer
- Beyer DT100 headphones (x5)
- Boss GX700 guitar multi-effects
- Drawmer MX40 Punch Gate
- Korg TR-rack and X5DR sound modules
- Lexicon PCM90 multi-effects
- Lexicon Reflex multi-effects
- M-Audio Duo USB mic preamp
- MAM Warp 9 analogue filter
- Marantz CDR630 CD recorder
- MOTU 2408 MkII digital recording system
- Neumann U87ai microphone
- Oktava MK391 (x2) microphones
- Sennheiser E604 (x3) microphones
- Shure SM57 & SM58 microphones
- Sony DTC690 DAT machine
- Soundcraft Absolute 2 monitors
- Soundcraft Spirit Folio Rac Pac mixer
- Studiomaster P7 32:8:2 mixer with MIDI muting
- TC Electronic Finalizer mastering processor
- TEAC SW1 subwoofer
- TL Audio dual valve preamp
- TL Audio C2021 valve compressor
- TL Audio C2012 valve parametric EQ
- Yamaha NS10M Studio monitors

Mixer & Outboard

Given that Andy uses so much software now, I was a little surprised that he still works with such a large analogue desk and a fair amount of outboard. "I still use bits of the main desk, although its main function is impressing clients — people walk in and see a big desk like that and they think, 'Wow, this man's a professional!' For recording bands, the first dozen channels are used, and sometimes I still mix down using the mixer and outboard gear, rather than doing everything via software. The valve units I have still sound better than most plug-ins, and I like to use the Lexicon reverbs and the Finalizer as well. Which way I go depends on the project. If I think I might have to remix things and it's not a particularly big-budget thing, I'll do everything in software.

"I got the NS10Ms for monitoring when I was new to the game, just because everybody else had them. At least if you make a terrible mistake going for an industry standard, everyone else has made one with you! I stopped using them for a while, but I started using them again once I heard them on speaker stands full of gravel, which made *such* a difference. They suddenly started doing something below about 100Hz, which was a bit of a surprise! Now I generally work on the NS10Ms, with the Spirit Absolute Twos and their subwoofer just for comparison — the Spirits don't give you a particularly reliable sound, but they do give you a different type of sound which helps you spot some of the stuff going on down at the bottom end.

The outboard rack really is stacked, with a good selection of processors including Lexicon and Alesis effects and a TC Electronic Finalizer, plus the rackmount hardware for Andy's MOTU digital audio system.

"As far as mics go, my best one is a Neumann U87, which is a real asset to me. I've had people who've been used to working with an AKG C414 who've noticed the improvement with the U87. I've got a pair of Oktava 219s, which sound fantastic — I often use these for drum overheads — and a pair of AKG 391s, which will usually be on the hi-hat. For miking drums, I have a set of Sennheiser 604s, the tough little clip-on ones. These are really useful, given the limited space inside the booth — I can now mic up an entire drum-kit with only three stands. People can, and do, hit the Sennheisers with their drumsticks, but they seem to be able to take it. I've also got an AKG D112 for kick drum, as per usual, and I usually have a Shure SM57 on the snare."

Business Sense

Before I made my way back home, Andy passed on some final tips for anyone planning to set their studio up as a business. "It's important to try to get repeat bookings, especially if you're trying to make a living in a market as small as Cambridge — more than half of the people who have recorded here have come back at least once. I find I also have to be very versatile, because I get a whole range of different projects coming in here — editing, restoration, mastering, live albums, jazz and rock bands — everything, really.

"Another major source of bookings is the *Yellow Pages*. The first time I took out a block advert it came to about £180; before I'd even realised it was in print, someone had phoned up and booked two days of recording, which paid for the advert before I'd had to pay for it myself! The advert *always* pays for itself before I have to pay for it." SOS

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DAT PRODUCTIONS

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Waldorf *D-Coder*

Formats: Mac/PC PowerCore (PC/Mac VST & Mac MAS)

Vocoders are clearly back in vogue, so who better than Waldorf to come up with a plug-in offering a powerful yet intuitive combination of vocoder and synthesizer? Designed to run on a TC PowerCore DSP card under version 1.6 software or above, *D-Coder* can be accessed from within any VST or MAS-compatible application, and combines a vocoder offering up to 100 bands with a simple eight-voice polysynth. There are two tuneable multi-waveform oscillators (which include noise), multimode filters, ring modulation, EQ and an LFO that can be locked to time or song tempo. Three faders allow the sound of the synth to be mixed with the vocoder output and/or the analysis input, and if you don't want to use the included synth as a carrier, a small carrier plug-in can be inserted into any audio mixer channel and then selected so that channel becomes the carrier instead. A side-chain button allows any audio track or mixer channel to be selected as the analysis input.

D-Coder has a typically clean and tidy 'Teutonic' interface, as befits its provenance, where a window display shows both the analysis input spectrum and the filter spectrum applied by the vocoder. Normally these will be the same, but controls are provided to limit the range of analysis and/or to move the boundaries of the vocoder filter bank so that the analysis and vocoder filters are offset or pitch-scaled with respect to each other. This simple system makes it possible to radically alter the characteristics of a voice or other sound, from cartoon character to demon. Further changes can be made by adjusting the bandwidth and resonance of the vocoder filters. At one end of the scale the sound is similar to that of a traditional vocoder, albeit somehow more 'digital' sounding, while at the other extreme the effect is almost like singing wind chimes. A voiced/unvoiced detector is also included to improve intelligibility. A whole bank of presets is included to show off the range of sounds this plug-in can produce.

During my tests, *D-Coder* worked faultlessly but I found it took some juggling to get a classic vocoder sound with good articulation — the result always had a flavour of digital resynthesis about it. It is possible to get reasonably close to the traditional analogue vocoder sound, but *D-Coder*'s strengths are most evident when you move away from familiar territory and start to experiment with more radical effects. In this respect it is probably the most flexible vocoder/synth combination I've tried and makes a fascinating tool for sound design work. *Paul White*

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Camel Audio *SuperCamelPhat*

Formats: Mac & PC VST

SuperCamelPhat made its first appearance in *SOS* in the October 2001 issue, where it was praised for its originality by no less an authority than our own Martin Walker. For the uninitiated, it's a multi-effects plug-in offering distortion, compression, EQ, filtering and flanging effects, all accessible from the same 'idiot-proof' front panel. Now at version two, the plug-in has undergone a major overhaul, improving the user interface, and adding extra features including envelope and attack/release controls for the low-pass filter, a new band-pass filter section, and useful on/off buttons for each of the effect 'modules'.

First in the signal path is the band-pass filter. This offers controls for both low and high cutoff points, which can be adjusted independently or linked together for 'swept' EQ sounds. There's also a Mix knob, which can be used to control how much of the unfiltered signal is added back into the sound at the plug-in's output. Since only the filtered sound is passed to *CamelPhat*'s DSP modules, this provides an easy way to set up frequency-specific processing (so you can, for instance, apply flanging only to the ride cymbals in a drum loop). Using two or more *SuperCamelPhat*s in series, it's even possible to do basic multi-band compression.

SuperCamelPhat's compressor couldn't be easier to use, offering as it does just a single knob for the amount of compression, and no other controls! This simplicity does not detract from the quality of the sound, however, which is full and warm, and quite usable even at the highest setting.

Most of the other modules are similarly straightforward: the Flange effect offers only a depth control, as do the 'Mech' and 'Tube' distortion modules, and the mysteriously named Magic EQ. While you might expect this lack of editability to be frustrating, it really isn't. Each of *SuperCamelPhat*'s effects seems to have been carefully tuned to produce absolutely the right kinds of sounds by default. Instant gratification is what this plug-in is all about: insert it in a mixer channel, tweak a couple of

Plug-in News

TC Works have released a new plug-in for the PowerCore platform. *247C* is a virtual limiting amplifier modelled on the legendary UREI 1176 dynamics processor, and was apparently created in response to requests from PowerCore users for an emulation of this classic compressor. Its appearance follows that of the 1176 closely, right down to the VU meter and push-button ratio and meter-range controls. Up to four stereo instances or six mono instances of the plug-in can be run simultaneously on one PowerCore card. *247C* is available to registered PowerCore users as a free download and will be added to the plug-ins bundled with the PowerCore, which is already supplied with a vintage-modelling voice processor, *VoiceStrip*.

W www.tcelectronic.com

Meanwhile, Bomb Factory have updated their range of 'virtual vintage' plug-ins to run at sample rates of up to 96kHz. The range includes emulations of classic processors such as the UREI 1176, Fairchild 660, Universal Audio LA2A and LA3A compressors, along with more modern devices from the likes of Joemeek, Sansamp, Big Briar and Voce.

W www.bombfactory.com

knobs, and immediately things are sounding warmer, fuller and undeniably 'phatter'.

The Magic EQ is particularly good in this respect. The supplied HTML documentation talks about "analogue modelled soft saturation" and "a custom high-end shelf", promising "extra weight and punch to the bass regions". In practice, it seems to function as a Make The Bass Drum Sound Better knob. When you want the bass drum to sound better, you turn it up. I don't really understand how this works, but it consistently does the business, transforming even the least promising sampled kick into something solid and convincing.

The most complex *SuperCamelPhat* module is the low-pass filter, which boasts Attack, Release, Envelope (amount), Cutoff and Resonance controls. A few tweaks here are all it takes to set up some very nice, dynamic 'envelope follower' sounds, which are excellent for percussion loops.

Overall, *SuperCamelPhat* is an impressive piece of work. It manages to combine absolute user-friendliness with varied but always usable sounds. The Mech and Tube distortion algorithms complement each other nicely, allowing *SuperCamelPhat* to sound as bright and metallic or as dark and woody as circumstances demand. The flanger exhibits a colourful 'analogue' character, and the filters are resonant in just the right way. *SuperCamelPhat*'s parameters are controllable with MIDI Continuous Controllers, and if you're ever stuck for inspiration, you can click on the camel logo to randomise the current patch. A few moments' camel-clicking can turn up a whole range of unexpected sounds, from muffled 'band next door' rumblings, to in-your-face thrashing guitars, to grainy 'telephone' vocals.

At just 38.75 Euros, *SuperCamelPhat* is an absolute bargain. To my mind, the combination of compressor and Magic EQ alone would almost justify the asking price, and the MIDI-controllable filters will be a real bonus for dance producers. It's available to buy for both Windows and Mac OS (with OS X support due imminently) from www.camelaudio.com. So don't delay, get the hump today!
Paul Sellars

£ 38.75 Euros.
W www.camelaudio.com

Izotope *Ozone* v2

Formats: PC DirectX

The original version of Izotope's *Ozone* was reviewed in *SOS* back in April 2002 and received a very definite 'thumbs up'. In basic operation, little has changed in the version 2 release, so interested readers can check out the details in the earlier review (www.sospubs.co.uk/sos/apr02/articles/izotopeozone.asp). In summary, the plug-in provides a combination of six processing modules: paragraphic equaliser, mastering reverb, multi-band dynamics, multi-band harmonic enhancer, multi-band stereo imaging and loudness maximiser. The equaliser offers high and low shelf plus six bands of parametric EQ, while the multi-band modules offer a maximum of four-band processing.

Of course version 2 brings a number of improvements and additions. Top of this list is high-order noise-shaped dithering. Users can now dither and prepare word-length-reduced audio within *Ozone* via a number of different dither algorithms; conversion is possible between 8, 12, 16 and 24-bit audio. *Ozone* v2 also includes a much better system for managing presets and is supplied with some 60 examples for users to start work with (addressing a minor criticism made in the original *SOS* review), with more available for download from Izotope's web site.

For most users, the multi-band modules are key to the mastering process and a number of improvements have been made here. Settings can now be copied between bands and it is also possible to work with fewer than four bands if required (perhaps to reduce CPU load). Of the other improvements, various display enhancements for better metering are helpful, as is the ability to alter the gain of the unprocessed signal when using the Bypass switch. This makes it easier to do processed/unprocessed comparisons to hear what the processing as doing to the tonal balance of the audio rather than the overall output level.

I've been using *Ozone* v1 extensively within *Sound Forge* since carrying out the original review and have found it capable of producing very good results. Testing *Ozone* v2 suggests the new version is just as stable in operation, and the upgrade is certainly good value. New users can download a demo of *Ozone* 2 for a 'try before you buy' test run and, at $199, it is a pretty inexpensive way to get into the mastering process. Izotope should also be complimented for adding an excellent PDF article on dithering (to go with their existing 'Introduction to mastering' document) as a free download via their web site. Both are well worth a read even if you do not buy the software.
John Walden

£ $199; upgrade from version 1 $49.
W www.izotope.com

Da Nu Hiphop Era

UEBERSCHALL AUDIO

Much to many people's surprise (as well as joy/horror, depending on your tastes), hip-hop still refuses to be a flash-in-the-pan musical fad and has now been around for over 20 years. It seems fitting, then, that the sample companies remain keen to cater for hip-hop practitioners, and Ueberschall are no exception.

Da Nu Hiphop Era is a two-CD set (both audio) made up of 27 construction kits. Each kit consists of an extended mix of the full groove, lasting over a minute and covering an intro, main groove and breakdown. The full mix is then stripped back into tracks of just the beats, instrumental backing, solo-ed riffs, and all the drum samples as single hits. Style-wise, *Da New Hiphop Era* wears its influences proudly on its sleeve. Aimed squarely at the more commercial side of hip-hop, this collection is heavily influenced by the mainstream, platinum-selling styles of artists like Dr Dre, Nelly, Eminem and P Diddy.

The kits are very good; all the programming is of a high standard and each groove contains anything from five to around 15 elements, which is a lot of riffs and loops to play with. In terms of tempo, kits range between 60 and 105bpm, with the majority hovering around the 90-100bpm mark. In keeping with this collection's influences, a large number of the grooves are synth-led, with simple, choppy riffs (*à la* Dr Dre) and programmed beats, though each also includes some type of 'played' loop, either guitar or keys, to add that human feel.

In addition to instruments and drums, six of the kits feature surprisingly good (American) rapped vocals, consisting of a few lines of verse and a chorus that could easily be cut into loops and dropped into other compositions. That said, the lyrics are not exactly ground-breaking, sticking to the well-trodden path of money, guns, sex and 'keeping it real'. A touch too predictable for my taste but, nevertheless, a welcome extra element that is lacking in other hip-hop sample libraries.

On the downside, I'd like to have seen a bit more variation in style, as this collection's focus is quite narrow for such a varied genre, and the lack of any real scratching samples also surprised me. I'm also not sure that two discs of construction kits alone will appeal to producers looking for odd loops to throw into their own compositions. Don't get me wrong — there is some great stuff here, but it might take a bit of digging to get to it.

These are just minor niggles, however, as overall *Da Nu Hiphop Era* is a well-assembled collection of authentic hip-hop construction kits (several of the Dre/Eminem-a-likes are spot-on) just waiting to add a touch of iced-out US street culture to your recordings. *Oli Bell*

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Creative Essentials

ZERO-G REASON REFILL

Sometimes size does matter, and Zero-G's *Creative Essentials Refill* for Propellerhead's *Reason* software is a good example. Many *SOS* readers probably started out their sampling lives with some of the budget audio sample CDs from the 31-strong *Creative Essentials* series. Now Zero-G have reworked the entire contents of this extensive library into a single, three-CD Refill package for use with *Reason*, providing over 9000 individual samples. Considering that the original 31-CD set would have set you back about £600, the £99 price tag for this re-working of the collection looks like a real bargain.

The three CDs contain eight Refills. The five NN19 Refills are Dance Instruments (mostly based on single samples rather than multisamples), Live and Sequenced Riffs, Vocals (some single samples and some

multi-phrase sets), Instruments (single-sample and multi-sample types here) and Percussion. Two Dr:rex Refills provide Drum Loops and Groove Loops, the latter a collection of *ReCycle*-d musical phrases using a huge range of different instrument types. The final Refill is a collection of ReDrum Kits and Samples.

Anyone familiar with the original *Creative Essentials* series will know it covers some diverse musical ground. With individual tiles such as *Dance Vocals*, *Spices of India*, *Vintage Keyboards*, *Jungle Frenzy* and *String Textures*, the complete series has something for almost every musical occasion — and all of that is presented here. In attempting the mammoth task of working through the collection, I was impressed with the overall quality of the sounds and I feel that the sampling technique behind both the single-sampled and multisampled instruments is of a very high standard. True, some of the multisampled instruments are perhaps not as technically sophisticated as a dedicated *Reason* library might be, but they are all usable in their own right.

What really impressed me was the Dr:rex loops, of which there are over 2000! The Drum Loops cover jungle, dance, hip-hop, techno, reggae, funk and various ethnic styles, amongst others, and everything I tried seemed to have been processed with considerable care through *ReCycle*. As a result, most of the loops worked well at a variety of tempos. While the sheer number of loops provided is already impressive, the ability to re-program them further via MIDI just makes the collection that much more versatile. The Groove Loops, while fewer in number (only a few hundred!), also work pretty well at a range of tempos. The various brass grooves are good fun, and there are also some excellent electric guitar loops.

The ReDrum Kits and Samples ought to form a good bread-and-butter collection for most *Reason* users. All the usual suspects are present, from 808 and 909 samples through to 'real' drums and percussion instruments. Some of the samples are dry, while others are processed in some way. I particularly liked some of the 'ambient cymbals', for example. As well as 26 full ReDrum Kits, there are also more snares, kicks and hi-hats than you could shake a rainstick at (although, sadly, I couldn't find a rainstick — but plenty of other ethnic percussion samples are included).

Most of the samples in the *Creative Essentials* series have been around for a while (and you may well recognise a number of the loops present here!), but there's still plenty of good stuff in this collection to get the muse working. The huge variety of styles covered ought to appeal to any *Reason* user who is looking to

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cover all the musical bases without digging too deeply into the pockets. At £99, the *Creative Essentials Refill* is simply excellent value for money. *John Walden*

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Classic Accordions

BARDSTOWN AUDIO

GIGA/EXS24

While accordions may not immediately spring to mind for many musical applications, they can be used successfully in a variety of genres, ranging from traditional country, folk, and Celtic-inspired ensembles, to jazz, ethnic, pop, and even rock music. While concertinas and accordions both have bellows, only the accordion has bass and chord buttons on one side, to provide rhythmic and harmonic accompaniment to the melody buttons or keys on the other, making it far more versatile than the concertina.

Kip McGinnis of Bardstown Audio has collected together nine classic accordions in this two-CD GIGA-format collection, and all are sampled from instruments made in the 1950s, when they were hand-made to high standards. Kip has been a professional accordion musician for over 30 years, and certainly knows his accordions inside out. Each note has been separately recorded in stereo using superb quality gear, and no looping was used, although with sustained tones like these it wouldn't have been too difficult. However, with low notes typically 18 seconds long, dropping to about six seconds for the highest ones, you'll rarely 'run out of puff'.

All instruments feature a 41-note piano-style keyboard. On the first CD-ROM, the most intimate sound comes from the single reeds of the Italian-made Bell Symphony Clarinet, while the New York-manufactured PANcordion Tone Chamber is sampled with both 'three Middle Reeds' voicing for a richer sound, and the 'Master' (all voices) setting that incorporates reeds sounding an octave lower. The PANcordion Straight Box is presented in French Musette and French Musette Master versions, both featuring the traditional 'wet' richness obtained by using several detuned 'unison' reeds for each note — French, Italian, and Irish musette tunings are traditionally more detuned than those from the Americas.

On the second CD there are three voicings of the famous Excelsior Symphony model, from Excelsior's Manhattan factory. The Clarinet is somewhat wirier than the Bell Symphony version, while the Musette has far more subtle detuning than its French cousin, and the Master with its octaves is again wirier but refined. Like all the instruments on CD one, these have a single velocity layer. However, the final instrument — a Sano Stereo Concert Master 60 with Violin voicing — features two velocity layers, to create the most expressive instrument in the collection, somewhat closer to a harmonica in tone.

The 770Mb library itself is excellent, and each GIGA Instrument captures the idiosyncrasies of the original, complete with their unique attacks, subtle variations from note to note, natural chorusing, and the merest suggestion of a wheeze. However, the support material could be improved. The sleeve features a single cover photograph and a simple list of instruments, but there's no help file or manual. While you don't need to know all about accordion sounds to choose a suitable instrument for your own music, it would certainly help novices if more details of the sampled instruments and chosen voicings were supplied.

Unusually, Bardstown Audio sell their sample libraries exclusively from their web site, to every country around the world. Shipping and handling charges are detailed on their web site, and range from just $4 for US priority mail, through to $19.95 for International Express. *Classic Accordions* will certainly please anyone with a penchant for the squeezebox, and is probably the best GIGA collection currently available in this admittedly specialist area. *Martin Walker*

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demo doctor

The main demos featured this month can be heard in both RealAudio and MP3 format at www.sound-on-sound.com/sos/jan03/demodoc.htm

Resident specialist John Harris offers his demo diagnosis and prescribes an appropriate remedy.

How To Submit Your Demo

Demos should be sent on CD, DAT, Minidisc or Cassette to: Demo Doctor, *Sound On Sound*, Media House, Trafalgar Way, Bar Hill, Cambridge, CB3 8SQ, UK. Please enclose a band/artist photograph and/or demo artwork (which we may use here and on our web site to illustrate your demo review). Including contact information, such as a telephone number, web site URL or email address, will enable anyone who is interested in your material to contact you.

top demo

King Bathmat

Recording Venue: Home.
Recording Equipment: PC running Emagic *Logic* MIDI + Audio sequencing software, Sonic Foundry *Sound Forge* audio editor and *Acid* loop software, Midiman Audiophile 24/96 soundcard, Alesis 3630 compressor, Shure SM58 mic, BBE Sonic Maximiser enhancer, selection of plug-ins.

The mixes on this three-song demo are generally very good. Rock music needs to have a strong drum sound and the sampled loops used are both well chosen and well edited, to produce something coherent for the drum arrangement. On at least one of the tracks it sounds as though a real drummer is playing, but the equipment list leads me to believe otherwise.

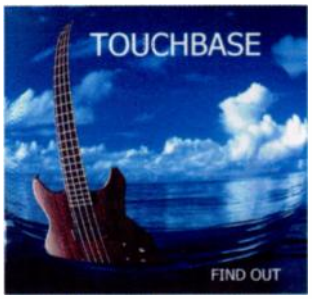
Bolstered by a strong rhythm track, the other sounds fall into place with greater ease. I particularly enjoyed the use of effects on the electric guitar tracks. A fine backwards effect that sounds like echo is used on one of the guitar solos, and elsewhere backwards guitar chords and reverb are utilised to create tension in the arrangement. This is especially good when leading from one section of the arrangement to another — for example, when the arrangement moves from the verse to the chorus. Here, the first chord of the chorus has been copied, reversed and placed in the bar leading into the chorus itself. The reversed decay of the sound now builds from a couple of beats before the chorus to a crescendo on the first beat, leading to a dynamic tension and release. It's an old production trick, but still a good one.

The only thing I'd take issue with is the level of the guitar. Often (especially when 'clean') it's too low, and I think the whole mix would sound more brash, confident and contemporary if all the guitars were a bit louder. Too often they're playing second fiddle to a monophonic and portmento'd synthesizer line, which is OK on one song but starts to get irritating by the third! This is a good idea over-used.

Vocal effects are well chosen, with a touch of echo and reverb applied tastefully and never obtrusively. I'm particularly impressed by the vocal sound achieved via the Shure SM58 microphone, although I know a lot of rock bands who like to use this particular mic to record lead vocals. It's a fairly natural sound which suits the organic nature of the other timbres.

Turning to post-production aspects of the tracks, I suppose a bit more energy could be added with some upper-mid boost, and also a touch of 14kHz boost to add presence, especially to the cymbals. Given the compression used, I expect some of the treble got lost in the processing and needs to be replaced.

With some obvious influences from Radiohead (toy piano sounds) and Oasis, this is nevertheless good stuff and really sounds like a band, even though it appears to be the work of one man! The good arrangements help; for example, I really like some of the key changes, in particular the move up a tone from the E-minor verses into the F-sharp-minor choruses on the second song. This really lifts the choruses onto another dynamic level and is particularly effective. ■



Touch Base

Recording Venue: Home.
Recording Equipment: Korg Triton synth workstation, Yamaha MD8 MiniDisc multitracker, unspecified Lexicon reverb.

With a general production approach that deliberately looks to the late '70s and the '80s, Touch Base certainly have the drum programming, bass playing, keyboard and vocal skills necessary to achieve their goal. By today's standards everything is pretty mellow, from the choice of warm, expansive reverb on the voice (probably an LXP1 or LXP5, both particularly good at this) to the style of keyboard playing and choice of sounds ('80s session man, plays a bit of pop but is really into jazz-rock fusion!).

Dealing first with the mixes, I think the hi-hats and other high-frequency sounds, such as programmed cabasas (very '80s) are a bit low in level. This gives the impression that the overall sound lacks presence, because

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there is really nothing else occupying the high-frequency area of the mix. A post-production EQ boost in the presence area of 12-15kHz would lift these instruments, in addition to giving the whole mix a little more energy. Otherwise, the only song whose instrumental balance I would question is the second, where the kick seems too loud. Although the '80s was the era of the dry, clicky kick-drum mixed up front, this is a few dBs too far. Finally, the keyboard brass works well, but I'd have injected some more bite into the sound by boosting the upper-mid EQ, and also would have tried some short room reverb, or even true-to-the-era gated reverb on the brass parts, using the Triton's internal effects processor if the Lexicon was tied up on vocals.

Some of the gear may be budget, but the sounds are pretty good. The mid-EQ boosted sound of the Stingray bass works well, although I could swear that the more classy and expensive sounds of the Korg Triton provide some of the bass work. The Triton's lead-guitar patch is also rather effectively exercised on the second song! In fact, it's the wide stereo pad patches of the Triton which add mellow class and polish to the entire production sound.

The use of a JoeMeek preamp for vocals has certainly helped iron out the harder mid frequencies of the Shure SM57 mic, but the vocal sound still lacks presence and I think it's probably time to invest in one of the many budget condensers on the market.

Summing up, this is a pleasantly executed demo which could only really be improved by a better vocal microphone and some real instrumentation in place of the programmed brass and alto sax. ■

Doctor's Advice: Effects Return Levels

A few of this month's demos demonstrate basically good effects ideas that are marred by poor execution. One example of such an idea is pre-delayed reverb applied to drums and panned to one side of the stereo image, to provide stereo interest to the listener and aid the groove. However, such effects never really come off unless the effects return level is just right. Too much and you've lost the clarity and purpose of the original dry sound; too little and the effect sounds half-hearted and pointless.

I'm also noticing that some stereo effects on the vocals aren't being balanced that well, particularly the pitch-shift and harmoniser-style treatments. Remember that the dry vocal sound will, in most cases, occupy the middle of the stereo image, being panned to centre. The two effects returns are then panned one left and one right, and should be a bit lower in level than the dry signal, unless they're being used for a special vocal effect on a phrase or two of the lyrics.

QUICKIES

Keir Doherty

Keir coaxes a lot of decent sounds out of his Playstation Music 2000 and also balances the instrumentation well. Most of the sounds have a lightweight, enhanced flavour which makes them sound quite hi-fi — very good on small speakers, no doubt. Transferred to a larger playback system, the mixes lack the grit and sonic interest which filtering, modulation and distortion effects allow in a more comprehensive recording setup. Yet, given the equipment limitations, this demo does show a good grasp of mixing and some nice touches in arrangement. Some obvious influences also show. For example, the slow-attack strings on the second composition are instantly reminiscent of Moby, but the addition of a metallic marimba loop towards the end of the piece really lifts the dynamic.

Change

Kicking off with an excellent acoustic guitar sound, double-tracked and panned hard left and right, this is a nice song from production student Thomas Fox. However the pro guitar sound highlights the shortcomings of the drum and vocal recording in particular. The drums sound woolly and lack the definition which equalisation and decent microphones give to an acoustic kit.

As for the drum mix, the cymbals are too loud and lack the high-frequency content necessary for them to add presence to the mix. Whether this was caused by an an EQ error or by the use of dynamic mics instead of condensers is hard to say without a gear list. The DI'd bass is OK, but the well-intentioned wah-bass solo is too long and the choice of notes suspect. As for the vocals, a pseudo-stereo effect (short delay, by the sound of it) pans them hard left and right, when a stronger centre image is what's required. Usually when vocals are treated to ADT or pitch-shifting to fatten them up, the dry signal remains in the centre, with the stereo effect returns panned left and right respectively, and mixed lower in level than the dry signal.

21st Sentry

The general sound of this demo is hard house-style beats with a tendency to go for a digital edge to give bite in the upper mid-frequency area. Mixes are pretty minimal but well handled, the only exception being a rather quiet kick-drum in the first mix. This improves in the second mix, which also makes better use of the stereo field, incorporating auto-panning and tempo-related delay. Naturally, this makes the whole mix sound bigger and more interesting. I was intrigued to hear that the best instrumental balance came from the Native instruments *Pro-52* softsynth and Jomox Airbase 99 drum module combination. The sounds from these are considerably fatter than some of the other outboard modules. However, the arrangement never really develops, sounding more like a bit of a trial run for the kit.

W **www.mp3.ev**

Charlie's Horse

This is a CD of good song ideas pretty much wrecked by the over-application of vocal effects. The main culprit is AutoTune, which is used without restraint on the vocals of two of the three mixes I listened to. When the effect is used all the time it ceases to have any impact, whereas if it's saved for certain phrases it retains its interest. Even on the one mix I heard where AutoTune is applied sparingly, the vocals are treated to a massive amount of pitch change with an ADT-style delay, so we never really get to hear the real character of the singing. Having said that, I really liked the general bubblegum pop approach to the songwriting and the use of strings in the arrangements, for that '60s American mood. Some of these could have been softened by mid-cut EQ (400-600Hz) to make them sit better in the mix, and also to lend the lush quality required in these fairly demanding mixes.

Wilberforce

A CD with songs that tell stories and sometimes have sound effects dropped in, mostly to good effect. The opening 'Drink' has recordings which I think were made on location at the pub, plus some struck beer-bottle percussive parts. Both tie in nicely with the lyrics and add zest to the arrangements. Add to this the use of effects such as backwards reverb and delay and the result is interesting, quintessentially English and eccentric compositions. Occasionally the effects are overdone, or a good idea is poorly executed. For instance, the panned drum reverb on the second mix doesn't work because the reverb return level is louder than the dry signal, and therefore makes the beat lack punch and rhythm. A tendency to use the same room reverb on the vocal for nearly every track doesn't help either, but overall the good points outweigh the bad.

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Business End enables you to have your demo reviewed by a panel of producers, songwriters, musicians and managers. If you want your demo to be heard by them then please mark it 'Business End'. This month's industry panel is drawn from the MPG (Music Producer's Guild).

Slacklander: Vol. 1&2

Recording Venue: Home
Main Equipment: Steinberg *Cubase VST* v5 and Image Line *Fruity Loops* sequencing software

Jona Lewie (J Lewie): "I enjoyed the intro in the first piece. It sounded like he was putting a lot of thought into it and it contained lots of textures. He's obviously very much into sound architecture and the architecture of mixing, and he takes it very seriously because he's named the CDs Volume One and Volume Two. Unfortunately it's hard to come to conclusions about such long pieces of music when you only have time to listen to a small clip. With this sort of thing you have to sit it out to understand his sense of pace and timing. There may be some good bits in there and that was suggested by how it was developing a couple of minutes into Volume Two. It might be possible to pick out certain sections to create a single, but without a vocal a single would be difficult — so maybe he should consider adding some vocal interest? As it stands I think he should be thinking about production and library music."
Jo Harrison (JH): "I think these were great arrangements but they would work best as production or library music because they don't work well enough on their own. Together with something visual I can imagine this music being great soundtrack or background music."
Felix Cemmell (FC): "From the small sample that we heard it is hard to say in which direction it's going. It is easy to make rubbish ambient music but as far as ambient music goes it was quite good. I quite like the dark atmospherics in the first track which seems interesting and quite beautiful. The melody reminded me of The Future Sound Of London. Maybe he should think of a contemporary way to perform it: it would be a good idea to try sending it out with a video and market it that way because a lot of acts on Ninja Tunes and other similar labels are doing that. Their work comes across much better that way."
John Leckie (J Leckie): "I thought it was quite good but I agree that it is probably the sort of thing you have to a sit down for one hour and listen to. He's got two hours of music and he's probably had a lot of fun doing it but I'd suggest that the next time he creates some music he should limit himself to doing a three minute song. He should be able to write some music in the same style that is no more than five minutes long and send us that. There is one very popular ambient hit single that everyone forgets about and that's Laurie Anderson's 'O Superman'. That track demonstrates a way of taking ambient music, condensing it all down and still achieving the same effect but in pop song format — even without a vocal. He's got all the sound and the taste, but now he should focus on the performance."

Sean Booth: Footsy

Recording Venue: Home
Main Equipment: Steinberg *Cubase VST* v5.1 sequencer, Roland JV1080 sound module

JH: "I absolutely loved this demo and I would rush out and buy it if it was released. I loved the arrangements and I think he's recorded some fantastic vocals that are very bold and seem to come from the heart. In track one the vocals were still incredibly strong but they didn't work with the rest of the production so in that respect I didn't think track one was as good as two and three. I like the way he used crackle on track three which added just the right texture. To a certain extent the feel of the music reminds me of The Smashing Pumpkins' *Mellon Collie and the Infinite Sadness*."

FC: I'm sure he's getting his music out there already, but if not, I think he should take advantage of all the big gigs and festivals around his Manchester home, because this would work really well live. I would advise him to move to London and put himself about a bit more. If he's playing gigs I'm sure he can get some A&R from some major record companies to see him play. He'd fit into that Coldplay market. One the negative side, Footsy is a terrible name so he should change it."
J Leckie: "Each track seemed to get better. I don't know what his lyrics are about but he seems to have a talent for both singing and piano playing. I don't know if we should be judging his recording skills or use of equipment, but he's probably the sort of guy who doesn't need to use equipment — he could probably sit here now and entertain us quite well. So in that respect it doesn't need anything else. The drums were well recorded and it might have been a real piano, so he's done well to produce so much live material on his own, but the vocals got lost a bit when the strings came in. He should lay off the string synth on the first song.
"I don't think a record company would listen to anything else we've listened to this session but I think they'd take notice of this."
J Lewie: "I would say that he is a far better musician than he is a mixer and he admits that in his letter. It is from the heart but if the tracks were better mixed the emotional quality would come through even more. There is always room for a good ballad in the charts and tracks two and three have that potential. I thought that track two was more successful than track three at this point, but there was a lot of feeling in track three. Track one meandered on a bit, but there are some good solid blocks in its construction. It's a shame the vocals got lost in places because they are so important."

The Ghosts: Vibrations

Recording Venue: Crux Studios
Main Equipment: None Listed

J Leckie: "The Ghosts have a long way to go. There are probably hundreds of bands in England and Scotland doing that kind of material and the first thing you think of nowadays are the Strokes, or The Velvet Underground or something like that. The reason why a lot of kids try to do this sort of

music is because it is so easy to play; you can pick up the guitar and strum a few chords, and if you want to sound like Jim Morrison you don't really have to sing because you can half speak it. They probably get all their mates to their gigs and it goes crazy and everyone thinks the Ghosts are a great band, but as far as the musical talent goes it is pretty minimal. I think it's a shame that the music press and a lot of the record companies have championed this kind of music because the musical exploration is so limited, and I find it really sad that British youth is doing that kind of music rather than broadening their horizons."

FC: "I liked it. Where John saw rubbish I saw poetry! The vocals in the first track sounded slightly like the Fall and the third more like The Velvet Underground so they have chosen a particular style and their sound is exactly where it should be for what they are doing. I don't want to offer any advice on their arrangements because I think they can probably get backing as it is."

J Lewie: "Some of the other demos sounded quite dull in comparison with this, which was really bright and loud, but when they're doing this kind Velvet Underground stuff they are not bringing anything new to the table, and they've got to do that to make a mark. One of the ways they can improve is if the songwriter collaborates with some of the other guys in the band. The first track had no change and in the end and it just went on and on. In that respect it is rather Dylan-esque. Bob Dylan did it well with 'Subterranean Homesick Blues', but these guys certainly don't compare to Bob Dylan. They should have included some changes and made some departures into other areas. I thought the second track was better, but the changes didn't happen soon enough to keep my attention. I think they need to do a lot better. This may be the sort of style that currently appeals to the NME, but the NME doesn't sell records."

JH: "I think the vocals were weak and the music does need to be more challenging. The first track was reminiscent of The White Stripes or the Strokes and that sort of thing is all out there already. Having said that they would probably find a place in the American market."

The High Tea Company

Recording Venue: **Home**
Main Equipment: **IBM Thinkpad running Emagic *Logic Audio Platinum*; Emu Proteus 2000 sound module**

J Lewie: "That was original and inventive. They were just doing their own thing and it was all just coming from their *Logic* software. if they want to go further I think they should improve their vocal contributions. They do have vocals there which add interest but they could be much more developed. The drumming in track two was very original and totally off-the-wall."

JH: "They say they are original and don't want to be categorised but to me the whole thing sounds like a Playstation game. I found track three the best by far."

J Leckie: "I thought the most interesting thing about it was the name. The music sounded a bit like an exercise or as though they have recently bought some gear and have been fiddling about with it to show what they can do. They've been creative, but I'm not sure if they've got any musical talent. They have made the best of their limitations, although I get the feeling that these are just experiments with some phrases of poetry over the top."

FC: "Reading their press release you'd have thought it was really fantastic because they use a lot of words like 'ingenuity' and they have written 'in this world of target marketing and buzz-word mania, individualism seems to be seen as a long-shot gamble and most companies look for the easy option of conformism — we choose to be different.' But I don't thing they are being different at all, and I think artists like Kruder & Dorfmeister do it much better. Maybe this was their first go but they were building themselves up far to much with their press release. They are trying to be very arty, but unfortunately it's not done with much style." SOS

This Month's MPG Panel

John Leckie began his career as tape-op at Abbey Road Studios in 1970 and soon found himself working under Phil Spector on high-profile projects like George Harrison's *All Things Must Pass* and John Lennon's *Plastic Ono Band* albums. After graduating to engineer, he worked on classics such as Pink Floyd's *Dark Side Of The Moon* and *Wish you Were Here*, before leaving to become a freelance producer in the late '70s. In that capacity he has been responsible for some of the most influential releases of the last 20 years, including albums by The Stone Roses, Radiohead, and Muse.

Award-winning songwriter, musician and producer Jona Lewie began his career back in the late '60s, when he played with Arthur Cudup during the British blues boom. He has had numerous solo worldwide hits, most notably with 'You'll Always Find Me In The Kitchen At parties', 'Seaside Shuffle' and the perennial Christmas favourite, 'Stop the Cavalry', for which he won an Ivor Novello Award. Jona operates his own studio facility and is a member of the MPG and BACS.

Felix Cemmell is a graduate in Music Industry Management and Studio Production from the Buckinghamshire Chilterns University. She is also a mentee in the new Music Industry Mentoring Scheme. As an active MPG member, Felix is involved in expanding the membership and contributing to the website. She is currently a reviewer and contributor to The Wire magazine.

Jo Harrison entered the industry as fundraising manager for The Market Theatre Foundation in Johannesburg. Having gone on to study music administration in New York, she began working for artist and producer Alan Parsons as his company and studio manager. Her varied role included album project and tour co-ordination. More recently Jo joined Abbey Road as PA to the directors to coordinate industry events including the BBC's Music Live and the Brits Awards Nominations. Jo now works as sales and marketing manager for DAT Productions.

Many thanks to DAT Productions who hosted the session.
The MPG's web site is at www.mpg.org.uk

Email your queries, comments and tips to: sos.feedback@sospubs.co.uk
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Piracy Not The Cause of Industry Woes

Marius Kahan: controversial opinions.

I'd never been in such wholesale disagreement with a Sounding Off piece until reading Marius Kahan's in the November issue. Blaming digital piracy for people's dissatisfaction with today's music industry sounds absurd when, throughout my 46 years, complaints about the industry have been pretty much the same. The mainstream industry, at least, has always been seen as manipulative of the public and often grossly exploitative of its artists. Powerful corporations and wealthy stars and producers bleating about MP3 and CDR cut no ice at all with music lovers, who are sick of inflated prices, and sick from the knowledge that many musicians they've admired over the years have made big profits for their labels but ended up owing crippling sums and losing ownership of their work because of contractual small print. Who can forgive those who raked it in while Hendrix was on 50 quid a week doing sell-out tours? And do the survivors of the Experience get a penny out of the still-buoyant Hendrix industry? The very idea!

Kahan mentions the 'home taping is killing music' campaign of the analogue days. Well, it didn't, did it? The obvious fact, then as now, was that copying music propagates it. (I'm probably not the only one to resent being told I'm no better than the mafiosi because I once made up a compilation tape to play in the car; so arrest me!) The casual copying of albums for personal use has the principal effect of developing the audience for the artists in question. How many of us have gone to see a band in concert or bought their records having heard them for the first time on a dodgy cassette? I'd be willing to bet, too, that most readers have given away far more CDs/MP3s of their own music than they've ever 'stolen' from commercial albums.

Technology is rather like the weather. Insurance companies must stump up after a hurricane. So too must industries adapt when the landscape changes in the way that information technology has changed all our lives. It's not these inescapable realities that prevent our self-styled benefactors in the music industry from developing new artists for our consumption. It's lack of business vision, and above all, remoteness from, and not a little contempt for, the consumer.

Rob Norman

Whose Audio Is It Anyway?

Regarding Sounding Off, October 2002, by Chris Eccles, Mr Eccles rather offhandedly dismisses the rights of originators of audio source material. With all due respect to the author, the argument fails to convince.

The author claims that "audio clips that have no intrinsic value either musically or sonically in their original context are, I believe, fair game". This is an impossible and rather conveniently self-serving standard. Who is to decide what audio has value musically or sonically? The B-movie actor so gratuitously slammed in the article might have considered his work to be brilliant. The approach advocated by the author would only initiate a slide down a slippery slope, leading to more and more protracted litigation.

Furthermore, the judgement of artist de-merit is disingenuous: apparently the object in question does have musical or sonic value, or else one would not have been interested in lifting it in the first place. Maybe I should justify piracy of every recording in existence by simply claiming that none of them actually had any artistic or sonic value, until my brilliant recontextualisation redeemed the worthless lives of the original creators? In fact, perhaps the original creators should pay me for my noble salvation and salvage work!

The drum loop you carelessly pilfer is not yours to take. While, as you say, "no one actually owns a rhythm" (a questionable premise in its own right: what to make of compositions that are purely percussive?), someone most certainly owns the recording of said rhythm. The originators in these cases might feel generous and offer sample use without the need for compensation, but that decision is on the basis of their own generosity, not on your assumption thereof. In fact, the arrogant presumption of someone who lifts a sample without even attempting to obtain permission from its originator begs to be refused, just on principle of etiquette.

If the sample is important to the success of one's work (as apparently it must be, if the samplist chooses to include it), then the originator of said sample is effectively a collaborator, and should be treated as such.

Keep the law simple: any use of a sound recording sampled from another's work should require explicit permission (and, if so requested, credit and reimbursement) from the originator.

Not wishing to be one who only writes to complain, and therefore contributes to the general negativity of Western civilization, as well as the wealth of the psycho-pharmaceutical industry, I would like to end on a positive note: Thank you for producing the best music publication within the charted boundaries of known existence!

Zenon Marko

Ivory Power

Like Malcolm Anderson (Q&A November 2002), I am seeking the holy grail of a digital piano that feels and sounds just like a real Grand, and I have to say that many of the latest efforts by the big manufacturers are pretty good now.

Regarding the Studiologic SL880, I agree with both Malcolm and Mark's comments, having bought one myself for the simple reason that it was the cheapest 88-note weighted keyboard I could find. The action has a rather rubbery feel to it, which isn't at all conducive to sensitive, subtle piano playing, and I'm not at all impressed with build quality — I went through three in two weeks!

At the quality end of the market, there are some fabulous stage pianos, including the Kawai MP9500 mentioned in Q&A, plus Yamaha's Grand Touch digital pianos, and both the Yamaha Silent Disklavier and Kawai Anytime range — real pianos that can convert to digital at the flick of a switch. My personal favourite — and a bargain, given the spec — has to be the Yamaha CLP990 Clavinova: full wooden keyboard, six-step graded hammer action, each-note sampling, 192-note polyphony, an amazing 89.4Mb for the Grand sounds alone, String Resonance, Key-Off samples, and a reverb. I've played this little beastie, and it's very nice indeed. I was quoted £2,700 (before any haggling) in my local music shop, so it has to be at the top of the list for anyone wanting a truly playable grand piano with all the advantages of digital and MIDI. SOS

Phil Harrison

Yamaha's CLP990 Clavinova comes highly recommended for its authentic piano tone and feel.

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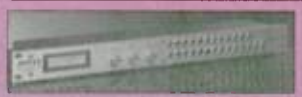

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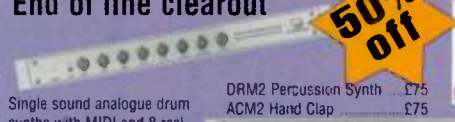

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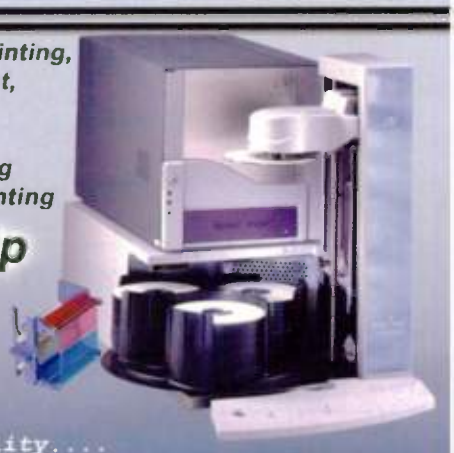

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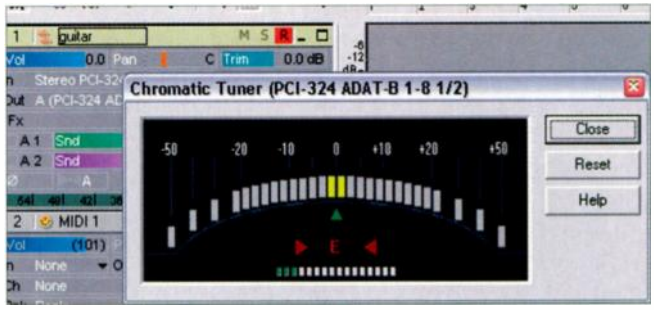
sonar notes

This month, there's news of another update to *Sonar*, plus tips on using its built-in tuner, changing the order in which track parameters appear, processing Groove Clips without having them revert to audio, getting more from the *VSC* soft synth and customising *Sonar*'s appearance.



Sonar's tuner is very handy for quick tuning touch-ups. Here it's monitoring a channel coming in to the ADAT interface of a MOTU 2408. This feeds Track 1, which is record-enabled. Note how the title bar shows the interface input being monitored, and also that the E string is perfectly in tune.

Craig Anderton

The just-released 2.1 update to *Sonar* is now available from www.cakewalk.com, and is free to registered owners. It adds some welcome compatibility-oriented features and enhancements, but also squashes several bugs and speeds up operation.

OMF support was promised, and *Sonar* 2.1 both imports and exports OMF1 and OMF2 format files. Also, you can select whether *Sonar* reads or ignores Broadcast WAV file time-stamps (although it only recognises PCM, not MPEG-based, BWFs). It also recognises MMC messages. Slip-editing MIDI data now defaults to destructive mode, although you can choose the earlier, non-destructive method. The video window is resizeable and the frame rate is adjustable. And if you load a file and don't have all the required plug-ins, *Sonar* identifies the missing plug-ins as well as which tracks, busses, and mains used the plug-ins.

One of the least glamourous but most useful features is a 'safe mode' for opening files. I became acutely aware of the need for this when *Sonar* wouldn't properly load an older file because I had updated a plug-in used in the file, but the update had a bug. Holding the Shift key during any open function causes *Sonar* to load a basic track layout, then prompt you before loading any DirectX, MFX or DXi plug-in. You can specify 'no' for naughty plug-ins, and carry on from there.

There's also a fix for the Waves 3.5/3.6 plug-ins, some of which deliver output asynchronously and can lead to extremely slow response in *Sonar*. A new parameter in the AUD.INI file allocates 'reserve buffers' for these types of plug-in.

There are numerous bug-fixes, as I was delighted to find out when I opened up a huge file I had been working on where moving pieces of Groove Clips was agonisingly slow. I don't know what they did, but the response is now instantaneous.

Time For A Tune-up

Sonar has a built-in tuner, which you can access by choosing Tuner from the Tools menu. To use it, check which track is being fed by the instrument you want to tune, then make it the active track. The tuner will then read the soundcard input to that track (identified in the tuner's title bar).

The help file says that you need to disarm all tracks prior to using the tuner, but I didn't find this to be true; the active track can be record-enabled and the tuner will work just fine. (I also noticed that other tracks can be record-enabled too. As long as the track you want to tune is the active track, everything seems to work out OK.) Although the track's meter will not register, the meter on the bottom of the tuner will advise you of the incoming signal strength. Note that the tuner likes a fairly strong signal.

The tuner shows the deviation in cents along the top, the note name, and arrows to indicate whether the note is sharp, flat, or on pitch. The lower meter indicates signal strength. OK, so a tuner isn't exactly the most ground-breaking concept, but it's one of those thoughtful little extras that helps save time.

Customising Audio Widgets

The parameters within a track — volume, pan, trim, effects, auxes, in, outs, and so on — can be changed from the standard layout. This is important because as *Sonar*ians know, resizing the track means that the panel shows more or fewer parameters. Ideally, you want the parameters you use the most toward the top, so you can keep a small track 'window' yet see the parameters you need.

For example, in the default, the Vol/Pan/Trim 'trinity' are followed by the In and Out connections, then by FX, Auxes, Phase and Interleave (stereo/mono). I always wished for a way to move the In and Out parameters to the bottom, as once they're adjusted I don't really need to deal with them any further. However the FX parameter was something I did want toward the top, and ideally, the Out would be on the same line as the Phase and Interleave, while In — the parameter I adjust the least — would languish on the bottom.

The secret to doing this lies within the cakewalk.ini file, found within the *Sonar 2* folder (typically the path on the C drive is Program Files / Cakewalk / Sonar 2). This can be edited with a text editor like *Notepad*. Add the following anywhere within the file:

```
[Audio Widgets]
W0=Volume
W1=Pan
W2=Trim
W3=Input
W4=Output
W5=FX
W6=Aux
W7=Phase
W8=Interleave
```

Sonar Tips

There's no need to document a session in a separate word processor document. Go File / Info, and you can enter all kinds of information about the project, as well as viewing file statistics.

The Cakewalk *Amp Sim* effect is supposedly for guitars. But try cloning a drum track, applying the *Amp Sim* to the clone, choosing the British Crunch amp model, turning the Drive control way up, and adjusting the level to suit. Crunchy!

You can add or delete a Toolbar by right-clicking on any Toolbar icon (not data-entry field or slider) or empty space in the Toolbar dock, then ticking or unticking the desired Toolbar from the pop-up menu.

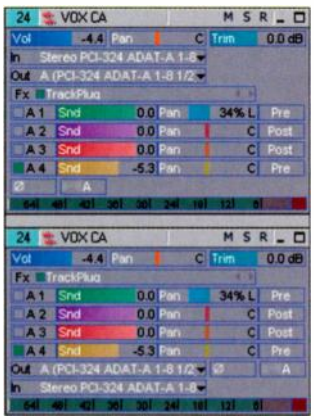
To find out a clip's length in samples, position the clip's beginning at the start of the sequence. Centre the screen on the ending edge of the clip, and zoom in all the way. Right click on the Time Ruler and go Time Ruler Format / Samples. Read the value above the end of the clip.

This is the default order. To change the order, simply renumber and rearrange the lines. Here's what I use:

```
[Audio Widgets]
W0=Volume
W1=Pan
W2=Trim
W3=FX
W4=Aux
W5=Output
W6=Phase
W7=Interleave
W8=Input
```

The names are not case-sensitive, but if any 'keys' are missing or otherwise incorrect, *Sonar* will revert to the defaults. Here's what I did for the Aux and Mains widgets:

```
[Aux Widgets]
W0=Send
W1=Return
W2=FX
W3=Output
[Mains Widgets]
W0=Volume
W1=Balance
W2=FX
W3=Output
W4=Interleave
```



The upper track view results from the default widgets placement. The bottom view shows the same track with the modified widgets parameters. With the bottom version, decreasing the track height to the top three lines still allows the FX parameter and first aux buss to be easily visible.

Again, this allows the FX parameter to be more easily visible with reduced track heights. MIDI tracks can be similarly modified; here are the default widget parameters (which I didn't change):

```
[MIDI Widgets]
W0=Volume
W1=Pan
W2=Trim
W3=Input
W4=Output
W5=Channel
W6=Bank
W7=Patch
W8=Key
W9=Time
W10=FX
W11=Chorus
W12=Reverb
```

Incidentally, you can edit the cakewalk.ini file in the middle of a project, and these edits affect any subsequent tracks you add. But this is of limited use because next time you load the project, all tracks will simply grab the current cakewalk.ini settings.

A Groove Clip Tip

Sometimes when you apply an audio process within *Sonar* to a Groove Clip, it loses its grooviness and reverts back to ordinary audio, but sometimes it retains its *Acid*ising markers (see screen shot on next page).

If you reach the effect by using the Process / Audio Effects path, choose the effect, and click on OK to apply the effect, the Groove Clip *Acid*ising markers are retained. This has worked with the Cakewalk effects I've tried, as well as those from other manufacturers. However, if you insert an effect in the FX insert ▶

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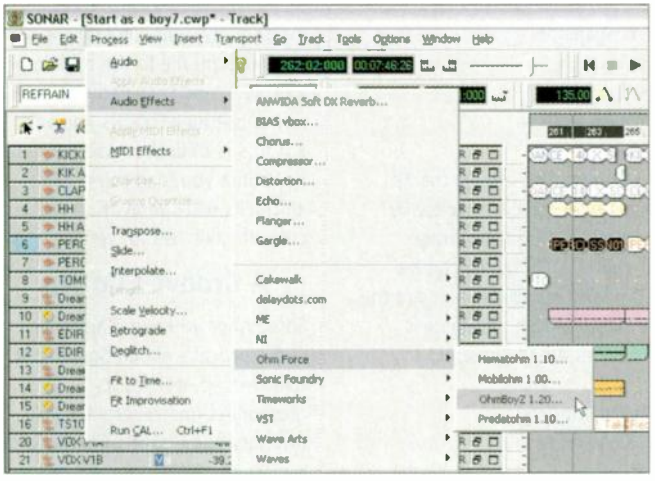


Using the Process / Audio Effects path to select effects allows Groove Clips to retain the markers that enable time-stretching, even after processing.

▶ bin and then go Process / Apply Audio Effects, the Groove Clip reverts to a standard type. If you work a lot with Groove Clips, it's a good idea to get into the habit of using the Process / Audio Effects function.

There is a catch: auditioning the effect is more of an off-line process. The sequence needs to be stopped; calling up the effect then presents you with an Audition button (this won't be present if the sequence is playing when you call up the effect). Make your edits, hit Audition, and wait for *Sonar* to build a temp file. Don't like the results? Hit Stop, edit some more, audition, and wait. When it sounds the way you like, hit OK.

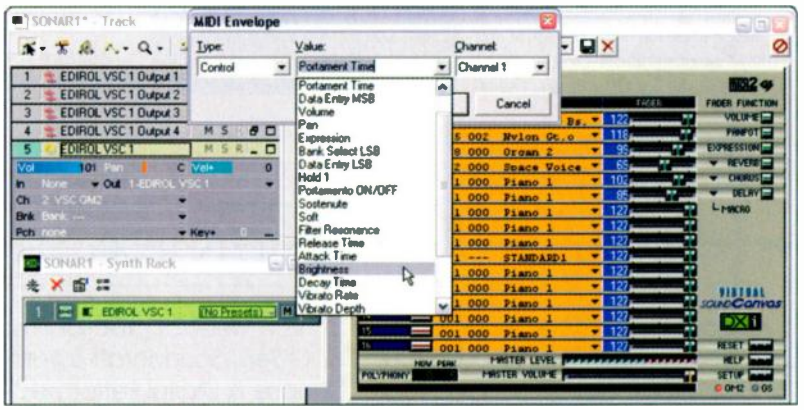
Fortunately, there's a faster workaround. Insert the effect in the FX bin, edit in real time to your heart's content, and when everything is just as you like, save the settings as a preset. Then go Process / Audio Effects, call up the effect and preset, then click on OK. Just don't forget to remove the effect from the FX bin when you're done, otherwise you'll hear the effect applied twice — once from the processing, and once from the real-time FX bin effect.

Exploiting Edirol *VSC* Automation

Don't dismiss the Edirol *Virtual Sound Canvas* soft synth just because it's included free with *Sonar*. Not only can it make some decent sounds without draining a lot of power, but it also handles basic automation functions. For example, you can tweak *VSC* faders and record the movements as automation data for volume, pan, expression, reverb send, chorus send and delay send. To do this, click on Setup in *VSC*'s lower right corner and go to the Misc tab. Tick 'Record VSC Panel Operations'. Now arm *VSC*'s corresponding MIDI control track for recording (not automation, just recording), go into Record, and move the faders around as desired. On playback, the faders will move to reflect the automation data.

VSC will respond to even more parameters using envelopes. Right-click on its MIDI track in the Clips View, and go Envelopes / Create Track Envelopes / MIDI. Click on the Value drop-down menu, and you'll see a list of automatable parameters. These include the ones that can be recorded from the front panel, but also several others, such as filter resonance, brightness, decay time, and so on.

In addition to automation, *VSC* can provide four discrete outputs if you specify All Synth Outputs in the Insert DXi Synth Options dialogue box that opens up when you insert a DXi synth. To assign channels (parts) to these outs, click on *VSC*'s setup button, go to the Output Assign tab, and assign the desired part to the desired output. Each out will be represented by an audio track in the Track View.



The active MIDI track drives *VSC* channel 2. Right-clicking on the track in the Clips pane activates the Envelope options, where you can create track envelopes for various parameters. In this example, Brightness is being selected.

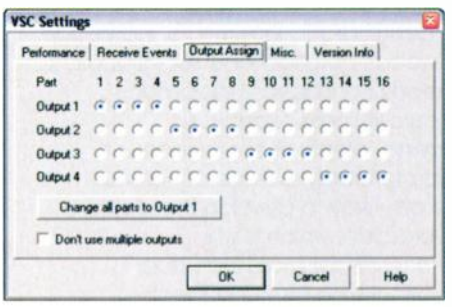
A Clearer View

If you find *Sonar*'s default Window backgrounds hard to look at for a long time, or even just plain dull, you can change them to suit. You can see the colors change as you adjust them. For example, open up a MIDI piano-roll view, then choose Options / Colors. Under Screen Element, select Window Background, and tick Use Specific Color rather than Follow System Color. Click on Choose Color, and use the standard Windows colour picker to select the colour of your choice.

While you're at it, here are some other screen elements you might want to modify. Don't go too nuts, because the default colours are fairly carefully chosen — for example, you don't want to choose a background colour that's the same as an envelope, thus obscuring the envelope. But the following are pretty safe:

- Track view control border. This determines the trim colour around the various track parameters (such as volume, pan, FX bin, and so on). I'm partial to a dark purple/grey.
- Track view background. This is the grey background behind all the clips in the Clips View. Making it a bit darker allows the clips to 'pop' a little more; I use a dark grey/blue.
- Audio clip background. A very light robin's egg blue works well against the darker background.

Finally, for Wallpaper, tick Custom, and *Sonar*'s background can change from the default *Sonar* logo to something more pertinent, like your studio's logo (or picture of your significant other). Of the desktop images included with Windows, Soap Bubbles.bmp is kind of fun. SOS



Any of *VSC*'s 16 parts (which correspond to MIDI channels) can go to any of the four available audio outputs. If multiple parts feed multiple outputs, they'll be layered together, which is great for layering parts that you want to process with the same effects.

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cubase notes

While using keyboard shortcuts in a sequencer is nothing new, this month we explain how *Cubase SX/SL* takes the idea further, and look at Hans Zimmer's unique solution for accessing Key Commands in *Cubase*.

Mark Wherry

Although the mouse has arguably made computers easier to use, it isn't always the most efficient device for carrying out certain tasks, especially when you might have to navigate a large display that spans multiple monitors. For this reason, keyboard shortcuts have been popular since even the very early graphical user interfaces, allowing you to instantly access commands from a single key combination and develop efficient patterns of working for different tasks.

In *Cubase*, the handling of keyboard shortcuts (or Key Commands, in *Cubase*-speak) is very flexible, and almost any action in the application can be assigned to a Key Command. Unlike previous versions of *Cubase*, *SX/SL* doesn't allow you to assign Key Commands to MIDI events, but the extra functionality now provided in this area of the application more than makes up for it, and it isn't something I've personally missed since I began using *SX*.

Key Commands

The management of Key Commands is handled, unsurprisingly, by the Key Commands window, which is opened by selecting File/Key Commands. To make life easier, the Key Commands have been grouped into a list of Categories, and the Commands list always shows the Key Commands available in the currently selected Category. However, if you're not sure which category a Key Command might be listed under, you can use the search facility to help you.

To search for a Key Command, click 'Search' to open the Search Key Command window. Click the black text field at the top of the Search window, type in a keyword and press Return — don't click 'OK' just yet, as this closes the window without performing the search. If your search was successful, you should see a list of matches describing the Key Command, the Category it's listed in and the keyboard shortcut that triggers the Command, if a shortcut has been assigned. Unfortunately, the Search Key Commands window is just a reference tool and you can't use it to automatically jump to a Key Command.

Once you've selected a Command in the Key Commands window, any assigned keyboard shortcuts for it will be detailed in the Keys list, so if the list remains empty, you can deduce that the Key Command is currently unassigned. To assign a Key Command, make sure the one you want to assign is selected, click the text field underneath the 'Type New Key Command' label and press a key (or combination of keys) on your keyboard. If the key (or keys) you pressed is already assigned, the Key Command it's assigned to will be displayed underneath the text field. Should this happen, try another combination.

Burger, Fries & Transpose The Selection

This month, I've been fortunate enough to spend some time at Media Ventures in California looking at *Cubase SX* with Hans Zimmer, who's probably the world's most experienced *Cubase* user, in addition to being one of its greatest film composers. Over the years, he's developed an incredibly efficient working method with *Cubase*, and one aspect of this is based around the concept that it should be possible to trigger every action with a Key Command. Inspired by the keypads used on cash registers in fast-food restaurants, where keys are assigned to different foods and beverages, Hans and his team came up with a really neat way of accessing Key Commands in *Cubase*, using the same type of keypad.

The model in question is the Electrone KM128A, which provides a 16x8 matrix of 128 user-definable keys that can be assigned to any combination of standard keyboard actions. Devices like the KM128A behave just like regular keyboards and have no problem co-existing with such keyboards, interfacing with your computer via a PS2, USB (with the aid of a PS2-to-USB adaptor) or serial connection. Unfortunately, a Windows PC with a serial or PS2 interface is required to program the keypad, since the supplied software is only compatible with Windows and doesn't support USB, although, once programmed, you can also use the keypad with a Mac.

During keypad programming, each key is assigned a unique combination of keys that you would never hit by accident on a normal QWERTY keyboard, and that wouldn't already be assigned to a Key Command, such as 'Control/Apple+Shift+{'. So when you're assigning Key Commands, you simply press the required key on the keypad, which *Cubase* interprets as a regular combination of keys on a standard keyboard. Afterwards, as you'd expect, you can press the same key on the keypad to trigger the Key Command in *Cubase* — pretty neat.

So which *Cubase* Key Commands does Hans assign to his keypad? This is where things get interesting. Since most of the commands Hans wanted to assign to his keypad couldn't be assigned as Key Commands in *Cubase VST*, the team turned to CE Software's *QuickKeys*, which allowed them to create both relatively simple menu-based shortcuts, to trigger Logical Editor presets, and more complicated macro-based solutions.

Although you can now create Macros in *Cubase* itself, you still can't assign Key Commands for Logical Editor presets. Another feature you'd still have to use *QuickKeys* for in *SX/SL* is Hans' row of keys for switching the data displayed by the Controller Lane in the Key Editor. Being able to switch between volume, pan and modulation data, amongst others, with a single keypress is particularly useful — so useful, in fact, that Steinberg are considering adding this ability directly via built-in Key Commands in future versions.

Hans Zimmer's custom keypad: notice the yellow keys along the bottom for switching Controller Lanes and the light-purple keys at the right for triggering Logical presets. The two rows of black keys are there to make the keypad easier to navigate.

If you're interested in getting one of these keypads, at £265.55 in the UK (from www.intolect.com) their cost is fairly high, although you might be able to apply the same ideas to cheaper alternatives. *QuickKeys* is available as an online download, at www.cesoft.com. It costs $79.95 and comes in three different versions, for Mac OS 9.x, Mac OSX and Windows.

The Key Commands window showing a user assignment of the 'Add Track' Audio Command.

When you have a unique keyboard shortcut entered, click the Assign button to assign the Key Command, and you'll notice that it appears in the Keys list. You can remove an assignment from the Keys list by selecting it and clicking 'Remove'. You'll then have to confirm, in the Alert that appears, that you really do want to remove the assignment, by clicking 'Remove' once more.

Many of the available Key Commands are unassigned by default. Perhaps the most commonly used Commands just crying out to be assigned are the Add Track Commands. However, it's interesting to note that some of the unassigned Key Commands can't be accessed in any other way than by assigning them. These include useful features such as the nudge Commands, which allow you to nudge the current selection by the current quantize setting.

Key Command assignments are Project-independent and stored within *Cubase SX* itself, meaning that any Key Commands you assign will be available to any Project you open or create. If you want to use your assignments on another system, you can save them by clicking the Export button in the Key Commands window, and reload them via the Import button. Steinberg supply many Key Command sets with *Cubase*, to emulate the way keyboard shortcuts are assigned in other applications, such as *Logic*, *Sonar*, and earlier versions of *Cubase*. Windows users can find these in the 'Program Files/Steinberg/Cubase S?/Key Commands' folder, while Mac users will find them in the 'Library/Application Support/Steinberg/Cubase S?/key commands' folder.

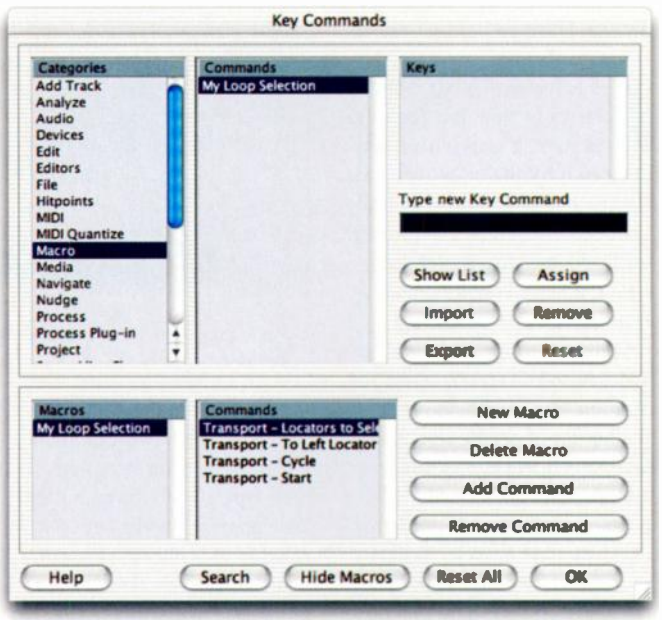
Macro Madness

While Key Commands are useful, *Cubase SX/SL* takes the idea one step further by implementing Macros, making it possible to define a sequence of Key Commands that can be triggered via a single command from the Edit/Macros sub-menu. And, naturally, you can also trigger a Macro with a Key Command, since any Macros you define automatically appear in the Macros category of the Key Commands window.

A good example of what's possible with Macros is the Loop Selection Command in the Transport menu (while this is not strictly a Macro, it does demonstrate the kind of command that can be defined with one). If you're not familiar with Loop Selection, it sets the Left and Right Locators based on the current selection, positions the Project Cursor at the Left Locator, activates Cycle Mode and starts the Project playing — all in a single Command that can also be triggered by pressing [Shift]-[G]. But let's pretend that the Loop Selection Command doesn't exist for a moment and investigate how we could create it using a Macro.

As mentioned above, Macros are handled in the Key Commands window, and although the Macro options are hidden by default, you can access them by clicking the Show Macros button. To create a Macro, click the Create Macro button, type a suitable name into the highlighted space in the Macro list, and press Return. The next step is to add the Commands you want the Macro to trigger, which you can do by selecting the Macro you want to add the Command to in the Macros list, selecting the required Command in the upper part of the window and clicking 'Add Command'. It's important to note that the Command is always added below the currently selected item in the lower Commands list, and that there's no way to change the order in which the Commands are triggered after they've been added, unless you manually remove them and start again. You can remove a Command from the Macro by selecting it in the lower Commands list and clicking 'Remove Command'.

To recreate Loop Selection, you'd need to add the following Commands from the Transport category to a Macro, in this order: Locators to Selection, To Left Locator, Cycle, and Start. Once a Macro has been defined, you can assign a Key Command to it in the upper part of the window, or simply close the Key Commands window by clicking OK. Macros can be triggered by either pressing the assigned Key Command, or selecting them from the Edit/Macros sub-menu.



The Key Commands window again, showing the Macro options with a recreation of the 'Loop Selection' Command.

Conclusions

It will be interesting to see if Macro functionality is enhanced in future versions of *Cubase*, but, even as it stands right now, there are plenty of interesting uses for Macros. For example, you could define a Macro that created Hitpoints and audio slices in a single keystroke, or a series of quantize buttons, such as 'quantize quarter notes' or 'quantize eighth notes' that select a quantize resolution and quantize the current selection — and this is just scratching the surface. If you come up with any interesting Macros, email them to us, at sos.feedback@sospubs.co.uk, so that they can be featured in future *Cubase* Notes columns. SOS

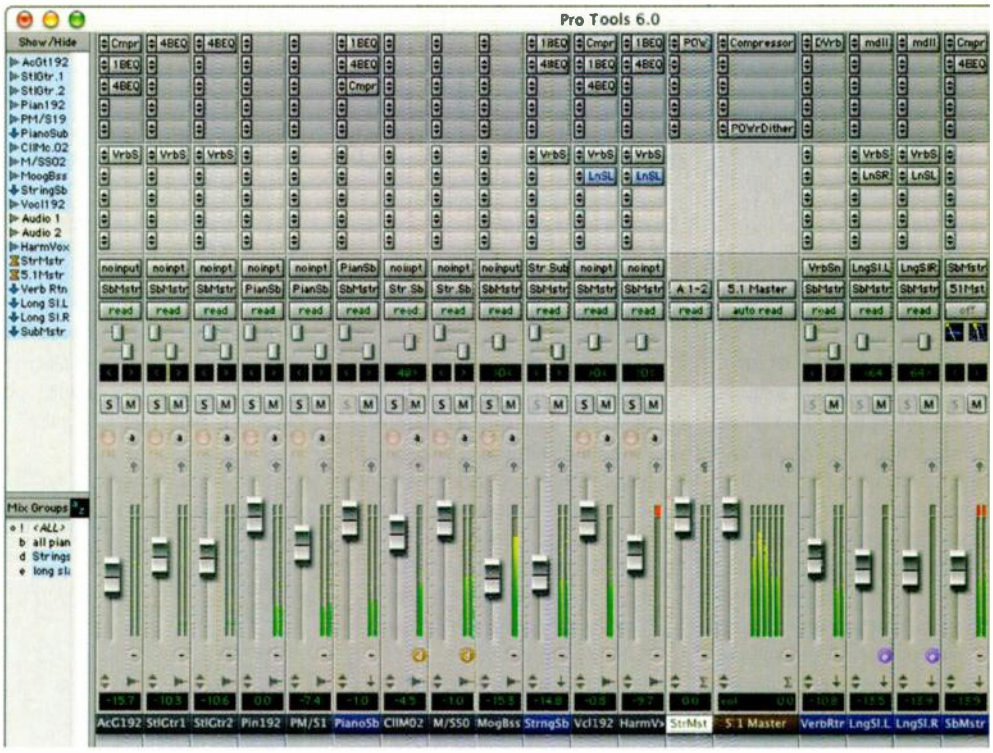
Key Commands & Control Surfaces

If you use a hardware control surface with *Cubase* that supports user-assignable function keys, you should be able to assign Key Commands to them in the Device Setup window. This works really well with control surfaces such as the Mackie Control, for example. This unit has eight function keys that, with the aid of a shift key, can provide access to 16 Key Commands. However, Mackie Control also supports two footswitches that can also be assigned Key Commands, and I've found it really useful to assign these to Start/Stop and Return To Zero, in the Transport, for example.

pro tools notes

This month Pro Tools Notes reports from the recent Digiworld show in London, offering the first chance to see *Pro Tools* 6.0, and what Mac OS X can do for you.

Simon Price



Pro Tools version 6 will be available only for Mac OS X and Windows XP, necessitating upgrades to both OS and computer for some users.

As previewed in last month's News section, *Pro Tools* 6.0 is coming, and Digidesign showed it for the first time in the UK at a two-day event in central London in November. Digiworld was held in a large townhouse near the BBC's Broadcasting House — a welcome change from the usual audio dealership or trade show venues. In fact the surroundings, combined with the hordes of people who turned up, made it feel less like a pro audio event and more like a posh cocktail party. TDM Mac users should hopefully be able to update to *Pro Tools* 6.0 in December, followed by Digi 001, Audiomedia III, M Box and Digi 002 owners. Windows XP users should get the new goodies in the second quarter of 2003. Many of the new features are summarised on the Digi web site at www.digidesign.com/news/hotnews/PTv6, and a full *SOS* review will give *PT6* a thorough going over. In the meantime, here's my pick of the important developments, and what OS X can do for us. Please be aware that these details are subject to possible changes before the actual release!

Perfect 10

Indications are that *Pro Tools* 6.0 is a completely new application, most particularly because from now on it's exclusive to Mac OS X and Windows XP. It's obviously been in development for a long time, as many long-awaited features have surfaced here, but I'll come back to that. Graphically, *PT6* is still obviously *Pro Tools*, but with a new curviness and three-dimensional depth befitting the OS X and XP GUIs. Finally (you might want to sit down) colour is sprouting out across the screen, with larger, brighter indicator lights, colour-coded mixer channels and coloured audio regions.

Veteran Mac PT users, myself included, may find the prospect of switching to OS X fairly depressing, but the benefits do really seem to be worth it. As well as the basic stability of OS X's UNIX foundations, immediate gains are *PT6*'s support for multiple-processor G4s and a switch from the obsolete OMS to Apple Core MIDI services. This last point means that *PT6* should be compatible with just about any MIDI device or interface that supports OS X. On a related point, Digidesign have decided not to follow Emagic in supporting Apple's Audio Units with this release. (Audio Units provide an OS-level plug-in/soft synth format). I would guess that, at least for the moment, Digidesign prefer to maintain an independent plug-in structure to give them more control over functionality and simpler cross-platform compatibility.

Another breakthrough made possible by shedding OS 9 was hinted at by the presence of the new Task Window on the demo system's screen. OS X is Apple's first fully multi-tasking platform (stop that smug snickering

Legacy Support

***Pro Tools* 6 represents a major software update, and for most Pro Tools owners, ugrading will involve a change of operating system too. Owners of pre-HD systems are naturally expressing concerns about whether they will be supported, and for how much longer.**

What we know for sure is that *PT6* will not support OS 9, or Windows 98/2000: it's Mac OS 10.2+ and Windows XP only. (Actually, the careful wording of the web site information leads one to suspect that the XP release may not initially be the 6.0 code base). It does support TDM systems from Pro Tools 24 upwards, and will support all host-based systems from Toolbox upwards (Digi 001, Digi 002 and M Box) eventually. Support for Unity and AVoptionXL systems will come next year.

Unfortunately, plug-ins will need new versions to work. As is usual in these situations, we can expect Digidesign plug-ins to be available from the beginning, with third parties following after. At least moving to OS X and *PT6* should be less upheaval than the core hardware change from Mix to HD. Support for PT24 is encouraging, suggesting that Digidesign are concerned not to abandon those with older systems (PT24 been around for more than five years). The majority of TDM users currently have Mix hardware, and I can see no cause for concern for Mix owners. I would be surprised to see Audiomedia III/Toolbox support lasting long into further versions, but all the other *LE* systems are current products, so my money is on *PT6* support being long-term.

In summary, the primary issue to focus on will be OS upgrades, and possibly swapping to a machine that can handle OS X/Windows XP. Mac users also face the issue of OS X compatibility with other applications.

please, Windows users) and *Pro Tools* takes full advantage with background processing support on a number of tasks. For example, we saw an audio file that needed sample-rate conversion brought into the Session. *Pro Tools* 6 didn't give us the chance to go and make a cup of tea while the new file was created and waveform overview calculated; instead, the file was dragged straight into the timeline, and could be played back from the start while it was being converted!

Instant Gratification

Digi started their formal presentation of new features with a couple of real crowd-pleasers. Plug-ins can now be inserted or switched during playback on TDM systems (*LE* can already do this). Up till now it's been necessary to stop playback while adding plug-ins, although *Logic* has long had a kludge where TDM plug-ins could be selected, and playback is stopped briefly while the DSPs are reconfigured. In a similar fashion, *PT6* mutes output during the plug-in rejigging, but the pause seemed much shorter: just a tiny glitch.

Second were vast improvements to MIDI quantise functionality. At last MIDI quantising is non-destructive thanks to the Restore Performance command. This removes the need to make a 'safety' duplicate of MIDI regions before altering timing. Going further, *PT6* includes groove quantising and groove template creation/import, meaning groove quantising can now be achieved using methods in line with those available in other music packages. Previously, groove quantising was achieved by ▶

Guest presenter Tom Holkenborg from Junkie XL during his talk at Digiworld.

Pro Tools 6 allows TDM plug-ins to be inserted during playback, with minimal interruption.

A New Level Of XXLence

New, improved versions of two studio classics! The K141S's and K240S's now feature detachable cables for increased servicability and AKG's new XXL diaphragms. XXL uses patented Varimotion™ technology to achieve even more accurate response at extremely high playback levels. The result is improved high and mid-frequency detail and a more powerful low end.

K240 Studio

The "integrated semi-open air" design incorporates a highly accurate dynamic transducer, and an acoustically tuned venting structure behind the element produces a naturally open sound quality. The circumaural (around-the-ear) pads are designed for hours of wearing comfort, while the steel cable, self-adjusting headband construction and single-sided pro quality audio interconnect ensure extended reliability in demanding professional studio applications.

K141 Studio

A small coupling volume in the ear cup, combined with an "integrated semi-open" venting system behind the transducer, gives the K 141 Studio its trademark sound: punchy, accurate and crisply defined. The K 141 Studio will deliver high sound pressure levels without distortion and it is solidly built to withstand around-the-clock session use.

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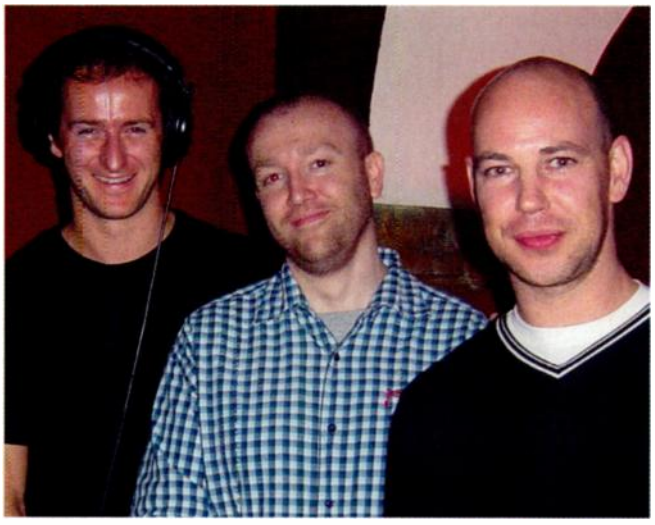
AKG

imprinting the timing variations that constitute a song's 'feel' into the tempo map of the song, then conforming MIDI passages to the map. While this was very useful for certain tasks, it was quite inflexible and the 'groove' was always tied to a particular point in a particular song. The new suite of groove template features separates the quantise information from any song's Bars and Beats grid. TDM systems carry all this functionality over into the realm of audio groove extraction and quantising via additions to Beat Detective.



DJ for the Friday night Digiworld party was Sasha, pictured here with manager Dean and producer Rob Playford.

DigiBase

The single largest addition to *PT6* is a new media management system, named DigiBase in conformity with the company's obsessive addition of 'Digi' to the start of everything! Anyway, being a little slow on the uptake, it took me a while to realise that DigiBase is an expanded version of a feature request many people (particularly post-production users) have been making for a few years. The request was to move away from a situation where songs just have a single local file/region list to a more versatile system where you have fast access to additional catalogues of files that be searched, auditioned, and dragged into the timeline. If you've seen or used an Avid Media Composer or Audiovision system you'll know this idea as media 'bins'. DigiBase seems to combine aspects of this functionality with a sophisticated file indexing system designed to kiss goodbye to 'Where is file x?'-type messages when moving projects around.

Apparently, DigiBase keeps track of all media files on all your volumes (including off-line devices) in a centralised master index independent of the Mac OS Finder or Windows Explorer. Far more sophisticated than the *PT5* 'Import Audio' page, DigiBase can search for audio using various parameters such as name or date ranges. Additionally, you can create your own catalogues of pointers to your media: the part-equivalent to Avid's bins. DigiBase appears as an additional window in *Pro Tools*, listing volumes, catalogues, and files. Files are accompanied in the window by small 'thumbnail' waveforms, allowing quick auditioning from any point in the audio clip. Digidesign hint that further into the future you'll be able to open up files from DigiBase into a separate audio editing window, meaning that you can edit the clip without it having to be dropped into the timeline first. While some of this might not have instant sex appeal to non-post users, I think it'll be a slow-burner that we come to rely on. Even with *PT5*, for example, you become so used to Sessions being able to re-link to their files via unique IDs that you can tear your hair out when using other programs where this feature is not available. Also, for us as investors in Digidesign systems, this stuff is a big deal in terms of securing Pro Tools's relatively recent wide-scale adoption in the TV and film sectors. Digi assured us that despite earlier rumours, DigiBase will not be a paid-for addition to the software.

LE Gets Less 'Lite'

As was pointed out in last month's Digi 002 review, deciding just how 'limited' the Limited Edition is represents a tough job for Digidesign. While they wish to offer a 'super-pro' version for their large studio and post-production clients, and some features rely on TDM hardware to be viable, rival host-based packages keep creeping forward in line with personal computer technology. Apparently recognising this, version 6 of *LE* will include many of the new version's advances, while also stealing back some previously restricted features. Recently the 24 audio track limit was relaxed to 32, and *PT6 LE* will also share the doubled MIDI track limit of 256. Digi's site also mentions support for inactive tracks and voice management, as available on the full TDM version. If this means what I think it means it will greatly increase the tracking power of the system and make it possible to open large TDM projects without losing material. The Trimmer Tool will now include the time-stretcher mode, which makes matching loop tempos to the Session possible in a single mouse move. DigiBase will be included, although without the catalogue feature. And finally, I'm really happy to see that my own number one *LE* wish has come true: the TDM version's 'command focus' mode will be included. This provides single-key keyboard shortcuts for just about all *Pro Tools*'s edit and zoom functions, and could be the final bit of persuasion I need to get an OS X-capable Mac! SOS

Current Versions

Mac OS
- HD: 5.3.1r2.
- 24/Mix: 5.1.3cs4.
- *LE* for Digi 001/Audiomedia III: 5.2.1cs1.
- LE for Digi 002: 5.3.2cs1.
- *Free*: 5.0.1.

Windows
- 24/Mix/HD: 5.3.3.
- *LE* for Digi 001/002/Audiomedia III: 5.3.1.
- *Free*: 5.0.1.

Quick Tips

While we have to wait until *PT6* for the new Relative Grid mode as shown at Digiworld, it's already possible to avoid moved items from snapping to the grid in Grid Mode by using a Bars/Beats value Nudge instead of the mouse.

Another *PT6*-style hack: *PT6* will have an Import Session Data option which can import data from tracks in other Sessions. One useful application of this will be to import automation data only from audio tracks, where now it's difficult to separate layers of automation from underlying audio. However, this is possible if you know how. For example, you may want to create a template Session from one song, using all the fader moves, pans and plug-in sweeps with different audio. There's a way of doing this which uses the 'Special Automation Paste' key combination. Save a new copy of the Session with the automation moves you want — this will become your new template. Now select everything across all tracks (triple-clicking the time ruler is a quick way to do this), and switch all tracks to Volume view. Hitting Command-Ctrl-C will copy all the automation. Now switch all the tracks to Waveform view and hit Delete to bin everything. Switch back to Volume view and Command-Ctrl-V will replace the automation onto the empty tracks. You can now record or place audio onto the tracks from the region bin or virgin tracks without disturbing the automation.

DIGITAL VILLAGE

PRO TOOLS HD

Refurbished Pro Tools Systems from DV

Refurbished Pro Tools|24 MIX, MIXplus and 888|24 I/O are now available from Digital Village. This is a real opportunity to purchase an industry standard Pro Tools TDM System for around half the usual price - see DV website or contact one of our product specialists for more information!

Two special hardware exchange programmes have been created to provide an opportunity for owners of earlier Pro Tools Systems and Pro Tools LE Systems to upgrade to a refurbished MIX system, and for people who invest in a refurbished Pro Tools|24 MIX systems now to upgrade to Pro Tools|HD later on!

Digital Village for Pro Tools | HD

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Digital Village is the UK's largest, friendliest and most respected pro-audio retailer. We have unrivalled knowledge, expertise and experience in providing solutions for some of the biggest names in music and sound production. When you choose Digital Village you can be sure that you have a customised and tested solution to suit your needs at the best price, and be secure in the knowledge that you are dealing with an established professional audio company.

Plug-in Power

Pro Tools | HD has roughly twice the power per card of older MIX systems, and many plug-ins and functions can also use the host computer's CPU power. Most TDM plug-ins and third party software have now been rewritten to be compatible with, and to take advantage of, Pro Tools | HD hardware.

Speed

With Pro Tools | HD, DSP tasks such as adding and removing plug-ins, audio tracks, and changing signal paths through the system, are faster. The new DSP architecture means that a plug-in can run on any chip - meaning no waiting around for plug-ins to reallocate on large sessions.

Sound

Pro Tools | HD sounds fantastic! A new mixer algorithm improves the internal signal path. Digidesign has redesigned its range of audio interfaces, to make them arguably the best AD/DA converters on the market. Third party interfaces from Apogee and Prism can still be integrated into the system using Digidesign's legacy connector. Want to hear Pro Tools | HD in action? Call one of our product specialists to arrange an audition!

Flexibility

Pro Tools is a scalable system. If you run out of inputs and outputs – add another audio interface. Running out of plug-in power – add more Process cards. Want to synchronize to timecode? Add SYNC.
For sound to picture work, Machine Control, Post Conform, Digitranslator and an armoury of third party plug-ins and utilities are available.

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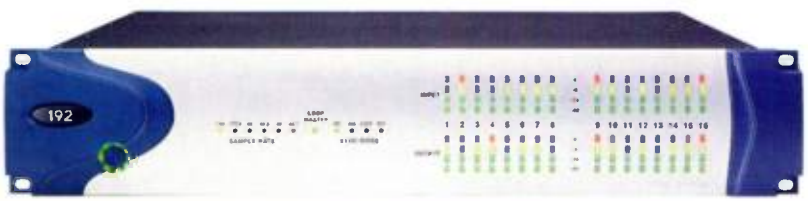

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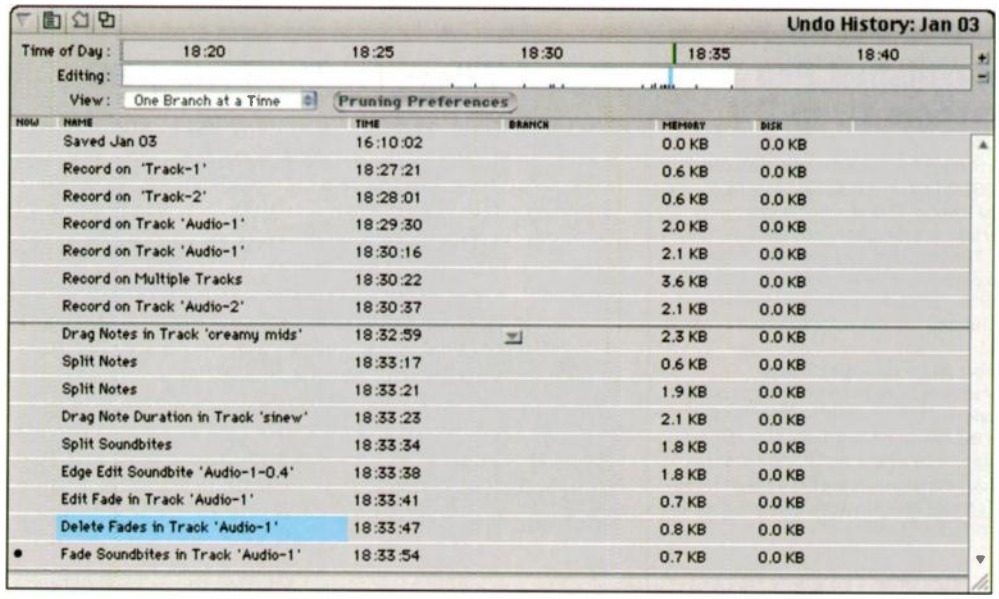
With *DP*'s new unlimited Undo facility, you really can go back in time and change history...

Robin Bigwood

Unlimited Undo/Redo was one of the most eagerly anticipated new features of *DP* 3.1 and its implementation is, in true MOTU style, very flexible and highly user-configurable. Inevitably, though, it has come at the price of added complexity, and there's something about time-line-based operations like Undo that every now and then ties all but the brains of seasoned Starfleet captains in knots. So here, hopefully, is a simple, non-nerdy guide to this great new feature.



DP's new Undo History can take you back through every stage in the development of your tracks.

Action Hero

Taking a project from start to finish consists of a series of actions — recording tracks, editing, moving faders, applying effects, bouncing and so on. It might take an hour or a year, but either way there's a finite number of individual actions involved in getting, as it were, from A to B.

Previously you could undo (or redo) only one action — the most recent — in *Digital Performer*. Now *DP* makes a list of all your actions, and allows you to step back through them as far as you like. If you've never felt the need to undo more than your most recent action, you'll be pleased to hear that not very much has changed — Command-Z is still Undo (one step). By hitting it again you'll Redo the action.

However, if you, like me, often wish you could go back more than one step, the new shortcut Option-Command-Z will do the honours. Every time you hit this you're undoing another action in the Undo 'history'. And if you need to Redo those actions, Shift-command-Z is what you need.

History Lesson

Sometimes, though, you'll need even more help, which is where the Undo History window comes into its own. Called up with Control-Apple-U (or from the Edit menu), this window is where you can view every single action you've taken in developing your project. Actions are listed chronologically, with a brief description (under the Name column) as well as a record of the time they took place, the amount of RAM *DP* is using to 'remember' them, and, when applicable, the amount of disk space they're taking up. The current state of the project is reflected by the position of the dot in the 'Now' column, and you can undo to any previous point by double-clicking in this column next to any action you choose. For clarity, any undone actions are highlighted in the list.

If you choose to jump back, say, 100 steps, you're basically turning back time and restoring the project to an earlier state. You can then develop it in an alternative way, effectively creating a brand-new history for the project. And this is the clever bit — *DP* supports 'branching', meaning that as well as writing a new Undo history for whatever you now do, the previous 'alternative' history is also remembered, on a separate branch. You can investigate and manage multiple branches at will, and we'll look at this in a moment. Before we go any further, though, there's one important thing to be taken into consideration. In the words of Scotty, 'ya cannae change the laws of physics...'

Here's what I mean: imagine you record a few vocal takes and delete all but one that you ▶

More Enhancements In v3.1

• Tap Pad

The Tempo Control pane in *DP*'s Control Panel has a new mode, selectable from its pop-up menu. 'Tap Pad' puts a button in place of the Tempo Slider, which can then be clicked repeatedly (preferably when the sequence is stopped) to establish the tempo of the sequence. All good stuff, but you'd do even better to remember a similar keyboard shortcut, 'Tap to Enter Tempo', which by default is the forward-slash key. The great thing about this is that you can tap it to establish a tempo even when the Tempo Control pane isn't set to Tap Pad. It works just as well in Tempo Slider mode, and once you've tapped in a tempo you need only hit Return to enter it or Escape to cancel it. Even better, the same technique works for entering a tempo in any appropriate dialogue box or window. For example, in Change Tempo (in the Change menu) you need only click once in a tempo field (to select it) and then start tapping the forward-slash key to enter the resulting tempo.

• Edit Resolution

***DP*'s Edit Resolution functions have improved. With the overall Time Format set to Measures, Edit Resolution pop-ups (in windows such as the Graphic Editor and Sequence Editor) now have dotted, double-dotted and triplet versions of all the main 'mensural' time units. This, allied with the ability to display the edit grid ('Show Edit Grid Lines' in Editing windows' mini-menus), makes for a much more powerful visual editing environment than ever before.**

When the Time Format is set to something other than Measures, editing windows get a new Edit Resolution pop-up with some pre-defined choices ranging from 0.01 seconds to one hour. There's also a new text field alongside, showing the exact Edit Resolution in the prevailing time units, allowing you to define exact edit resolutions in Real Time, Samples, or Frames (timecode) format.

USE YOUR MACHINEDRUM AS A SOUND PROCESSOR

pro tips

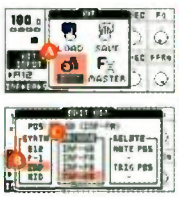
TIPS TO ADVANCED MACHINEDRUM USAGE

THE SPS-1 has a pair of inputs for sending external sound sources through the unit. This tutorial will teach you how to use your SPS-1 as a fully qualified sound processor.

Connect a sound device to the standard 1/4" audio jack named **Input A** which you find on the back of the unit.

When your SPS-1 is connected it is ready for the next step. Now press the kit button. This takes you to the **kit menu**.

3 In the kit menu, choose edit (**a**) and press enter. In the edit kit menu you simply change synth type to **INP** (**b**) which stands for input, with the cursor keys. Then choose which type of processing you'd like and which input jack used **Input A** (**c**). Your set-up is now ready.



Step thru the three parameter screens and use the encoders. Trig the key corresponding to the current sound selection.

5 Repeat step 3 & 4 to create a palette of effects with colorful variations. Tip! Save some time using the copy machine function. This makes it easy to duplicate the same settings and later add variations to a set of keys.

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choose as the best. You then do another month's work on the project, taking it to a state of near-completion, before wondering if that first vocal take wasn't the best after all. It would be nice to think you could jump back, select one of the alternative takes, and restore everything that you did afterwards. But that's not possible, and never will be, because it assumes that *DP* could intelligently adapt later actions to suit the change you made. There'd be naming, location and timing disparities amongst other things, and *DP* would somehow have to guess that any edits made to your original soundbite now apply to the new one. It couldn't happen, because you've changed something to which later entries in the history refer — and this is just a simple scenario! But before you lose faith in the power of unlimited Undo let me just say that there are ways around this issue, which I'll be looking at next month.

Branching Out

OK, now to put some of this into practice. Create a new project, record a few MIDI or audio tracks, and make one or two edits. Open up the Undo History window and you'll see a list of your actions. Double-click in the Now column, next to the last recording, before you did the edits. If you've got any editing windows open, you should see the edits you made disappear. Now change the sequence tempo (with the Tempo Slider) before making some alternative edits. View the Undo History once more and make sure the View pop-up is set to 'One Branch at a Time'. You'll notice that there's now a bold horizontal line after the last 'Record on' action. This indicates that more than one branch of history stems from this point. You'll also see a pop-up menu in the branch column, and clicking on it shows you the action that took place at that point in the 'old' history, along with the current action. If you select the 'old' action, you'll find the first of your original edits re-done and entries for all of them restored in the Undo History window. You can now redo those actions one at a time (by hitting Shift-Command-Z), or all at once (by double-clicking in the Now column next to the last entry in the list).

DP, left to its own devices, will maintain an unlimited number of branches, including branches off branches, and branches off branches off... you get the picture. It can all be a bit overwhelming, especially if you choose the 'All Branches at Once' View option, which discards the branch pop-ups and literally shows every single action in all branches in the same window. Here, single branches are shown bounded by bold horizontal lines, and any branch which is not involved in getting to the current state of the project (the action with the 'Now' dot next to it) appears highlighted.

Time Travelling

There's one thing that can really help to maintain your sanity — the Undo History time-line. This appears at the top of the Undo History window and gives a clear indication of when single actions took place, by displaying them as black vertical lines underneath a time-line helpfully referenced to 'real' time (ie. the 24-hour clock) and, when necessary, calendar date as well. The current state of the project appears as a green line within the time-line itself.

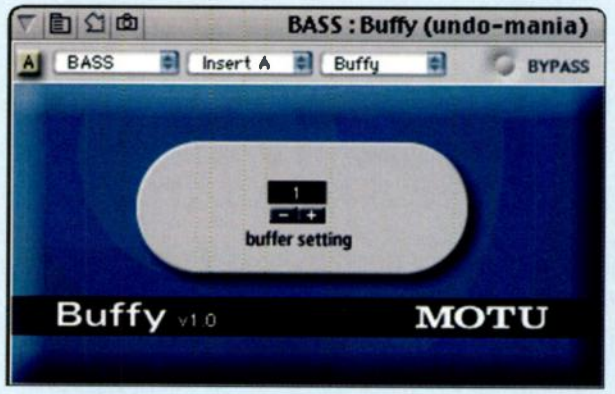
The time-line really helps on several fronts. First, if you start ploughing through multiple branches of history in search of something particular it's all too easy to actually get lost and forget how to return to the most recent state of the project. With the time-line it's easy — roughly decide what time it was when you started searching and find a vertical black line near that time. Then click on the line. It becomes highlighted, as does the action it represents in the Undo history. What's more, all the necessary branches and sub-branches that lead to that action are selected. The time-line also comes into its own if you want to undo a relatively large number of actions, and means you need only think about what time (on what day) you want to return to, saving you having to wade through hundreds of actions possibly buried in separate branches.

The time-line has a couple of little zoom buttons to the right of it, though an easier way to zoom is to click in the lower bar (with the black vertical lines) and drag vertically. The zoom range stretches from individual seconds, through a few minutes, all the way to months and years, and the action lines scale accordingly. You can also drag the time line's upper bar to graphically view different parts of the Undo history.

The ability to undo a year's worth of work comes with a trade-off: storage space. A single Undo history can use up monstrous amounts of RAM and hard disk space, and for large audio editing jobs, in particular, things get impractical very quickly. Projects become impossible to backup or archive, except onto dedicated hard drives! Managing an undo history is what the 'Pruning Preferences' are all about, as well as the 'Flush' commands in the Undo History window's mini-menu. More on this in next month's 'Project Management Special Edition' of Performer Notes! SOS

Buffy The Latency Slayer

Not part of a normal *DP* 3.11 installation, but available for it from www.motu.com, the *Buffy* plug-in is designed to provide processing-delay compensation for users of TC Works' PowerCore card, by delaying audio passing through it by one (or more) buffer's worth of time. This means you can change the Samples per Buffer setting in DP's Configure Hardware Driver dialogue without having to manually realign all your tracks that are not passing through a PowerCore plug-in, providing they have a *Buffy* on them. For users of the PowerCore this is as good as it gets until *DP* has proper plug-in delay compensation.



Quick Tips

The new 'Split at Counter' Edit menu command comes into its own during editing of audio. Its keyboard shortcut, option-Y, is similar to the standard Split command. Now a good deal of soundbite chopping-up can be done on the fly, during playback, and at other times, without the need to touch the mouse to make selections, or place the Scissors or I-Beam tool.

DP's Quantize function now works on many more kinds of sequence events, amongst them soundbites, controllers, markers, tempo changes and automation data. A whole swathe of different event types can be quantized at once, courtesy of the Custom option in Quantize's 'What to quantize' pop-up menu. Also, time units other than mensural (notes) can now be selected by clicking the Time Format button in the Grid section of the window.

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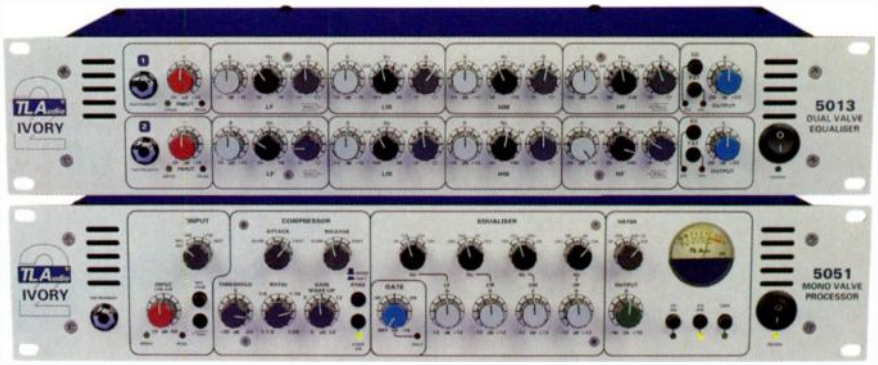

The industry's trend towards computer-based music systems may be making life difficult for some hardware manufacturers, but TL Audio — famed for their range of valve-based studio processors — are going from strength to strength. Ironically, their success is at least partly due to the clinically accurate qualities of digital audio which has increased the demand for high-quality analogue processors that are able to 'warm-up' the audio signal before it is converted into the digital domain.

TL Audio's extremely popular Ivory series of valve processors (including a quad preamp, EQ, compressor and preamp/compressor) first went on sale back in 1998, but this year the whole range has been re-released having undergone some significant design improvements. Most interestingly, an optional digital board has been designed for the Ivory range so that those people who are using digital systems don't have to rely on the converters in their soundcards or hard disk recorders. Common to all the range is a new and improved line level circuit which offers a lower noise floor.

This month, TL Audio have been kind enough to offer us a VP5051 voice channel and 5013 equaliser, each fitted with the specially designed D02 digital board. The 5051 and 5013 were reviewed in last month's issue of *SOS*, but for now, here's a reminder of some of the main features and updates.

The 5051 is a voice channel which uses three ECC83 dual-triode valves to drive its input, compressor and equaliser. The 5051 also has a gate which uses an optical circuit design. All of these sections keep the same controls as the original, but there have been many additions to the overall feature set. A new mic circuit stage incorporating a 30dB pad so that adjustment can be made for extremely loud sound sources. The compressor now has a hard-knee setting giving the 5051 the option of adding more aggressive compression to the signal. There is also a new optical gate circuit that improves on the performance of the original gate/expander. The I/O remains the same, but the optional DO2 board provides an S/PDIF output and Word Clock on a BNC connector so that the unit can be sync'ed to a master clock source. The board's output bit-depth is fixed at 24-bit but its sample rate can be switched to either 44.1 or 48KHz.

The 5013 is a two-channel valve EQ designed to offer the sort of control traditionally found on professional mixing consoles. At either end of the EQ are continuously variable input and output gain controls providing -20dB to +20dB cut and boost for each of the two channels. Both channels have four bands of fully parametric equalisation ranging from 30Hz to 1kHz, 100Hz to 3kHz, 1kHz to 12kHz and 3kHz to 20kHz. 15dB of cut or boost is on offer for each band, and Q (bandwidth) can be adjusted between 0.5 and 5. The Inputs and outputs are on a choice of either balanced XLRs or line level jack connectors and there is a high-impedance instrument jack on the front panel. A switch bypasses the EQ stage on both channels.

The new 5013's features include a shelving mode present on both LF and HF bands which can be activated by pulling the 'Q' control. There is also a new 'Fat' contour switch that introduces a gentle LF/HF lift and mid cut for added warmth. The 5013 uses the same optional D02 digital output board as the 5051.

Each processor has a VAT-inclusive retail price of £528, and the digital boards are a further £149 each, all adding up to a grand total of £1354. Of course, one lucky winner will take the whole lot for nothing.

To enter this competition, you just need to fill in the entry form on this page and post it to the address on the coupon. (Alternatively, you may enter via the electronic form on the *SOS* web site.) Please make sure you answer all the questions and complete the tie-breaker. We also require your full address and **daytime** telephone number. Your entry must arrive with us by the closing date of **21st February 2003.** SOS

the small print

1. Only one entry per person is permitted. 2. Employees of SOS Publications Ltd, TL Audio and their immediate families are ineligible for entry. 3. No cash alternative is available in lieu of the stated prize. 4. The competition organisers reserve the right to change the specification of the prize offered. 5. The judges' decision is final and legally binding, and no correspondence will be entered into. 6. No other correspondence is to be included with competition entries. 7. Please ensure that you give your DAYTIME telephone number on your entry form. 8. Prize winners must be prepared to make themselves available in the event that the competition organisers wish to make a personal presentation.

questions

Which one of the following is a connector included on the Do2 digital board?
a. ANC ☐
b. YMCA ☐
c. BNC ☐
d. MMC ☐

Which one of these features is *not* new to the 5051?
a. 30dB pad ☐
b. EQ pre/post selector ☐
c. Hard-knee compression ☐
d. D02 board ☐

Which one of the following is the total adjustable EQ range of the 5013?
a. 30Hz to 20KHz ☐
b. 20Hz to 22KHz ☐
c. 10Hz to 100KHz ☐
d. 0Hz to 44.1KHz ☐

TL Audio Ivory 2 tie-breaker

The Ivory 2 range make particularly good front-end processors for digital systems. What or who do you think would be most improved with a new 'front end' and why? Answers in 30 words or less please.

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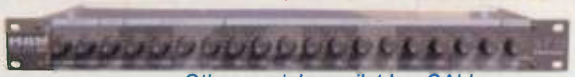

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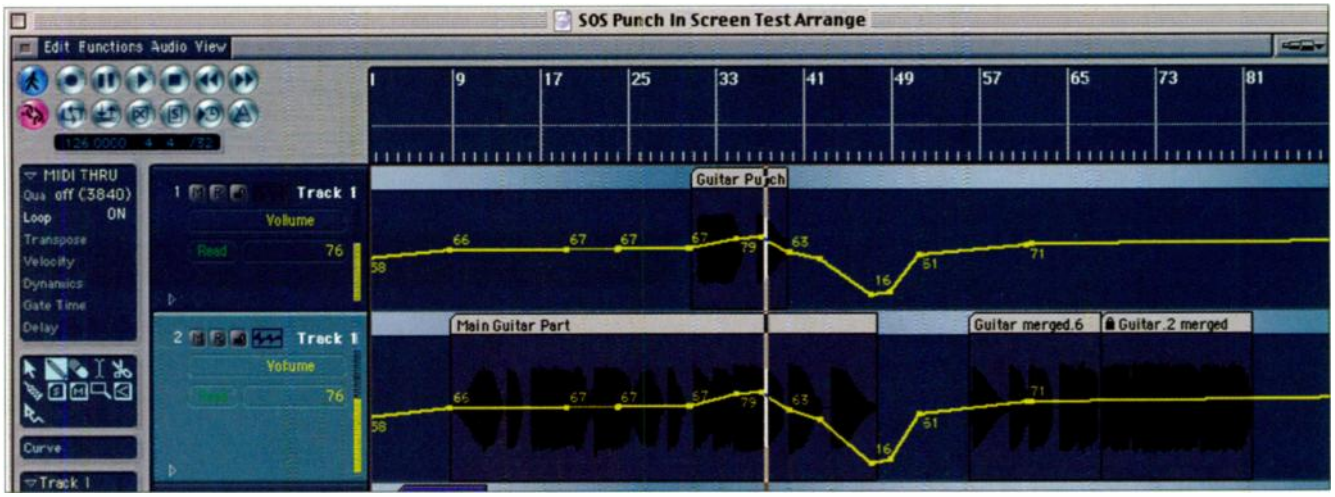
logic notes

This month's workshop shows you how to get *Logic* to fill the shoes of a multitrack tape machine. Plus a handy way to display multiple automation passes side by side, and the usual bucketload of tricks, tips and workarounds.



You can make punching in with *Logic* much simpler if you do the drop-ins on a separate track, leaving the original track untouched.

Paul White

For many years I have worked using ADATs for conventional recording and *Logic Audio Platinum* running on a Mac for my own projects. However, I'm now using *Logic* for all my regular multitrack recording as well as for my own work. Here's how I set up *Logic* to replace the old system.

Multitrack *Logic*

The first thing needed for multitrack recording is an audio interface with multiple inputs and low latency, and I opted for the MOTU 828. This has eight analogue inputs and outputs, as well as ADAT and S/PDIF I/O. The ADAT I/O means I can transfer work to and from my existing ADATs, and I can also feed the output from *Logic* to my Yamaha 03D digital mixer — I use this to add hardware effects when mixing or to add reverb to the monitor signal when doing overdubs.

The 828 has zero-latency monitoring, because I've found that some musicians are put off by the slightest hint of latency — even in systems where the latency is too low to notice over loudspeakers, it may still be audible to the performer over headphones.

Any low-latency interface with enough analogue I/O should serve perfectly well in most situations, and input monitoring can be arranged by using a small mixer, or by doing your overdubs using a mic preamp with built-in monitoring facilities. You just need to remember that you need to switch off software monitoring in *Logic* in this case, otherwise you'll hear both the zero-latency sound and the slightly delayed software monitoring.

Logic still lacks proper audio file organisation, and I've found the best method is to create empty folders on my audio drive before the session starts, each named after the song title. That way, I can choose the appropriate folder as my audio path when starting a new song.

Recording Modes

An ADAT only has one way of working. The first recording pass creates a continuous recording that is fixed in time relative to the other tracks. When you come to punch in sections to correct mistakes, the original material is overwritten, and a short crossfade is created at the edit point to prevent any clicks from occurring. There are no timing discrepancies during the punch-in, the monitoring automatically switches from track to source and back again, and the punch-in points happen exactly where and when you press the record button. Apart from the lack of Undo, it's hard to fault the way ADATs handle punch-ins. Analogue tape machines are slightly less obliging, as most produce an overlap corresponding to the distance between the erase head and record head when punching in, and leave a corresponding gap in the audio when punching out.

Recording the original tracks into a sequencer is usually no problem — you just set up the different tracks you want to record, adjust the levels and start work. Setting an automatic drop-in is also easy and, because the computer knows in advance when the recording will start, the process works quite seamlessly. But for true tape-like operation, you need to be able to punch-in manually, and this isn't quite so straightforward. You might think that all you need do to punch in is to select Replace mode using the 'X' ▶

Logic Tips

What if you want to use the Pickup Clock Key Command to sync a sound effect file to a specific SMPTE time, but it's some mid-point of the file you want to sync to, not its start? All you have to do is double-click on the audio file to get to the Sample Editor, and then drag the Anchor point (the solid black triangle which resides above the Start point by default) to the relevant point in the file. If you now close the Sample Editor and return to the Arrange window, the Pickup Clock Key Command will work exactly as you want. *Mike Senior*

I have a Celeron 667MHz PC running Windows ME, and I use *Logic Audio Silver* v4.8 and Native Instruments *Dynamo* with a Terratec EWS88MT soundcard. I used to get digital noises and crackles over most of my *Logic* recordings, but after some time spent troubleshooting I found that this was because *Dynamo* retained output settings from its stand-alone mode even when used as a VST instrument. Setting *Dynamo*'s stand-alone output to an unused ASIO channel (or to no channel) solved the problem. *Andy Gooding*

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button in the Transport window, and then hit the Record button at the punch-in point, followed by Play or Stop at the punch-out point. In practice, however, it's not the best way to work.

The problem is that *Logic* doesn't know when you're going to hit the Record key and, like any sequencer, it has a little background work to do before it can start recording. On my system, this results in a delay of about one eighth of a bar (at 120bpm) between me hitting Record and recording actually starting. The punch-out time is dead accurate, though. Clearly this makes tight drop-ins very tricky indeed, even though you can undo the recording and try again. Furthermore, the newly recorded section of audio has a fixed start time, so you can't stretch the region start point back to the intended punch-in point, because there's no audio to 'uncover' before recording started. Where there are large gaps between phrases, this may be an acceptable way of working, but for punching in individual words or notes, it's simply not accurate enough. Fortunately, *Logic* has a better way.

Punch On The Fly

The secret is to tick the Punch On The Fly option, visible if you click and hold the Record button in the Transport window. This in effect records audio in the background, even when you're not recording, so that when you do hit Record, audio that occurred even before you hit the Record button can be captured retrospectively. Not only does this allow *Logic* to do the punch-in at exactly the time you hit Record, it also stores a short section of audio before that point, enabling you to adjust the punch-in region start time after recording, if you need to. On my system, the monitoring switches seamlessly between track and input at the punch-in point, but when I hit Play to punch out again, the timing of the playback seems to stumble very slightly. This doesn't present any problem in practice, because, by the time you hear it, you've already punched out, so your recording can't be affected. When you come to replay the section, the timing is fine. Note that using Punch On The Fly does tax your system a little more than regular recording, so if you run into problems, simply mute any non-critical tracks while you do your punch-ins or bounce down the existing backing tracks to a temporary mixed file and use this as your guide when punching in, keeping the original tracks muted.

You can use Punch On The Fly in Replace mode, but I've discovered that a much more flexible way to work is to create an empty duplicate of the track where the original audio is stored, recording your punch-in parts alongside the original part. This doesn't require Replace mode to be switched on and, because you're not now chopping your original track into sections by breaking into it at each punch-in point, there's no chance of the original audio parts being accidentally moved within a track. In fact, once you've made the original recording, locking the tracks in place by selecting Lock SMPTE Position (from the Object submenu of the Arrange window's Functions menu) is a good safety precaution. This is different to using the Track Protect Switch, as that prevents any edits or changes of any kind being made to that track.

Once you've been through a track and done any necessary punch-ins, you'll be left with a continuous audio track, plus a second version of that track containing just the punch-in segments. What's more, because both the original recording and the punch-ins are assigned to the same Audio object, only one part can play back at a time, so whenever the track reaches an overdub section, playback switches from the original audio to the punch-in, and then back again at the end of the new section. (Note that this relies on the punch-in track being above the main track in the Arrange window.) You *could* do all these operations on one audio track, but it's very easy to get into a mess, as selecting the original audio part will bring it to the top, hiding the punch-in sections.

Crossfading & Gluing

At this point, you have all the benefits of working with tape, except the necessary crossfade to produce a smooth transition between edits, so if you have edited during audio rather than during pauses, you may hear a slight click. Fortunately, even this is fixable in a very simple way. First of all, set the default crossfade time to around 20ms (Arrange Page > Audio > Default Crossfade Options), which is short enough to be inaudible but long enough to prevent clicks. This is the crossfade time that will be applied to any edits when tracks are mixed, so when you're happy all your punch-ins are in the right place, simply select all the audio in the original and punch-in version of the track using the glue tool and a new file will be created with your punch-ins smoothly integrated into the original (with the punched-in parts replacing the corresponding sections of the original recording). This technique is applicable to both mono and stereo tracks.

Once all the overdubs and punch-ins are complete, you can tidy up your audio files by getting rid of everything except the final, edited tracks, and then all you have to think about is mixing. SOS

Set Up Multiple Automation Displays

This *Logic* v5 tip comes courtesy of *SOS* reader Tom Dolbear: "Let's say you're automating a vocal track in the Arrange window, and you need to draw in automation for both volume and an aux send. If you don't want to be switching back and forth between the volume and send displays, simply create a track under the one you're working on, giving it the same Track Instrument — in other words, whichever Audio object is assigned to the vocal track, assign the same one to the new track. Clicking on the little triangle at the bottom left of the track name panel will do this automatically. You can now display the volume automation on one track and aux send automation on the other. In *Logic* you can have as many tracks with the same Track Instrument as you like, so you can have automation displays for lots of different parameters simultaneously."

Current Versions

- Mac OS X: *Logic Audio Platinum* v5.4
- Mac OS 9: *Logic Audio Platinum* v5.3
- PC: *Logic Audio Platinum* v5.3

Logic v5.4 Update For Mac OS X

This is an incremental update for Mac users with OS X 10.2 or higher. Audio Units are now accessible from the individual objects' drop-down plug-in menus, and can be used both for effects and virtual instruments. In addition to this, some functionality has been reinstated from previous versions: *Recycle* files can once again be imported into *Logic Platinum* and converted by *EXS24*. *Mike Senior*

Think USB

M-Audio USB solutions are the shortest path between inspiration and final tracks. Once you experience a laptop-based virtual studio running with an M-Audio USB interface, you'll wonder how you ever made music any other way. The killer rig now even fits in a backpack so you can make music on your own terms—anywhere, anytime.

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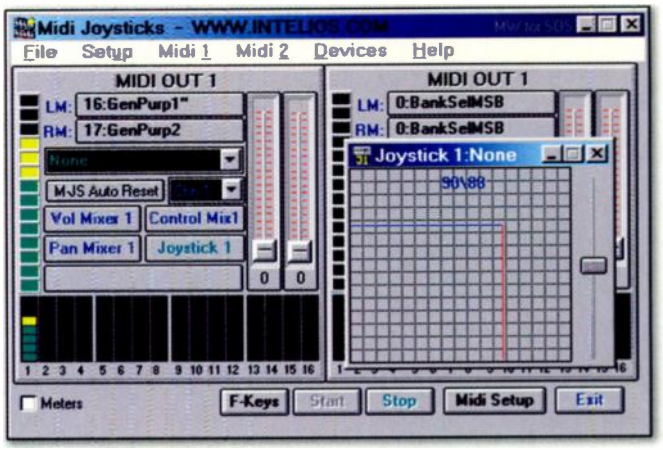
PC notes

This month, we transform the humble and inexpensive games joystick into a simple but effective MIDI controller, and find a word processor that will have minimum impact on the clean music partition of your PC.

Martin Walker



MIDIjoys can convert a game joystick, mouse, trackball or trackpad into a dual-axis MIDI controller.

Given that so many musicians these days are using hardware MIDI controllers to provide them a real-time, hands-on softsynth experience, I'm surprised that so few seem to be pressing other controllers — such as those used with games — into service. Many PC musicians already have a suitable interface for such controllers, in the form of the 15-way game-port connector found on many motherboards, and also on many consumer soundcards, such as the SoundBlaster range. Games controllers also tend to be very inexpensive.

Stick With It

Granted, many games machines employ digital joysticks that simply send left/right/up/down messages (plus the essential 'fire' message, of course!), and these are not as useful to musicians as fully variable controls, but game-pads that employ a group of discrete switches could still be utilised as a remote transport bar with controls such as Play, Stop, Record, Fast Forward, and Rewind. All you need is a software utility to convert their data into a suitable format.

Even easier to use for the same purpose is a dedicated PC keypad (these are often available as extras for laptops), since many modern MIDI + Audio sequencers already use the appropriate keypresses for their default transport control functions. Others can have their functions re-allocated to different keys if required. This means that no conversion software is required.

There are also plenty of analogue joysticks available. These are popularly used for flight simulator-style games, and many have a rather more 'precision' feel to them than the digital variety, as well as being far less flimsy. I've found analogue joysticks really useful for music purposes, since you can modify two parameters simultaneously, for wonderfully expressive possibilities. Part of my interest in doing this is due to my Korg Wavestation SR. Many of its sounds respond to MIDI controllers 16 and 17 but, unlike the other Wavestation models, it doesn't have a built-in joystick to generate the controller data. You may not have a Wavstation SR, of course, but you should be able to assign the X and Y joystick axes to two suitable parameters on nearly all software or hardware synths.

Games-to-MIDI Conversion

Windows has directly supported both analogue and digital game controllers for many years. All you need, as mentioned earlier, is a small PC software utility to convert the incoming game-port information into MIDI continuous ▶

PC Snippets

After officially abandoning it for several years, Sonic Foundry have surprised us all by relaunching the wonderful *CD Architect* Red Book pre-mastering and CD-burning application. Version 5.0 includes the same comprehensive PQ and Playlist editing as ever, but now also offers support for up to 32-bit, 192kHz source material, high-quality on-the-fly resampling for non-16-bit/44.1kHz files, dual monitor support, real-time DirectX effects for individual regions and the master bus (20 DirectX effects are bundled with the package), event normalisation, and audio scrubbing. By the time you read this, it should be available as a download purchase only, at a price of $299.
W www.sonicfoundry.com

September saw the release of a 2.8GHz Pentium 4 processor, but Intel are also apparently working on a new version of their Pentium 4 chip, codenamed Nehalem (no, I don't know what it means either), which will be released in 2005. As you might expect, it will include a new architecture and features that will make it as different from the current P4 as that was from the P3 — so it doesn't sound like a P4 at all. However, an updated P4, codenamed Prescott, should be released sometime next year, and this will be closer in concept to the existing P4, apart from a new security system and the use of 'strained silicon' to speed up operation.
W www.intel.com

Meanwhile, AMD have announced the Athlon XP 2700+ and 2800+, featuring an advanced 333MHz front side bus that runs synchronously with the memory clock, resulting in significantly faster performance. Although it's technically a 'paper' launch, since you can't buy the products yet, both should be available by the time you read this. Most of the publicity material I've seen refers to the impressive performance of the new processors with games. Perhaps people have finally realised that office applications will still run fine on last year's PCs? However, musicians never seem to have enough CPU power, so I'm sure these new models will sell well in this field once their 'cutting edge' price drops a little, especially since from the lower-level 2200+ model onwards they use AMD's new 0.13 micron core for cooler operation (and can therefore use quieter fans).
W www.amd.com

Tascam have announced the release of a four CD-ROM tutorial guide entitled *Gigastudio Mastery*, written by Dave Govett, whose name will already be very familiar to most *GS* users. Originally part of the Nemesys team before they were acquired by Tascam, Dave has extensive knowledge and reveals it in multimedia tutorials featuring audio narration, active screenshots, and streaming video. All aspects of installing, using, and getting the most from the *GigaStudio* player and Instrument Editor are covered in the guide, which I hope to be reviewing shortly. The official place to find more information is Tascam's web site, but you can download a small demo from Dave's own web pages, at www.davidgovett.com.
W www.tascam.co.uk

Software Technology have released a free upgrade for existing users of the *VAZ Modular* softsynth. Still resolutely PC-only, version 2.5 can, like its predecessor, be run as a stand-alone softsynth, but you can now also launch it as a VST or DX Instrument inside a suitable host application, to bring it in line with new product *VAZ 2010*.
W www.software-technology.com

Not content with giving us his *Impulse Modeler* software (PC Notes October 2002), Alexsey Vaneev has now released a "high-quality freeware sample-rate converter tool". It can process both mono and stereo WAV files of any bit depth and convert between different bit depths using noise-shaped dithering. Batch processing is also supported.
W www.yohng.com/r8brain

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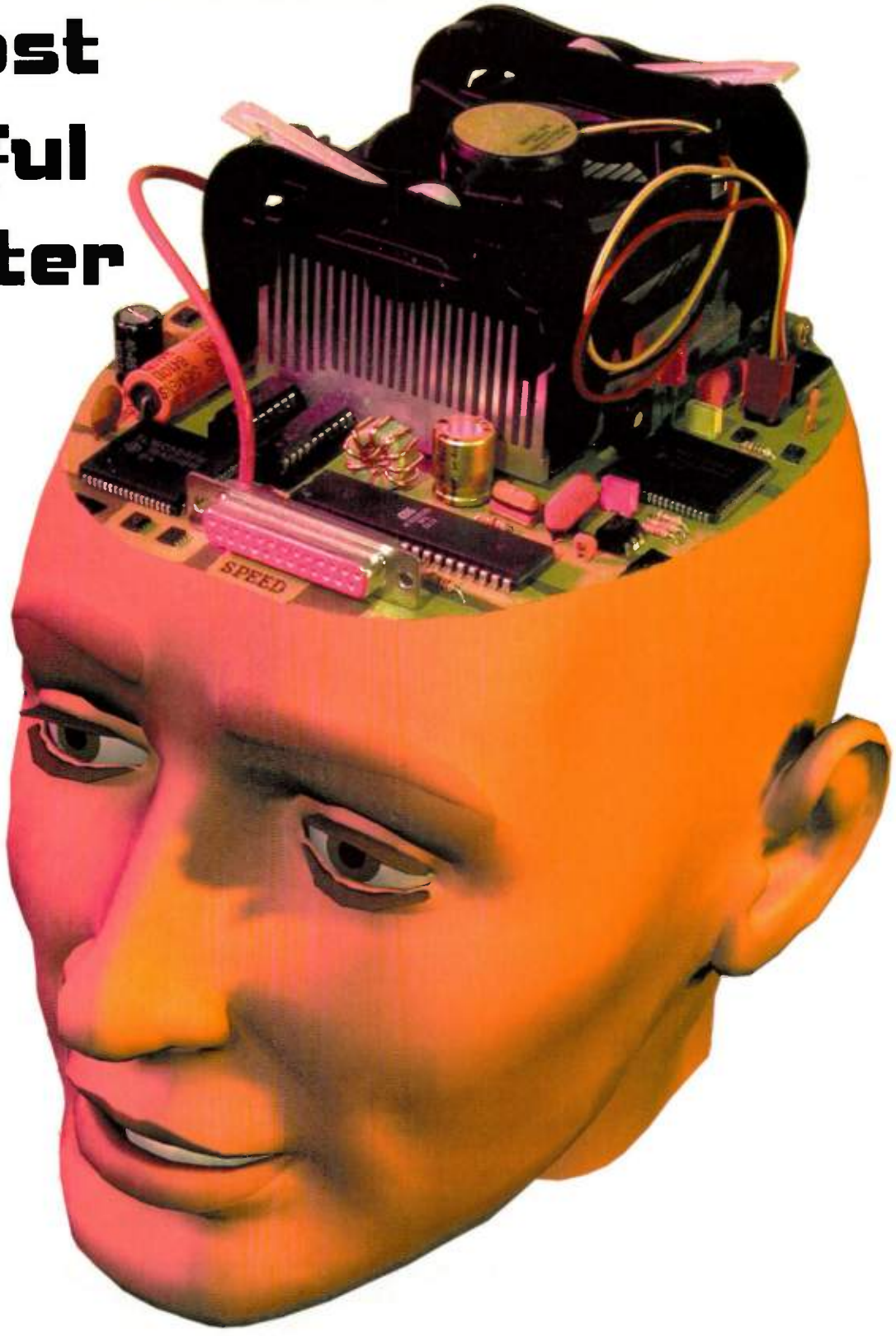

Nowadays, the human brain is often compared to an electronic computer. The mind is then compared to the software running on that computer.

Some observers conclude that the computer is superior to the brain. Others reach the opposite conclusion.

Perhaps, we should say that the brain is better at some jobs, while the computer is better at others.

The brain can't run *Cubase*, so that's clearly a job for the computer. However, inspiration and feeling need to emerge from the mind.

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controller data, to pass on to your softsynth or sequencer application. One example is Vellocet's *VMIDIJoY* (http://vellocet.com). This was originally written in 1998, but was most recently updated in 2000 — although it seemed to work in the more recent Windows XP when I tried it. It converts joystick X, Y, and even Z axis movements into your choice of MIDI controller data, and also supports up to four buttons, which can be defined as MIDI pedals or notes. It even has some rudimentary arpeggiation features.

MidiJoys, from SoundTower (www.soundtower.com), is rather more ambitious but even older, being originally written in 1997. Again, though, it seems to work inside Windows XP. *MidiJoys* not only supports one or two game joysticks, but also standard mice, trackpads and trackballs. Amongst other facilities, it provides three extra windows with software sliders dedicated to volume, pan, and your choice of additional controllers.

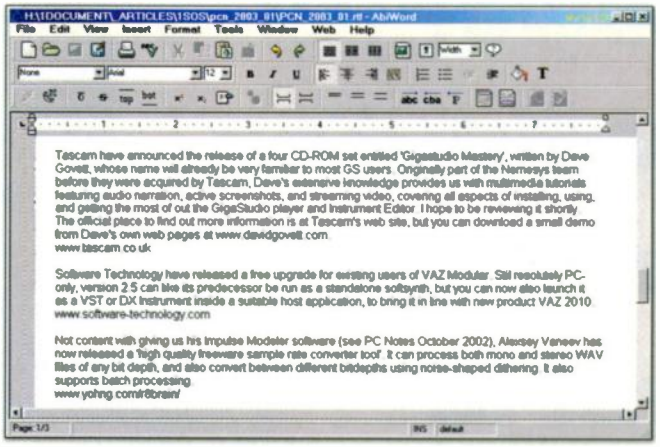
Both utilities can output data directly to any of your existing MIDI ports, and you can use *Hubi's Loopback* or a similar routing utility to send this data directly to your sequencer for recording purposes. Although I've heard some grumbles that the joysticks aren't scanned fast enough to cope with fast sweeps without jumping, I haven't found this to be the case.

If you don't have a suitable joystick but you're into a bit of soldering, you can create your own hardware controller. Each game-port supports up to four rotary or slider controls and four buttons, giving plenty of scope. Tomi Engdahl has an excellent web page detailing all the ins and outs of the PC analogue joystick interface, both from the hardware and software points of view. Go to www.epanorama.net/documents/joystick/pc_joystick.html.

Other pages at this site detail the wiring of a huge variety of analogue and digital game controllers, but if you want to build your own, essentially all you need are some switches and 100K potentiometers. Skot McDonald of Vellocet shows one user's rackmounted creation on his *VMIDIJoy* page (address given earlier). Such devices may not provide as many controls as a dedicated hardware unit, or the ability to send SysEx and NRPN data, but they offer a cheap way to start twiddling!

Abiword: The Write Stuff For Musicians

It may seem to strange to be introducing a word-processing application — which *Abiword* is — here, but I make no apologies, since what I'm about to discuss is actually more relevant to music making than you might think. Most musicians now accept that it's best to keep their music partitions as streamlined as possible, installing only those applications they need for their music making. Taking this approach means that there are fewer opportunities for conflicts, no unwanted background tasks, and a significantly greater likelihood of audio recording and playback running as smoothly as possible. However, while working in my music partition I've often found it useful to be able to create documents with an application somewhat more capable than Microsoft's *Notepad*, or even *WordPad*, despite the many enhancements in its XP incarnation.



Want a reasonably powerful word processor for your music partition that doesn't bloat your Registry or install unwanted background routines? Take a look at *Abiword*.

Some of you may remember my run-in with Microsoft's *Word* (reported in PC Notes June 2001), when it suddenly began posting error messages instead of booting up, even after a total uninstall and clean reinstall. *Word* has also caused its fair share of problems for musicians by adding default background tasks such as FastFind, and since the *Cleansweep* application also reported that it made over 2000 additions to the Registry, I decided to cut my losses and move over to Corel's *Word Perfect*, a much leaner and cleaner installation. I've been much happier with *Word Perfect*, but its huge number of features still seemed overkill for the majority of my word-processing needs.

Enter *AbiWord* (www.abisource.com), an 'Open Source' application that is not only distributable as freeware, but is developed in a public fashion by people all over the world, to run on Windows 95, 98, NT 4.0, XP, Linux, and other operating systems. I discovered it after an extensive search for freeware word processing applications, and it's proved ideal for me — it loads many more file formats than *WordPad*, and also provides an invaluable word count function. However, for me one of its best features is the lack of 'bloat': the latest preview version 1.0.3 is a tiny 3.86Mb download, and, apart from half a dozen new file associations, it seems to place next to nothing in the Registry either.

I've been using *AbiWord* almost exclusively for over a month now, and apart from a couple of rough edges, and very limited table functions, it suits me down to the ground. Best of all, I've even been able to install it safely on my music partition, safe in the knowledge that it won't interfere with my audio performance or bloat my Registry. Highly recommended! SOS

Tiny Tip: BIOS Beep Codes

In *SOS* June 2002, as part of my PC Musician article on Fault Finding, I covered BIOS Beep Codes and stated that you should refer to your motherboard manual for the particular sequence of beeps relevant to your PC. However, I thought it would be useful to provide a short list of the most common ones for IBM/Award PCs, neatly gathered together.

- No beeps: no power, faulty motherboard or CPU, or badly seated peripherals.
- One short beep: Everything is normal (you should hear this every time you boot up, after the POST routines).
- Two beeps: POST or CMOS error (perhaps your battery has failed).
- One long beep, then one short beep: Motherboard problem.
- One long beep, then two short beeps: graphics card not properly seated or faulty.
- One long beep, then three short beeps: similar to above, but may indicate faulty video RAM.
- Three long beeps: faulty keyboard.
- Continuous long beeps: badly seated or faulty RAM.
- Continuous high/low beeps: overheated CPU.

These codes should account for most PCs, except for those with AMI BIOS chips (seemingly far less common than those fitted with Award chips), and those with older Phoenix BIOS chips, which featured a complex system of four sets of short beeps interspersed with pauses. However, how that Award Software and Phoenix Technologies have merged, we can perhaps expect to see the simpler Award scheme take over.

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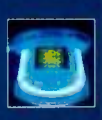

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apple notes

More OS X news from the AES convention, plus what you can *really* do with a fast Apple portable — now even faster — if you put your mind to it.

Paul Wiffen

I included two major AES OS X stories in this column last month — namely, Digidesign announcing *Pro Tools* 6 as an OS X-based product, and Spectrasonics shipping Audio Units versions of all three of their synth, bass and percussion plug-ins, before any of the other formats which will run under OS X. These were perhaps the two biggest OS X stories at AES, but they were by no means the only ones.

X Hits The Spot

For those who prefer to customise their own software, it was a relief to hear from Cycling 74 that the staple of this entire market, *Max/MSP*, will soon be moving to OS X. They also showed *Jitter*, a real-time video-processing effects program with 3D graphics, data visualization and analysis, under OS X. Meanwhile, BitHeadz showed their *Phrazer* and *Phrazer LE* loop sampling software running under OS X for the first time. The *Arkaos IV* VJ 'visual synthesis' software, now being distributed in the US by M-Audio, is also OS X compatible. It seems that any program that M-Audio decide to distribute automatically becomes OS X compatible overnight — just look at Ableton's *Live* and Propellerhead's *Reason* (which won a TEC award at the show).

EgoSys have really taken to OS X in a big way, with all their hardware now having fully-functioning OS X drivers. My favourite is their new MaXiO XD, a phantom-powered eight-in, eight-out interface supporting 24-bit/192kHz recording, with a dynamic range of 120dB and S/N ratio of 105dB. The Waveterminal 192 range gives numerous variations on the 192kHz theme. Other eight-channel analogue interfaces on show included GIGAPort AG, which manages eight channels via USB. The one I would have murdered for a few years back is the GIGAPort DG, which provides a full ADAT data stream. ADAT I/O was also on the menu from Universal Audio, who have an ADAT interface called the UAD-8 I/O for their UAD1 DSP card. The UAD1 itself is now dual-processor aware, which is just as well, as all Macs with PCI slots are now dual processor.

MOTU also moved into the 192kHz realm, with a sneak preview of a new high-definition 2U rack interface, offering 12 audio channels (in the basic unit, but expandable to 48) at up to 24/192. They also showed the 24 I/O, which squeezes two dozen 24/96 analogue inputs and outputs into a single rack space.

After a late start in the OSX stakes, Edirol are now running neck-and-neck with M-Audio in the competition to have the greatest number of OS X-ready keyboards, weighing in with the 23-key PCR30 and the 49-key PCR50 at the AES show. Both feature eight sliders, eight rotary knobs and nine buttons, with memory presets for *Cubase*, *Digital Performer* and *Pro Tools LE*.

Immediately after an evening discussion in a bar about the lack of entry-level software for cleaning up vinyl-sourced and other audio, Jason of BIAS showed me the perfect such application. It's called *Sound Soap*, and is so easy to use that my Gran could use it on all her old 78s. It is equally good for cleaning up the background noise on DV camcorder audio recordings. Of course, it's OS X compatible, just like the rest of the BIAS range (*Deck*, *Peak*, *Vbox* and *SuperFreq*) has been for ages.

The arrival of Digidesign on OS X sparked a host of announcements from their third-party developers. These included Waves, with their full *Platinum* bundle, and the whole range from GRM Tools. It will be interesting to see how many of these are ready to go when Digi ships Pro Tools 6.

Just one of the growing crop of programs that will run under OS X: Bitheadz' *Phrazer* sampled-loop tool.

Apple 'Books Now Faster

Once more Apple's super-secret launch policy caught me napping during the final hours before my column deadline (causing more than even the usual consternation in the *SOS* office over the lateness of Wiffen's submissions), as they surreptitiously slid new Powerbooks and iBooks onto their web site when no-one was looking. Of course, I had heard the rumours, but the exact hour of their release is comparable to that of the Second Coming of Jesus ("no man knoweth the hour nor the day"). People don't believe me when I say that 99 percent of Apple employees don't know when these things are going to happen, but it is true. Certainly, no-one tells a humble consultant like me when to point his browser afresh at the Apple web site.

The milestone that this new generation of Powerbooks represents would surely (you would think) merit at least a bottle of champagne cracked against their Titanium hulls, as the psychological barrier of the 1GHz clock is finally broken in a portable form, especially when you add in the extra speed of the ATI Mobility Radeon 9000 graphics processor with up to 64Mb of DDR SDRAM, for lightning-fast graphics. Of course, this is primarily to make it the ideal portable to run *Final Cut Pro*, and no serious individual would ever dream of abusing such a professional machine with mere gameplay... would they?

In Praise Of Portables

I am more excited about this machine than any other in Apple's history, because for the last year I have done virtually no music-making or film editing on anything other than my trusty 667MHz Powerbook, simply because of its portability and my nomadic lifestyle. I have a dual-processor 1GHz desktop made available to me by Apple, but most of the time I don't have the time or energy to drag it around and keep setting it up and tearing it down. I am doubly grateful now to my managers for refusing my requests to upgrade to the last-generation Titanium (maxing out at 800MHz), simply because it had an audio input. The prospect of this upgrade to the magic 1GHz clock speed (along with a 1Mb DDR SRAM level-three cache, a first for a portable computer, the 60Mb hard drive and up to 1Gb of RAM) and the built-in SuperDrive with its ability to burn DVDs and CDs, together with all ▶

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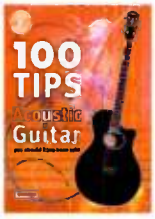

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▶ the extra plug-in effects and virtual instruments I will be able to run, has me feverish with anticipation.

In the spring of this year I foolishly agreed to co-write a musical for charity, to be performed in sunny Margate over the summer, despite the fact that I was half the time in Switzerland and the rest in Dunstable (except for a two-week spell in a mobile home near Cannes for the duration of the Film Festival). My co-writer, Sherin Sahagian, opted for the more sedate lifestyle of both living and working in Bromley, Kent. *A Day To Dance* only opened at all because I could pick up Sherin's emailed MP3s of his *a capella* melody lines and lyrics wherever I happened to be, via my Titanium, and arrange them in *Logic* with the EXS24 and other plug-ins. All this could not have happened without the 667MHz Powerbook. The follow up will now be done on a machine at least 33 percent faster.

Talking Pictures

Similarly, I only have a serious prospect of becoming a real film-maker (if my producer pulls in the threatened finance for the budget he is working on) because of being able to edit the footage I shot with my cast for Cannes on the same Powerbook in our mobile home each morning, before heading off to the Palais des Festivals to show it to the great and the good (and slimy and sleazy) on the wide-screen display of said Titanium. The one problem last year was that I had to get my editor back in the UK to burn new DVDs there and send them down with late-arriving cast members or via courier. With the new 1GHz machine, I will be able to burn demo DVDs in front of movie moguls at next year's Cannes film festival. The problem with devices like these is that they give people like me ideas above our station. If you are ever stuck in a movie theatre (or in front of your DVD at home) watching a dreadful horror film and Paul Wiffen comes up as the director's name, blame Steve Jobs for putting these ludicrous ideas into my head!

More than just a pretty picture: not only can the new 1GHz Titanium Powerbook run *DVD Studio Pro*, it can burn DVDs with it.

The final accolade for the Powerbook is the fact that it enabled me to easily produce demos for MacExpo and the subsequent UK tour (which will be all but over by the time you read this). Working with singer Simone Kaye, who is also the lead in my film, I was able to knock out demos in her living room with the 667MHz machine and a Swissonic USB Studio to send to producer Steve Levine to work his magic on. Of course, if I had had the audio inputs of the newer machines, I wouldn't have had to put my guitar through the Swissonic, but I would still have needed its mic preamps to record her vocals. At showtime, I'll be able to play back these demos on the new 1GHz Titanium.

Simone was so enamoured of the work process that she got an iBook and is now able to do similar things by herself, not to mention her *Photoshop* work, which she used to struggle with on a deskbound PC (she has also designed all the on-screen logos, artwork and backdrops for the DVD we are burning in presentations). However, I suspect she will be trying to persuade Apple UK to upgrade her to the new speed-bumped iBooks, as they too have been turbo-charged.

The new clock speeds for these machines are 700 and 800MHz (there is also an 867MHz Powerbook, but who would get that when you can go 1GHz?) and their graphics are now flying through the 7500 version of the Radeon graphics processor. The top model also features a 512K on-chip level-two cache running at full processor speed, and a 100MHz system bus. Even the entry-level portable is now a high-speed machine. In line with Apple policy, the pricing has not really changed, even though the power has. SOS

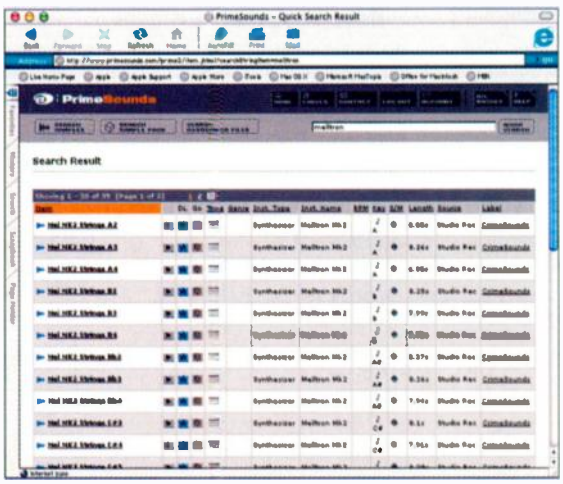
Site Of The Month: Primesounds

A colleague recently drew my attention to this sound-library site (www.primesounds.com) and asked for my opinion. You might think that any site that comes up with 70 eight-second Mellotron samples when you type in the word 'strings' was designed with me in mind, even if they spell it 'Melltron' and classify it as a synthesizer. I would have preferred not to have to wade through all the 'dance' strings (whatever that means!) first, but clearly the database offers dance sounds first, as it assumes that the average user is "doing dance" (the term used by some of my more artistically-challenged colleagues) instead of making music.

I was a little disappointed that searches for 'footsteps' and 'gunshot' gave no results and 'explosion' yielded only three, the best of which was truncated after only three seconds. I guess this makes the site of limited use for people doing sound effects for film, but then Primesound don't claim this as one of their target markets.

The browsing integrated nicely with *iTunes* — which, incidentally, I recently discovered being used to catalogue sample libraries at Hangman Studios, the AV facility operated by IE Music, Robbie Williams' management, so that their clients can browse unaccompanied for the samples they want to use. The 'Melltron MK2 A3' sample I chose (from a CrimeSounds collection) was eight seconds long, including some nice ambience, took three minutes to download over a 56K modem, and sounded great.

Looking around the rest of the site, it was good to see my old colleague from Sequential days, Chris Meyer, talking about his career through Digidesign, Marion Systems, Roland, and Music Maker Publications (where many of us *Sound On Sound* contributors first met *SOS* founder and Managing Director Ian Gilby). Chris apparently uses this site as a major resource for his AliasZone music project.



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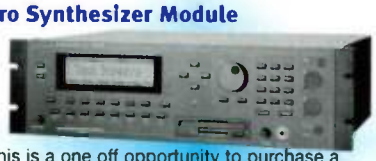

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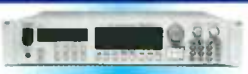

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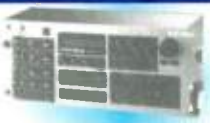

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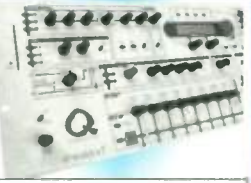

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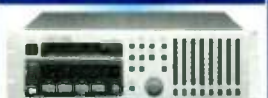

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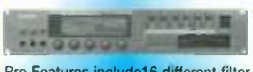

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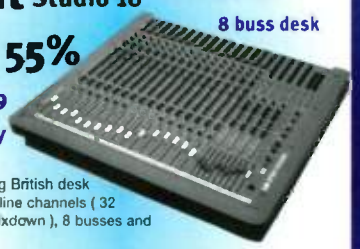

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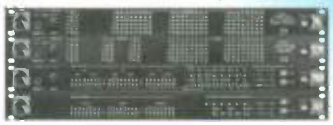

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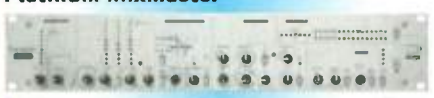

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- Hard Disk Recording/Editing: Digidesign Pro Tools HD3 system. 3 x 192 i/o analog/digital interfaces, 1 x Sync i/o, 1 x Midi I/O, SCSI64 kit, 2 x Digidesign 36Gb Quiet Digidrives, 1 x Digidesign PRE I/O.
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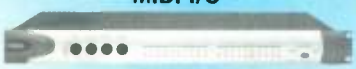

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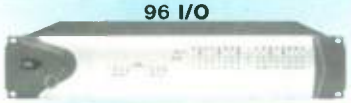

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- 56 channels
- Surround mixing with surround effects and joystick
- DAW integration inc. Digidesign Pro Tools and Steinberg Nuendo
- 5 times the processing power of 02R

Yamaha DM2000

The Music Corporation has been appointed as an authorised Dealer for the Yamaha DM2000 Digital console. With over nine times the processing power of the 02r plus a feature set that outclasses desks at twice the price including full integration with Pro Tools, the DM2000 makes pro digital mixing an affordable option.

For More information and to arrange a demonstration contact our DM2000 specialist **Neil Jones on 01425 479090.**
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Mackie 16-8 mixer £795.00
Mackie SDR 24 Track Digital Recorder ex demo £1,575.00
Otari DTR7 DAT Recorder - works fine £175.00
TAC Scorpion 40:8 - appx 5.5' wide 33" deep - old, meters not all working, otherwise OK £995.00
Tascam 34 1/4" 4 track £325.00
Tascam 48 1/2" 8 track £650.00
Tascam DM 24 Digital Mixing Console £1,995.00
Yamaha O2R Cascade Card (2 available price each) £345.00
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Roland U220 .... £125.00
Sequential Circuits Six Trac £325.00
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Yamaha DX7 .... £175.00
Yamaha REV 5 .... £245.00
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Autumn Clearance

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Guitar Stuff

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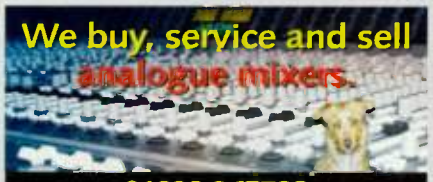

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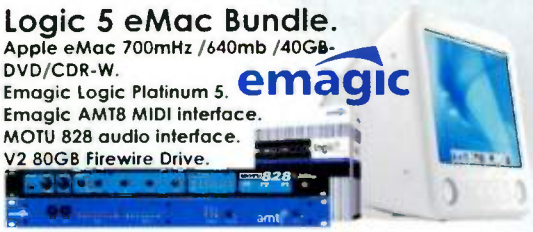

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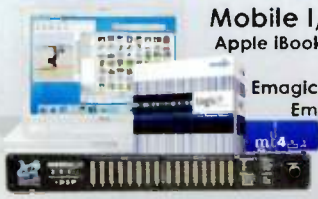

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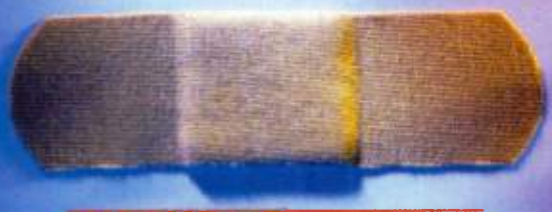

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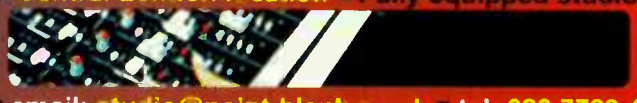

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ALLEN & HEATH eight-channel add-ons for S2 mixer required, I also need the manual for S2 desk; Akai A-DAM DR1200 and DM1200 units wanted, auto'ocator and/or DR1200 recorder, anything related to A-DAM considered. ☎ Richard 079 4918 3014 (North Yorkshire).

ALLEN & HEATH GS3000 32-channel mixer, must be reasonably priced and in fair condition. ☎ Ian 01307 819164 (Angus).

EMU E5000 Ultra wanted, internal hard drive 128MB RAM, RFX if possible, will pay good price. ☎ 079 5091 9712 (Guildford, Surrey).

FOCUSRITE ISA430 or 220 wanted in good condition and at a fair second hand price, no traders please. ☎ Michael 01865 311269 (Oxford).

KAWAI XD5 drum module, full working order and a manual will do, will pay up to £85. ☎ 020 8918 1524 (London).

MACKIE 1604VLZ or 1642VLZ wanted, I need one of these mixers in good operating condition, quick sale if the price is right. ☎ Alan 0118 965 6333 (High Wycombe, Bucks).

SOUNDCRAFT ABSOLUTE 2 monitors wanted, cash waiting, but must be in Southampton area, I will travel 50 miles in any direction but I want to view and listen before buying. ☎ Lee 023 8032 0485 (Southampton, Hampshire).

TASCAM DA38 pair wanted, cash waiting, also MMC box, must be in good condition. ☎ Paul 077 7390 4212 (Brighton).

WURLITZER ELECTRIC PIANO any model considered, cash waiting. ☎ 078 8771 2070 (Loughborough).

YAMAHA CP30 electric piano wanted, will pay up to £100. ☎ Lee 078 1772 2980 (Essex).

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sounding off

Matt Bell

I'm getting increasingly set in my ways of late. Despite telling myself I could always go in forwards if I want to, thus leaving the window open on a life of youthful spontaneity, I've now come to terms with the fact that I pretty much always reverse into parking spaces. Likewise, I no longer attempt to buck the now-comfortable notion that toilet roll must always hang forward over the holder, not dangle behind. No doubt before long, I'll be firing off letters of complaint to *The Times* and refusing to let the kids next door have their ball back.

In my defence, I'm certainly not closed to *all* new concepts. When CDs appeared, I couldn't wait for everything I owned on LP to be re-released on CD. Not for me a die-hard existence clinging to crackly old vinyl — the future was chrome-shiny, rainbow-hued, and *programmable*. Likewise, when really affordable MIDI gear appeared in the late '80s, did I say "It's not real music — I'll stick to the piano lessons, thanks!"? I did not; I bought a drum machine, a MIDI synth, and a sequencer. More recently, when Apple launched the new flexible-stalk iMac, I praised it as a design classic (oh, all right — after some initial rumblings about it being a triumph of looks over function).

So, if I'm still capable of embracing progress, surely I must have done away with my stone-age stereo home studio and hi-fi, and replaced it with surround setups? Well... no. I have no intention of 'upgrading' to any kind of multi-channel system in my studio or elsewhere at home, be it 5.1, 7.1, 9.1, 10.2, or even (as I heard someone mention recently) 20.4. What's more, I *don't* feel it's merely approaching decrepitude that leads me to spurn surround like this.

Firstly, there's my home studio. I struggled with an analogue tape multitracker mastering to cassette for many years, and then finally I got myself a nice digital multitracker and a CD-R. Now, at last, I can create decent-sounding stuff on CD that I can play almost anywhere. But now I'm supposedly meant to upgrade almost everything — mixers, recorders, effects, processors, monitors, mastering equipment, and even storage media — in the interests of surround compatibility. And there's not even just one set of surround standards to upgrade *to* — there's no agreement on number of channels and speakers, nor one media standard equivalent to CD (wave hello to DVD-Vs, DVD-ROMs, DVD-As and SACDs). It's all far too complex and expensive for a home-studio owner to be bothered with, in my opinion.

OK, so I'm not sold on surround as a viable means of production for the home-based musician. But what about for home listening? This is more of a personal viewpoint, but to me, stereo CD-quality audio simply ain't broke and don't need fixing, despite the belief of surround advocates that higher-resolution multi-channel audio will lure us onwards. Perhaps it's just my cloth ears, but I feel silver CDs give me all the quality I need for this lifetime. To be honest, if I could still experience that indefinable tingling feeling I get from fantastic music by listening on a wax cylinder, I'd settle for that. The bottom line is that it's music I get off on, not the spec of the system it's being played on.

Even if I thought surround sounded better, I think economics would still prevent me from embracing it. The move from vinyl to CD made sense to me, but the supposed improvement that comes with moving from stereo to surround is simply not sufficient for me to be able to justify ditching my current stereo system, to say nothing of the cost of repurchasing my entire record collection in 5.1-remixed form.

And finally — what if it's all a conspiracy? Everyone gains from surround — producers paid to remix it, studios paid to remix it *in*, equipment manufacturers paid for new gear to remix it *with*, and record companies paid to re-release their back catalogue again. It's no wonder everyone says it's great! Some industry figures clearly believe surround audio is truly better audio — but that makes it no easier to swallow record company press releases like the recent one which claimed that with the release of their back catalogue in 5.1-remixed form, it was now possible 'to hear the music as it was meant to be heard'. Since stereo has been the planned release format for nearly all music for at least 30 years, this is at best disingenuous, and at worst complete rubbish. It's easy to claim that Robert Johnson would have wanted a 5.1 mix of his famous mono blues recordings if he'd had the chance, but not even Satan, it seems, could conjure up 5.1 in the early '30s. Nevertheless, a 'more involving, inclusive mix of these classic recordings' is surely only a matter of time. My Switch card, however, will remain coolly unruffled, and my stereo will remain just that. And no, you can't have your ball back. SOS

The combined might of the record industry is currently behind the attempt to persuade us that surround is the next big thing — but many of us still remain to be convinced...

About The Author

Matt Bell is *Sound On Sound*'s Managing Editor.

If you'd like to air your views in this column, please send your ideas to: Sounding Off, *Sound On Sound*, Media House, Trafalgar Way, Bar Hill, Cambridge, CB3 8SQ, UK. Any comments on the contents of previous columns are also welcome, and should be sent to the Editor at the same address.

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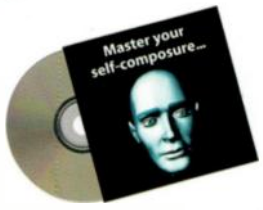

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