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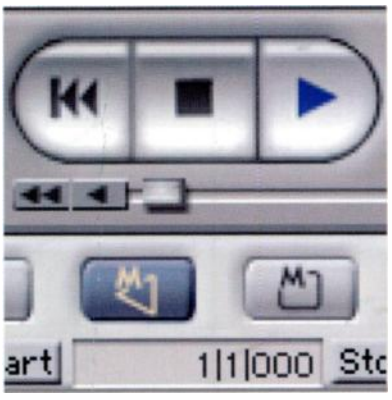

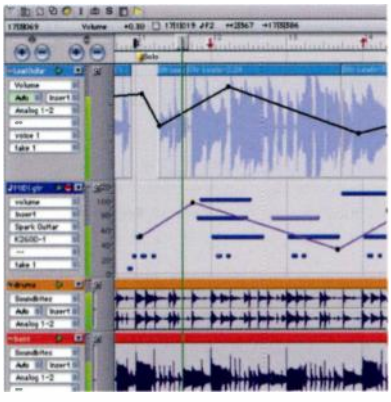

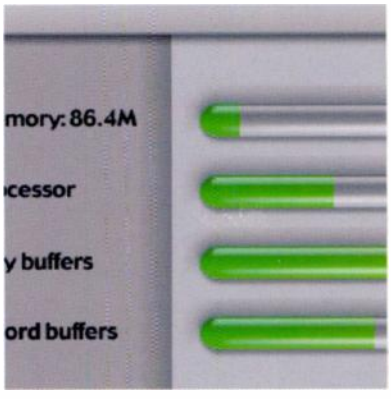

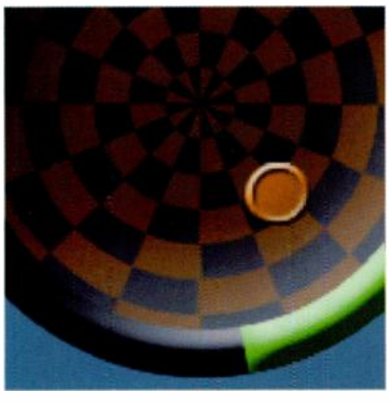

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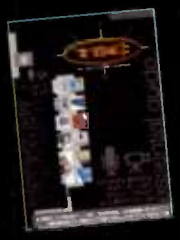

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surrounded by hype?

Despite the slow commercial take-up for music recorded in a surround format, the industry is busy telling us that we need surround mixing facilities if we're to compete in the modern world — even if we're just running a home studio! My take on all this is that while surround might not be quite in the mainstream yet, we ought at least to be putting it through its paces, to see what it can do. After all, several major software sequencer packages now support surround audio mixing, and some of the newer digital mixers boast 5.1 compatibility. Personally, I rather like the idea of surround, because the type of ambient music I cook up at home should work nicely in the all-immersive world of 5.1. However, when you start thinking about how to go about it, you realise that there are certain bits of vital kit that nobody actually makes. For example, you have five active monitors and a subwoofer, all set up on the periphery of a mystic circle, like something out of a Dennis Wheatley novel, but what do you plug them into?

None of the mixers I've seen (at least, none that are aimed at the home studio market) actually cater for surround monitoring, even if they can output a surround mix to a mastering recorder via their buss outs. By surround monitoring, I don't mean anything fancy — just six monitor outputs that can be adjusted in level using the Control Room volume knob on the mixer. If you have a mixer with enough busses and enough aux sends, you can kludge something, but if it doesn't have plenty of busses, and fader-grouping capabilities, you may find you have to adjust several controls at a time, just to turn the level up and down.

At the last AES show, I decided to try to find a solution. When I came across a well-known digital console manufacturer actually demonstrating surround mixing, I thought, "Great — they'll have the answer." And they did. Their monitoring was controlled by a multi-channel level-control box, of much the type I've described, fed from the buss outs of the mixer. Where did they get this vital piece of kit? It turns out that their Italian distributor made it so he could demonstrate the mixer! Fantastic, but is he going to make one for everybody who buys one of their mixers? I think not.

Further searching yielded a couple of professional surround monitoring boxes with all the trimmings, but they cost upwards of £1500 — more than a lot of people pay for the computer that runs their entire studio. What's needed does not require rocket science. It's little more than three stereo faders in a Tupperware box, with a Biro glued across the fader caps so that they all move together! A little balanced electronic buffering would be good too, and a switch to let you play DAT machines and so on through the speakers, but it's not in any way complicated and shouldn't cost more than a couple of hundred pounds — less, ideally.

Next, I spoke to the software companies. Their response was that, as you can mix down to 5.1 audio files within the computer, you can use the outputs of any multi-output soundcard or interface to feed the speakers, using the software mixer to control the monitoring level. In most software mixers, you can group the faders so that adjusting one causes all six outputs to change, but could you actually trust a system like that? It's fine when everything is working properly, but what happens when you have one of those crashes that dumps continuous, full-scale digital grot on all the outputs? Would you have time to run around all six active monitors and turn them down or off before their cones met in the middle of your control room? Make no mistake, you need something physical within arm's reach, to turn down all your monitors in an instant if anything untoward happens.

If anybody comes across anything simple and cheap that will do the job, please email me (sos.feedback@sospubs.co.uk). Otherwise I'll need to make friends with a certain Italian distributor or get out the Superglue and go through my dead Biro collection! SOS

Paul White *Editor*

SOUND ON SOUND
Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ, UK

T +44 (0)1954 789888
F +44 (0)1954 789895
I ISDN +44 (0)1954 781023
E sos@sospubs.co.uk
W www.sound-on-sound.com

editorial
E sos.feedback@sospubs.co.uk
Editor Paul White
Senior Assistant Editor Matt Bell
Assistant Editors Tom Flint, Sam Inglis, Debbie Poyser, Mike Senior
Technical Editor Hugh Robjohns
Editorial Director Dave Lockwood
Publisher Ian Gilby

advertising
E adsales@sospubs.co.uk
Group Sales Manager Robert Cottee
Classified Sales Manager Patrick Shelley

production
E graphics@sospubs.co.uk
Production & Event Manager Andy Brookes
Graphic Design Alan Edwards & Ian Gilby
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administration
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Managing Director Ian Gilby
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Printing Warners Midlands plc
Colour Scanning G&E 2000 Ltd
Newstrade Distribution Warners Group Distribution Ltd, The Maltings, Manor Lane, Bourne, Lincolnshire PE10 9PH.

ISSN 0951-6816
A Member of the SOS Publications Group

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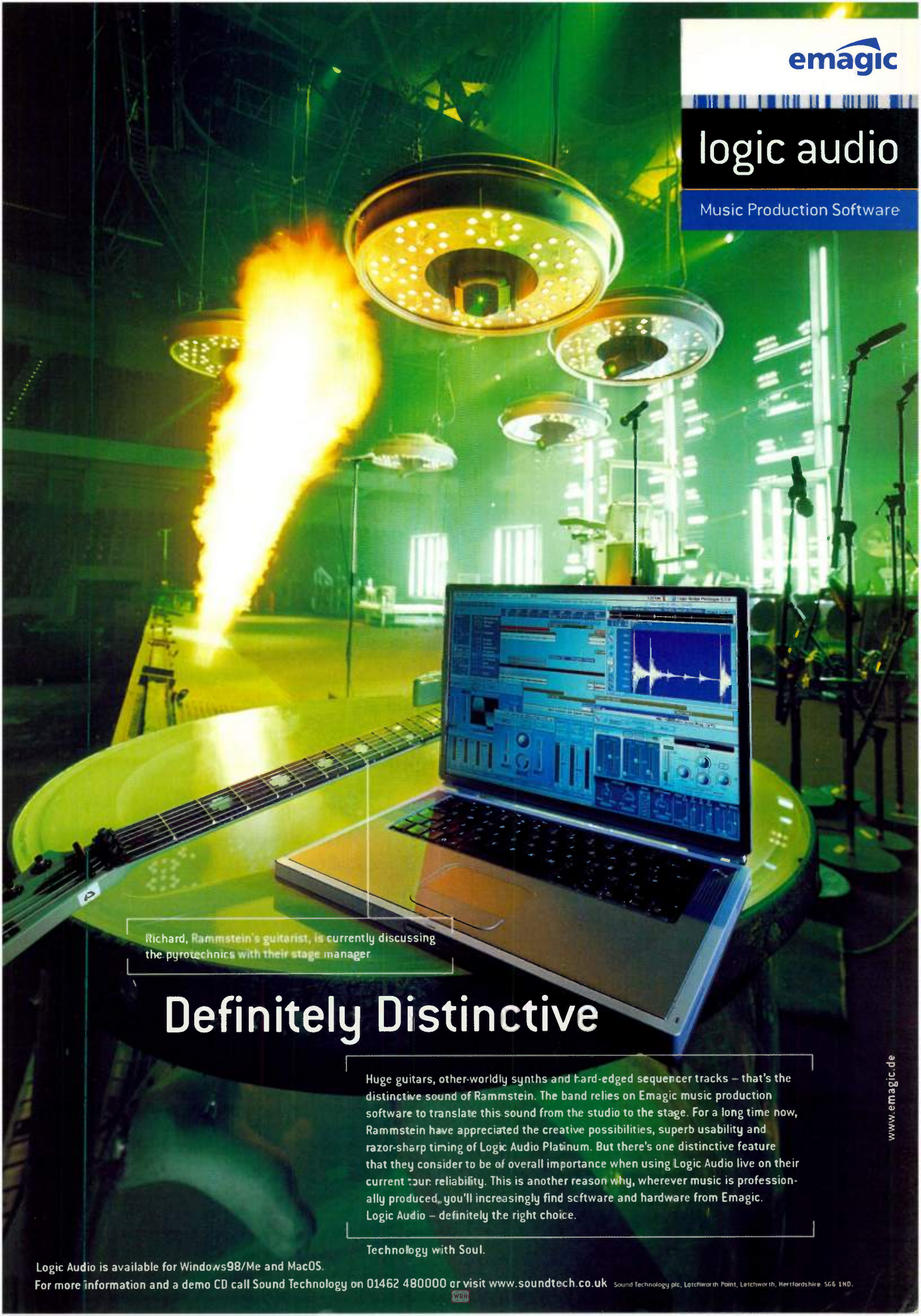

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Richard, Rammstein's guitarist, is currently discussing the pyrotechnics with their stage manager.

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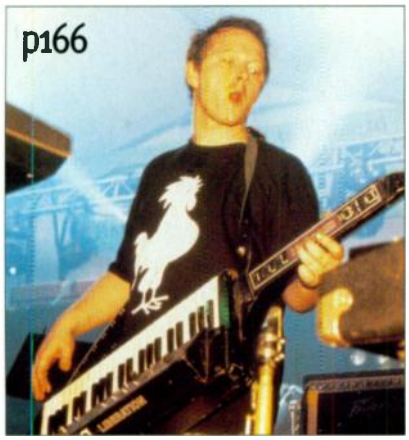

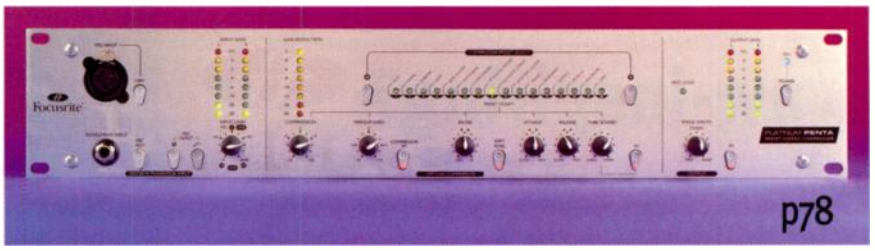

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aw-inspiring?

Lower price tag for slimmed-down sibling to Yamaha AW4416

For many users, Yamaha's 16-track AW4416 (reviewed in *SOS* November 2000) represents the peak of what is currently available in an integrated digital multitrack recorder and mixer. Now Yamaha are taking the concept and repackaging it with a lower price tag, which is good news for those who couldn't stretch to the price of the original. The AW2816 digital audio workstation, which is due "imminently", can record a maximum of 16 tracks of up to 24-bit, 48kHz digital audio to an internal 12Gb hard drive, and each track has access to eight virtual tracks for alternate takes. The mixing section on the 2816 is reduced from that available on the 4416, providing 28 simultaneous digital mixing channels rather than 44, but still borrows many features from Yamaha's 02R and 01V digital mixers. Layout is similar to that of the 4416, and the new machine features nine motorised faders, with a display similar to that on the 02R. Non-destructive digital audio editing facilities (including cut and paste, time-stretch and pitch-shift) and mastering tools are provided, as are 22 internal dynamics processors, four-band parametric EQ on all input channels, and two built-in multi-effects processors.

There are eight analogue inputs, including two phantom-powered XLR ins and a dedicated guitar DI input. The 2816 also features four of Yamaha's user-configurable 'Omni' outputs, and further interfacing is possible with optional mini-YGDAI boards, one of which can be accommodated. The current range of boards includes ADAT and TDIF multi-channel digital I/O and analogue-input models. Automation is provided, and the MIDI spec apparently improves on that provided for the AW4416. In fact, a number of operational enhancements that have been implemented on the 2816 (such as an improved 'Quick Rec' facility and MIDI Remote capabilities) won't even be available on the 4416 until the next software upgrade (due shortly) is released.

Pricing for the AW2816 hasn't been fixed yet, but it looks as though a basic machine will retail for £1699 including VAT, and a version with optional rewriteable CD recorder ready-installed (for data backup and mix mastering) should cost £1999.

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solar flair

New Eventide Eclipse effects processor aims to shine

Eventide's new Eclipse, available now from UK distributor HHB Communications, is the company's most affordable effects processor. The new machine is quoted as offering "five times the power" of its predecessor, the H3000, in a single rack space, and it benefits from a range of new features, too. A total of 90 algorithms is provided for effects creation, and the Eclipse's dual-engine architecture is configurable in series, parallel, stereo or dual-mono modes. A library of 217 presets, including all Eventide's most popular reverb, delay, pitch-shifting, chorus and dynamics patches, is included to get you going, and a search facility is available for program or preset selection by category or application.

The Eclipse's audio spec includes 24-bit digital conversion and 96kHz sampling, with a quoted signal-to-noise ratio of better than 104dB. Comprehensive connectivity includes balanced analogue I/O, S/PDIF and AES/EBU digital I/Os, and ADAT lightpipe support. The Eclipse's suggested selling price is £2227 including VAT.

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step to it

Analogue Solutions Oberkorn sequencers sold to Human League

Analogue Solutions, makers of the Concussor series of analogue modular percussion modules, have announced the sale of two customised Oberkorn step sequencers to electro-popsters The Human League, who are using them on their new album, due later in the summer.

The 16-step programmable Oberkorn sequencer, which was announced at the Los Angeles NAMM show at the start of this year, has now been released to the general public. Three control voltage channels and five gate channels are available per sequencer step, and the voltage output on each channel may of course be tweaked at any time via the front-panel rotary controls. A wide range of sequence playback options is available, including the ability to change the playback order or direction, to skip steps or duplicate them. The Oberkorn [*which is named after an obscure heavily step-sequenced Depeche Mode B-side from 1982 — Trivia Ed*] can be integrated into the modern MIDI studio thanks to a built-in eight-channel MIDI-to-trigger converter. Expect an *SOS* review soon!

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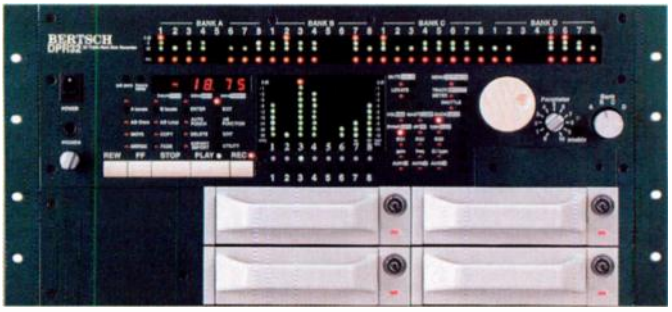
Canadian company Bertsch comes from nowhere to score with 32-track digital recorder



Just as we were getting used to 24-track hard disk digital recorders, Canadian company Bertsch have gone eight tracks better, with the launch of their DPR32 digital 32-track recorder. The multitrack may not be priced for the entry-level user, but its paper spec is more than satisfactory for a product that retails for US$7995. Not only does the DPR32 have a high track count and allow all its tracks to be recorded simultaneously, it also supports 24-bit, 96kHz uncompressed digital audio (with up to 3.9 hours continuous recording at those rates). In fact, it's capable of managing 64 tracks of playback if you work with 48kHz audio, through some clever re-allocation of system resources. The 5U rackmounting package also features an integrated 36:8 MIDI-automatable digital mixer, with 32 channels of level, pan, solo, mute, three-band EQ, gating, compression, and ducking/de-essing. A stereo out is provided, along with six auxiliary sends. Non-destructive editing is specified, as are SMPTE chase and varispeed. As you can see from the pic above, four IDE-format drives can be slotted into the front panel, for up to 132Mb of storage; these can be fixed, removable or CD/DVD-R drives. Bertsch offer a lifetime of firmware upgrades with their recorders; this means that their forthcoming computer waveform editor interface will be free to all users. Analogue ins and outs are on balanced jacks, with 16 ins as standard (upgradeable to 32) and 32 outs.

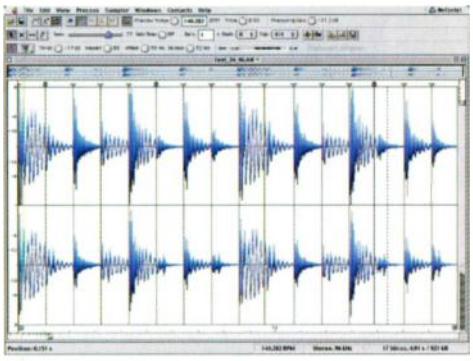
If you're wondering about where Bertsch have come from, it seems company boss John-Paul Bertsch spent seven years as chief engineer at IVL, the company behind Digitech's Vocalist family of harmoniser products. He also designed the well-regarded DPR6 digital multitrack for Vestax, and has been developing his approach to digital multitrack since; the DPR32 is the result.

Potential British customers for the new multitracker should note that no UK distribution has yet been arranged — though Golden Age Music have been appointed for the Swedish market (their web site, at www.goldenagemusic.se, does have an English element under construction, though). Watch this space for developments.

W www.bertschelectronics.com

'cycle path

Propellerhead update *Recycle* loop software with new features



The long-awaited v2.0 update of Propellerhead's *Recycle* loop-processing and regrooving software is finally available. Chief amongst its new features is the ability to process stereo audio files, and to preview most pitch and tempo processes in real time. Extra tools have also been added to help gate out unwanted noise, and to provide envelopes to individual slices of a *Recycled* loop. A new two-band parametric EQ (with high and low cut) offers further sound-design potential.

Finished loops can be exported to a range of samplers, with almost all Akai machines supported, as well as the Ensoniq EPS/EPS16+ and ASR10, Emu ESI32, EIV and E64, Kurzweil K-series instruments, and Roland's S760. Audio can also be saved in AIFF or WAV format, or as a new REX2 file. The latter file format is supported by Steinberg's *Cubase VST* and Propellerhead's own *Reason* virtual analogue studio software. It looks as though support for the format will be appearing from other applications, too. It's also good to hear that *Recycle* now supports ASIO (the Steinberg-developed standard for moving audio in and out of host computers via compatible audio cards).

Reason, mentioned above, has also had an update, which is downloadable from Propellerhead's web site. The most notable addition to v1.0.1 is a rewrite of the ASIO implementation that, it is claimed, will fix problems with ASIO drivers in the initial release of *Reason*. The new ASIO implementation adds support for external word clock and S/PDIF sync. This update also sees the release of the *Refill Packer*, a tool which will allow users to create their own Refill files with samples, loops, patches and so on. *Refill Packer* is also freely downloadable by registered *Reason* users.

T Midiman UK +44 (0)1423 886692.
F +44 (0)1423 886693.
W www.midiman.co.uk
W www.propellerheads.se

bullets

Access update spec of Virus Rack

Following completion of our recent review of the Access Virus Indigo in *SOS* June 2001, news reached us that Access have upgraded the spec of the Virus Rack. The Rack now offers 16-part multitimbrality, rather than the eight planned at the time the Indigo review was written. The change mitigates some of the comments made towards the end of the review, where we compared the then-provisional spec of the less powerful Rack to that of the Indigo, although of course the comparison was correct at the time of going to press. For the full story, look out for the review of the Virus Rack, which will be appearing in a forthcoming *SOS*.

Sennheiser UK to distribute Mindprint products

Products from Mindprint, the German company who specialise in audio input signal processing devices, are to be distributed in the UK by Sennheiser UK. The current range includes the En-Voice Class A mic/line preamp and tube compressor, the AN/DI Pro 24/96 Class A stereo analogue-to-digital converter, the T-Comp stereo tube adaptive compressor with optional digital I/O, and the DI-Port entry-level 24-bit Class A mic/line preamp and stereo analogue-to-digital converter.

T Sennheiser UK +44 (0)1494 551551.
W www.sennheiser.co.uk

winners parade

More *SOS* readers pick up competition prizes

It's time once again to announce the winners of some of our recent competitions. Back in October last year, our prize giveaway was over £1100 of Midiman gear (+44 (0)1423 886692/www.midiman.co.uk), and there were three lucky winners. Adam Goodlet of Hampshire netted himself the first prize, over £600 of Midiman hardware: a fantastic Midiman Delta 66 24-bit, 96kHz soundcard with separate OMNI I/O box and a Midisport 2x2 USB MIDI interface, and is already pressing all his new kit into service at his Hard Acid home studio. The second prize, a £299 Midisport 8x8 eight-way USB/serial MIDI interface, was won by Jonathan Lambert, a music teacher from Norwich (pictured left). Last but not least,

Christine Rathbone from Cheshire won third prize, a £179 24/96 Delta Audiophile soundcard for her PC, featuring analogue and digital audio, and MIDI interfacing.

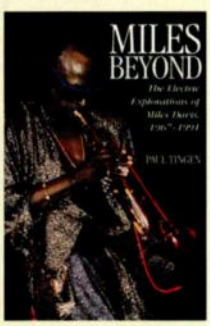
A couple of months later, in December 2000, AMIC (+44 (0)20 8614 2592/www.akaipro.co.uk), Akai's UK distributor, kindly offered a very generous £1700 prize — a fabulous Akai DPS16 hard disk recorder with built-in EB4M effects board. The lucky winner was Steve Holley of Surrey, who has finally made the transition from cassette multitracker to hard disk as a result of winning the competition, and is already putting his DPS16 to good use recording his band.

Thanks to Midiman UK and AMIC UK for donating the prizes, and congratulations to all our winners this month. Keep those entries coming in...

bullets

SOS author examines Miles Davies' electric period in new book

Regular *SOS* contributor Paul Tingen has completed a definitive history of the latter years of jazz legend Miles Davies, *Miles Beyond*. Many books have covered Davies' mainstream jazz period in detail, but his 'electric' period, which began in 1967 and continued until his death in 1991, is less well-documented. Nevertheless, Paul succeeds in untangling the complex and often divergent history of Miles' studio-based and live experiments during this 25-year period, and his genuine enthusiasm for the music is apparent without the content ever crossing the line into over-generous hagiography. A detailed session record of the period is also included. The book is published in America by Billboard Books, and costs $24.95 in the US (expect to see it for around £20 in the UK).



I ISBN Number 0-8230-8346-2
W Billboard Books www.watsonguptil.com

"Touring Project" seeks to bring "loop-based art" to the masses

Public Loop is a new "touring project", created by performance artist Helen Chown and composer Martin Delaney, which aims to bring interactive loop-based video and audio art to people who wouldn't normally get a chance to participate, such as schoolchildren, prisoners and community groups. The project will hold music and video workshops, news of which will be posted on their web site. Producer and iconoclast Brian Eno is a supporter, and has donated his Yamaha DX7 MkII (well, one of them, anyway) and other equipment which Public Loop will auction off to help raise funds. The group are also looking for donations. Planned audio and video courses vary in length from a single day to six months at one day a week, and all end with a live video/audio mix session in front of an audience. All participants receive copies of their work on VHS tape.

W www.publicloop.com

part of the furniture

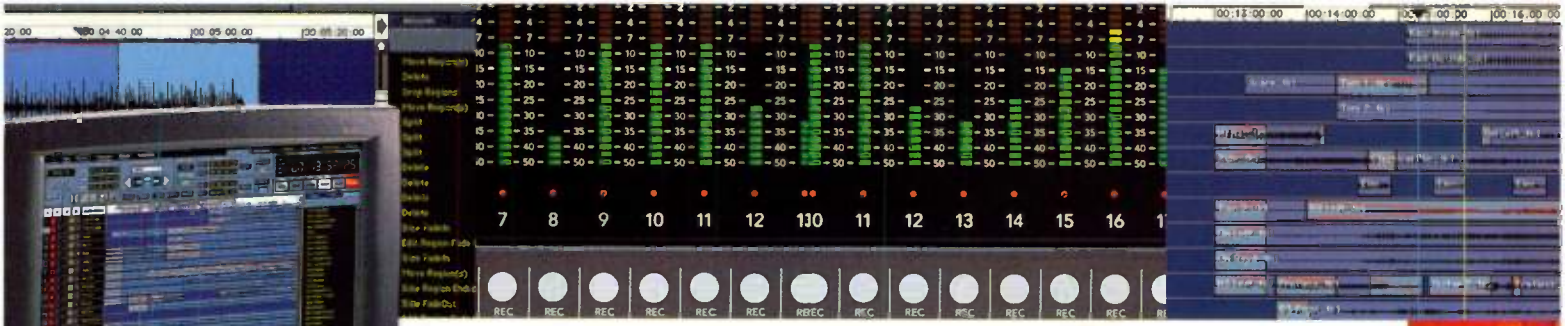
Kit out the studio with Omnirax

Omnirax are a US company specialising in studio racks and modular studio furniture. Judging from the catalogue we've seen, they have a good-looking range, and it's now available in the UK courtesy of Audio Agency. A quick glance through the catalogue reveals specialised desks and tables which can accommodate master keyboards, digital mixers, computers, monitors, rack equipment, and so on.

The latest releases in Omnirax's Synergy series of mixing console desks have been built to cater for Digidesign's Control 24 hardware control surface for Pro Tools and Sony's DMX R100 digital mixer. Both desks are finished in black melamine as standard, with custom laminate colours available as an option. The Control 24 or DMX R100 fits in the centre of the desk, with rack bays to the left and right housing outboard processors. Audio or video monitors can be placed on a wide riser above and to the rear of the main working area, and a padded armrest runs the length of the console. The Synergy system for the Control 24 retails for £1375 including VAT, while the model for the DMX R100 costs £1928.

Also new is the F2 keyboard composing, recording and mixing workstation, which can accommodate a keyboard with up to 88 keys, 54U of rack gear, computer and audio monitors, a m much other gear in a convenient wrap-around desk; an optional shelf can accommodate a computer keyboard, and slides out from under the main synth/keyboa shelf.

T Audio Agency +44 (0)1908 510123.
F +44 (0)1908 511123.
E info@audioagency.co.uk
W www.omnirax.com



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Plug in the HDR24/96 Recorder/Editor and start recording. No external computer to boot up. No hardware and software configuration night- mares. No compromises like settling for 20-bit audio or just 12 tracks at a time.

Recording is easy with the HDR24/96.

Simultaneously record 24 tracks of 24-bit digital audio…without waiting for lock-up, tape shuttle or CPU lag. Drop up to 192 alternate takes into "virtual tracks." Record onto affordable, removable media that you can swap in and out for each project.

And do it all with your hands on a familiar, analog-style machine (or two sizes of wired remotes) instead of resorting to myriad mouse clicks. All basic functions are right on the HDR24/96 front panel including transport buttons and a Record Enable button for each track.

"…the HDR24/96 is a stunning development with excellent sonic quality, (and) an extensive feature set…it's easy to use and priced right. This one rocks!"

George Petersen
Mix Magazine March 2001

Editing is easy with the HDR24/96.

Twenty-four track masters for under $10 each!! Divide the cost of a Mackie Media M90 into the 20+ pop tunes you can record on it and you'll appreciate why we call it an affordable medium. Non-linear hard drives store audio data only, not silence. Tape (and linear hard disk recorders) just roll merrily along… eating oxide and costing money.*

Plug in an SVGA monitor, keyboard and mouse, choose from 2x, 4x, 8x, 12x or 24-track views and then watch them scroll smoothly past a centerline.

Mark hundreds of cue points and four locate points for looping and auto-punch-in modes.

Use the mouse to "scrub" individual tracks, Cue, Punch and Loop points with continuously variable velocity.

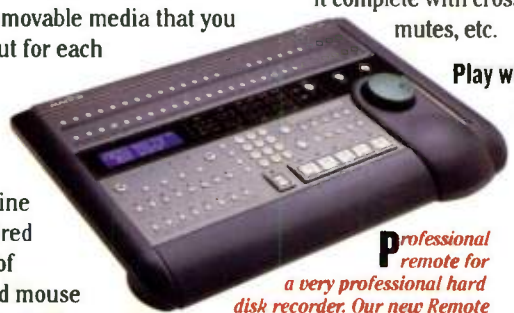
You can mark a segment (or multiple non-adjacent segments) as a *region* and then cut, copy and paste it anywhere — onto a blank track or right in the middle of an existing track without erasing anything. The part of the track after the insert just "slides down".

You can audition regions or modify their start/end points instantly, capture them as "sound elements" for later use or quantize them to user-defined time grids.

Create fade-ins, fade-outs and crossfades just by dragging and dropping them …and then set their length by dragging the mouse.

Add volume envelopes for simple level automation of regions or whole tracks.

Then use Track Render to combine all or selected regions of a track just as you hear it complete with crossfades, volume envelopes, mutes, etc.



Professional remote for a very professional hard disk recorder. Our new Remote 48 lets you run two HDR24/96s – 48 tracks of total control including a weighted jog/shuttle wheel and full display!

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Play back 24 tracks of pristine digital audio —instantly without any pause or lag time. It will be synched rock-solidly to everything in your studio — from MIDI-based sequencers to VTRs (via SMPTE and video black burst). Then let your partners, clients and friends "play" with your tracks anywhere in the world, thanks to the HDR24/96's Ether-net port and built-in FTP server.

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*based on average of length of current pop songs using 24 tracks @ 16bit/24-bits and a liberal number of extra regions and virtual takes. Discount apply for extended trance remixes. ©2001 Mackie Designs Inc. All Rights Reserved. Mackie and the Running Man figure are registered trademarks of Mackie Designs Inc. Mackie Media™ is a trademark of Mackie Designs Inc. ORB is a trademark of Castlewood Systems.

mr writer

Marantz add new CD-R and DVD player to range

The latest in Marantz Professional's range of pro CD recorders is the CDR770, priced at £429 including VAT. The new 2U rackmounting recorder is compatible with all CD-R(W) media formats, including data disks, and offers features previously only available with Marantz's high-end machines. The feature set includes a digital input without SCMS copy protection, AES/EBU digital I/O, CD Text recording, Audio DSP with buffer memory for frame-accurate ID writing, digital recording level control with balance adjustment, and auto track increment from CD, MD, DAT and DCC digital sources. The front panel also offers a jog wheel for scrolling through recorded CDs. An infra-red remote is included in the package.

Marantz have also added a DVD player to their Studio Line range of professional rackmountable products. The DV4100Pro will also play ordinary CDs, Video CD, and Super VCD media. Digital audio output is available on both co-axial and optical connectors, and Dolby digital/DTS, MPEG2 and PCM stereo audio formats are supported. The 24-bit/96kHz DAC-equipped analogue outs provide a choice of stereo, Dolby Surround or 'virtual' 3D sound output. On the video front, 16:9, 4:3 letterbox and 4:3 pan/scan screen formats are supported, and PAL/NTSC compatibility is available on the SCART, S-video and composite video outs.

T Marantz Professional +44 (0)1753 686080.
F +44 (0)1753 686020.
W www.marantz.com/marantz

power to the plug-in!

Universal Audio DSP card provides processing juice for plug-in effects

Arbiter have been appointed UK and Eire distributors for Universal Audio's new UAD1 DSP PCI card. The UAD1, whose underlying concept is the same as that of TC Works' recent Powercore DSP accelarator card, will work with any VST-compatible application, such as Steinberg's *Cubase VST* and *Nuendo* or Emagic's *Logic Audio*. Basically, it applies virtually all of its processing power to the creation of effects, allowing you to run plug-ins with no strain on the host computer's CPU. There are opportunities for running much more powerful plug-ins, too: for example, Universal Audio's *RealVerb Pro*, which was previously only available as a Pro Tools TDM plug-in, can be used within any VST environment if you fit a UAD1 in the host computer. All plug-ins appear as if they were normal VST devices.

Other features of the card include 'Ultra Dither' in hardware at all stages of signal processing, and an absence of zipper noise, according to Universal (it's been eliminated, apparently, by 'smoothing' of all parameters). The UAD1 will ship with the following Universal Audio 'Powered Plug-Ins': *RealVerb Pro*, the *1176LN* and *LA2A* 'vintage' compressors, and the *UAD CS1* channel strip with EQ, chorus, flanging, echo and 'Reflection Engine' for further reverb and acoustic space emulation. Antares, developers of the *Auto-Tune* plug-in, have announced support for the UAD1, with other software houses promising compatible plug-ins in the near future. Initially, the £881 card will be compatible with PCs only; Mac support is on the way.

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W www.arbitergroup.com
W www.uaudio.com

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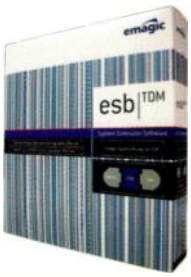

In an interesting move, Emagic have released Emagic System Bridge TDM (or ESB), a software link between the dedicated DSP hardware of Digidesign TDM-based recording systems, and the native processing power of an Apple computer. The software essentially allows you to route native audio tracks, *Logic Audio* and VST-format plug-ins and audio instruments to *Logic Audio*'s TDM mixer via a send/return system. ESB TDM therefore allows users of Pro Tools hardware to combine both native and TDM processing within *Logic Audio Platinum*. One side-effect of this integration is that up to 32 instances of Emagic's *EXS24* virtual 24-bit sampler, which is normally a host-based plug-in accessed from *Logic Audio*, can be patched through *Logic Audio Platinum*'s TDM mixer, allowing the plug-in to be processed using only TDM DSP. ESB TDM is available now, priced at £259 including VAT.

At completely the other end of the Emagic family, we learn that the entry-level *Micrologic AV* PC/Mac MIDI + Audio sequencer can now be purchased for just £89, down from £99. This package offers up to 16 stereo audio tracks, real-time effects, an integrated stereo sample editor and virtual General MIDI mixing console, and is compatible with all of Emagic's acclaimed virtual instruments *and* VST and VST 2.0 plug-ins. It can work with QuickTime or AVI movies and utilises some of the core technologies from the upmarket *Logic Audio* family. Thus, if you start out with *MicroLogic AV*, you'll develop skills and working habits which can be transferred easily to any other Emagic sequencer.

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F +44 (0)1462 480800.
W www.soundtech.co.uk
W www.emagic.de

bullets

Free plug-in with TC Powercore

If TC Works' Powercore DSP-equipped, VST/MAS-compatible PCI audio soundcard for Mac is on your shopping list, you'll be interested in a special offer. Buy one before October 1 of this year, and you'll get a TC Works three-band *MasterX* 96kHz multi-band *Finalizer* plug-in absolutely free. For more details on the Powercore card, check out the *SOS* review in June of this year.

T TC Electronic UK 0800 917 8926.

plug-in corner

Audionaut VST drum machine

The charmingly-named *Fresh Killed Beat*, from Audionaut, is a new PC-only VST instrument. As the name may suggest, it's a drum machine, but rather than using samples, it produces its results using analogue-style synthesis. An *FKB* kit can contain 12 sounds, and each sound is created by manipulating 11 MIDI-controllable parameters. Three waveforms — sine, sawtooth and triangle — are available to a sound's oscillator, and waveshaping extracts even more sonic potential from this raw material. Envelopes are provided for pitch and amplitude, and a resonant filter is also on board. The instrument is compatible with Windows 95/98/2000/NT and costs US$35 from the Audionaut web site. Loads of free kits, plus a demo, are also available on line.

W www.audionaut.com/software

Waves updates

Pure Distribution, who have recently taken on UK distribution of the Waves range of plug-ins, have announced the arrival of the new *Renaissance Voice* audio processor, comprising a newly designed compressor, limiter, expander and gate. The extremely simple user interface has just two controls: the Energy control, for adjusting the threshold of the multi-stage downward expander; and the Compression control, which adjusts the amount of compression and limiting being applied, while automatically providing output gain boost. *Renaissance Voice* is available as a Digidesign TDM or Native (Mac or PC) plug-in, and costs £176. Copy protection is via a 24-hour on-line challenge-and-response system. Also new from Waves is the L2 *Ultramaximizer* limiter plug-in for Digidesign Pro Tools 24|Mix TDM systems on the Mac.

Waves' popular plug-in bundles are now all at v3, and can be discovered via a free CD-ROM that outlines the plug-ins' new features, profiles famous users and provides demo versions. You can get hold of the CD-ROM from your local Waves dealer, or by calling Pure Distribution.

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

Muon plug-in synth family grows

Muon Software, a company behind a range of free and commercial VST plug-in instruments for both Mac and PC, have announced the availability of the *Tau Pro* monophonic bass/lead synth plug-in. The new plug-in is an enhanced version of the free *Tau* TB303 clone, over 50,000 copies of which were downloaded last year.

The starting point for the US$30 *Tau Pro* is still Roland's classic bass-line generator, but the new virtual take gains two 64-bit alias-free oscillators, with a choice of 11 waveforms, detune and pulse-width modulation, hard sync and ring modulation, a switchable 18db/24db/36db-per-octave resonant low-pass filter with EG, velocity-controlled accent, glide mode, a built-in stereo effects unit with distortion, delay, chorus and flange, and MIDI control. *Tau Pro* is currently PC-only.

Coming soon from Muon is *Positron*, which is in beta-testing at the moment. This virtual two-oscillator polyphonic synth will be equipped with a 24dB-per-octave low-pass filter featuring EG and LFO modulation, two ADSR EGs, MIDI-controllable LFO, and built-in stereo effects, like the *Tau Pro*. It will also feature a Unison mode with glide and detune, which stacks all *Positron*'s oscillators to create one big monophonic sound. Also coming are updates for Muon's established *Atom Pro* two-oscillator and *Electron* three-oscillator synths; *Electron* is also shipping with over 64 new patches.

W www.muon-software.com

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Only the System 6000 and its touch screen remote offer specialized software options. These include true benchmark standards like Multi-channel MD5.1™, Stereo MD-3™ Multi-band Compression and Brickwall Limiting, Backdrop™ Psycho-acoustic Noise Reduction, Engage™ Binaural Processing, Stereo to 5.1 Conversion, the 5.1 Monitor Matrix with Bass Management, Multi-channel EQ and much more...

Only the System 6000 is fully networkable via Ethernet. Talk about expansion... a single TC ICON remote can control up to 256 channels of digital audio, all using industry standard Ethernet cabling and routing hardware supported by continuous free software updates on the Internet.

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WRH

more strings to its bow

Full MIDI spec, software editor and S/PDIF Out for Digitech guitar effects

The latest floor-mounted effects processor from Digitech, the GNX2, features digitally modelled recreations of a variety of stomp boxes, amps and cabinet types, with the ability to 'warp' — that is, morph — between models. Up to 11 effects can be used at once, including a 'talker' effect, as well as standard delay, reverb, chorus, and distortion treatments. A built-in expression pedal is specified, and five other footswitches are fitted. The GNX2 also features a rhythm trainer and 'learn-a-lick' phrase trainer. Interestingly, the new unit, which is obviously aimed at guitarists, features a full MIDI spec, a bundled Mac/PC editor/librarian package, and a digital output in S/PDIF format. Expect it to retail for £449.95 including VAT. Also available is the GNX1, which offers similar facilities in a smaller package for £329.95.

T Arbiter Group plc +44 (0)20 8202 1199.
F +44 (0)020 8202 7076.
W www.arbitergroup.com
W www.digitech.com

education corner

Newcastle & Huddersfield Universities

Both Newcastle and Huddersfield Universities have recently had installations designed and installed by DACS, with hardware supplied by HHB Communications.

Newcastle now have a DACS-designed multi-room facility for their music department, consisting of two control rooms, two performance areas, and three programming suites, with 10 additional workstations planned for the future. HHB supplied Sony DMX R100 and Mackie D8b digital mixers for the control rooms, and a variety of outboard and other gear, including an Eventide Orville effects processor, HHB CD recorders, MD and DAT recorders, and a number of mics.

For Huddersfield, DACS designed a main control room and a large recording space, along with one 5.1 surround and two stereo production suites. From HHB came another DMX R100, plus a Tascam MX2424 hard disk recorder, a Tascam TMD4000 digital mixer (for the 5.1 production suite) and a full complement of outboard.

T Newcastle University +44 (0)191 222 6736.
T University of Huddersfield +44 (0)1484 472476.
T DACS Ltd +44 (0)191 438 5585.
T HHB Communications +44 (0)20 8962 5000.
F +44 (0)20 8962 5050.
E sales@hhb.co.uk
W www.hhb.co.uk

One of the DACS-designed rooms at Newcastle University

University of Central England

Experienced musicians are being given the chance to get into teaching music at secondary-education level, even if they lack a music degree, by the University of Central England in Birmingham. Essentially, the university's Faculty of Education will take experience into account, such that qualifying musicians can get straight onto a two-year BEd Music course, without having to do a year as an undergraduate first. At the end of the course, successful students will be qualified to teach music at secondary level.

T University of Central England in Birmingham +44 (0)121 331 6100.
W www.uce.ac.uk

Bath Spa College

Bath Spa University College, who claim to be one of the UK's largest providers of degree-level Music Technology programmes, have bought eight Focusrite Platinum Voicemaster input channels and an ISA 430 Producer pack to complement their Digidesign Pro Control control surface for Pro Tools. Bath Spa run 20 networked Mac systems (loaded with programs including Emagic's *Logic Audio Platinum* and Macromedia authoring software), and two Digidesign studios with *Pro Tools* 5.1. According to Bath Spa's Geoff Smith (pictured above), the college is also about to become one of Europe's first AVID-authorised training centres for AVID non-linear digital video-editing systems.

T Focusrite +44 (0)1494 462246.
W Bath Spa University College +44 (0)1255 875875.
W www.bathspa.ac.uk

London College of Music & Media

The London College of Music and Media (at Thames Valley University) has recently given its training facilities a £200,000 facelift, undertaken by Stirling-Syco. Central to the new facility is an Audient ASP8024 mixing desk. The college, which is part of the Thames Valley University, has a total of 21 training suites, ranging from small computer-based rooms to a large multitrack recording studio in which the ASP8024 is installed. The studio is used by second- and third-year students on the college's three-year Music Technology course.

T Stirling Syco +44 (0)20 7624 6000.
W www.stirlingsyco.com
T Thames Valley University +44 (0)20 8231 2180.
W elgar.tvu.ac.uk

Audio Masterclass distance learning

David Mellor, a major contributor to the pages of *SOS* over the years, is starting a sound engineering and recording distance-learning service, under the name of Audio Masterclass. According to David, the courses are suitable for serious-minded people with Internet access who wish to prepare themselves to apply for trainee positions in live sound, TV, film, post-production, theatre, radio and music recording. Students worldwide can work at home, keeping in touch with experienced tutors and assessors. There are two courses: a Certificate in Sound Engineering & Music Recording Theory, and a Diploma in Sound Engineering & Music Recording, each 36 weeks in duration, and courses can be started at any time, except August. The two courses are identical, but for the Diploma course students will need

cheaper buy tube

Lower-cost tube mixer launched by makers of VTC valve desk

TL Audio continue ploughing the specialised furrow of valve-based mixing consoles with the launch of the M3 'TubeTracker' 8:2 valve mixer. The M3 offers a compact and less costly alternative to TLA's larger VTC, for those whose tracking or submixing requirements don't warrant the bigger desk. Each of the M3's eight channels features discrete valve mic preamps, four-band EQ with swept mids (based on those of the VTC), a pair of auxiliary sends, and a post-fader direct out for direct-to-multitrack recording. The master section is based around a stereo valve mix buss, with a pair of auxiliary returns, monitoring and metering options and an optional stereo digital output. Multiple M3s can be linked to provide an unlimited number of channels; the link facility connects each unit's mix, PFL and auxiliary busses. The M3 can be rackmounted or used as a desktop mixer.

T TL Audio +44 (0)1462 680888.
F +44 (0)1462 680999.
E info@tlaudio.co.uk
W www.tlaudio.co.uk

their own equipment in order to do the practical work. David's been involved in audio education since 1986, and is behind the City & Guilds of London Institute 1820 Sound Engineering qualification, Parts I, II and III.

Audio Masterclass, PO Box 671, Beaconsfield, Bucks HP9 1AX.
W www.audiomasterclass.com

Alchemea Audio Engineering College

Audio engineering college Alchemea have recently upgraded their computer workstations. The new Apple G4s all run Emagic's *Logic Audio Platinum*, Steinberg's *Cubase VST* and a range of audio editors, virtual synths and CD-authoring software. Each workstation will now also be equipped with Digidesign Digi 001 hardware, an Emu Ultra 5000 sampler, an Emu Proteus 2000 synth and a Soundcraft Folio mixer.

T +44 (0)20 7539 4035.
F +44 (0)20 7359 4027.
W www.alchemea.co.uk

Atlantech Academy

Atlantech Academy run a range of music technology courses at North Devon College in Barnstaple, and their National Diploma in Music Technology is now reaching the end of its second year. During the two-year course, students have set up a record label and released CD EPs and albums. The course offers training in all aspects of music programming, production, sound and music for film and television, and music promotion. The first-year room is equipped with Apple C3s running *Cubase*, while the second-year students have access to G4s, Digi 001,

MOTU *Digital Performer* and a host of other sequencing and synthesis software.
A recording studio is kitted out with Alesis ADATs and MOTU 2408 hard disk recording, an Allen & Heath GS3000 console, and Lexicon and Focusrite signal processing and effects. The college also offer 'AS'/'A'-level Music Technology, an NCFE certificate in Music Technology (part-time evenings) and a Music Technology summer school.

T Atlantech Academy +44 (0)1271 338019.
W www.ndevon.ac.uk

TS2k courses expand

TS2k, established in 1996, provides free courses in web design, events management, photography, crafts and arts, film and editing, as well as giving free job advice and support for young and unemployed people in the London area. They're now expanding the courses, and the number of locations where they take place (educational centres and digital learning studios are being developed in Manchester, Belfast, Liverpool and in Wales and Scotland). Since June they've been offering a range of music courses, also free. The way the organisation is run means that eligible participants may even get help with the cost of childcare and travel. Courses for all levels, from beginners to the more advanced freelancer, are on offer, and are open to just about anyone, in or out of work. They include two-day intensive introductions to MIDI and sequencing, sampling, and effects, and eight-week music-freelancer courses on MIDI technology, sequencing, and hard disk recording. Workshops and lectures covering the music industry, copyright, and preparation for job-seeking/freelancing in the Industry are also being held. TS2k will offer on-line support, with course information and materials placed regularly on the Net. They also have a well-equipped programming facility in Kentish Town, in North London, that's available at subsidised rates.

T TS2k +44 (0)20 7401 5468.
F +44 (0)20 7401 5391.
W www.ts2k.org.uk

Korg Workstation Courses

Korg have passed on news of a couple more Korg Workstation Courses being held this summer, at Bath Spa University. The courses will be run between July 21-27 and July 28-August 3, and are designed to help you get the most from your Korg Triton workstation. Sound design, sequencing and real-time control will all be covered in depth. Students will also have access to Korg's Z1 Multi-oscillator synth and the brand-new KARMA workstation. Fees are £297 a week non-residential or £405 residential.

T Bath Spa University College +44 (0)1225 875522.

alesis under new management

President of Numark acquires top hi-tech developer

Speculation has been rife of late regarding the future of leading American hi-tech and recording equipment manufacturer Alesis, following the company's recent decision to file for 'Chapter 11' protection under US bankruptcy laws. This is a move which is generally seen as providing a company that may be having cashflow problems with breathing space, in order to find a way to carry on trading without having to liquidate assets to satisfy creditors. Happlily, however, the news of the Chapter 11 filing was soon followed by the announcement of a buyout: Jack O'Donnell, President and owner of Numark Industries (a company known for audio and DJ products) has acquired all assets of Alesis Electronics and its affiliates. The two companies will function as separate business units, and we understand that Alesis's end-users shouldn't notice much difference with regard to support. We'll bring you more news as it becomes available.

bullets

Erratum

Thanks to reader Paul Kerslake, who pointed out an amusing slip of the keyboard in last month's *SOS*. In the item on Neumann's new Solution-D digital mic, we erroneously stated that the capsule featured "Neumann's new 30cm K01 double-diaphragm design". As Paul noted, this would require a specially reinforced mic stand to hold it up. The item should of course have read 30*mm* (ie. three centimetres). Our apologies to everybody for the confusion!

MMF guide to music-business management now available

The Music Managers Forum, an industry body of music-business managers, has pooled its resources and produced a guide to their trade. Aimed at musicians and budding managers alike, the MMF guide, which is published in binder format and priced at £30 or US$45 a copy, is full of advice on everything from negotiating contracts to maximising merchandising and handling publicity. An international directory of managers is also included, making it a useful reference work.

I ISBN Number 1-86074-355-2
T +44 (0)20 8749 9171.
W www.sanctuary-publishing.com
W MMF web site www.ukmmf.net

LaCie launch palm-sized CD writer

LaCie have launched a palm-sized 8x4x24x CD-RW drive, priced at £399 including VAT. Offering both USB and Firewire interfacing, the 158x152mm drive is hot-swappable and should fit into any laptop carry case. The top speeds are available only with FireWire; USB performance is 4x4x6x. The drive is bundled with cables, a universal AC adaptor, one rewritable and one recordable disc, and recording utilities: *Easy CD Creator* and *DirectCD* for Windows 95/98/NT, or *Toast* 3.8 and *DirectCD* for Mac OS. Staying with LaCie for a moment, gremlins struck our item about high-capacity hard drives last month: the LaCie 180Gb external Ultra 160 SCSI drive that was given a price of £699 actually costs £1999. We apologise to all concerned.

W www.lacie.com

turnkey

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

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

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

The Birthplace of Recording for Musicians

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EMU ESI2000

SAMPLER

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

The ESI2000 brings Emu sampling power and high spec to entry level prices. SCSI is fitted for external CD-ROM drives, computers or Iomega Zip and Jaz drives. For the ultimate convienece, you can retrofit an internal Zip drive in place of the floppy and Emu have a Turbo Zip Kit available for this purpose. Memory can be expanded up to 128MB, and the sampler as a whole is 64 voice polyphonic with 16 part multitimbrility. It includes time stretching, EQ, compression, exciter, and the ability to merge two sounds into one new sound by a digital convolution process. Editing of samples is easily accomplished with full auto and manual trunctation tools, looping, crossfades, normalisation, and standard copy, paste, delete, insert actions. Emu's famous 6 pole resonant filters (36dB/oct) are available for each voice with 19 different types.

Strictly limited stocks only!

User Friendly Interface: Very fast and well laid out. Almost all functions no more than 2 button presses away.

Trigger Samples: easily using 10 programmable front panel buttons

E Series based Synthesis, FX and Editing: Huge range including stereo phase locked time stretch, pitch shift, parametric EQ, matrix modulation, doppler/pan, compressor, enhancer and the unique Transform Multiply which merges two samples accentuating common frequencies. A great feature.

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- *Full 64 Voice Polyphony*
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Buy an ESI and we'll give you free time to grab sounds from our huge working analog museum (See Loopstation flyer for full details)

STANDARD	TURBO
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£499.99	£699.99
EMU-ESI2000	EMU-ESI2000T

ADD TO STANDARD OR TURBO ESI4000	EXPAND TO 32 MEG	EXPAND TO 64 MEG	EXPAND TO 128 MEG	250 Mb ZIP DRIVE	250 Mb ZIP CARTS	10 250 Mb ZIP CARTS	CD ROM DRIVE	PACK PRICE
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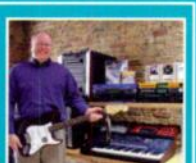
We are giving away £10,000 worth of brand new equipment! Any order you make will automatically enter you into our prize draw†, and the winner gets to select £10,000 worth of gear of their choice!

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



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

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

Turnkey Deal Guide

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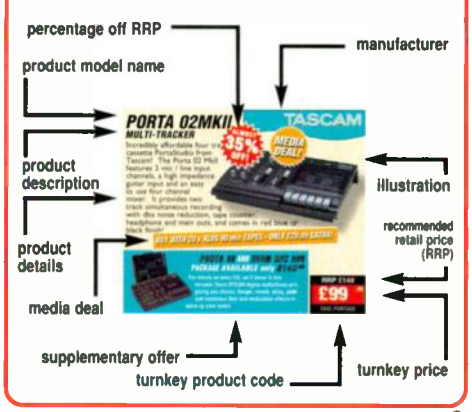

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† £10,000 as gear at RRP inc VAT. No purchase necessary for entry. Draw to be held July 2001. ‡ Subject to status/acceptance. Written conditions available on request. 0% APR for 6 months, thereafter 34.9%. § Calculated at the prevailing rate of Barclays Bank PLC. ¶ See bottom of following pages for price guarantee. ¥ Choice is subject to availability, please specify preference when ordering. Offer only applies to telephone orders for delivery made from this advertisement. Prices include 17.5% VAT and apply to current stocks only. UK mainland carriage from £3.95. Please allow 10 working days for cheque clearance. Errors & omissions excepted. In a small number of cases, some in store prices may vary as to those advertised for mail order on the internet or in press adverts such as this.

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

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

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

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MIX PLUS BUNDLE

DIGI 001 COMPUTER STUDIO

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

RRP £879
£799
DIGI-DIGI001

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

VX POCKET MkII PCMCIA SOUNDCARD

A PCMCIA soundcard to turn your laptop into a mobile recording studio, with a breakout loom for balanced XLR analogue ins and outs, and S/PDIF coaxial which allows the card to support up to 24 bit 8's exchange. Includes ASIO drivers for Mac and Windows.

RRP £507
£425

MIDISPORT 2x2 MIDI INTERFACE

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

RRP £99
£59

AUDIOWERK 8 SOUNDCARD

ALMOST 40% OFF!

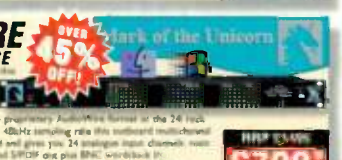
INC FREE ESI SOFT SYNTH!

Staggering deal on the superb Audiowerk 8 card for your PC or Mac, which gives two analog inputs, 8 analog outputs, and S/PDIF digi I/O as standard! 3 cards can be used in the same computer to give 24 outputs (Logic Audio Gold required). Integrates perfectly with the new Logic range and can be used with other Windows software. Turn your computer into a sophisticated digital multitrack!

RRP £399
£249
EMAG-AUDIOWER

24i + CORE AUDIO INTERFACE

OVER 45% OFF!



At a Turnkey exclusive price, the complete CORE setup brings you the M.O.T.U PCI-324 card and AudioDesk software to interface with the proprietary AudioWire format at the 24 inch unit. Operating at 44.1kHz or 48kHz sampling rate this multiband multichannel converter is an ideal front end and gives you 24 analogue input channels, main headphone stereo outs and S/PDIF digi plus BNC wordclock in/out. Converters are 24 bit with 111dB dynamic range, with the latest technology.

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£799

MOTU 2408 ALSO AVAILABLE only £899.99

OASYS V2 DSP SYNTH & FX I/O CARD

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INC 143MB OF TRITON WAVEFORM DATA

At under half price, this Oasys soundcard is more of a bargain than ever, especially with the new Version 2 software, giving you 24 bit, stereo PCM support. The soundcard holds 143MB of waveform data - almost all the Triton's internal ROM and first three expansion boards, giving over 350 samples and 546 multisamples. There are 16 new PCM-based synth plug-ins, to name just a few, features such as DSP-rate envelopes and multiple, complex, DSP-rate MIDI-synced LFOs as well as hundreds of new Programs and Mixes. The Oasys V2 offers a vast array of professional synthesis including the world of acoustic modelling derived from Korg's research into their Oasys keyboard synth. This card is capable of modelling numerous forms of synthesis as well as physical spaces, reflections and instruments and contains over 100 astonishing effect algorithms. Even better, it's fuelled by a powerful system of dedicated DSPs, leaving your main CPU free to play back audio tracks and run host-based plug-ins. The I/O architecture is based upon the 1212PCI card offering a total of 12 inputs and outputs ADAT, S/PDIF and analogue via built in 24 bit converters with very low latency. It supports all major audio and MIDI standards, for compatibility with virtually every audio and MIDI program. ASIO drivers for MacOS and Windows provide direct compatibility with Cakewalk Metro, Cubase VST, Digital Performer, Logic Audio, Vision DSP, Studio Vision Pro, and more.

We can't hold this deal forever - place your order today!

RRP £1299
£599

828 FIREWIRE INTERFACE

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

RRP £849
£795

SAC-2K ASSIGNABLE CONTROLLER

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

FACTORY DIRECT
£1249
RADI-SAC2K

CM AUTOMATION MOTORMIX

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

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ICMAL-MOTORMIX

CREAMWARE POWER SAMPLER

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MIMAN-MACMAN

MIDIMAN MIDISPORT 1X1

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

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MIDIMAN MIDISPORT 4X4

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

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MIMAN-SPORT4X4

MIDIMAN MIDISPORT 8X8

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

RRP £299
£249
MIMAN-SPORT8X8

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• 32 channel USB MIDI interface • Hot swapable and expandable with a hub • 100% compatible with OMS and FreeMIDI • Range of colours

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£69

MOTU MIDI EXPRESS XT USB

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

RRP £499
£339

MOTU MTP AV USB

• Versatile USB MIDI peripheral / interface • Timecode synchronized MTC, SMPTE, ADAT • Digital audio / video sync via computer

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RME HAMMERFALL LE

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KENTON CONTROL FREAK 16

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

RRP £299
£249

KEYFAX PHATBOY

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

RRP £149
£135

PEAVEY PC 1600X

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

RRP £399
£349

PHILLIP REES CF16

• Audiomatic hardware MIDI controller unit almost FIVE full size faders • Sixteen 60mm sliders for any MIDI CC parameters • 100 preset setups • Built in mains PSU

RRP £199
£149

ADAPTEC SCSI CARDS

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

FROM
£49

YAMAHA CRW2100

• External SCSI CDRW • 16x write speed for CDR • 10x ReWriting speed • 40x reading speed • Includes Toast Lite software • SCSI-II 50 pin connector

RRP £349
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* Our guarantee is that we will beat any genuine quote, on identical goods, from a UK or European dealer at time of order.

PRICES GUARANTEE*

See the Carillon ad on pages 88 & 89 of this issue for more information!

DEDICATED AUDIO PCs

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

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

Please call for a free 32 page full colour brochure

Call us today to transform your experience of computer music making!

VST FOUNDATION SYSTEM
- Intel Pentium III 800MHz
- 128MB 133MHz RAM
- 30GB ATA/100 7200 rpm Hard Drive
- 40x Speed CD-ROM Drive
- 15" SVGA Monitor, 8MB Video
- Windows 98, Keyboard & Mouse
- Yamaha SW1000XG Soundcard
- Audio & MIDI I/O - over 100 sounds onboard
- Cubase VST 5 Audio Sequencer

FACTORY DIRECT £1399*

VST SONGWRITER
- Intel Pentium III 800MHz
- 256MB 133MHz RAM
- 20GB ATA/100 7200 rpm Hard Drive
- 40x Speed CD-ROM Drive
- 17" SVGA Monitor, 16MB Video
- Windows 98, Keyboard & Mouse
- Yamaha SW1000XG Soundcard
- Audio & MIDI I/O - over 100 sounds onboard
- Cubase VST 5 Audio Sequencer

FACTORY DIRECT £1699*

PRO TOOLS LE WORKSTATION
- Intel Pentium III 800MHz
- 256MB 133MHz RAM
- 10GB & 30 GB ATA/100 7200 rpm HDs
- Yamaha 2100 CD Rewriter
- 17" SVGA Monitor, 16 MB Video
- Windows 98, Keyboard & Mouse
- ATI 1Transprint Control Panel
- Digidesign 24 bit Card & Interface
- 8 In, 8 Out ADAT I/O
- S/PDIF I/O
- Pro Tools 5.01 LE Software

FACTORY DIRECT £2499*

OTHER SYSTEMS INCLUDE:
- Logic Foundation System £1399
- VST Sampling System £1799
- Reason Workstation £1599
- Logic Pro Songwriter £2799
- VST Native Workstation £2899
- VST Pro Studio £3599
- Logic Pro Studio £3899
- Finale Songwriter £2899
- Sibelius Symphonic £2999
- Cool Edit Broadcast Workstation £3599
- Nuendo Workstation £4999
- ProTools MI Workstation £14999
- UltraSampler 160 £3299
- UltraSynth2 £3999
- "Bare bones" systems from £599

NEW MAYA SOUNDCARD

The AudioTrak Maya from Terratec is a PCI soundcard for Windows 98 and offers full duplex record and playback operation, with 18 bit A/D converters and 20 bit D/A converters for stereo analogue connections via phono plugs. There is also an S/PDIF digital input supporting up to 20 bit data, and a 1/4 inch jack socket for mic input. The card offers low latency and has ASIO2.0 MME, DirectSound and GigaSampler drivers. To compliment the overall partlaging style, even the Windows control panel has a rather fetching Aztec/Inca pyramid brick design!

FACTORY DIRECT £129* ATRA-MAYA

RE 2X2 MIDI ALSO AVAILABLE only £49.99

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

BRENELL PCs

CUBASE VST STARTER PACK!
- Intel Pentium III 733MHz
- 64 Mb 100 MHz RAM
- 13 Gb ATA66 HD
- 52x speed CD-ROM drive
- 15" SVGA display
- Windows 98 CD, keyboard & mouse
- Cubase VST
- Midiman DMAN PCI Audio card
- Top Quality GM Synthesiser
- 1x1 MIDI interface
- Installed and ready to go!

RRP £1479 £899* PACKAGE DEAL

MT4 MIDI INTERFACE

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

RRP £159 £119* EMAG-MT4

MONA 24/96 AUDIO INTERFACE

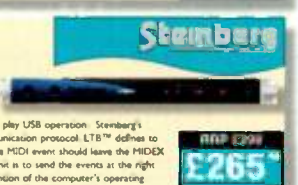
PCI soundcard and 1U rack audio interface breakout box with four combination XLR mic inputs and TRS line jacks. Converters are 24 bit 96kHz with wide dynamic range and low distortion, and the built in preamps offer up to 60dB gain and 48V phantom powering. The rear panel has six analogue outputs doubled on XLRs and phonos. Digital I/O supports up to 48kHz via S/PDIF or ADAT, so the 96kHz mode inbetween the Mona's own A/D and D/A converters and the computer record.ng software. It does include BNC wordclock for accurate transfers under an external master clock, and four channels of LED metering and includes a special version of Cool Edit Pro.

Turnkey Exclusive - buy now while stocks last!!

RRP £799 £499* EGNT-MONA

MIDEX 8 USB MIDI INTERFACE

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



RRP £299 £265* EMI-MIDEX

WAMI BOX PCMCIA AUDIO INTERFACE

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

RRP £429 £365* EGOS-WAMIBOX

US428 INTERFACE

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

RRP £449 £389* TASC-US428

AMT8 USB MIDI INTERFACE

MIDI interface with 8 MIDI in sockets and 8 MIDI out sockets giving you 128 channels to and from any computer with a USB port and suitable application. The AMT8 is similar to the Unitor 8 above and also has SMPTE synchronisation but does not have the 9 pin ADAT sync.

RRP £329 £289* EMAG-AMT8

SW1000XG SOUNDCARD

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

RRP £449 £339* YAMAHA-SW1000XG

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

RRP £529 £365*

EGO-SYS U2A
- Full duplex 2 in 2 out USB audio interface
- Up to 24 bit 48kHz data rate for I/O converters
- S/PDIF optical & coaxial
- Simultaneous analogue and digital monitoring
- Includes 2m USB cable

RRP £199*

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

RRP £819 £525*

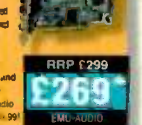
EMAGIC EMI 2/6
- Portable multichannel USB audio interface
- 2 analog inputs
- 6 analog outputs
- 24 bit converters
- Windows drivers
- Mac under preparation

RRP £399*

EMAGIC UNITOR 8
- 8x8 serial port MIDI interface
- 128 MIDI channels
- SMPTE to MIDI sync
- Mac or PC

OVER 30% OFF! RRP £575 £399* EMAG-UNITOR8

EMU E-CARD
- Card only has balanced stereo analogue (Cubase SPDIF coaxial digital)
- 64 voice sampling
- Real-time DSP effects
- Includes Wavelab LE and Cubasis software free
- Also available with audio expansion bay only £99.99



RRP £299 £269* EMU-AUDIO

MARIAN MARC 4 MIDI
- PCI soundcard with four low latency analogue I/O
- 24bit 96kHz converters
- 32 MIDI channels I/O via breakout cable with four 5 pin DIN MIDI sockets

RRP £229*

MIDIMAN DELTA 44
- 24 bit/96 kHz full duplex PCI card + breakout box
- 4x balanced TRS jack I/O
- Includes driver software
- Up to 103dB S/N ratio.
- W98, ME, 2k, Mac & Linux

RRP £249 £195*

MIDIMAN DELTA 66
- 4 balanced analogue I/O
- S/PDIF coaxial I/O
- 24 bit 96kHz converters and supported data rates
- PCI card + small external breakout box with cable

RRP £349 £275* MMAN-DELTA66

MIDIMAN DELTA 1010
- 8 balanced analogue I/O
- S/PDIF coaxial I/O
- MIDI in and out (16 ch)
- Wordclock I/O on BNC
- 24 bit/96kHz supported
- PCI card + 1U breakout
- W98, ME, 2k, Mac & Linux

RRP £549 £499* MMAN-DELTA1010

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

RRP £179 £169*

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

OVER 65% OFF! RRP £179 £59* PASXALE

ROLAND UA-30
- External USB audio interface for PC
- 2 ch analogue I/O on phonos with mic / line level switching
- 2ch digital I/O via S/PDIF optical or coaxial
- Hot swappable
- Built in headphone socket

R R P £199*

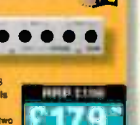
ROLAND U8
- USB hardware controller including compatible versions of Cubase VST and Cakewalk Home Studio
- 8 channel 2D bit A/D
- Stereo S/PDIF digital I/O
- 8 faders, data wheel, transport controls, etc

RRP £399 £349*

STEINBERG NU CARD
- 3x ADAT digital I/O (24 ch)
- ADAT 9 pin D-sub Sync In
- S/PDIF stereo digital I/O
- BNC Word clock I/O
- Breakout cable for coaxial S/PDIF operation
- 130MB/s full duplex transfer rate for 52 channels

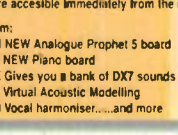
RRP £499 £399*

TERRATEC EWS88MT
- Soundcard + external A/D and D/A converter box
- Handles up to 24bit 96kHz
- 8 analogue in/out
- S/PDIF coax I/O, + MIDI
- Includes ASIO2 and WIN 95/98/NT drivers.



RRP £399 £319*

YAMAHA DS2416
- Including Free AT16 Dual ADAT I/O card
- Mixing capabilities of the 02R on a single card!
- Drive bay option for multiple analogue I/o
- Now fully VST24 & Logic Platinum compatible
- AX44 4in/4out analogue expansion also available at £109.99



RRP £599 £475*

YAMAHA UX256
- MIDI interface with 128 in and 128 out channels
- High speed USB port,
- Six MIDI sockets and two serial ports for 256 ch
- Driver software included

RRP £199 £179*

YAMAHA SW1000XG DAUGHTERBOARDS

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

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

FROM £99* YAMA-PLGXBX

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CAKEWALK

SO-NAR SO GOOD!

SONAR
MULTITRACK WORKSTATION

Cakewalk have reworked and revised their Pro Audio 9.0 package almost beyond recognition, to create this much improved platform with may extra features. Existing users can upgrade for just £89.95!!!

Sonar integrates everything together into one software package that can serve as a multitrack recorder (with a theoretically unlimited maximum number of tracks in the software), an audio editor, virtual mixer, MIDI sequencer and host to DXi software synthesizers - it even comes supplied with built in soft synths from Applied Acoustics Systems, Audio Simulation, EDIROL, and Live Update. Sonar will also run DirectX plugin effects, and offers live input monitoring of real-time effects, with low latency performance when working with WDM compatible soundcards supported by Windows 98SE and 2000. Cakewalk claim an unlimited number of realtime audio effects may be patched in, unlike the previous restriction of 256 with Pro Audio 9. Sonar further provides advanced audio sample loop construction tools to speed audio editing of drumloops and rhythmic phrases. The package is 24 bit 96kHz compatible, and has extensive peak and RMS metering options with animated retro style round VUs, including the ability to meter before and after effects blocks to see if they're clipping. Video and SMPTE sync is possible and AVI movies can be imported to run with audio tracks. The extensive graphical editing is all non destructive, and the MIDI tracks can be displayed in full musical notation with guitar TAB and chord symbols, and obviously you can automate parameters via MIDI at the native 960 ppqn resolution. Sonar supports dual monitor displays, multiprocessors, and WAV, AIFF, Acid loops, MPEG, MP3, SND plus other formats and can encode MP3 from WAV.

Call us for the low down on Sonar!!!

RRP £299
£249
TWEL-SONAR

ANTARES AUTOTUNE

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

FROM **£89** ANTA-AUTO

CAKEWALK PRO AUDIO DELUX V9

OVER 50% OFF!

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

RRP £399 **£199**

CAKEWALK PYRO

NEW

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

RRP **£39** CAKE-PYRO

CODA FINALE 2000

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

RRP **£499** CODA-FI2PC

GMEDIA M-TRON NEW

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

RRP **£49** GMED-MTRON

DUY SPIDER TDM

- 48 separate interface that can be user customized into any routing for DSP
- 250 presets as standard
- Comp, reverb, EQ, de-ess, FX, synths, noise gates, 30 effects, de-esser etc.
- Read only Spider only £349.99!!

RRP **£799**

DUY ANALOG TDM

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

RRP **£499** DUY-ANALTDM

DUY GLOBAL

- TDM plug-in bundle
- RedSpider: over 220 FX!!
- DaD Valve simulator.
- DaD Analog tape emulator
- DUY Sheen: mastering 3 band wonderfulness
- Max DUY: sound level normalizer
- DUY Wide stereo Imager

RRP **£999** DUY-GLOBALTDM

EMAGIC EVP88

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

RRP **£169** EMAG-EVP88

MOTU DIGITAL PERFORMER

- Integrated MIDI sequencing with Pro Tools recording
- Supports TDM plug-ins
- Polar loop recording
- Up to 2 billion ppqn!!!
- Over 90 effects included
- Sample accurate editing

RRP **£599**

EMAGIC ES1

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

RRP £59 **£49** EM-ES1

EMAGIC WAVEBURNER

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

RRP **£149**

EMAGIC SOUND DIVER

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

RRP £199 **£169** EM-SOUNDIVER

NATIVE INST PRO 52

- Software synth model of Sequential Circuits Prophet 5 keyboard
- VST instrument
- Almost 1000 presets
- Full parameter control
- Up to 48 notes polyphony

RRP £149 **£119** NI-PRO52

NEMESYS GIGASAMPLER FULL VERSION

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

FACTORY DIRECT **£199** NEME-GIGAPC

NEMESYS GIGASTUDIO

- The god of software samplers
- Patches up to 4GB size!
- 160 note polyphonic
- 96 part multitimbral
- Built in studio effects and mixing
- Realism unparalleled
- 160 note polyphonic giga studio also available for only £249.99

FACTORY DIRECT **£269** NEME-GIGA96PC

NEMESYS GIGASAMPLER LE VERSION

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

FACTORY DIRECT **£79** NEME-GIGAPCLE

PASSPORT MASTER TRACKS PRO

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

RRP **£299** **£19** PASS-MTRAXPRO

PG MUSIC BAND-IN-A-BOX

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

RRP **£89** PG-MU-BANDPC

PROPELLERHEADS REBIRTH RB-338

- Two TB303s
- One TR808
- One TR606
- All on your Mac or PC!
- Edit on screen or via MIDI controllers

RRP £149 **£119** STEI-RB338

NEW EVERPACK

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

5 PLUG INS FOR UNDER £300!

All five plugins in all of the above formats for an incredible £DM Inc VAT (VST, RTAS, Audiosuite, MAS, Premiere not for Z-Room)

RRP £399 **£299** DUY-EVERPACK

EXS24 SOFTWARE SAMPLER

emagic

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

RRP £299 **£235** EMAG-EXS24

LOGIC SEQUENCER RANGE

emagic

Range sporting DirectX / VST plug-in compatibility

LOGIC PLATINUM - Up to 128 audio tracks, 31 included real-time DSP effects, support of multiple high-end hardware.
RRP £549 OUR PRICE £419.99! EMAG-LOGPL MAPC

LOGIC GOLD - Up to 96 audio tracks, real-time DSP effects, supports Audiowerk 8 and Korg 1212
RRP £399 OUR PRICE £299.99! EMAG-LOGGOL MAPC

LOGIC SILVER - Up to 24 audio tracks, 3 effects busses.
RRP £199 OUR PRICE £159.99! EMAG-LOGSIL MAPC

FROM **£159**

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

REAKTOR SOUND GENERATION MACHINE

Future Music Readers Voted Reaktor Best Software of the year

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

Version 2.3

RRP £249 **£229** NATI-REAKTOR

B4 SOFTWARE ORGAN

Native Instruments' software synth models the famous Hammond B3 tonewheel organ, including its valve amplification and rotary speaker cabinet, with 9 drawbars for each manual keyboard and 6 for pedals. Parameters such as key click, percussion, harmonic foldback and loudness robbing add a realistic touch to your chops.

RRP £129 **£119** NATI-B4

BUY DYNAMO + B4 TOGETHER FOR ONLY £199

DYNAMO EFFORTLESS REAKTOR-ING

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

RRP £129 **£99** NATI-DYNAMPC

BATTERY SOFT SAMPLER

32 bit sampler for drums, including 20 kits and 54 instruments with 128 velocity layers, tuning, volume envelope, pitch envelope, bit reduction, stepper, FX Loop and 6 modulation inputs per instrument. Standalone or plug-in operation.

RRP £129 **£99** NATI-BATTERY

NEW SPEKTRAL DELAY EFFECTS PLUG-IN

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

RRP £129 **£99** NATI-SPEKTRAL

TRAKTOR DJ PRODUCTION

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

RRP £129 **£99** NATI-TRAKTOR

FM7 FM SOFT SYNTHESIZER

Native Instruments have produced a software synth that can recreate the sounds of the classic Yamaha DX series and TX series, and is able to read any of their program data. It adds extra distortion and filtering capabilities and a highly graphic user interface.

RRP £179 **£129** NATI-FM7

ABSYNTH SOFT SYNTH

A more general purpose "abstract synth" plugin to model subtractive synthesis, FM or ring Modulation using a modular approach with numerous filters, waveshapers and effects as building blocks. Up to 6 oscillators, and graphic wave drawing.

RRP £169 **£129** NATI-ABSYNTH

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PRICES GUARANTEE*

midiMAN-IA!

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

AUDIOPHILE SOUNDCARD

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

RRP £179
£169.99
MMAN-AUDIOFILE

MIDI SPORT 2x2 MIDI INTERFACE

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

RRP £99
£59.99
MMAN-SPORT2X2

1X1 ALSO AVAILABLE only £49.99
4X4 ALSO AVAILABLE only £119.99
8X8 ALSO AVAILABLE only £249.99

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
£195.99
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.

RRP £649
£499.99
MMAN-DELTA1010

OMNI I/O ALSO AVAILABLE only £189.99 · expaasion box for Delta 44/66 featuring 4 balanced imputs (2 with phantom powered mic preamps) 4 stereo ins, aux send + return + dual monitor outs.

NEW TASSMAN ACOUSTIC MODELLING V2

Applied Acoustics bring a breath of fresh air into the software synth market. Their scientific expertise has been harnessed to create a stunning collection of accurately modelled acoustic objects such as plates, strings, beams, tubes, mallets and reeds, all of various sizes and materials. You have complete control over all aspects of the models and can build completely unknown instruments with intuitive ease. Comes packed with ready made instruments including models of analogue synths andas well as real instruments.

New Version 2 with even lower latency, VSTi & DXi compatibility!

FACTORY DIRECT
£269.99
AACO-TASSMAN

NEW REASON SOFTWARE

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

RRP £299
£275
STEI-REASON

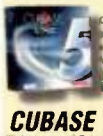
NEW STORM VIRTUAL STUDIO V1.5

A revolutionary completely modular virtual studio. Storm gives you a whole rack of professional composition tools including analogue synths, twin decks for mixing and scratching samples, samplers, beat boxes and with new modules downloadable off the internet possibilities are endless. Wrap it all up with real time effects and you have a fully configurable virtual studio. Use it stand alone, or as a VST instrument.

New version 1.5 allows up to 12 modules simultaneously & new polyphonic synth!

FACTORY DIRECT
£99.99

CUBASE VST V5



Cubase V5 is the affordable industry standard platform for music combining audio recording, effects and MIDI sequencing. Up to 72 channels of 16 or 24 bit 48kHz, with four insert effects and eight aux sends per channel plus 8 Global & 4 master insert effects. VST enables realtime effects and plug-ins. Huge mixer and MIDI automation etc.

£239.99

CUBASE VST SCORE

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

RRP £499
£365.99
STEI-CUBPC

CUBASE VST 32

Improving Cubase to match to power of today's professional audio workstations, Steinberg have added support for 32 bit audio files and processing and up to 128 simultaneous channels of audio. The professional MIDI and music notation capabilities are retained, and VST/32 also brings the very useful inclusion of Apogee UV22 encoding for your final 16 bit master, so you don't have to leave the software domain. It also features Rocket network integration so you can connect on-line to other Rocket powered studios and transfer audio files and even full projects with ease across the whole world!

RRP £599
£495.99
STEI-CUBAUDPC

PRODUCER PAC

The Producer Pack Logic gives you the tremendous power of VST32 together with Wavelab 2, their stereo audio file editor for total sound manipulation, plus two fantastic plugins - the Steinberg Freeeter which is a phase linear 30 band stereo graphic equaliser with RTA spectral analysis, learning mode to derive the difference between any two EQ signatures by listening to the files, and crossfade morphing between curves. Also you get Waves Renaissance Compressor, an excellent well designed plug-in to emulate the classic LA opto-electric leveling amplifiers.

RRP £799
£575.99
STEI-PRODPC

SONIC WORX 2

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

FACTORY DIRECT
£299.99
PROS-WSTUDIO

POWER BUNDLE

Plug-in bundle containing SonicWorx Studio 2 (see above) plus Spectrum Tone Analyser, Vocoder, pitch / time, ring mod, chorus, distortion, maximizers, audio morphing, convolution, telephone simulator, transient shaper, wow / flutter, and weird ones like Drumloop Designer, Atmosphere Designer, Tubulator and Turbulence.

FACTORY DIRECT
£399.99
PROS-POWERBUN

MAGENTA

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

FACTORY DIRECT
£99.99
STEI-MAGENTA

ORANGE VOCODER VST PLUG-IN

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

FACTORY DIRECT
£99.99
PRO-ORANGE

VST BUNDLE VST PLUG-IN PACK

Package of four VST plug-ins, including Ambisonia, a 3D placement panner for surround sound effects, Dynasone, a mastering mix normaliser and multiband compression plug-in, Roomalistor, an easy to use reverb with graphic control interface, and VoxCiser - a full-spectrum vocal channel strip with noise gate, equaliser, compressor, de-esser, exciter and valve saturation effect.

FACTORY DIRECT
£249.99
PROS-VSTBUN

PROPELLERHEADS RECYCLE

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

RRP £149
£139.99
STEI-RECYCLE

SONIC FOUNDRY ACID

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

RRP £349
£POA
ACID

SONIC FOUNDRY ACID MUSIC

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

RRP £99
£POA
SF-ACIDMUSPRO

SONIC FOUNDRY SOUND FORGE 4.5

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

RRP £399
£POA
SF-SFORGE

STEINBERG GRM TOOLS 2

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

RRP
£129.99
STEI-GRMTOO

STEINBERG CLEAN!

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

RRP
£99.99
STEI-CLEAN

SIBELIUS TOP-END NOTATION

- The leading notation package, now on PC
- Up to 64 staves
- Ultra fast screen redraws
- Intelligent MIDI playback
- Superb user interface
- New low price!

RRP £595
£569.99
SIBE-FULLPC

STEINBERG LM4

- Brand new VST instrument for Cubase
- Full on software drum machine
- Tons of 24bit drum samples included
- Sounds fantastic

RRP £99
£85.99
STEI-LM4

STEINBERG HALION

- VST software sampler ideal for Cubase VST
- Up to 32 bit samples
- Graphic interface for loop editor, keymap etc.
- 4th order filters
- Sample accurate groove

RRP
£249
STEI-HALION

STEINBERG NUENDO

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

FROM
£995
STEI-NUENDO

STEINBERG PPG

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

RRP £179
£129.99
STEI-PPG

STEINBERG WALDORF ATTACK

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

RRP
£129.99
WALD-ATTACK

STEINBERG STUDIO PACK

- Contains Cubase VST audio + MIDI workstation
- Contains Wavelab 3, full hi res stereo audio editor
- Contains PCI soundcard with 8ch ADAT I/O plus 2ch AES/EBU, S/PDIF and 24 bit analogue AD & DA

RRP £599
£499.99
STEI-STUDPKPC

STEINBERG WAVELAB V3

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

RRP £399
£299.99
STEI-WLABPL

STEINBERG MASTERING EDITION NEW

- Complete mastering plug-in solution
- Loudness Maximizer
- Spectralizer
- FreeFilter
- Compressor, Phasescope and Spectrograph

RRP
£339.99
STEI-MASTERDU

STEINBERG CUBASIS VST

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

RRP £99
£85.99
STEI-CUBASIS

SYNTRILIUM COOL EDIT PRO

- Still the best audio DAW on the planet bar none!
- 64 audio tracks of total sample accurate editing
- Countless built in effects and DSP tools superior to most specialist plugins
- Up to 32 bit 192 kHz
- Fingerprint denoising, convolution, FIR EQ etc.

RRP £299
£269.99
SYLN-COOLEDIT

TC WORKS NATIVE BUNDLE

- Professional class plug-in pack
- Contains reverb, EQ and compression
- Easy Interface
- For any DirectX program

RRP
£299.99
STEI-NATBUNPC

VOYETRA DISCOVERING MUSIC

- Interactive CDROM
- Recording studio with 5 piece backing band
- Notation printing
- Music theory and history tutor

RRP £70
£29.99
VOYE-DISCOVE

WAVES GOLD TDM BUNDLE

- The ultimate collection of all current plugins from the supreme experts.
- All the famous EQs, compressors, reverbs, stereo imagers that have built Waves' reputation.
- New PAZ analyzer and Enigma phaser modules

RRP
£2299.99
WAVE-GOLD2000

"I have always found your staff courteous, knowledgeable and helpful"
G.B. (Bucks)

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EUROPE'S LOWEST

SPIRIT BY SOUNDCRAFT — GET IN THE MIX!

FOLIO NOTEPAD
10 INPUT UTILITY MIXER

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

RRP £149 **£109**

M SERIES MIXERS

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

FROM **£499**

FOLIO F1
14 & 16 INPUT STEREO MIXERS

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

RRP £379 **£225**
SCRA-FOLF1/14,16

SPIRIT FOLIO SX
16:4 PORTABLE MIXER

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

RRP £479 **£329**
SCRA-FOLSX

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

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

FROM **£339**

DPS16 STUDIO
DIGITAL PERSONAL STUDIO

AKAI — OVER 35% OFF!

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

RRP £1699 **£1095**

BR8
PORTABLE 8 TRACK STUDIO

BOSS

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

RRP £599 **£495**
BOSS-BR8

VF-16
HARD DISK RECORDER

FOSTEX

Fostex's compact 16 track hard disk recorder with 8 virtual tracks, offers 16 track simultaneous recording via ADAT optical I/O or its analogue inputs. The complementary 16 channel digital mixer with 3 band EQ, 2 aux sends and 2 external effects busses. The VF16 can import or export WAV files to a computer for editing, and uses SCSI for backup. The transport can be synced to MTC. The VF16 is very user friendly and ideal for home recording.

RRP £1099 **£849**

D1600
HARD DISK RECORDER

Roland

Integrated hard disk recorder with 20GB drive and 24 channel 8 bus digital mixer with 3 band EQ and sweepable mid on every channel. The D1600 can record and playback 16 tracks at 16 bit 44.1kHz or 8 tracks at 24 bit 44.1kHz although with 8 virtual tracks per track you could have as many as 128 tracks for your song. It has stereo S/PDIF digital in and out and a 5.25 inch bay to support an optional CDRW drive which it can use to burn backup data or finished audio mixdowns. Features onboard time compression / expansion, normalize, fade, TouchView display and snapshot mix recall.

RRP £1399 **£1299**

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

D8 DIGITAL WORKSTATION

KORG — OVER 40% OFF!

Incredible end of line clearance deal exclusive to Turnkey on this superb 8 track hard disk recorder / mixer. The D8 is an ideal self contained workstation for the small home studio records up to 8 tracks onto its built in SCSI drive, has S/PDIF digital I/O and SCSI interface as standard, plus a whole range of built in digital effects ideal for guitar and vocals, including reverb, chorus etc, and even a guitar level input to do away with DI boxes.
Very limited stocks only - call now to avoid disappointment.

RRP £849 **£485**

D16 HARD DISK 16 TRACK

ALMOST 45% OFF!

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

RRP £1099 **£829**

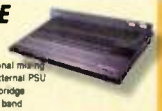
CD-RW700
COMPACT DISC RECORDER

TASCAM

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

RRP £499 **£399**
TASC-CDRW700

MACKIE 24/8



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

RRP £2949 **£POA**

MACKIE CFX12

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

RRP £599 **£499**

MACKIE CFX20

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

RRP £921 **£899**

MACKIE 1202VLZ PRO

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

RRP £329 **£POA**

MACKIE 1402VLZ PRO

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

RRP £481 **£POA**

MACKIE 1604VLZ PRO

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

RRP £581 **£POA**

MACKIE 1642VLZ PRO

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

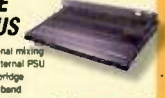
RRP £749 **£699**

MACKIE D8B

- 56:8:2 digital console with integrated meterbridge
- 24 analogue + 24 digital ins via expansion cards
- Dynamics, 4 band EQ, 12 aux sends, surround pan
- Full dynamic automation, UV22 encoding
- Optional effects plug-ins eg. Antares AutoTune
- NB price is for B Stock model

RRP £7499 **£6499**

MACKIE 32:8 BUS



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

RRP £3801 **£POA**

SOUNDCRAFT GHOST 24LE

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

RRP £2999 **£POA**

SOUNDCRAFT GHOST 32LE

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

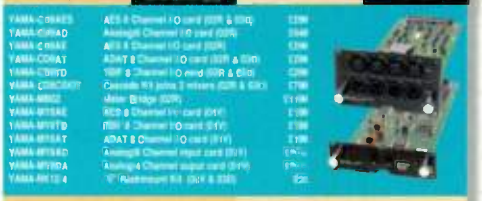
RRP £3499 **£POA**

YAMAHA 03D

OVER 40% OFF!

- 4 Band fully parametric eq & dynamics on each ch
- Fully automated digital mixer
- 26 ins,4 busses,4 auxes
- 2 Built in stereo effects processors
- Motorized faders

RRP £2999 **£1799**



YAMA-CO8AES	AES/EBU 8 Channel I/O card (SDIF & SMUX)	£POA
YAMA-CO8AD	Analogue Channel I/O card (SDIF)	£POA
YAMA-CO8AE	AES/EBU 8 Channel I/O card (SDIF)	£POA
YAMA-CO8AT	ADAT 8 Channel I/O card (SDIF & SMUX)	£POA
YAMA-CO8TD	TDIF 8 Channel I/O card (SDIF & SMUX)	£POA
YAMA-CO8CRDST	Cascade Kit joins 2 mixers (SDIF & SMUX)	£POA
YAMA-MR8S	Mini Bridge (SDIF)	£149
YAMA-MY8AE	AES/EBU 8 Channel I/O card (SDIF)	£POA
YAMA-MY8TD	TDIF 8 Channel I/O card (SDIF)	£POA
YAMA-MY8AT	ADAT 8 Channel I/O card (SDIF)	£POA
YAMA-MY8AD	Analogue Channel input card (SDIF)	£POA
YAMA-MY8DA	Analogue 4 Channel output card (SDIF)	£POA
YAMA-MR12S4	19" Rackmount Kit (SDIF & SMUX)	£25

AKAI DPS12i

- 12 track non-linear 16 bit hard disk recorder
- 10Gb drive = 160 minutes
- Integrated mixer with EQ, timestretching, graphic editing and optional FX
- SCSI backup or CDRW

RRP £999 **£699**

FOSTEX D160

- 16 track 16 bit MD recorder
- SCSI interface, ADAT digi i/o
- Non-linear edits, 8 virtual tracks

RRP £1999 **£1649**

FOSTEX VF08

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

RRP £549 **£499**
FOST-VF08

HHB CDR830 BURN IT

- More affordable version of popular CDR850
- Uses S/PDIF rather than AES/EBU and phono instead of balanced XLRs
- Includes SRC and 24 bit converters plus CD-TEXT

RRP £499 **£389**
HHB-CDR830

HHB CDR 850

MEDIA DEAL!

- Use regular or rewritable dis cs (pro or consumer)
- Balanced analog I/O
- AES/EBU digital input
- Get 100s CDR74 for only £69.99 extra!

RRP £749 **£539**

MACKIE HDR24/96

- 24 track 24 bit hard disk recorder
- 96kHz coming in V2
- 20GB UDMA66 drive
- Three 8ch I/O card slots for digital or analogue
- Graphic editing via built in proprietary software - just add keyboard & monitor

RRP £3299 **£POA**

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PRICES GUARANTEE*

marantz

EZ CD!

NEW **CDR770 PRO CDRW RECORDER**

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

£349*

CDR631 PRO CDRW RECORDER

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

£529*

CD4000P
CD PLAYER

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

£149*

SD4050P
TWIN CASSETTE

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

£199*

CDR500
TWIN DECK CD RECORDER

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

£549*

VS-1880GX
HARD DISK MULTITRACKER

Roland

OVER 40% OFF!

RRP £2199

£1299*

ROLA-VS1880GX

We have secured a strictly limited supply of Roland's top of the range hard disk recorder at an incredible price! The VS-1880GX has an integrated 28.2 digital mixer which can record 8 tracks simultaneously and playback up to 18. It can store up to 288 virtual tracks. The 12GB hard drive would store the equivalent of 135 minutes of uncompressed 18 track, but the Roland engineers did yet further by its various degrees of data compression, offering longer times with higher modes of recording quality for its 24 bit converters. Digital I/O is two channel S/PDIF and the VS1880 included EQ, effects and graphic editing facilities. *Buy NOW - before it's too late!!*

788 HD PORTASTUDIO

TASCAM

RRP £899

£749*

TASC-788

Tascam's new 8 track Hard Disk recorder with a 7.5GB drive offers either 16 or 24 bit recording and provides 3 band EQ with parametric mid, waveform display on the screen, 250 virtual tracks per song, 999 levels of undo, MMC/MTC sync and a huge range of onboard effects. There is a built in digital time-stretcher which allows you to audition tracks in slow motion playback at 50%, 65% or 85% normal speed, without changing pitch. SCSI backup to CDR is possible under the 788's control and the mixer includes S/PDIF master stereo I/O.

AW4416
HARD DISC RECORDER

YAMAHA

Integrated non-linear hard disk recorder and 24:8:2 digital mixer with EQ, dynamics, delay, effects, motorized faders, automation and S/PDIF I/O as standard. The recorder's up to 24 bit 48kHz linear, with 16 track real-time simultaneous playback from 120 physical tracks, and an optional internal hard drive up to 64GB may be fitted. Features include time stretch, pitch shift, 8 grid sampler, 16 track sequencer, SCSI interface, serial multiple input and optional onboard CDRW.

£2295*

01V DIGITAL MIXER

YAMAHA

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

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

RRP £POA

£POA

CDR1000
PRO CD RECORDER

YAMAHA

ALMOST 50% OFF!

Another Turnkey scoop! At last someone has thought to include Apogee UV22 encoding in a professional CD recorder! Yamaha's CDR1000 is a 2U rack CDRW machine with balanced XLRs for analogue in and out, and digital I/O on both AES/EBU and S/PDIF coaxial, plus a wordclock BNC input so that you can sync the CD player's digital output when playing it into your digital mixer, for example. The functionality is fairly straightforward, its like most standalone CDRW machines, with fader, peak hold metering down to -60dBFS, variable audio delay, sync record and an infrared remote control. So, what exactly is the Apogee UV22 process...? It is claimed that over 80% of American mastering studios use UV22 to create their CDs, as it is recognised as one of the best wordlength reduction processes for generating a smooth 16 bit data stream from any typical 24 bit source that may be fed in via AES/EBU. Simply truncating the signal would result in harsh audible quantisation distortion, so most CD recorders apply flat or spectrally shaped dither noise to randomise the quantisation errors and produce an audibly smoother, dissolve like the limit of resolution, at the expense of a slightly worse signal to noise ratio. Apogee UV22 however, toggles the lowest bits on and off in cycles at 22.05kHz carrier frequency, whose duty cycle is modulated by the waveform of bits 17 to 24, which leaves an impression of these finer details embedded in the 16 bit signal, and performs the necessary randomization of the quantisation errors, whilst revealing itself inaudible at 22kHz carrier frequency. This improvement is startling on very low level material, going far greater clarity than you expect from 16 bit, and much less hiss than conventional dithering methods. Definitely worth the price! Limited ... [illegible]

£599*

02R DIGITAL MIXER

YAMAHA

RRP £5499

£3199*

YAMA-02R

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

"The staff were professional, friendly, polite, approachable, humourous, knowledgeable and human" D.H. (London)

FOSTEX X12

- Cassette four track
- Input level meter
- Volume and pan for each channel
- 4.76 cm/s tape speed
- Phono line ins and jack for MI guitar / mic sources
- 3 digit tape counter

RRP £119*

FOST-X12

KORG D12

NEW

- Integrated mixer and 6GB hard disk recorder
- Direct uncompressed 20bit 4 in tracks (4 record) 16bit 12 tracks (4 record)
- 3 band EQ and 19 effects

RRP £799*

PANASONIC SV3800

MEDIA DEAL!

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

RRP £799*

ROLAND VS2480

- 16 track 24 bit 96kHz HD recorder with 21 track playback at 48kHz
- Built in CDR drive
- Automated digital mixer
- Onboard editing & effects
- 8 XLR mic inputs
- Vocal phrase sampler

£2699*

SONY MZR-700

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

RRP £199*

SONY MZR-900

- MiniDisc recorder walkman
- New blue colour and LCD status oscilloscope
- S/PDIF digital input
- Sample rate converter
- 40 second anti-shock

£249*

TASCAM DA20 MKII

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

£POA

TASCAM DA302

MEDIA DEAL!

- Twin DAT recorder
- Both sides record separately, SCMS free
- AES/EBU and S/PDIF
- High speed dubbing

£899*

TASCAM CDRW-2000

- True professional CDRW recorder from Tascam
- Full I/O on AES/EBU, S/PDIF optical & coaxial, balanced XLR and phono
- BNC wordclock input
- Handles 80 minute discs

£659*

TASCAM DA45HR

MEDIA DEAL!

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

£1099*

TASCAM DAP1

MEDIA DEAL!

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

£949*

TASCAM 202 MKIII

- 3U rackmount double cassette deck
- Records on BOTH decks
- High speed copying
- Allows safety duplicate recording from source
- Or records two sources

£269*

TASCAM MD301 Mk2

ALMOST 60% OFF!

- 2U rack MiniDisc recorder
- Coaxial S/PDIF digital I/O
- Sample rate converter accepts 48 to 32kHz
- Infrared remote control
- Analogue I/O on phonos

RRP £295*

TASCAM MX-2424

- 24 track 24 bit HD mixer/rec, 40GB SCSI drive
- Supports 24-ch I/O simultaneous digital + analog
- Jog/shuttle wheel and AES/EBU & S/PDIF standard
- Now has Version 2 software for 96kHz recording
- Ethernet based GUI free

£POA

TASCAM PORTA 02 Mk2

MEDIA DEAL!

- Cassette four track
- dbx noise reduction
- Mixer with mic inputs
- 2 band EQ
- Pitch varispeed control

£99*

TASCAM 424 MkIII

- Big blue Portastudio!
- 4 track cassette with dbx noise reduction
- 6 channel mic / line mixer
- 3 band sweep mid EQ
- Two aux sends, varispeed
- Backlit display & meters

£289*

TASCAM 414 MkII

OVER 40% OFF!

- 4 track tape Portastudio
- 2 band EQ & effects send
- Noise reduction by dbx
- Double speed for higher audio bandwidth
- 4 trk simultaneous record

RRP £399*

£199*

YAMAHA MD4S

MEDIA DEAL!

- MiniDisc 4 track
- 5 ch mixer, 2 mic inputs, 3 band EQ, 2 aux sends
- Cue from 22x to half speed
- 37 minutes of 4 track

RRP £599

£449*

YAMA-MD4S

YAMAHA MD8S

MEDIA DEAL!

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

RRP £999

£749*

YAMA-MD8S

YAMAHA MT400

MEDIA DEAL!

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

£199*

Soundcraft DRAWMER MACKIE Roland SONY TASCAM fostex digitech

EUROPE'S LOWEST

Focusrite MASTER OF ALL!

MIXMASTER COMPRESSOR

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

RRP £795 **£695**

COMPOUNDER COMPRESSOR

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

RRP £495 **£385**

VOICEMASTER CHANNEL STRIP

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

RRP £399 **£329**

PENTA COMPRESSOR

2U rack stereo compressor with preset buttons giving quick automatic control settups optimised for most sources (kick, snare, ambient, loop, bass guitar, synth bass, percussion, acoustic picked, acoustic strum, electric guitar, piano, keyboards, vocals, crunch, mix pump & limit) or full manual action with knobs for makeup gain, ratio, attack & release. Front panel XLR mic input, high pass filter, polarity, 48V phantom power and high impedance line in. "Tube Tran" valve warmth simulator effect plus output stereo width control ranging from mono to wide. LED bargraph level meters and optional A/D conversion.

RRP £399 **£299**

DIGITAL PROBLEM SOLVERS

FRIEND-CHIP

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

FriendChip's current range includes:

DT-30 PRO-CON S/PDIF control + + AES/EBU bidirectional 24bit SCMS device £129.99
DT-31 PRO-CON S/PDIF optical + + AES/EBU bidirectional 24bit SCMS device £129.99
DT-41 COPY-CON 4 mic 2 S/PDIF mixer, 4 in 2 out coaxial inc. one optical, SCMS device £129.99
DT-60 SYNC-1 24bit S/PDIF coaxial sample rate converter (25 - 55kHz) with wordclock in/out £179.99
DT-61 SYNC-1SR 24bit AES/EBU sample rate converter (25 - 55kHz) with wordclock in/out £229.99
DT-74 D DT-74 Super Clock Driver - DigiDesign 1024 Superclock + + normal word clock, 2 mic 2 outs £179.99
DT-82 Audio Clock - generates 44kHz AES/EBU or S/PDIF output from source BNC wordclock to let you sync up devices which lack wc input. Also SPC to house clock £179.99
DT-86 SYNC-1SW 24bit 96kHz AES/EBU sample rate converter, wordclock in/out, single wire double rate £299.99
DIGIMAX DM-1 8 channel digital patching with 12 inputs and 12 outputs via coax S/PDIF. Includes optical S/PDIF or ADAT format. Supports up to 24bit 96kHz and is fully MIDI controllable £299.99

RRP £199 **£129**

PCP330 PROCODER

FAT

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

RRP £299 **£249**

AIR FX
REALTIME STEREO EFFECTS

ALESIS

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

RRP £199 **£159**
ALES-AIRFX

266XL
DUAL COMPRESSOR GATE

dbx

OVER 40% OFF!

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

RRP £229 **£129**
DBX-266XL

ISA-430
PRODUCER PACK

Focusrite

Channel strips proliferate the outboard market, but your choice is still quite restricted if you hanker after a top quality high-end signal path. Today's most desirable mono-channel-strip-in-a-box has to be the Focusrite Blue series ISA430, which follows Focusrite's philosophy of adding subtle colouration (some say warmth) to the audio signal giving that famous polished studio sheen. The transformer coupled I/O stages and legendary 4 band parametric EQ section are greatly responsible for this, along with the VCA compressor, wide bandwidth mic preamp and noise gate. Optional 24/96 A/D converter.

RRP £2349 **£2099**

MOOGER FOOGER
FILTER & RING MODULATOR

Big Briar

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

FACTORY DIRECT **£219**
BIGB-RINGMOD

286A CHANNEL STRIP

OVER 30% OFF!

dbx

Sensational clearance deal on the dbx 286A solid state mono channel strip offers a mic preamp with phantom power and high pass filter, a classic dbx OverEasy™ compressor with manual or auto control settings, a de-esser to reduce sibilance, an enhancer and finally includes a noise reducing expander which can be particularly helpful with radio mic signals or DI'd electric guitars with assorted FX pedals. ***Our stocks won't last forever, so order today!!!***

RRP £299 **£199**
DBX-286A

VC3Q

JOEMEEK

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

RRRP £199 **£149**
JOEM-VC3MK2

12 STAGE PHASER EFFECTS UNIT

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

FACTORY DIRECT **£299**
BIGB PHASER

376 CHANNEL STRIP

ALMOST 30% OFF!

dbx

Now's your chance to add some distinctive colour to your signals with the 376 hybrid valve channel strip, at a rare discounted price over 30% off! The mono signal path includes mic / line preamp with valve gain stage, 48V, polarity and HPF switches, an OverEasy™ compressor, a de-esser / enhancer and a 3 band equalizer with sweepable midrange. Its Type IV 24 bit 96 kHz A/D converter offers AES/EBU, S/PDIF and wordclock. An ideal front end for most project studios. ***Don't miss out on this special offer - place your order now!***

RRP £549 **£399**
DBX 376

EXTRA 10% OFF

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

ANALOGUE DELAY EFFECTS UNIT

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

FACTORY DIRECT **£499**
BIGB-DELAY

CP251 CONTROLLER ALSO AVAILABLE only £299.99

FILTER QUEEN
RESONANT FILTER EFFECTS

EVENTIDE

In a 2U high half-rack casing the Electrix Filter Queen provides a full gamut of filter effects under complete user control. The analogue circuitry is based around multi-mode stereo analogue resonant filters which may be switched to LPF, HPF, BPF or notch. Their sweeps can also be set to track the audio level of the input or an alternative key input, using the built in envelope follower, or to automatically sweep up and down from the control voltage of the LFO, which has sawtooth, square, triangle, random or inverse sawtooth patterns. With its true analogue nature you get completely smooth glitch free filter sweeps.

RRP £1199 **£POA**
ELEC-QUEEN

KAOSS
REALTIME EFFECTS

KORG

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

R R P **£249**
KORG-KAOSS

VF1
MULTIEFFECTS

BOSS

Compact digital multieffects utilising algorithms from the top-of-the-range Boss VG-8 guitar modelling effects. The VF1 has 24 bit A/D and D/A converters and offers 200 factory presets plus 200 user programs. It includes S/PDIF coaxial digital out as well as a front panel headphone socket. Effects types include COSM speaker modelling, reverbs, choruses, delays, distortions and numerous modulation FX.

RRP £399 **£289**

VOCALIST ACCESS VR
HARMONIZER

DigiTech

Intelligent processing creates up to four extra harmony parts from the original signal input, whose musical intervals are adjusted to match the chosen key centre. Built in XLR mic preamp and 50 preset harmony chords, including subtle detuning pitch changes for rich chorus type effects. Patch changes can also be triggered by MIDI, along with the scale, key or chord type, so full backing harmony tracks can be sequenced and then automatically play along in accord! (sic). Indeed many commercial SMF backing arrangements are available with SysEx data included specifically for the Vocalist range, such is the extent of DigiTech's dominance on this area of the markets.

RRP £399 **£319**

M-ONE MULTIEFFECTS

t.c. electronic

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

RRP £449 **£359**

Prices include VAT and apply to current issue only. UK mainland carriage £5.99. Please allow 10 working days for cheque clearance. Errors & omissions excepted. In a small number of cases, some of the prices may vary as it does advertised by mail order or in other shops and price changes may not be updated in time for publication.

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PRICES GUARANTEE*

Lexicon ROOM ON TOP!

MPX100 DIGITAL REVERB / EFFECTS

One of the first budget digital effects to include S/PDIF coaxial digital output as standard, to preserve those smooth Lexicon reverb algorithms. A well-equipped multi-effects processor, giving 16 effects each with 16 variations, not to mention MIDI control and tap-tempo delay times, but for many it will just be used as a primary reverb for that Lexicon feeling.

RRP £249 £POA LEXI-MPX100

NEW MPX200 EFFECTS + COMPRESSOR

Hey, it's new! The MPX200 may look strangely familiar with its black and blue front panel, but it boasts a brand new stereo digital compressor section which runs simultaneously, before the effects stage. There are 4 compressor presets to join the 240 famous reverb and multieffects presets. Like the MPX100 you get coaxial S/PDIF, complete MIDI parameter control and 24 bit converters.

RRP £349 £POA LEXI-MPX200

MPX500 DIGITAL REVERB / EFFECTS

Lexicon's newest multieffects unit has a whole host of top quality studio effects and offers remote MIDI control of up to 16 parameters in realtime. Its dual channel processor handles the DSP and provides 240 presets, 30 user patches, 4 edit knobs, MIDI and a big LCD. It uses 24 bit converters with balanced XLR & jacks I/O, plus S/PDIF coaxial digital I/O.

RRP £499 £POA LEXI-MPX500

MPX1 TRUE MULTIEFFECTS PROCESSOR

With one dedicated Lexicon DSP chip for reverb and another separate one for the multieffects, the MPX-1 brings you powerful simultaneous signal processing for an incredibly low price, with up to 6 concurrent effects blocks in some algorithms. These include even morphing from one effect to another, as pioneered in the Lexicon Vortex. The latest operating system includes on-line help and database for sorting presets - achieving quality results is as quickly and easily as possible.

RRP £1199 £POA LEXI-MPX1

D-TWO DIGITAL DELAY

t.c. electronic

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

RRP £369 £329

PRO R3 DIGITAL REVERB

OVER 65% OFF!

YAMAHA

This 2u rack effects unit uses the same 32 bit chip as Yamaha's 03D and 02R digital mixers, but focuses on reverbs which can incorporate echoes, chorus, flange, pan or pitch shifting effects. A pre or post 3 band sweep EQ with front panel knobs is available, and there are also compression, filter and noise gate settings, across the 90 preset and 90 user programs. Whilst MIDI implementation allows remote control of programs and parameters etc. Analogue connections are on balanced XLRs and jacks. *Take advantage of the incredible Turnkey megadeal now, while stocks last!*

RRP £369 £329

TRIPLE C MULTIBAND COMPRESSOR

ALMOST 50% OFF!

t.c. electronic

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

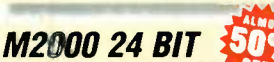
RRP £499 £359

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

M2000 24 BIT DIGITAL MULTIEFFECTS UNIT

ALMOST 50% OFF!

t.c. electronic



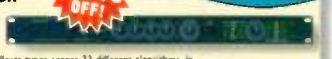
If you've been struggling to find a high class effects unit with full digital I/O for under £500, this will be welcome news! The TC M2000 runs dual simultaneous true stereo effects including reverb, delay, pitch shift, chorus, phaser, compression, gating, expansion, limiting, EQ and announcer / stereo width enhancement. It has 500 patches, MIDI control, AES/EBU and S/PDIF I/O, 24 bit converters, and a rather handy Alias feature. Also features Help function, Wizard auto setup, "Preset Glide" and "Dynamic Morphing". *A fantastic discount price to be had but strictly limited stocks only!!!*

RRP £1199 £599

RFX-1000 MULTIEFFECTS RACK

OVER 30% OFF!

ZOOM



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

RRP £199 £99

FAT-1 VALVE COMPRESSOR

TL Audio

TL Audio's newest stereo compressor unit packs itself into a dinky red box and combines fully manual controls for threshold, attack, release, hard / soft knee etc. with a range of 15 compressor presets to save you the trouble. The channels are always stereo linked with common controls, and VU metering for level or gain reduction and both channel's output gain makeup use a valve stage. Line level I/O is via balanced TRS jacks plus there is a front panel high impedance DI input to suit electric guitar or bass etc. Great for fat vocals, jumbo synth riffs, and rounded basses!

RRP £349 £249 TLA-FAT1

RFX-2000 MULTIEFFECTS

ALMOST 35% OFF!

ZOOM

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

RRP £299 £149

IVORY 5051 CHANNEL STRIP

TL Audio

One of the few hybrid valve channel strips on actually include a noise gate / expander function! From left to right, this 2U mono processor provides a mic preamp with 48V switching, line input and high impedance jack input for electric guitar or bass, followed by a manual VCA compressor, downwards expander / noise gate and the four band sweep EQ. Finally, the signal goes through the valve output buffer stage, to square TL Audio's signature sound colouration. The round VU display provides level and gain reduction metering and the I/O use professional balanced XLRs.

RRP £469 £425

RFX-300 DESKTOP MULTI-EFFECTS UNIT

OVER 30% OFF!

ZOOM

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

RRP £109 £69 ZOOM-RFX300

DIGITECH STUDIO QUAD 4

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

RRRRP £399 £POA

DIGITECH TALKER

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

RRP £379 £POA

DRAWMER MX30

- Dual gated stereo compressor
- Switchable release time
- Gain reduction and In/out metering
- Easy front panel layout

RRP £299 £249

ELECTRIX FILTER FACTORY

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

RRP £329 £279

FMR REALLY NICE COMPRESSOR

- Stereo half rack compressor
- Two modes of operation - Normal manual control and SuperNice™ mode
- This gives auto adaptive nearly invisible gain riding

RRP £249 £199

FOCUSRITE PLATINUM TONE FACTORY

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

RRP £379 £379

LINE 6 POD II

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

RRP £279 £259

PRESONUS ACP88

- 2U rack eight channels of compressors and gates with sidechains for each
- Hard / soft knee switch
- VCAs by THAT Corp
- Balanced TRS jacks I/O

RRP £1249 £1169

SAMSON AUDIO QUAD GATE

- 1U rack four channel noise gate / expander
- Stereo linkable in pairs
- Sidechain inputs enable ducking or frequency concious gating
- HPF and LPF filters built in

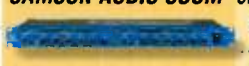
RRP £169 £159

SAMSON AUDIO SCOM PLUS

- All the features of the new S-Com, plus a de-esser section, more controls for the gate and compressor and external sidechain
- 2 channels of complete dynamics processing

RRP £159 £149

SAMSON AUDIO SCOM



- 2 channel VCA compressor
- Auto mode and smart knee
- Built in expander / gates
- Enhancers to brighten dull treble after heavy comping
- Spectra mid band boost

RRP £129 £119

SPL VITALIZER STEREO JACK

ALMOST 55% OFF!

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

RRP £299 £139

TC ELECTRONIC FINALIZER EXPRESS

40% OFF!

- Low cost / easy to use Finalizer
- 24 bit conversion with balanced XLR
- AES/EBU, S/PDIF optical and coaxial
- Finalisers also available - only £1669.99

RRP £1199 £699

TC ELECTRONIC M3000

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

RRP £1799 £1585

TC ELECTRONIC GOLD CHANNEL

- Dual mono channel strip with mic preamp front end
- 24 bit conversion into digital processor engine
- LPF, Soft Limit, EQ, De-S Compressor, Enhancer
- Suits digital I/O or line I/O

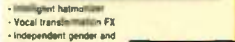
RRP £1749 £POA

TC ELECTRONIC FINALIZER 96K

- Now supports 96kHz via double fast AES/EBU
- 3 band digital compression, 5 band EQ
- De-esser, Enhancer, Limiter, Expander
- Levelling, sample rate conversion

RRP £1799 £1629

TC VOICEPRISM



- Intelligent harmoniser
- Vocal transformation FX
- Independent gender and vibrato, formants and hum-anizing parameters for each harmony part
- Mic pre, reverb, effects
- AES/EBU, S/PDIF + more!

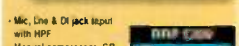
RRP £749 £POA

TLA IVORY 5021 COMP.

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

RRP £469 £425

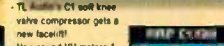
TLA IVORY 5050



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

RRP £299 £249

TLA CLC1 CLASSIC



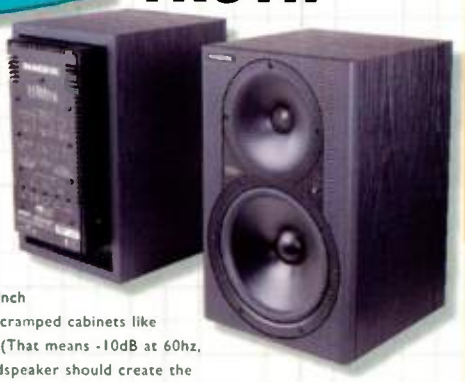
- TL Audio's C1 soft knee valve compressor gets a new facelift!
- New round VU meters & chunky brass front panel
- 2 mic preamps + aux in
- Very smooth, XLR + jack

RRP £1299 £1099

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

EUROPE'S LOWEST

MACKIE. FACE THE TRUTH



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

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

Mackie have utilised a passive radiator method, at the rear of the cabinet with a 12 inch x 6 inch eliptical honeycomb membrane, whilst the main woofer is an 8.5 inch cone driven by a 150 watt amp using negative feedback to greatly increase the damping factor. The cabinet is foam-lined 3/4 inch MDF with a 1 inch baffle. The waveguided alloy dome tweeter is driven by a seperate 100W amp, with a 24dB/oct active crossover. EQ trim switches are included, but we wouldn't touch them ourselves, because each HR824's electronics are hand-trimmed at the factory so its flat position gives an incredible ±1.5 dB frequency response between 39 - 22,000 Hz, and 30° off-axis behaviour is within 5dB to 16kHz. THD is under 1% (-40dB) and IMD is around 0.3% (-50dB), and the step response is very good, which should come as no suprise considering Mackie used FFT analysis from Ometron laser vibrometry measurements to fine tune the design. ***A realistic pair of nearfields at a realsitc price.***

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

RRP £1099
£1099
MACK-HR824

LSR25 BI-AMPED

JBL

OVER 55% OFF!

JBL are one of the few companies to make significant advances in cabinet technology with their moulded enclosures, composites and aluminium baffles coupled to the woofer baskets to aid heat dissipation. The entry level LSR25 benefits from some of these innovations with its rigid aluminium enclosure and integral tweeter waveguide. The trade ported 2 way bi-amped nearfield monitor sports a 5 inch woofer and 80 watt amp plus a 1 inch titanium tweeter and 40 watt amp. It has switchable 80Hz HPF (should you ever need it) and volume trim. -3dB @ 65 - 20kHz.

RRP £899
£399
JBL-LSR25P

ABSOLUTE ZERO PASSIVE NEARFIELDS

SPIRIT

There are several well thought out points of good design in Spirit's dinky Bose Absolute Zero nearfields, and so be humist (as always) they are arguably the best performing monitor speakers on the market for under £200, with a very acceptable sound - it's not too bright and raspy, and neither is it too muffled and boxy. The overall sonic balance is good, and benefits from rear porting, rounded edges and a recessed, time aligned tweeter. Woofer is 6.5 inch with a 1.5 inch voice coil. Impedance is 8Ω nominal, for a loud 95 watts RMS at 89dBSPL per watt.

RRP £199
£159
SCRA-ABO

BM5 PASSIVE NEARFIELDS

dynaudio

At this end of the market the Dynaudio Acoustics BM5 is one of the foremost contenders you should consider when comparing nearfield monitors, especially if you are after a compact design - ridiculously models like the Alesis Monitor 2 sound great for the money, but they're just too big for some people's very cramped conditions. This powerful 6.5" woofer with 3" voice coil keeps audible control down to 38Hz or so, where most rivals have totally lost it! Wish Dynaudio, if it's there - you'll hear it.

RRP £406
£349

ABSOLUTE TWO PASSIVE NEARFIELDS

SPIRIT

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

RRP £269
£179
SCRA-AB2

1029A BI-AMPLIFIED MONITORS

BUY WITH SUB WOOFER FOR ONLY £099.99

GENELEC

ALMOST 35% OFF!

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

RRP £749
£479
GENE-1029A

REVEAL PASSIVE NEARFIELDS

TANNOY

A magnetically shielded two way nearfield monitor with a contoured front baffle. The 6 inch woofer is rear ported in a 12 liter cabinet and achieves a -3dB point around 80Hz. The port is tuned to approx 40Hz. The design uses a soft dome tweeter and offers 50 watts power handling as a sensitivity of 86dBSPL/W with [illegible] -3dB 80Hz. The drivers are crossed [illegible] good [illegible]

RRP £249
£175
TANN-REVEAL

ACTIVE VERSION ALSO AVAILABLE only £399.99

SERVO 170 TWO CHANNEL POWER AMP

SAMSON AUDIO

A power amplifier for the budget conscious in a solid 2u rack housing. The amp has unbalanced jack inputs and push spring output terminals, and provides a low frequency damping factor of up to 100. Power ratings are: 55 watts per channel into 8Ω, 85 watts per channel into 4Ω or 170 watts into a single 8Ω load when both channels are bridged together.

RRP £289
£POA
SAMS-SERVO170

SERVO 260 TWO CHANNEL POWER AMP

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

RRP £399
£POA
SAMS-SERV260

SERVO 550 TWO CHANNEL POWER AMP

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

RRP £399
£POA
SAMS-SERV550

YST-M8 & MSW10 MULTIMEDIA SPEAKERS

YAMAHA

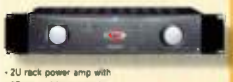
65% OFF!

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

Order now to avoid disappointment!

RRP £199
£69
PACKAGE

ALESIS RA-150



- 2U rack power amp with 3D curved front panel
- 45 watts per channel 8Ω
- 75 watts per channel 4Ω
- 150 watts bridged (8Ω)
- LF damping factor = 200
- Jack & phono inputs

RRP £199
£199

BEYER BLUEPRINT

ALMOST 45% OFF!

- 1U rack dual channel high quality power amp
- XLR input, Speakon out
- 100 watts per ch into 8Ω
- 180 watts per ch into 4Ω
- LF Damping factor = 200
- VCA control 6ms option

RRP £416
£229

DYNAUDIO BM6 P

- Two way bi-amped, rear ported, close field monitor
- 6.5" woofer with 3" voice coil, discrete 100W amp
- Eurotec silk dome tweeter with discrete 100W amp
- Max 110dBSPL @1m each
- -3dB @ 42 - 21,000 Hz
- Pairs matched within ±1.5dB

RRP £1119
£1119

GENELEC 1030A

- Small two way active nearfields
- 80W amp drives 6.5 inch woofer
- 50W amp drives metal dome tweeter
- Front ported, max 98dBSPL

RRP £1098
£949

GENELEC 1031AM

- Very accurate portable biamped nearfield monitor
- 8" woofer, 120W amp
- 1" metal tweeter, 120W amp
- ±2dB @ 48 - 22,000Hz
- Max 114dBSPL @1m each
- Front ported, high low EQ trim, MF waveguide

RRP £1149
£POA
GENE-1031AM

HHB CIRCLE 3P

ALMOST 35% OFF!

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

RRP £349
£225
HHB-CIRCLE3P

HHB CIRCLE 5

- Popular low cost nearfields, Pink cone
- 8 inch woofer, silk dome tweeter
- Front ported, 8Ω nominal load
- 60 Watts RMS, 87dB SPL per Watt
- Active versions also available only £858.90

RRP £399
£315

JBL CONTROL 1

OVER 50% OFF!

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

RRP £199
£89

JBL CONTROL 5

ALMOST 45% OFF!

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

RRP £429
£249

SPIRIT ABSOLUTE 4P

OVER 35% OFF!

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

RRP £769
£479
SCRA-AB4P

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

F11 ACTIVE NEARFIELDS

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

RRP £1149

VS2205 ACTIVE MONITOR

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

RRP £1699
QUES-VS2205

VS3208 ACTIVE MONITORS

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

RRP £3699

MSP5 ACTIVE SPEAKERS

YAMAHA

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

RRP £449
£299
YAMA-MSP5

Prices include VAT @ 17.5% (E&OE and apply to current stocks only). UK mainland carriage from £7.50. Please allow 10 working days for delivery. Subject to availability. E&OE. Errors and omissions excepted. Prices and specifications subject to change without notice. All trademarks acknowledged. Images for illustration purposes only. Any mail order business transacted with us will be governed by our terms and conditions, copies of which are available on request. We reserve the right to refuse any business. Typographical errors may occur.

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

PRICES GUARANTEE*

beyerdynamic

HAVE YOU GOT THE DT's?

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

DT100 CLOSED HEADPHONES

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

RRP £125
£85.99
BEYE-DT100/4

DT75

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

RRP £29
BEYE-DT75

DT231

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

RRP £39
BEYE-DT231

DT250

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

RRP £109
£85
BEYE-DT250

DT770 Pro

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

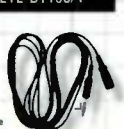
RRP £116
BEYE-DT770PRO

DT100 EAR PADS

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

RRP £15
BEYE-DT100EP

DT100 CABLE



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

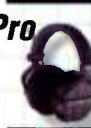
RRP £24
BEYE-IC10007

DT150

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

RRP £149
£119
BEYE-DT150

DT990 Pro



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

RRP £179
£139
BEYE-DT990PRO

C1000S CONDENSER MIC

ALMOST 40% OFF!

A back electret condenser mic with battery or phantom power operation. The polar response is cardioid but the included MPC1000 adapter, if fitted over the mic capsule, will convert the response to hypercardioid. There is a steep bass rolloff below 80Hz for vocals and AKG's famous treble zing, and the mic gives 6mV/Pa output sensitivity at 200Ω impedance. AKG's updated silver version also has a presence boost adapter for a treble peak centred around 6-7kHz. Unprecedented value price.

RRP £199
£119

C3000/B LARGE DIAPHRAGM MIC

INC FREE SHOCK MOUNT

OVER 50% OFF!

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

RRP £289
£189

LIBERATOR RANGE 21L LAVALIER SYSTEM

audio-technica

INC FREE MIC STAND!

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

22 HANDHELD MIC

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

RRP £199
£119

AT4033 LARGE DIAPHRAGM MIC

audio-technica

With their range of affordable back electret condensers, Audio Technica offer both high performance and large diaphragm warmth at very competitive prices. The 4033 is a cardioid model including an 80Hz HPF, switchable -10dB pad and has 23mV/Pa sensitivity with 17dBspl equivalent self noise. The shockmount is an optional extra, to keep the cost even lower!

RRP £299
£225

TLM 103 LARGE DIAPHRAGM MIC

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

RRP £699
£485

ECM907 STEREO MICROPHONE

SONY

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

RRP £99
SONY-ECM907

NT1 LARGE DIAPHRAGM MIC

RØDE

OVER 55% OFF!

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

RRP £229
£139

NT2 LARGE DIAPHRAGM MIC

ALMOST 40% OFF!

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

RRP £299
£275

BG1.1 BUDGET MIC

SHURE

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

RRP £69
£49
SHUR-BG1.1

SM58 INDUSTRY STANDARD DYNAMIC MIC

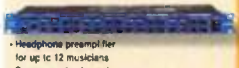
OVER 30% OFF!

SHURE

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

RRP £109
£75.99
SHUR-SM58LC

SAMSON S-PHONE



- Headphone preamplifier for up to 12 musicians
- Four seperate channels with 3 headphone sockets
- Each channel has hi / low EQ, volume, L-R balance
- Aux ins allow soloists to have extra direct feed without affecting main ins

RRP £149
SAMS-SPHONE

SAMSON Q5

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

RRP £119
SAMS-Q5

AKG K55

50% OFF!

- Low cost dynamic headphones
- Open back, supra-aural design
- 32Ω nominal impedance
- Response -10dB, 20-20,000 Hz

RRP £48
£24
AKG-K55

SENNHEISER HD25

- Closed back dynamic headphones
- Padded double headband
- 70Ω nominal impedance
- Response -10dB, 15-22,000 Hz

RRP £159
£129
SENN-HD25

SENNHEISER HD25SP

- Closed back padded supra-aural dynamics
- 200mW @ 100dBSPL/mW
- Low 85Ω impedance
- Lightweight, and very popular, especially for DJ monitoring in noisy club.

RRP £99
£79
SENN-HD25SP

SENNHEISER HD250II

- Closed padded circumaural design
- 1800Ω nominal, 200mW, 94dBSPL/mW
- Response -10dB, 10-25,000 Hz
- 3 metre detachable QFC cable

RRP £179
£149
SENN-HD250II

SENNHEISER EH2200

- Closed back circumaural dynamic headphones
- Neodymium magnets
- Kevlar reinforced cable
- 64Ω load impedance
- 12 - 22,000 Hz @ -10dB
- 106dBspl/mW sensitivity

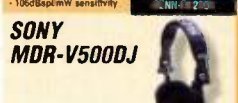
RRP £59
£49
SENN-EH2200

SENNHEISER HD570

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

RRP £99
£89
SENN-HD570

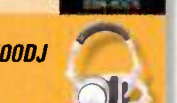
SONY MDR-V500DJ



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

RRP £69
£59
SONY-MDRV500DJ

SONY MDR700DJ



- DJ monitor headphones with swivel earcups
- Curly case, 50mm drivers and neodymium magnets
- Sleek silver metallic finish
- Supra-aural closed back
- Gold plated plug adapter

RRP £149
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SONY-MDR700DJ

AKG DRUM MIC SET

- AKG D112 is an industry standard kick drum mic with presence lift and high SPL handling.
- Four C410 mics are includec for snare / hi hat toms / cymbals.
- Hypercardioid condensers with gooseneck clip.
- + version also available only £599.99

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£429

AKG C2000B

- Large diaphragm cardioid condenser mic with pad
- Switchable 500 Hz low-cut
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- 200Ω nominal impedance
- Includes stand adapter and elastic suspension

RRP £199
£149
AKG-C2000B

AKG D112

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

RRP £219
£139
AKG-D112

AKG C414

- Multipattern large diaphragm condenser mic
- Omni, cardi, hypar & Fig-8
- Switched 10dB / 20dB pad
- Switched 75Hz - 150Hz HPF
- Accepts 9V - 52V phantom
- Characteristically bright sound with resonant top and around 15kHz band.
- Industry standard mic for recording acoustic guitar

RRP £599
£459
AKG-C414

RØDE NTK

- Large diaphragm condenser with class A valve preamp
- Cardioids polar pattern
- Low self noise 12dBspl-A
- Sensitivity 12mV/Pa
- 200Ω output impedance
- 20Hz - 20,000 Hz @ ±6dB
- PSU and cables included

RRP £499
£415

RØDE NT-3

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

RRP £149
£119
RODE-NT3

SHURE BETA 58A

- The new improved Beta version of the all-time classic dynamic SM58
- Neodymium magnets are lighter and more efficient. Transient performance is improved, along with treble extension.
- Less handling noise due to capsule suspension.

RRP £195
£149
SHUR-BETA58A

SHURE ETV 58S

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

RRP £299
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SHUR-ETV58S

SHURE ETHOS

- WH20 headset mic, T11 bodypack radio transmitter and T3 receiver unit
- Cardioid dynamic mic has gooseneck adjustment and elastic headband
- Single antenna receiver has squelch control and jack output
- Diversity version available

RRP £399
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SHURE SM57

ALMOST 30% OFF!

- Industry standard dynamic cardioid
- 40Hz-15kHz (-10dB)
- Stand clip & Case
- Suits instrumental and combo miking
- Slim, unobtrusive yet robust design

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SHUR-SM57LC

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cutting edge

THE FUTURE OF MUSIC TECHNOLOGY

It could be argued that technology hasn't encroached as much on the average gig as it has on the typical project studio. **Dave Shapton** would like to change all that...

I was musing with some friends the other day about the band we used to play in. We got together in 1989 and played sporadically until a couple of years ago. There was absolutely nothing remarkable about the band except, perhaps, our first gig, which should stand as an abject (*sic*) lesson in how not to do it. Which provides a somewhat tenuous link to my subject for this month — how I think we may set up live gigs in the future.

Live & Dangerous

I've dabbled with electronic music ever since I discovered that by putting my fingers on the circuit board of an early battery-powered transistor tape recorder I could make it break into oscillation. With my fourth and third fingers in a certain position I could make it sweep through a couple of octaves. (Obviously, don't try this on anything mains powered!) Moving my fingers around made random squeaks and farts that were inordinately satisfying to a 10-year-old, if not necessarily to his parents. With much of my creative life spent making bleeps and bloops, I came very late to the art of playing live.

So when a mate suggested we should put a band together to play at his thirtieth birthday bash at a cricket club, I figured we should do it properly. I was in the business of selling digital audio workstations at the time, so I managed to blag some kit. The trouble is, so did the other members of the band, and we ended up with enough gear to play Wembley Arena.

It's not that we did anything wrong, particularly: it was just a matter of scale. What was, essentially, a glorified pub gig required 12 car-loads for the equipment alone. Most spectacular of all was the lighting rig. With a total power consumption of 30KW, it blew every fuse in the building instantly (and probably a few on the national grid as well). But we were prepared for this. Luckily, the drummer had a degree in electrical engineering. What he did next, you should never, EVER think about doing yourselves, because it's so dangerous. He put on some Wellington boots (for insulation), walked into the ladies' toilet, and — without turning off the power — wired an extension cable to the national grid side of the fuse box. He ran it across the roof, and into the kitchen behind where the band were setting up. Nice job. You could have seen the lights from outer space.

The gig was a triumph, if getting to the end of most of the songs could be used as a measure of success, and the guests were surprisingly understanding about the band and its kit taking up three-quarters of the venue.

As our experience grew, we managed to reduce our setup time from nine hours to a couple. And we always wondered how the other bands managed to do it in 10 minutes. The secret, it turned out, was simplicity, and only taking the gear that you actually need. Like a small mixer (possibly powered), and cable looms that plug in simply and unambiguously.

Fixing The Mix

I started wondering how I would do it today, 10 years on from our original efforts to be a very average covers band. I think for starters I'd look at mixing. Of course, I'd downsize the desk. And I'd dispense with the front-of-house sound-mixing person (impractical in very small venues). I think I'd be very tempted by digital mixing, but I'm not completely convinced I'd use it in a live context.

What's good about digital mixing is very good indeed. Virtually all digital mixers have memories that can store 'snapshots' of a complete setup at any given time. This is useful not so much for individual levels, but for all the other facilities you get with a digital desk, like reverb, dynamics, and, of course, EQ.

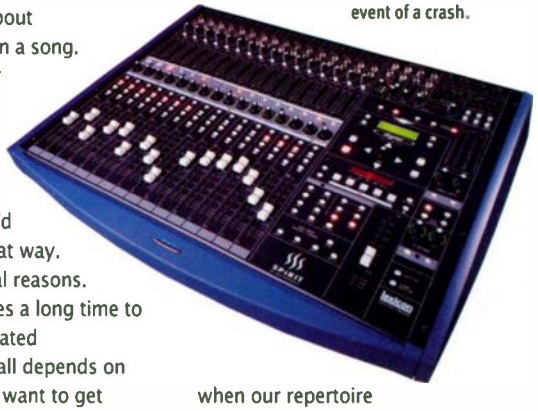
It's quite possible that you could have different settings for each song, or even for parts of a song: it all depends how structured your performances are. It's also a question of how much control the individual musicians want over their own sound. If you're running a sequencer, then of course you can dynamically automate just about everything within a song.

But, however attractive these capabilities may be, I'm still not convinced that I'd want to work that way. There are several reasons.

Firstly, it takes a long time to set up an automated performance. It all depends on how deeply you want to get involved with setting up every aspect of the show in advance. I can certainly see the advantage of setting up a mix (and its associated effects) on a per-song basis. I used to do something similar with my keyboard rig. Once I'd figured out that the 'Combinations' on my Korg M1 could be accessed by external MIDI devices, I had a different setup for virtually every number we did, with the M1's sounds mapped between two keyboards, or with the selected combination on the M1 also selecting a patch on another keyboard or my M1R.

The up-side of this was that I was able to use much more complex sets of instruments than if I had to punch in several patch-changes and keyboard zones manually during a song. I even allocated sound effects to single notes on an auxiliary controller keyboard. The down-side was demonstrated to me when I lent my M1 to a fellow musician and, not thinking to check it when it came back, found, in the course of my next gig, that my friend had overwritten all my Combinations.

After this experience, I found that it was actually much more useful to have a good knowledge of the individual sounds on the keyboards, and to select them manually at the start of each song. Although not as polished, it was more flexible, especially when our repertoire started to run into hundreds of songs, and with the idea of a set-list a distant memory.



A digital mixer can be a great advantage in a stage setup, but if your set is highly automated you could have a big problem in the event of a crash.

I suppose it's for the same reason that I would hold back from programming a whole gig into a digital mixer. Losing your settings from a digital desk could be worse than losing them from your keyboard. With a keyboard, you can always bring up a Hammond organ or a piano — you'll always get a sound, even if it's not the one you intended.

But if you lose your mix settings you might just get ▶

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nothing. The last thing you want to worry about as the venue is (hopefully) filling up with punters is which menu you need to poke around in to get anything out at all! What might change my mind is if all small digital desks defaulted to a very simple and obvious routing, such that anyone used to conventional mixing desks could have a go at sorting it out.

Gigs Of The Future

Putting aside any doubts about reliability and usability for a while, let's look at how we could use some of the new, emerging technologies to make the life of a gigging band easier. Those of you with long memories may remember a Cutting Edge report on GMICS (Global Music Instrument Communication Standard), a digital audio interconnect protocol for use specifically in live environments (see *SOS* December 1999). Based on computer industry standard Ethernet, it was bi-directional and capable of carrying at least 16 channels of digital audio per cable. Well, judging from the GMICS web-site, not much seems to have happened in the last year, which is a shame because Gibson

Gibson's GMICS digital interconnection protocol could revolutionise live performance.

(the guitar people behind GMICS) defined and solved many of the problems presented by a digital live environment.

Still, now we have MLAN. It's rather different from GMICS, being based around IEEE 1394 (Firewire), rather than Ethernet. If you've read Paul Wiffen's excellent articles in *SOS* about MLAN, you'll have a good appreciation of its potential.

The first, and perhaps most obvious, way to use a digital interconnect system is to replace the cables between the instruments and the mixer. There would be several benefits arising from this. For a start, you would be virtually immune to interference. Any digital system is, by definition, less prone to disruption by transient analogue phenomena, and, where errors do happen, there is robust error correction. Digital stage-boxes have been feasible for years. MADI (Multitrack Audio Digital Interface) would be OK for the last application, but it's not a network protocol, so you couldn't have one cable winding its way around several instruments.

And, of course, you would start from a position of unity gain throughout the system: you wouldn't have any problem with levels, as you'd be receiving digits and not voltages, which would make the sound person's job easier. The only discussion about levels would thus relate to the artistic rather than the technical — for example, how loud the keyboard player thinks he should be during solos.

So far, so dull, because we've only talked in terms of replacing analogue 'string' with digital 'string'. But when we move on to the next stage of the technology things get a lot more interesting. The new digital interconnect technologies are bi-directional and can carry many channels. MLAN can carry at least 50 digital audio channels, and double that in ideal conditions. So you're no longer limited to a setup where the individual instruments have to send their audio to a central mixer. You could, for example, daisy-chain instruments and devices together.

There should easily be enough channels available for a small to mid-sized stage setup, which is good for simplicity — although I would worry about someone tripping over the one cable that connects everything together. You'd need to build in some redundancy somewhere — perhaps have two cables, taking different routes?

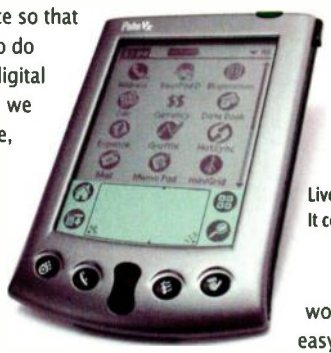
Decentralised Control

Modern keyboards and effects processors tend to be based on Digital Signal Processors (DSPs). Signal paths to and from these DSP devices are limited because of the cost of building inputs and outputs. Keyboards, these days, despite massive polyphony and multitimbrality, rarely have more than a stereo output. This restricts their usability in any context, including live, where it might be desirable to bring a bass part out of the keyboard into its own mixer channel, so it won't have to be drowned in reverb or whatever. Using MLAN, or something like it, should reduce the cost of I/O enormously, because at some point it will be as cheap to have 100 channels in and out of a device as two.

Once this is in place, we just need one more technological leap to completely revolutionise live setups (and possibly studio configurations, for that matter — but that's a separate discussion).

If we could free up any spare DSP on each device so that it could be used to do general-purpose digital signal processing, we could, for example, dispense with a central mixer altogether. You'd need to put in place a protocol that could analyse available DSP on the network, and co-ordinate processing resources to create a 'distributed' virtual mixer. With suitable software, you could use control panels on any of the devices in the network to set up the mix. Put a web server in there somewhere (manufacturers should be thinking about building web servers into all their equipment now) and you could even set up the mix from a mobile phone or Personal Digital Assistant. Or you could connect a control surface that looks and behaves like a mixer but has no audio processing itself — on balance, I think I'd prefer this arrangement to doing a live mix on a mobile phone!

If all the above actually came to pass, we would be able to turn up to a gig, string our instruments (including microphones and guitars) together with one cable, connect the stereo outputs from a keyboard or effects unit to the main PA speakers, the outputs from another to the monitors, and mix the whole thing from a control panel or even from a web browser.



Live mixing on a PDA? It could happen!

Getting this to work wouldn't be easy. It would demand extraordinary cooperation between manufacturers, and some very clever software. But I think we will get there. This idea makes MIDI look like child's play. But don't forget that MIDI was revolutionary in its own time. SOS

Celestial Harmony?

I was speaking to someone recently who used to work at an Antarctic research station. His job was analysing the ionosphere (the layer of charged particles in the atmosphere that allows short-wave radio to travel round the world), and, bizarrely, he therefore had an interest in the lightning that happens at the *North* Pole. Apparently, the lines of magnetic flux surrounding the earth act like pipes, or channels, that can carry the electromagnetic vibrations caused by the atmospheric discharges all the way from the North Pole to the South Pole.

You can hear lightning on AM radios. It's a very short burst of white noise. But these magnetic flux conduits, running from the top of the Earth to the bottom, also act like prisms, except that they work at audio frequencies. A prism splits up white light into its component frequencies, creating rainbow effects. And that's exactly what happens to the noise of the lightning. The magnetic flux lines transport high frequencies faster than low ones, and so what started as a splat of white noise ends up as a sine-wave sweep, starting with a high note and ending with a low one, over a period of about half a second. A kind of celestial Syn Drum, in fact.

It bestows a kind of cosmic splendour on the works of Kelly Marie and Rose Royce, doesn't it?

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Q&A

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www.sound-on-sound.com/sosforum.htm

Q What kind of CD recorder is best?

Should I buy a stand-alone CD recorder or a SCSI computer peripheral CD burner? I don't know what the advantages and disadvantages of the two would be.
Alan Fish-Barr

Editor Paul White replies: *On the face if it, this is a simple question, but before you can answer it, you need to ask yourself what you want a CD writer to do. If you're considering the computer option, you also need to check whether there are suitable drives that are compatible with your computer and with your prospective choice of CD-burning software.*

In favour of the stand-alone recorder option is its simplicity of operation, and the fact that you don't need a computer to make it work. You can also use it to play back audio CDs or, in conjunction with a regular CD player, make copies of your own audio CDs at the press of a button or two.

However, if you want to make CDs to be used as masters for Red Book commercial audio CDs, you will need to burn your album in disk-at-once mode, which normally means compiling the individual tracks on a DAT machine or computer editing system first. If you master directly to CD-R one track at a time, pausing or stopping the machine between each recording, the final disk can't be used as a production master. One stand-alone machine that gets around this problem is Marantz's CDR500, which has two drives, enabling disk-at-once masters to be made from track-at-once CDs. The Alesis MasterLink also provides a flexible solution, as it combines the roles of hard-disk mastering machine, editor and audio CD burner.

The disadvantage of stand-alone machines is that they record in real time, making them quite slow, and they can only record audio — you can't use them to back up computer data.

The computer-based CD writer is a cheaper solution, even if you need to budget for a SCSI card to connect it to your computer. It's also more flexible, but as you might imagine, it's also slightly less straightforward to use. Perhaps the best way to set up a system is to first choose the software you want to work with (Toast, Jam, NeroMax, Easy CD Creator, Waveburner or whatever), then visit the appropriate web site to find out what drives are compatible with that software. Once you have the list of drives, find one that's still in production (many supported drives will be obsolete) and that meets your needs for speed, price and connection protocol.

When using a CD burner with a computer, it's sometimes best to have a general-purpose piece of backup software (Adaptec software comes bundled with many drives), as well as something a little more specific for audio-CD generation. For example, Roxio's Jam is popular for Mac users, while PC users have rather more choice.

Stand-alone CD writers are simple to use but not as flexible as the computer-based variety.

The benefits are that stereo music tracks saved on a computer hard drive can be compiled in a playlist, auditioned, then burned to a Red Book-compatible audio CD, often much faster than real time. This needs around a Gigabyte of free hard drive space to hold the audio, and the same is true if you want to duplicate an existing CD, as the tracks usually have to be copied onto the computer first to do the job reliably. However, this is usually quite straightforward, and there's the added bonus that you can make CD compilations of your favourite tracks from different albums very easily (for your own use, naturally!).

In addition to greater flexibility when producing or copying audio CDs, the CD-R machine also provides a useful way of backing up computer data, MIDI song files and audio data files from your sequencer. The usefulness of this can't be over-emphasised, as backing up work done in a MIDI + Audio sequencer is hugely important. Furthermore, if you use CD-RW discs, you can re-record the discs if you need to, and software is now available that allows CD-RW disks to behave much like regular hard drives (in other words, you don't have to erase stuff sequentially or all at once), albeit somewhat more slowly.

Q Is my wordclock good enough?

Is there an objective way of determining the quality of a wordclock source? I'm running a setup of an Apple G4 computer, Digi 001 digital recording system, Spirit 328 digital console and a MOTU MTP AV interface. I'm using the MTP AV as wordclock master, as I was told it was superior to the wordclock of the 328. There is a recent software upgrade of the 328 which claims to have a better wordclock than its previous versions. But how can you tell if it's better than, say, the MTP AV?
Dirk Blanchart

Technical Editor Hugh Robjohns replies: *The only pukka way to check the quality of your wordclock is to test it with a digital test-set designed to measure jitter, sampling frequency and drift. Unless you can track down a friendly digital-audio test engineer with* ▶

quick fixes

Q In past issues of *SOS*, Paul White has mentioned using a software program to analyse his room's acoustic response, stating that it wanted him to move his speakers away from the wall! I was wondering if you could tell me what the program is and where I could get it?
Peter Lozinski

A I understand that there are a couple of acoustic analysis programs available to the general public, but I the one Paul was using, at least a couple of years ago when he last extensively revamped his studio, was Pilchner-Schoustal's *Acoustic-X*, which you can read about at the company's web site: http://joy.idirect.com/pilschaa/public/index.html. *Matt Bell*

Q I enjoyed your article about Emagic's *Sound Diver* editor/librarian in the May 2001 issue. Do you have any information on utilising it with Mark Of The Unicorn's *Digital Performer* sequencer?
Andy Boyd

A Unfortunately I don't use *Performer*, and I suspect that *Sound Diver* won't integrate with it, as it is designed specifically to run with *Logic Audio*. However, *SD* works fine as a stand-alone editor/patch librarian, in which case it doesn't matter which sequencer you use. *Paul White*

Q I seem to remember that there was an article once in *SOS* regarding specialist cleaning fluids for switches and pots. Can you let me have some details? *Alex Burak*

A We reviewed Caig Laboratories' DeOxit, which "deoxidizes, cleans and protects electrical connections", in the words of its manufacturer, in the August 1998 issue. Could it be this you're thinking of? Surf to www.sospubs.co.uk/sos/aug98/articles/bencounters.html for more on this. You could also check out www.caig.com. *Matt Bell*

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Q&A

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a suitable test-set, you aren't going to have much luck, I'm afraid.

Most desks at the Spirit/Yamaha 0-series end of the market have relatively poor wordclocks, so it makes a lot of sense to run everything from a purpose-designed reference unit.

The effects of bad jitter are to raise the level of background noise very slightly, particularly at high frequencies, and to cause increased vagueness in stereo imaging. Neither are very easy to hear under normal monitoring conditions.

If I were you, I think I'd continue using the MOTU as a clock master — the practical advantages of having a single, identifiable master which you can easily distribute to your other digital equipment far outweighs the worth of having the Spirit upgraded.

Q How do I give my Mac MIDI?

I have recently started using *Cubase VST* with my G3 Apple Mac and I am on the verge of buying a Korg Trinity synth. How do I connect MIDI leads into my Mac (which has SCSI and USB ports)? Where can I get the necessary converter? Is it a Midiman? Or a Macman? Help! I presume I will only need MIDI In and MIDI Out. Is this correct?
Richard Murray

Senior Assistant Editor Matt Bell replies:
The bit of equipment you need to interface your Trinity to the Mac via MIDI is, perhaps unsurprisingly, called a MIDI interface! Depending on whether your G3 has a grey case or is one of the blue and white translucent ones, this will either connect to the serial or USB port of your Mac. As you mention that your G3 has USB, it's probably a blue and white one, so your interface will connect there.

There are various MIDI interfaces you can buy, ranging from basic In/Out devices to multiple interfaces with several MIDI In/Out ports and sophisticated MIDI routing features. If you only intend to connect the Trinity, you'll be able to get away with a basic interface, but if you intend to add lots of MIDI gear to your setup in the future, you'll quickly outgrow a small interface and need to buy a bigger one anyway, so you might want to buy a larger one with several MIDI ports to start with, although these are, of course, more expensive.

Regarding manufacturers; you mention Midiman, and they do indeed make a huge range of MIDI interfaces, from small to large, USB and serial, and they offer good value for money. However, some G3 and G4 users have experienced timing problems when trying to run MIDI systems that interface via the USB ports of their Mac. Incidentally, this is nothing to do with Midiman, whose products are renowned for their quality and affordability — it's believed to be a problem with the USB protocol and the way the new G3s and G4s drive the buss.

Some people who have experienced problems have found that they disappeared when they switched to an interface made by the same manufacturer who made their sequencing application — so in your case that would be Steinberg. It's believed that this may have cured the problem in some cases because Steinberg software addresses its proprietary MIDI interfaces directly, without the need for a further layer of software, such as OMS or FreeMIDI, to address the MIDI interface from the MIDI application. So you might prefer to check out a Steinberg MIDI interface, such as the Midex 8 (a large eight-way interface) or the USB 2 MIDI (a small two-in, two-out affair).

However, as I say, these timing problems have not affected everyone, nor every new G3 or G4. There's nothing that says you have to use a Steinberg MIDI interface, and you may well find that everything works OK with a non-Steinberg one. My bottom-line advice would be, whatever you buy, to make sure, if at all possible, that you get an option to try the interface with your setup at home before you part with your money.

For more on choosing USB MIDI interfaces for a new G3 or G4, check out Paul Wiffen's four-part series on the subject, which ran in SOS from November 2000 to February 2001. You can get to part one of this series at: www.sospubs.co.uk/sos/nov00/articles/g4s.htm, but to access the rest of the series you have to be an SOS subscriber (although it will slowly become publicly accessible over the next three months).

Steinberg's Midex 8 USB MIDI interface.

Q Which recording system has the widest compatibility?

I am a professional session drummer with my own studio, which has mainly been used for teaching. However, I've decided to buy a multitrack recorder so I can record my drums *in situ*, removing the need for transporting the kit and opening the possibility for the recording of live drums for people who would usually use drum machines. I have good studio experience, and good engineer backup from friends, who have mostly recommended the Pro Tools system. As somebody who has never really used computer-based recording (hands on), I was wondering if this is the best system?

Obviously, one of the main criteria for the

quick fixes

Q I m designing and making a DJ desk to hold two turntables and a mixer, as part of an A-level project, but I have no idea where to buy the rack 'rails' from (the metal bit that runs down each side of the rack that the gear is bolted to on the rack). *Robert Cowley*

A Studiospares (+44 (0)20 7482 1692; www.studiospares.com) have exactly what you're looking for, plus almost anything else you can think of in the way of studio accessories. They'll send you a free catalogue if you contact them. *Tom Flint*

Q Where could I earn money from selling my dance tracks for, say, video games? *Darren*

A There's only about 10 million other people worldwide wondering the same thing! Get hold of an industry guide like the one from Showcase Publications (about £40 plus p&p from *SOS* Mail Order, page 272-6), find the names of some production companies, and fire off some letters. You'll probably need to send letters to about 100 companies for every one you receive back.

Alternatively, research on the Internet to find the names of some video game production companies, and contact them directly. Making money in the music industry is all about putting in absurd amounts of effort to make your work stand out, because there are so many people chasing (relatively) few opportunities. *Matt Bell*

Q As a subscriber to *SOS*, I rely on your advice when making purchases. However, I am at a loss, as I now require an upright acoustic piano and cannot find anyone or any publication who is an authority on all pianos (only biased parties wishing to sell their own). Can you point me in the right direction? *Ken Dobson*

A Try the UK Piano page, at www.uk-piano.org/construction.html. Also worth a try is The Piano Page, at www.ptg.org/index.html. Both these sites are packed with useful information. *Tom Flint*

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▶ system is that it be compatible with other peoples' systems, so that they can mix the recordings done at my studio later on. If they were stored as WAVs, people with *Cubase*, *Logic*, *Pro Tools* and so on could use them. Is there another option?
James Hester

Assistant Editor Sam Inglis replies: *One of the main irritations about the fact that several different computer-based recording systems exist is that they are not really cross-compatible. You can't directly load* Pro Tools *Projects into* Cubase, *nor* Logic *songs into* Digital Performer, *and so on. You can, as you suggest, load WAV or AIFF files into all of these applications, but of course these are only stereo audio files, so the process of transferring multitrack drum recordings from your system to someone else's will be a bit complicated — you'll need to extract the individual parts from Pro Tools, or whatever system you decide upon, name them, burn them to a CD-R, and give the end-user instructions as to how to reassemble them into a multitrack drum part within their chosen sequencer. This is certainly possible, but a bit involved.*

There are two other methods you might want to consider. Firstly, some software manufacturers have built into their programs compatibility with a standard known as OMF (Open Media Framework). This allows projects to be transferred between compatible systems, complete with effects settings, edit decision lists, mix automation data and so forth, and should save a lot of time. Unfortunately, however, it's mainly available on high-end systems only at present: I believe OMF is supported by the full version of Pro Tools, *but not by the* LE *version that comes with the 001 system. OMF support is also present in Steinberg's* Nuendo *(which will read Cubase song files) and is coming in the forthcoming v3 of* Digital Performer, *but it's not included in the current versions of* Logic *or* Cubase.

Rocket Networks can provide a useful way to swap sequencer files between different platforms.

The other possible method is to use the Rocket Networks system (find this at www.rocketnetwork.com) for Internet collaborations. Currently, this is supported by both Cubase *and* Logic, *and* Pro Tools *support will be forthcoming soon. Essentially, the Rocket method allows you to post projects from your chosen sequencer on to a remote server, from which your collaborators or clients can download them. This has obvious advantages for collaboration at a distance, but one of its main plus points is that it provides a way of transferring projects between ostensibly non-compatible applications such as, say,* Cubase *and* Logic, *with most of the mix and edit data intact.*

As for recording the drums themselves, Pro Tools *and any of the other major software sequencers will have the features you need, so long as you can find a recording interface with enough inputs — try to get hands-on time with as many as you can to find the one you like best.*

Q Which soundcard should I choose?

I'm interested in producing music at a level as near to professional as possible. I have bought a PC, have *Cubase*, and will soon be getting *Reason*. At the moment I have a Soundblaster 5.1 soundcard, which produces sounds similar to my sister's Casio keyboard (OK, slight exaggeration). I have a budget of under £200 and have been advised to look at the M Audio Audiophile and the Turtle Beach TBS2000. I have a Yamaha keyboard which I would like to use, so MIDI connections would be useful. Do most cards have MIDI as standard?

Another question: when creating a drum track in *Cubase* using my soundcard's sounds, I can't change the velocity of individual sounds. I can change the velocity number, but this has no effect. Am I doing something wrong? Or are my soundcard's sounds set at a rigid velocity?
Andrew Wilson

Assistant Editor Sam Inglis replies: *Of those two soundcards, in your position I'd go for the Audiophile (reviewed* SOS *April 2001). The Turtle Beach card is likely to offer sounds quite similar to the Soundblaster's. The Audiophile has no built-in sounds, but is a professional-quality recording card, so will give much better sound quality on inputs and outputs. Few soundcards come with MIDI ports, but you can get an adaptor for the joystick port on something like the Soundblaster.*

Are you selecting notes in the drum editor before changing the velocity value? Obviously, if you have nothing selected, changing the velocity value will make no difference. The easiest way to change note velocities is to set the editor up to show velocity data for each note along the bottom, then use the pencil tool to adjust that data. SOS

quick fixes

Q I have a Roland MC80 EX. How can I program fade-outs in my songs? ***Dennis Zeppenfeldt***

A You have two options. Firstly, find the System Exclusive message for the Master Volume parameter of each of your sound modules (or for the MC80's internal sound card, if you're using that) in their manuals' MIDI implementation charts. Once you know the SysEx code for this parameter, you can program fades with it on a module-by-module basis. Secondly, you could use Control Change 7 (Volume) on each MIDI track, to fade them down together — the quickest way would be to copy and paste a single fade to the required tracks and channels. The first approach is more elegant, but the second might be your only option if your sound modules have no master volume parameter available over SysEx. *Mike Senior*

Q I use a Joemeek VC3Q recording channel/compressor, but I still find myself running the vocal track through a limiter after I've recorded it, to even it out further. The VC3Q seems to take a millisecond or so to kick in, so the first syllable of each vocal line is slightly louder than the rest, even with the fastest attack. The manual says to back off the attack and increase the input gain to overcome this, but I find that doesn't compress enough. Am I taking away the character of the VC3Q if I limit afterwards? ***Lee Abraham***

A The VC3Q uses an optical gain control unit to do its compression. These are quite slow to respond compared to some other designs of compressor, so even on the fastest attack setting some transient may creep through. I see no reason why you shouldn't deal with this by using a limiter. For vocals you normally want the fastest attack time available, so the limiting stage is really just making up for a slow compressor attack. You won't be losing the character of the compression, since the limiter will tend to act only on those bits of the vocal track that haven't been compressed. *Sam Inglis*

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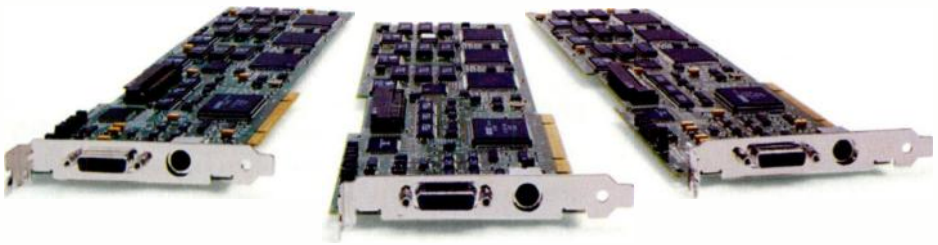

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LEXICON MPX200 DUAL-CHANNEL EFFECTS PROCESSOR

Paul White tests Lexicon's new multi-effects unit, which offers the classy sound quality of the MPX500 at an even more affordable price point.

Lexicon's new MPX200 effects processor is priced between their existing MPX100 and MPX500 machines and is designed to offer the more expensive unit's sound quality, but with reduced editability. The unit combines dual effects processors with a digital compressor, and the front-panel layout breaks the mould of the earlier MPX units in having few physical controls and rather a lot of status LEDs.

Powered via an IEC mains inlet, the MPX200 features unbalanced jacks for the stereo analogue I/O, with 24-bit A-D/D-A conversion, and phono connectors for coaxial S/PDIF digital I/O running at 44.1kHz. An Input knob on the front panel sets input level, with visual feedback via dual three-segment bar-graph meters. MIDI In and Out/Thru sockets are also fitted for remote parameter control, patch dumping and so forth, and the choice of MIDI Out or Thru is software selectable.

The inputs have a fairly high impedance and can therefore be used directly with electric guitars — plugging an input into only the right channel feeds both channels for mono operation. The manufacturer's specifications quote a dynamic range of 95dB using the analogue connections, or 100dB when working entirely digitally. A novel touch is that the left output jack socket is of a TRS type, and can drive stereo headphones directly if required. A further TRS jack allows a footswitch to be connected for remotely engaging the unit's bypass mode.

The MPX200's 24-bit algorithms embrace all the usual reverb and ambience treatments, as well as tremolo, rotary-speaker emulation, chorus, flange, pitch, detune and delay (up to 5.5 seconds). There's also a handful of special effects, including infinite reverb and a few weird pitch-shifting tricks. There are several routing options for the two internal processors, which allow them to be used in series, in parallel, as independent mono blocks, or in a dual mono-in/stereo-out setup. In the latter case, the two stereo effect outputs are mixed. Front panel icons depict the four possible routing options, and each has a status LED so that you know which one is selected.

The Edit button brings up any one of eight different effects parameters in a three-digit LED display, whereupon it can be edited using the unit's main rotary encoder — the currently

LEXICON MPX200 £349

pros
- Easy to use.
- High-quality Lexicon reverbs, including Ambience patches.
- Digital compressor built in.

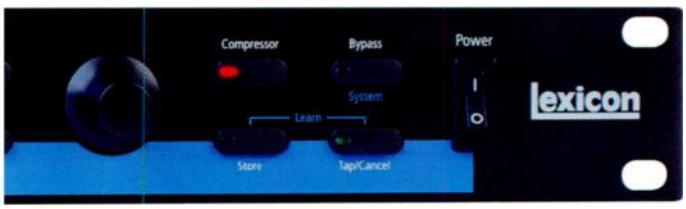
cons
- Displays only patch numbers, not names.
- Editing may be too limited for some users.

summary
Good-sounding multi-effects, with a compressor and quality reverb algorithms, at an attractive price.

SOUND ON SOUND

selected parameter is shown by eight Edit status LEDs to the left of this LED display. Similarly, the Load button shows which of the 304 programs (240 preset and 64 user) is active. The rotary encoder can then select another, if required, the new program being confirmed with another press of the Load button — the patch change takes between one and two seconds.

All the possible routing configurations are provided in the factory presets, so you never have to get involved in setting any of them up from scratch. Instead, you just pick a suitable one, tweak the parameters to your requirements and then save the result in one of the user memories using the Store button. Not having an alpha numeric readout means you need to keep the manual handy when selecting effects programs, otherwise you don't really know which patch is



Photos: Mike Cameron

which, though the LED matrix on the front panel does show what types of effects are being used once a patch has been loaded.

The built-in compressor has its own Bypass button and a four-segment LED gain-reduction meter, while the main Bypass button can be configured either to mute the MPX200's output or simply to bypass all the effects processing. Holding down this latter button for two seconds accesses global system parameters. A Tap button allows you to quickly match relevant effects settings to tempo, and doubles as

"The reverbs are the stars of the show, creating a convincing sense of space and depth without submerging the dry sound or making it seem detached from the reverb that follows it."

a Cancel button — the internal LED flashes whenever the current patch allows any parameter to be sync'ed in this way. (A chart in the manual shows which presets offer tempo-sync'ing facilities.) The Tap and Store keys can also be used to access a MIDI learn mode, designed to simplify the process of assigning external MIDI messages to control internal parameters.

The Effects

The compressor always comes before the main effects block and only affects the signals feeding into the effects, not any dry component mixed in with them. Of course, being a digital processor, it can't prevent input overloads as it comes after the A-D conversion stage. It requires a little bit of a workaround if you want to get the compression on its own (feeding the compressor into a single delay effect with a

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Martin Walker SOUND ON SOUND

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▶ delay time of zero), though there are presets provided for doing this. If the dual mono-in/stereo-out effects configuration is used, then this workaround allows you to mix a compressed dry sound together with reverb generated from it.

The compressor's Ratio parameter can be adjusted from 2:1 up to 10:1 in four steps and the Attack and Release parameters are calibrated in milliseconds. Given that the MPX200 is designed to be a simple unit to operate, I'm rather surprised that there's no automatic option for setting the time constants, as I feel that far more people have difficulty setting up compressors than effects. However, the compressor sounds very smooth and musical and is particularly flattering to guitar. For patches where the original signal is not compressed, the compressor enables the effect level to be made more even.

The most important of the editable parameters for the dual multi-effects is Adjust. This functions differently depending on the patch selected, with several effects parameters often linked so that they are changed simultaneously — the overall result is generally more appropriate than you'd get if you were only adjusting one parameter. In addition there is the EQ parameter, providing tonal adjustment, and level-setting parameters.

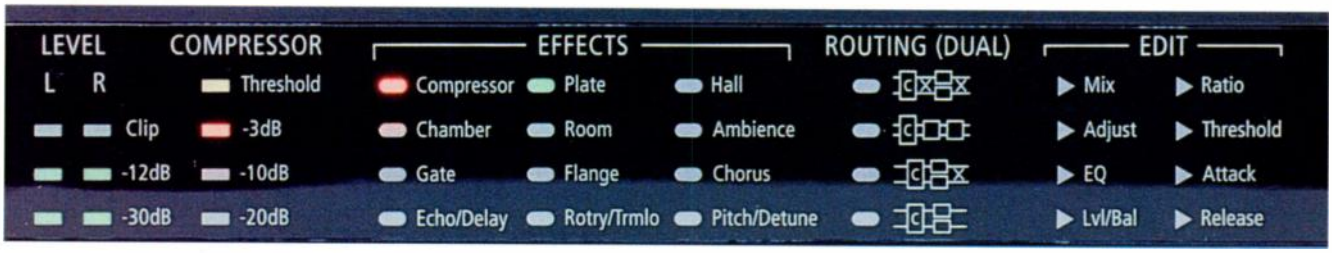
On Test

After running a few tests, I could detect very little difference between the sound quality of the MPX200 and that of the more flexible MPX500. Naturally, the reverbs are the stars of the show, creating a convincing sense of space and depth without submerging the dry sound or making it seem detached from the reverb that follows it. The small room and ambience programs are particularly impressive, especially compared with some software plug-ins which often have to economise on CPU power.

"The MPX200's operating system is very intuitive, not least because of the limited editability, and the unit would therefore be suitable even for users who have had little previous experience with effects."

The delay and modulation effects also stand up very well. OK, so the rotary speaker sounds more like a flange/chorus hybrid, and the pitch-shifting still reveals the expected side effects, but both are very usable — the pitch-shifting is fabulous for mixing with the dry sound for gentle detuning effects, for example. If you've heard an MPX-series processor before, you'll have a good idea what to expect from these effects, and though you can only have two effects plus a compressor running at once, the result is still richer and classier than produced by most cheap multi-effects boxes.

The operating system is very intuitive, not least because of the limited editability, and the unit would therefore be suitable even for users who have had little previous experience with effects. I find not being able to name patches somewhat irritating, but at some point the designers have to decide what they can offer for a given price and what they can't. In this case, they've decided to keep the intensely nice-sounding algorithms, and I'm not about to argue with that logic.



The MPX200 sports a large LED matrix, which offers audio and gain-reduction metering, as well as various status indicators.

Simple Pleasures

Lexicon have not done anything radically new in the MPX200, beyond adding a digital compressor to the input, but they have succeeded in producing an affordable unit that still delivers an expensive sound, albeit with limited editing. Anyone wanting the same sound with more control can save up for the more powerful MPX500, but if you like an easy life, yet find completely fixed presets too restricting, then the MPX200 could be for you. SOS

Tapping In Time

The Tap button offers a number of options for sync'ing relevant time parameters to your music, the simplest of which is to set the tempo by hitting the button in time with the track. Holding the Tap button down, on the other hand, causes the tempo to automatically set itself according to the timing of transient sounds fed into the input, a feature which could be useful where you're trying to match the delay to an existing rhythm groove. The tempo can also be sync'ed to incoming MIDI timing information, if required.

Note that not all delay-based effects can make use of the Tap button's tempo-setting abilities. However, in such cases where tempo-sync'ing is not available, the delay time will usually be tweakable by changing the effect's Adjust parameter. Where the Tap functions are available, the tempo setting is stored as part of the patch. However, there's a system option which allows you to override this setting with the most recent tempo value you've set.

information

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tanks for the memory

IK MULTIMEDIA *SAMPLETANK XL* VIRTUAL SOUND MODULE VST INSTRUMENT FOR MAC & PC

All sorts of weird and wonderful instruments have been recreated in software, but IK Multimedia's *Sampletank* is the first serious attempt to make a high–quality workhorse sound module available in virtual form. **Sam Inglis** explores what it has to offer.

Italian software manufacturers IK Multimedia are best known for the mastering application *T-Racks*, which simulates a rack of valve compressors and limiters, allowing Mac or PC owners with golden ears the chance to buff their music to a high gloss. Their latest release brings another piece of studio hardware into the virtual world, for *Sampletank* is, in essence, a high-quality bread-and-butter sound module in the Roland JV1080 vein, in the form of a VST Instrument suitable for use in *Cubase*, *Logic*, and other compatible programs.

Unlike existing products such as Bitheadz's *Unity DS1*, Native Instruments' *Transformator* or Emagic's *EXS24*, *Sampletank* has no user-sampling facilities at all: you can't even import sounds recorded in another audio application. It won't stream sounds from hard disk, like Nemesys' *Gigasampler*, although IK Multimedia do claim to have developed 'RAM doubling' technology to squeeze more sounds into your computer's memory. Nor does it offer extensive editing possibilities for programs or effects. Instead, the program stands or falls on its ease of use, and principally on the quality of its preset sound library.

There are three basic versions of *Sampletank*: *L*, *DJ* and *XL*. The program itself is the same in each case, as is the selection of 20 different effects. What differs is the sound library provided. A basic set of sounds common to all three versions is included on the program CD-ROM to get you started, while the *L* and *DJ* versions include additional libraries, each occupying a single CD-ROM. The *XL* version collects together both of these discs along with a third CD including yet more sounds, and throws in an additional utility called *Sampletank Converter*, which allows you to convert programs from Akai S1000 and S3000-format CD-ROMS for use within *Sampletank*. At present, this is the only way to

IK MULTIMEDIA *SAMPLETANK XL* £399

pros
- An excellent selection of top-quality sounds in almost all areas.
- Impressive effects.
- Very easy to use.
- *XL* version can convert Akai discs.

cons
- Uses a lot of processor power, on the Mac at least.
- Peter Siedlaczek won't lose any sleep over the orchestral sounds.
- Not very good for working with loops.
- Akai conversion utility not as user-friendly, flexible or reliable as it might be!

summary
If *Sampletank* were a rackmount, it would be a serious rival to the likes of Roland's JV-series modules — and if you've got the CPU muscle, it could provide a serious alternative.

SOUND ON SOUND

expand the *Sampletank* sound palette, although IK Multimedia promise that further sound libraries will be made available in future: nine of their own titles are planned by the end of the year, along with additional releases from Masterbits and other third-party developers.

Installation

Installing *Sampletank* is straightforward. The program generates a unique ID number based on the serial number you enter and the configuration of your system: you register online and IK will send back an authorisation code. Those without Internet access can apparently fax or post their ID number to IK Multimedia instead.

Sampletank itself needs to live in the VstPlugIns folder of your chosen sequencer, but the sounds themselves can be placed anywhere — which is fortunate, as the *XL* version includes 2.5Gb of them. Thanks to IK's proprietary '2pac' file-compression technology, these take up only 1.9Gb of drive space, but unsurprisingly, even that much data takes a lot of copying from CD-ROM, so installation gives you plenty of time to browse the slim but reasonably comprehensive manual.

Using *Sampletank*

Once installed, *Sampletank* works just like any other VST Instrument. Everything is controlled from a single panel which, although it's not particularly large and purports to look like a hardware rack sound module, is nonetheless very straightforward to understand and navigate. When you first call up *Sampletank*, the first thing to do is tell it where to look for its sounds. This is done by clicking the Root button, which as the name suggests prompts you to choose a root folder in which all the sounds are stored. *Sampletank* uses a normal heirarchical folder structure, and the preset sounds are by default arranged in folders such as Drums or Piano, and sometimes in subfolders too: the drums, for instance, are divided into Acoustic and Electronic.

Sampletank can play back a different sound on each of 16 MIDI channels, each of which can be routed to one of four stereo outputs (unless you're running it in *Logic*, in which case you're restricted to a single stereo output), and offers a theoretical maximum polyphony of 128 notes. Should you find yourself running out of notes, parts or simultaneous outputs, you could always have more than one instance of *Sampletank* running at once, but I imagine that most people will run out of CPU power first.

A set of 16 virtual buttons along the bottom left of the *Sampletank* window is used to select which MIDI channel you wish to choose or edit a sound for. In *Cubase*, getting a sound out of *Sampletank* is as simple as routing a MIDI track to it, selecting the relevant MIDI channel in *Sampletank* using these buttons, and browsing through the presets. The main part of the *Sampletank* window is devoted to showing, on the left-hand side, the currently selected sound, and on the right-hand side, the sounds available in the currently selected folder. Loading a sound on the chosen MIDI channel is simply a matter of double-clicking an entry in the list, or selecting one and clicking Load. Note that double-clicking on the square blob next to each entry offers you the chance to delete that sound, so you have to be a little careful.

As befits its emphasis on ease of use, *Sampletank* also provides additional tools to help you track down the right sounds. A Browse button takes you back to the top level of the heriarchical folder structure, while there's also a Search function not unlike that found in Roland's JV3080 and 5080 sound modules. Each *Sampletank* patch is stored with various hidden keywords, and typing in words such as 'Rhodes' or 'hip-hop'

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▶ brings up a selection of relevant sounds for you to audition. Although the Search function worked perfectly well, I found that I rarely needed to use it: the default organisation and naming of the presets is extremely clear, and you're rarely more than three or four clicks away from the sound you want.

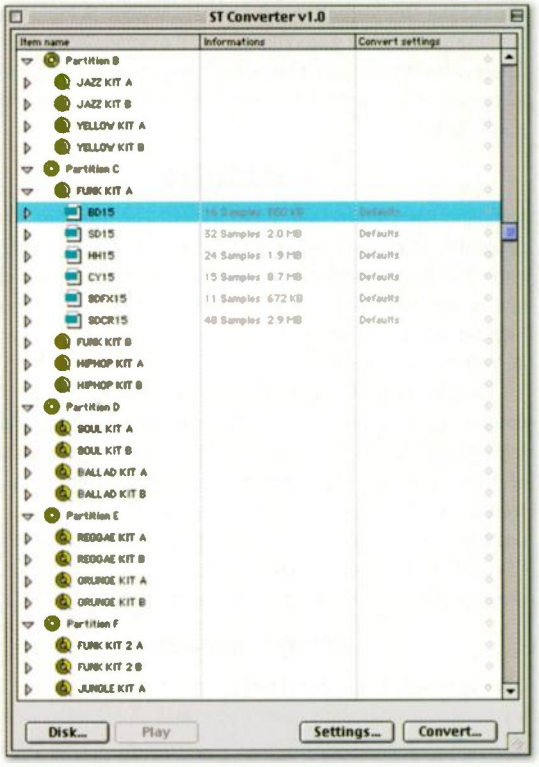
I do, however, have a couple of minor niggles about *Sampletank*'s user interface. The first is that because of the *faux* rack module design, there's no way to resize the basic window, meaning that you have to do a lot of scrolling through lists. The second is that it's easy to end up unintentionally choosing sounds on the wrong MIDI channel in *Sampletank*. In order to choose a sound for, say, MIDI channel 3, you have to select that channel in *Cubase* and then make sure that you also click the button marked '3' on the *Sampletank* front panel. I found myself forgetting to do this on many occasions, and wishing that *Sampletank* could automatically update to display settings for whichever MIDI channel is selected in *Cubase*, though I suspect that this may be a limitation of the VST Instrument protocol rather than a fault of IK Multimedia's making.

Editing Sounds And Effects

When you load a sound, its name appears on the left-hand side of the control panel, and *Sampletank*'s virtual rack controls update to reflect the editing and effects parameters available for that sound. The most basic parameters available in each case are volume and pan, while sound editing is restricted to a maximum of four parameters, controlled by the four virtual knobs along the bottom left of the main panel. The action of these knobs depends on the selected sound. In drum kit programs, for instance, they usually control the respective levels of the kick, snare, hi-hat and other instruments; pianos are mainly set up to allow pitch and brightness to be modified, along with the response of the volume and/or filter cutoff to input velocity; typical synth patches might offer filter cutoff and resonance as well as pitch and velocity response, while parameters used in other patches include sample start point, tremelo, vibrato, attack and release time, and keyclick and percussion levels for organ sounds. Deep-level editing is not an option in *Sampletank*, but in most cases the parameters assigned to the knobs for each sound are well chosen and useful.

Each sound you choose can also have up to four effects. The first effect is always 'EQComp' which, as the name suggests, offers EQ and compression, while the other three can be freely chosen from a list of 20 (some of which come in more than one version). In some of the presets, the effects are actually integral to the sound, such as the rotary speaker simulator implicated in many of the organ patches. The five virtual knobs in the centre are used to set up the effects: again, deep-level editing is not possible, but the most important parameters in each case can be adjusted. The Reverb, for instance, allows you control over Decay, Colour, Density, Size and Level, while a simpler effect such as Tremelo might offer only Depth and Speed. All of *Sampletank*'s effects are truly multitimbral, applying only to an individual patch on a single MIDI channel. If you want, say, a global reverb, you'll have to apply it within your sequencer.

Edited patches can be saved, complete with effects settings, in the usual way. Saving a Song in *Cubase* also preserves all *Sampletank* settings within that song, and given that editing in *Sampletank* is really just a matter of tweaking presets, I rarely found that I needed the latter's own patch-saving facilities. Both program and effects parameters can be automated in *Cubase* or *Logic*, or assigned MIDI Controller numbers for real-time control from a keyboard or knob box.



Sampletank Converter displays the contents of an Akai CD-ROM in a tree structure on the left-hand side, allowing you to select volumes, programs or individual samples for conversion.

The Sound Of *Sampletank*

I remarked earlier that thanks to its lack of deep-level editing and sampling facilities, *Sampletank* would stand or fall as a product on the strength of its sound library. I'm pleased to report, therefore, that its sound library is very strong indeed. In the main, IK have concentrated on providing a comprehensive selection of 'bread-and-butter' sounds, and most of them are first-class.

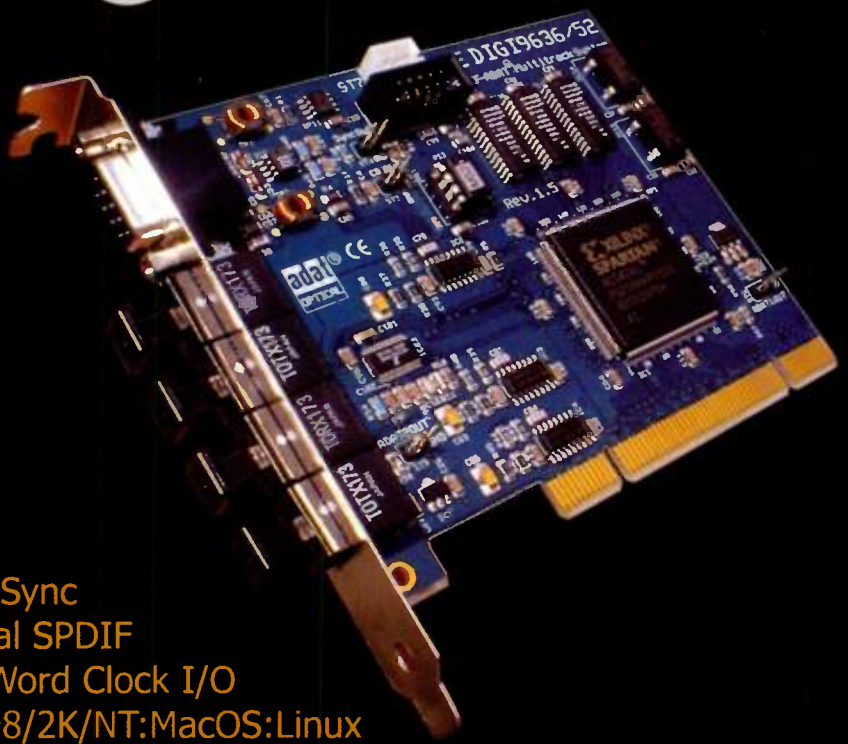
My first port of call was the drum kits. *Sampletank XL* offers 23 'real' drum kits (along with programs offering just a selection of kicks, snares and hi-hats) and mighty impressive they are too. From powerful rock kits with lots of room ambience ▶

Sampletank Converter

The *Sampletank XL* CD includes a separate Mac/PC application called *Sampletank Converter*, which is designed to convert programs and samples from Akai S1000- and S3000-format CD-ROMs into a form where *Sampletank* can use them. It's very much a no-frills program (see screenshot, above): on launch, it asks you to insert an Akai CD-ROM, before displaying its partitions, volumes, programs and samples in a heriarchical tree structure. You can select any or all of these, whereupon the program chunters away to itself for a few minutes as it does the necessary calculations. If you like, you can also enter name and keyword information. When it's finished, your Akai programs should be available to be loaded into *Sampletank*, provided you remembered to adjust the *Converter*'s preferences to tell it where to put the converted files. *Sampletank Converter* also has a built-in database feature that remembers both which elements of an Akai CD you've already converted, and what name and keyword information you added. This could be handy, since converting an entire library of Akai CDs could take a long time.

I tried converting an Akai-format drum CD, and did eventually succeed in getting the sounds from disc into *Sampletank*. However, I found *Sampletank Converter* to be a rather temperamental piece of software — and worse, when I tried to load the converted drum programs into *Sampletank* itself, several of them caused it and *Cubase* to crash. IK say that they are aware of this problem and will address it in a future update. The current version of the program converts some Akai parameters, such as filter settings, but not all; IK hope to increase the thoroughness of the conversion in forthcoming updates.

The Classic



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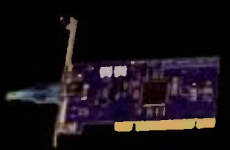
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to vintage funk and R&B drum sounds, not forgetting a fantastic brushed kit, nearly all are fresh-sounding, exciting and most of all immediately useable. These are complemented by some equally convincing percussion, ranging from tambourines and shakers to unusual ethnic instruments like the repinique, tanta and pandeiru.

Staying with the rhythm section for a minute, *Sampletank* is also strong on basses, offering a good selection of punchy electric basses as well as some evil synthetic ones. Elsewhere in the synth department, there are also a number of very useable pads, leads and synth pianos, but better still are the real keyboards. The three acoustic pianos feel a tiny bit 'stiff' to play, but sound good, eschewing the artificial 'bigness' of some sampled pianos in favour of a classy, understated smoothness of tone with no obvious looping, multisampling or velocity-switching points. There's also a nice harpsichord and a rather good Fender Rhodes (although the velocity-switching is more obvious in the latter case), and the selection of organs is most impressive, especially when you consider that the distortion and rotary-speaker effects are modelled using *Sampletank*'s effects rather than sampled at source.

In fact, *Sampletank*'s effects are worthy of praise in their own right. The rotary speaker is among the best I've heard, Lo-Fi is a great effect combining distortion and bandwidth filtering, the delay-based effects are musical and sweet-sounding, the Reverb and Ambience effects are perfectly acceptable, and there are a couple of novelties such as AM and FM modulation. I only wish they could be used as VST plug-ins outside *Sampletank*!

Of course, no collection of sounds is perfect, and *Sampletank* does have its weak points. Most of these, for me, are to be found among the orchestral sounds. I've never found ensemble patches such as 'Full Orchestra Trem' particularly useful, and *Sampletank*'s sound set has a tendency to concentrate on these rather than solo instruments. While its string ensembles are not bad, for instance, it's disappointing that even the *XL* version doesn't give you good enough solo strings to put together your own string sections. Only two solo violins and violas are included, and both sound as though they might just as well be Larry Adler as Yehudi Menuhin. Most of the woodwinds sound fine, but each instrument is represented only by a single sound, and the oboe is marred by an obvious crossover point between samples. For some reason the brasses are much more varied, offering a decent selection of solo trumpets, trombones and saxes, although I still wonder who will find a use for ensemble patches such as 'Saxophones Section'.

Along with a large selection of synth sounds and electronic drum kits, *Sampletank DJ* also introduces a range of 'construction kits' in true sample CD tradition. These consist of tempo-matched loops arranged across the keyboard, allowing the user to construct songs simply by holding down the relevant notes. While the loops themselves are pretty good and cover a wide range of contemporary dance styles, however, I feel that *Sampletank* doesn't really provide the best environment for using them. Apart from switching the individual loops on or off and applying effects to them, there's very little the user can actually do within *Sampletank*. There's none of the control afforded by a dice-and-slice program such as *Recycle*, nor any of the clever time-stretching available in *Acid* — and since all the loops are in proprietary *Sampletank* format, they can't easily be imported into another program.

The most serious difficulty I encountered in using *Sampletank*, however, was not to do with its sound quality or features, but its use of processing power. I tested the program on my 300MHz G3 Mac with 192Mb RAM — no longer at the cutting edge of computer technology, but normally capable of running a goodly number of audio tracks, plug-in effects, and other VST Instruments — and found that it didn't take much to push *Sampletank* over the edge. There was certainly no danger of exceeding the theoretical maximum 128-note polyphony or 16-part multitimbrality. The manual claims that "for reference, a PIII 500MHz supports more than 100 notes polyphony, a G3 350MHz supports up to 32 notes", and my Mac often crapped out before reaching this level: in general, a drum kit, bass, and piano going at once was about as much as *Sampletank* could handle. I didn't have a chance to test the PC version, but IK Multimedia claim that *Sampletank* is 'highly optimised' for Pentium III CPUs, so some PC owners at least should suffer much less from processor drain. They also told me that they are in the process of optimising the Mac version for the latest Altivec G4 chips, so the situation should improve for some Mac owners too. The program's effects architecture doesn't help economise on CPU power, though, since reverbs and other processor-hungry modules cannot be used globally.

Verdict

The real worth of a program like *Sampletank* can be judged by how much difference it makes to the way in which you make music: and although it's only been in my computer for a few weeks, it's become the first sound source I turn to when I start work on a new song. The sounds just seem to work in a mix without requiring extensive EQ or processing, and in sonic terms, *Sampletank* easily holds its own against the rack units currently available. Whether you should choose *Sampletank* over a Roland or Korg module, however, depends upon whether you have the CPU power to make the best use of it. With a hardware rack unit, you have the confidence of knowing that your maximum polyphony and multitimbrality are guaranteed. With *Sampletank*, on the other hand, you have the convenience, tight timing and flexibility of full integration into your sequencer, as well as an excellent set of fresh sounds unavailable in any rack unit. I doubt that I would be depending on it if I were a film composer looking for quality orchestral sounds, or a *DJ* looking to make loop-based music, but if you're after a solid, reliable, and classy set of basic sounds for rock, pop and dance, *Sampletank* really hits the spot. SOS

L, *XL*, Or *DJ*?

If you do decide to invest in a copy of *Sampletank*, which version should you buy? Those whose primary interest is in dance music should obviously investigate the *DJ* version, but the choice between the *L* and *XL* versions is less clear, and £200 is a substantial price premium for what is effectively two extra sample CD-ROMs and an Akai conversion utility — especially since there are few crippling omissions from the palette provided by *L*, which is a good, balanced set of sounds. That's not to say that the extra sounds in the *XL* version don't provide a very impressive extension to this palette, however, and as there's no financial penalty for buying *L* or *DJ* and then upgrading to *XL*, I can envisage a lot of people taking this route.

"Although *Sampletank* has only been in my computer for a few weeks, it's become the first sound source I turn to when I start work on a new song."

information

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SURROUND SOUND EXPLAINED • PART 1

Surround sound in one form or another has been a part of the film industry for many years, but the emergence of affordable digital technology has now pushed it into the domestic mainstream. **Hugh Robjohns** begins *SOS*'s definitive guide to surround and its implications for the hi-tech musician.

I think it would be a pretty safe bet to assume that everyone reading this will have some idea of what surround sound is all about. After all, it has been with us in various guises since the production of Walt Disney's *Fantasia* in the 1940s, and the hype 'surrounding' its recent incarnations (excuse the pun) is very hard to overlook, both in professional and consumer circles. Nevertheless, just to make sure we are all talking about the same thing, by surround sound I refer to a means of audio reproduction that involves more than two speakers — that is, something beyond conventional stereo, requiring four, five, six or more loudspeakers positioned around the listener at specific locations.

You might already have had some contact with surround sytems in a domestic environment, in the form of a four-channel Dolby Pro Logic-equipped video system, or even a five- or six-channel DVD video 'home theatre' setup. However, with the recent publication of the final specifications for DVD audio-only discs (DVD-A) and consequent release of suitable players and media onto the marketplace, not to mention the growing libraries of competing (but incompatible) surround-sound formats such as Digital Theatre Systems' DTS and Sony's Super Audio CD (SACD) and their associated players, it seems a good time to give the whole topic a thorough examination in the pages of *Sound On Sound*.

Over the coming months, we will take a look at what surround sound is all about, where it came from, where it is going and, most importantly of all, why it is relevant to you! We will work through some of the theoretical aspects of producing and presenting sound in surround, and look at how the professionals are handling the format, both in studios and in mastering environments. Perhaps of more direct relevance, we will also examine ways that you can set up surround-sound monitoring and perform mixes in surround — either using your existing equipment or, if your equipment does not support surround already, we will provide some suggestions as to how to acquire the ability for the smallest outlay of cash.

Surround For The Consumer

Although many people subscribe to the view that surround sound will never be as popular or as practical a medium as stereo — primarily because of the unacceptable domestic demands imposed by six (or more) loudspeakers — the technology is certainly available to support it in both professional and domestic environments. What's more, our understanding of the psychoacoustics involved is far more advanced than it was when the ultimately unsuccessful domestic quadrophonic systems (of which more later in this article) were launched 30 years ago.

It must be said, however, that the greatest

enthusiasm for surround today comes from equipment manufacturers, who are extremely keen to promote it. From their point of view, their markets have become fully saturated; stereo CD systems can be found in virtually every home in the developed world, and so profits are either levelling off or falling. The only way to boost their sales is to persuade the punters to part with their money for new hardware and software all over again — and that means the introduction of a new format.

There is nothing new in this approach — we saw the same thing at work with the launch of CD in the first place, and with Minidisc and MP3 more recently. In the context of surround sound, we are now seeing it all once again with DVD Video, SACD, DTS, and now DVD Audio — all of which share the generic DVD platform.

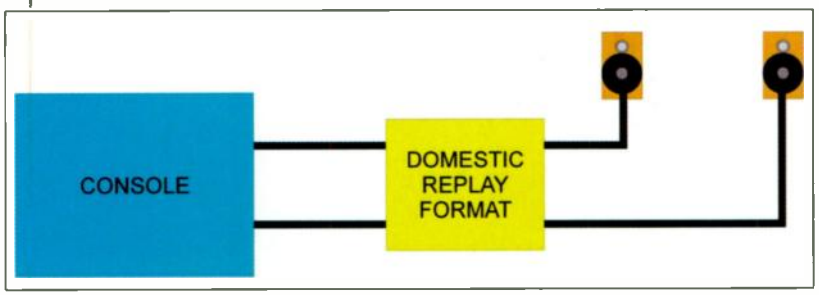


Figure 1(a): The familiar conventional stereo mixing setup, with mixer, recorder for the replay format (which might be CD-R, DAT or Minidisc, for example), and two speakers for monitoring the final left-right signal.

However, the main problem from the consumer's point of view is that these are mutually incompatible formats — a problem that is often the Achilles heel of Japanese manufacturers, who seem always to want to push their own bespoke designs, rather than agree from the outset on a range of wholly compatible formats. While a lot of consumers have already bought standard DVD-V players — although not as many as the manufacturers would have liked — a significant reason for the slow uptake has been the confusion of formats and the almost continual upgrading of the DVD format specifications.

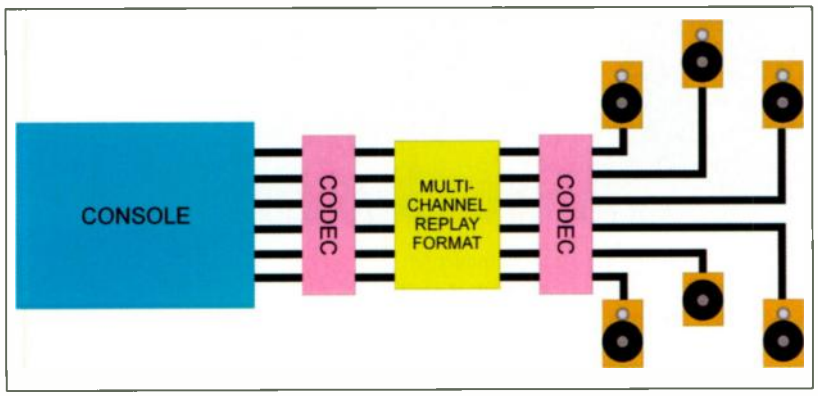


Figure 1(b): A discrete 5.1-channel surround mixing system. A finished six-channel mix is routed on separate channels through a manufacturer-specific codec to the multi-channel replay format (which might be a DVD-A disc or DTS-encoded CD, for example). The mix is then passed to the six speakers for monitoring — there are left, centre, right, rear left and rear right channels, and the bass subwoofer.

Consumer DVD magazine reviews are frequently highlighting DVD feature film releases with extended functionality which is not accessible on certain machines at all, or machines which can not play video discs without the assistance of an external audio format converter to handle (for example) DTS-encoded tracks.

At the present time, very few DVD players indeed can handle SACD discs or the full set of DVD-A requirements — although many manufacturers have been promising true 'universal' players capable of extracting any information from a DVD-style disc for some time. Until universal players are the norm, though, the public at large cannot be confident that any disc they happen to buy will play back properly. Unsurprisingly, these kinds of issues tend to make the consumer wait until standards are established. We have just reached the point where this is starting to happen — the DVD-A specs are now cast in stone, SACD is becoming widely recognised and endorsed by the record companies, and the manufacturers have sorted out most of the licensing deals. Multi-format or 'Universal' machines are just beginning to come on to the market and will hopefully become the norm in a short space of time (say within three years or so).

Surround for the Musician

From the musician's point of view, surround provides a far more challenging and potentially more creative environment in which to work, although there are also some significant fiscal and technical implications in terms of equipment and facilities (more on these in a couple of months). The bottom line, though, is that the record companies and other commissioners of music (film, television, computer games, and so on) are increasingly expecting or demanding surround mixes because of their intrinsic commitment to surround formats in general. The general public, too, may well start to expect everything to be presented in surround — if only so that the pretty little light on the hi-fi comes on and those extra speakers that came with the new stereo produce some sound in the dining room (...and you think I'm joking?)!

To me and my colleagues at *SOS*, it therefore seems very sensible that if you have any interest in working in surround at all, you should start thinking about the whys and wherefores now, and begin formulating a plan to acquire both the gear and experience necessary to work comfortably in the medium. Hopefully, this new series will go some way to helping you achieve those goals.

Lessons Of The Past

Before diving headlong into the technicalities of the subject, we should reflect a little on the relevant surround experiences of the past. A sizeable proportion of the *SOS* readership will be old enough to remember Quadraphonic systems (even if only as a distant recollection of Uncle Bill's weird hi-fi) and might have wondered why the format disappeared so quickly. It might be instructive to consider the reasons for these past, failed systems to avoid making the same mistakes again.

In the beginning of recorded sound, over a century ago, one-channel (mono) recording was all that was possible. However, within a surprisingly ▶

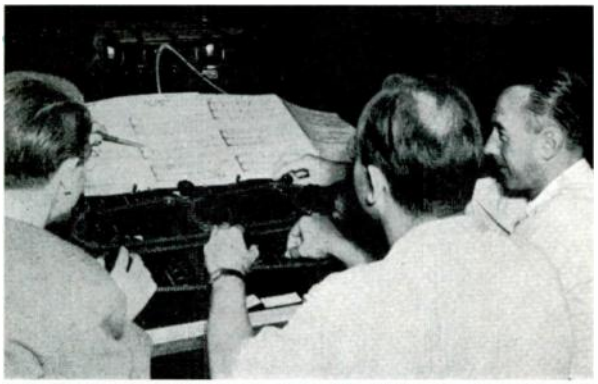
short space of time, the science of sound recording had evolved tremendously, and amongst the possibilities brought about by the electronic age was multi-channel sound, which attracted the attention of many inventors. The introduction of the thermionic valve (or vacuum tube in America) by Lee de Forest in 1907 enabled electrical amplification and bought about the means of combining and controlling signals from multiple microphones, not to mention the ability to record and replay such signals from multi-channel media (initially with optical tracks on film).

By the 1930s a lot of effort was being put into finding better ways of reproducing 'soundscapes'. The word 'stereo' (a contraction of 'stereophony', from Greek roots meaning 'solid sound') was originally used to refer to reproduction systems employing multiple sound channels. The early experiments in 'stereo sound' were attempted to recreate life-like three-dimensional sound images using a variety of techniques, all of which employed at least two channels and often many more.

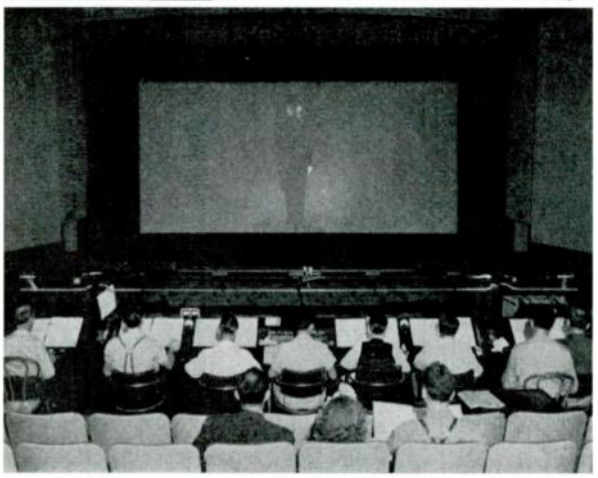
Building on the pioneering work during the first few years of the 1930s of such industry luminaries as Alan Blumlein of EMI and Harvey Fletcher of Bell Labs, the typical 'stereo' (ie. two-channel) systems we have today gradually evolved (see Figure 1(a) elsewhere in this article). In fact, Blumlein's work on coincident stereo has remained the foundation and fabric of all domestic stereo replay systems, as well as many common studio and location recording techniques, which have remained completely unchanged in 70 years! The work of Bell Labs can also be traced directly to the top of the family tree of replay formats employed universally in the cinema industry — particularly in the use of a third, front-centre channel to localise dialogue and key actions to the centre of the vast projection screens used during the first heyday of the worldwide film industry.

The first public use of genuine, discrete-track surround sound — in the context that we would understand today — was by Walt Disney in his famously surreal animation film, *Fantasia*, which married animated mini-features to excerpts of popular orchestral music. The conductor for the original production, Leopold Stokowski, had previously been working closely with Bell Labs in their development of various advanced music recording systems and techniques, and it was inevitable that he would act as a conduit for their expertise in the Disney project. These combined talents and resources proved inspirational, and led directly to the realisation of what can only be described as a technological masterpiece, over 60 years ago!

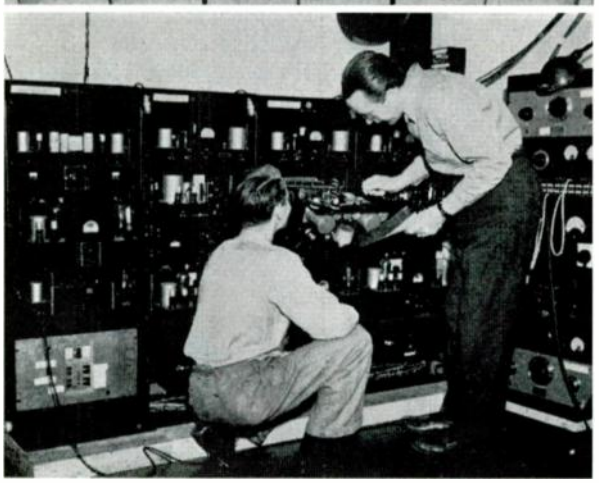
For the first time in cinematic history, a film's sound stage was designed to completely surround the audience — up to eight separate music and effects tracks were mixed and panned, live, during each performance (see above). Obviously, cinemas were not equipped to handle such complex or pioneering technical requirements, so Disney toured the film across the United States, complete with its own technical crew and reproduction system (christened Fantasound), to great acclaim. Unfortunately, the 'roadshow' was brought to a premature end by America's entry into World War II, and this innovative surround-sound technology was never used again in the same form.



A view of a three-channel mixer developed for use with Disney's Fantasound system. This one was used at a vocal recording facility in Burbank, California, in the early 1940s for the tracking of some of *Fantasia*'s vocal numbers.



Engineers mixing the Fantasound soundtrack live during playback of the film from a custom-built eight-channel console.



Fantasound engineers servicing part of the system's multitrack monitoring system in the early 1940s.

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Disney and Bell Labs were undoubtedly the first pioneers of surround sound, and had to develop many original techniques and technologies for the project. For example, to be able to pan sounds around the auditorium they actually had to *invent* pan pots, as nothing like them had existed before. They also had to invent multitrack audio recorders so that different orchestral sections could be replayed, and therefore positioned, independently. To obtain sufficient separation to allow the various orchestral sections to be manipulated independently, they also developed ▶

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close-microphone techniques, overdubbing, and even click-tracks — all techniques we take for granted today, but revolutionary at the time.

The advent of magnetic film soundtracks in the 1950s maintained a limited degree of surround technology in the cinema. The popular 35mm Cinemascope films employed four tracks, for example, and there were six on the prestigious 70mm Todd-AO format. Both of these mainly used the additional tracks to allow side and rear sound effects, in addition to the widely adopted three frontal channels.

The Quad Squad

The first time surround sound raised its head in the consumer environment was with quadraphonic (or quad) systems in the 1970s. Once again, the introduction of these new formats was principally driven by hardware manufacturers, who were trying to expand the market after it reached near-saturation with stereo record and tape players. Unfortunately, the whole quad era was a commercial disaster, principally brought about by far too many incompatible formats and a very confused public, but also because the fundamental concept didn't actually work very well!

At this time, surround sound meant four channels — essentially a conventional stereo pair at the front and another at the rear, with the angle between adjacent speakers being 90 degrees. Conventional stereo requires the loudspeakers to subtend an angle of 30 degrees either side of the centre line of the listening position to produce the most coherent and stable stereo imaging. If you move closer to the speakers, such that their relative angle increases to 90 degrees (±45), you will find that the imaging quickly collapses into puddles of sound at the speakers with the slightest movement either side of the central axis. Even if you manage to remain in the incredibly narrow 'sweet spot', the imaging is highly unstable and distorted unrealistically. This is precisely the problem encountered with quad systems — only made all the worse by suffering not only unstable frontal imaging, but also virtually non-existent side and rear imaging. Essentially, sound tended to puddle unconvincingly around the speakers, or leap about disconcertingly when panned around.

At the time, little had been done in the way of scientific research into the psychoacoustic effectiveness of such a system, and not much was known about how human hearing deduces directional information. The bottom line was that most Quadraphonic systems failed to reproduce anything remotely convincing by way of a surround soundstage. In particular, achieving stable and solid images across the sides proved to be a major hurdle, and the systems only worked at all if the listener remained in a very small, highly impractical 'sweet-spot'.

Matrixing

Although there were a couple of bespoke, discrete four-channel tape-based systems (quad reel-to-reel and eight-track cartridge formats), most quadraphonic systems involved some form of signal matrixing. In this context, the idea of a matrix is to combine the original four sound channels — corresponding to the signals required in each of the four loudspeakers — into (typically) two channels for recording or transmission. This is normally done in such a way that the resulting two-channel signal remains broadly compatible with conventional stereo and mono replay — in other words, it is 'backwards compatible'. This was the idea with domestic quad systems — that by employing stereo matrixing, they could offer playback of quad, stereo and mono records from the same record player.

On replay a special decoder is employed to reconstruct the original four channels from the matrixed two-channel signal for auditioning through the loudspeakers. This arrangement is often referred to as 4:2:4, because the four original channels are matrixed into two channels for transmission and storage, but reconstituted into four channels for replay. Lexicon and RSP Circle Surround both manufacture 5:2:5 systems today, but the Dolby surround (Pro Logic) format, of which more towards the end of this article, remains a 4:2:4 system.

The problem with matrix encoding is that you can never reconstruct the original four channels perfectly: something is always lost through the process — normally separation or isolation between the four channels! Or, put another way, matrixing introduces a lot of crosstalk. Whilst there are some very clever methods to minimise

"The whole quad era was a commercial disaster, brought about by too many formats and a very confused public, but also because the fundamental concept didn't actually work very well!"

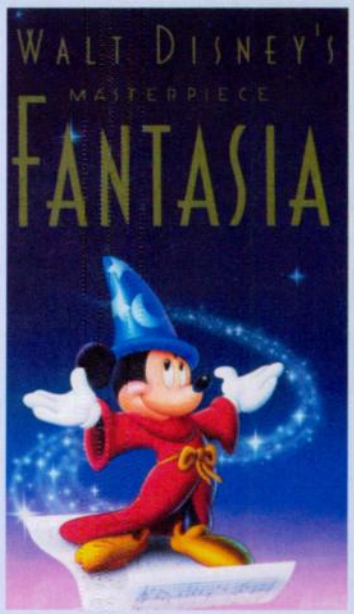
Fantasia In Surround On DVD

The original *Fantasia* film is now available on DVD in a specially restored, uncut edition which has been remastered to celebrate its 60th anniversary, with its soundtrack remixed into surround according to the original production notes.

The restored material includes both the intermission and narration, neither of which have been incorporated in the film since its original theatrical release in 1938. In addition to the memorable scenes of Mickey Mouse as the Sorcerer's Apprentice, and plump hippos performing ballet in tutus, this latest release also contains various behind-the-scenes material including audio interviews with the late Walt Disney and some insightful commentaries by those who contributed to the reproduction of the original film. It's highly recommended and a justifiable purchase as *the* original, definitive surround reference!

Fantasia 2000, also available on DVD, carries on where its predecessor left off, with seven completely new segments in addition to the ever-popular Sorcerer's Apprentice. The musical excerpts span Beethoven to Gershwin to accompany everything from flamingos with bobbing yo-yos, to a 'city in bluesy motion'! Although not as revolutionary as the original, this latest film still makes interesting use of the surround medium.

W www.disney.com



Disney's masterpiece *Fantasia*, now re-released with original footage restored, extra material, and a 5.1-compatible soundtrack created from the original Fantasound production notes.

The best-known film to be produced with a soundtrack in Dolby Stereo — the original *Star Wars* film from 1976.

this and improve the situation, all matrixing produces significant and undesirable side-effects. This is why all of the current surround-sound formats maintain multiple (more than two) discrete channels all the way from origination through to the loudspeakers in the listening environment, as shown in Figure 1(b) elsewhere in this article.

The side-effects of matrixing are not so apparent in the feature-film environment, but in a quadraphonic surround system, the crosstalk severely limits the system's ability to image accurately. As a result of this, few, if any, quad systems really came close to delivering the performance that their marketing propaganda promised in the '70s.

Another problem hampering the domestic takeoff of quad was that there were a great many competing (but largely incompatible) quadraphonic surround systems in existence during the mid-to-late '70s. UMX (also known as UD4) from Denon and Columbia, and CD4 Quadradisc (JVC & RCA), avoided the inherent problems of matrixing by employing a separate high-frequency subcarrier to convey the rear-channel information (in a similar way to that used by stereo FM radio). UMX and CD4 were only available on vinyl records and needed specialised phono cartridges and decoders for surround-sound replay. Although fully backwards-compatible with stereo record players, the inevitable wear and tear of the disc groove quickly destroyed the high-frequency information carrying the rear-channel signals.

Matrixed systems of the period included SQ (CBS & EMI), QS (Sansui & Decca), 45J (National Research Development Council, or NRDC), Stereo 4 (Electrovoice), Dynaquad (Dynaco), and Matrix H (BBC). None of these formats survived beyond the start of the 1980s, although a couple did form the basis of further developments which are still with us today. For example, the 45J and Matrix H systems formed the roots with what is now known as Ambisonics UHJ — a more recent simplification of the original Ambisonics surround system, which is truly periphonic — that is, capable of conveying height information as well as horizontal surround sound.

Ambisonics deserves a separate investigation as it is a kind of purist surround technique — the surround equivalent of coincident mic techniques, you could say — which was way ahead of its time when it was invented over 25 years ago. We will return to it again later in this series, because it is still very much alive and offers a great deal of ▶

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format-independence in gathering and processing surround sound.

Suffice to say, for now, that UHJ-encoded CDs are widely available and have been for many years, and are capable of producing very accurate surround images when decoded correctly. Unfortunately, Ambisonic decoders have been few and far between, but growing interest in the format, combined with the almost universal use of digital signal processing in surround-sound controllers, means that implementing the complex Ambisonic decoding algorithms is now fairly straightforward and more domestic decoders are beginning to offer the feature.

Dolby Surround

Another surround format which has survived the quadraphonic era is the 'MP Stereo' format produced by Dolby Laboratories, which first came to popular recognition with the original Star Wars film in 1976. Dolby had been involved with the film industry for some time as its Dolby A noise-reduction system was widely employed in an attempt to improve the relatively poor noise performance of optical soundtracks on 35mm film release prints.

By building on the work of the quadraphonic matrix encoders and decoders (and incorporating some of their own ideas), Dolby were able to provide a reliable four-channel system which was fully compatible with standard mono and stereo replay systems, but which could also envelope the audience with atmospheric effects to enhance significantly their involvement in a film.

The original Dolby system was not intended to recreate a stable 360 degree soundfield from four corner speakers as the quadraphonic systems had been, but was designed to encode signals for the prevailing three front speakers, which provided good frontal imaging, plus a fourth feed for numerous surround speakers along the sides and rear of the auditorium, which were all fed from a single 'Surround' channel. The four-channel stem (Left, Centre, Right and Surround, or LCRS) fed into the matrix encoder at the recording stage had total separation between channels, but once encoded into the two-channel matrixed signals (known as Left-total and Right-total, or LtRt), that separation was all but lost completely (see Figure 2 above).

Separating the four components on replay was a major headache, as with many of the matrixed quad systems, but the process was enhanced by a couple of psychoacoustic tricks, including the use of (originally) analogue delay and bandwidth limiting (100Hz-7kHz) on the rear surround channel. The delay ensured that crosstalk from the front channels into the rear arrived at the listener long after the front-channel sounds, and was therefore not perceived, let alone objectionable.

The analogue (bucket-brigade) delay lines of the time were very noisy, but the use of a simplified form of Dolby's B-type noise-reduction helped a lot. A very clever active steering system was also developed to increase the perceived separation, cancelling some of the crosstalk in adjacent channels in the presence of a 'dominant' sound signal. Although the steering system improved the separation between channels, it had some 'entertaining' side effects and, as a consequence, Dolby made it mandatory to monitor the results of the complete encode-to-decode process when mixing a soundtrack in their format. In that way, the inevitable side effects of the matrix decoding could be minimised or mitigated at the mixing stage.

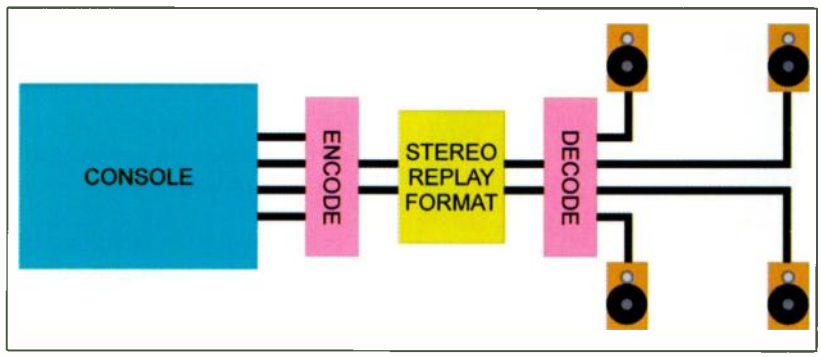

Figure 2: A so-called 4:2:4 matrixed surround mixing system, such as that offered by Dolby Pro Logic. The big difference between this system and those in Figure 1(a) and (b) is that here the discrete channels of the finished mix are not maintained throughout the process. The completed mix, this time on four channels, is passed to a matrix encoder which combines the channels into a two-channel stereo signal, allowing the matrixed mix to be stored on a stereo replay format such as CD. In passing the matrixed stereo signal through a decoder, an attempt is made to reconstitute the four discrete channels for monitoring, although the channels recreated in this way will never be completely free of crosstalk.

The original cinema system used the 'Motion Picture' or MP matrix, and was trademarked as 'Dolby Stereo' in cinema applications. When films were released on video with Dolby MP-encoded soundtracks, the first domestic incarnations of the decoder (around 1982) were trademarked 'Dolby Surround', although these systems used a passive decoding arrangement which provided appalling channel separation. Around 1988, the original professional MP matrix decoder was redesigned and manufactured as an integrated circuit, making it cost-effective for use in the consumer mass market, where it was marketed as 'Dolby Pro Logic'. The system has now been in widespread use across the world for over a decade, and is frequently integrated into domestic hi-fis, televisions, and computer consoles. Last year, Dolby launched 'Pro Logic II' — an updated version of the complete encode/decode process which, whilst still compatible with existing MP-matrix encoded media, provides enhanced results with non-encoded music and other stereo sources for replay over a 5.1-channel surround monitoring system.

Since Dolby Stereo (aka Dolby Surround or Dolby Pro Logic) is still a standard release format, and is employed on countless computer games, as well as in a significant proportion of radio and television broadcasting, we will come back to looking at it next month.

Next Month

In the next part of this series, we'll take a closer look at the two current surround-sound technologies which have survived from the past: Ambisonics and Dolby Stereo. They both have applications in modern surround-sound productions, and both involve techniques and technologies which provide a foundation for discrete 5.1 systems and beyond. SOS

Thanks to Martin Hart of The American WideScreen Museum (widescreenmuseum.com) for his help in sourcing the archive Fantasound pictures used in this article. Special thanks to Mary-Ann Frusciante, Dianne Purrier and David Juhren of The Society Of Motion Picture and Television Engineers, New York (www.smpte.org), without whom the publication of these images would not have been possible.

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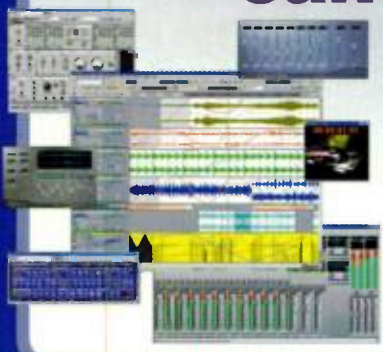

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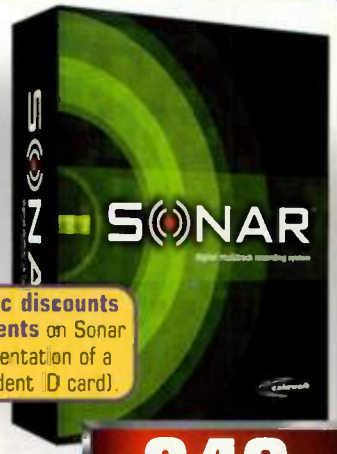

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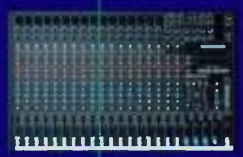

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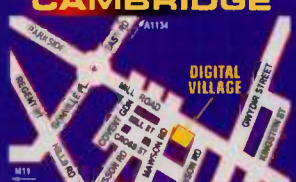

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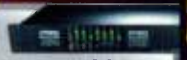

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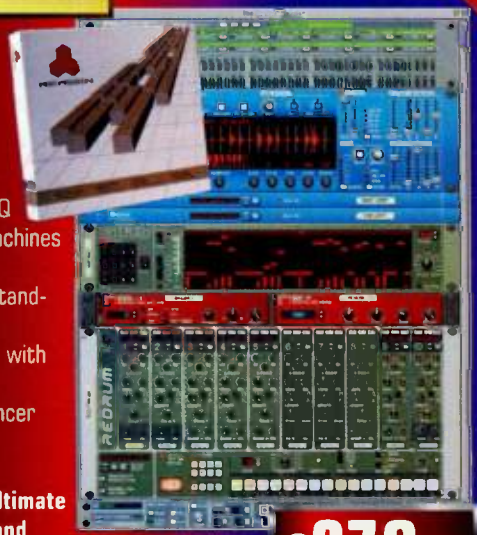

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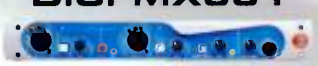

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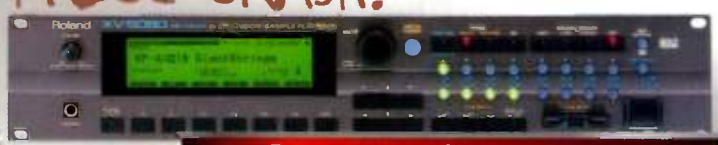

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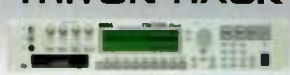

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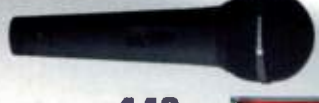

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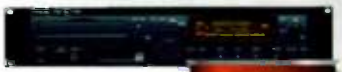

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double decker

MARANTZ CDR500 CD RECORDER

Marantz's dual-deck CD writer uniquely allows the creation of a Red Book CD from a CD-R recorded in Track-at-once mode. **Paul White** finds out if you really can compile masters in the studio without a hard disk recorder.

The Marantz CDR500 is a dual deck audio CD writer/copier that works with both CD-R and CD-RW discs. Copying audio between drives is at either normal or double speed, with the option to add SCMS. The Marantz CDR500 is strictly 'audio only' but is distinguished from other copiers by something Marantz call Automaster — a feature that enables the user to make a Red Book, Disc-at-once copy from a CD-R that has been recorded in Track-at-once mode. Furthermore, the laser is fan cooled for lower jitter levels and longer laser life. The manufacturers claim that this, combined with robust error correction means that difficult-to-read discs can often be cloned with far fewer errors than the original. CD text recording and duplication (Mode 4) is possible from the internal CD deck while ISRC/UPC codes and Indexes can be copied in disc-at-once mode. An audio buffer compensates for slightly late start IDs on the source CD and also prevents the start of the first track from being clipped.

Features

The CDR500 is similarly styled to other recent Marantz CD writers with large controls for the main functions, and also includes an infra-red remote controller. There's a headphone output with a level control and the digital input includes an inbuilt sample rate converter that can accommodate sources between 11kHz and 56 kHz, though it can be bypassed for use with stable 44.1kHz sources. The digital I/O is on both coaxial and optical connectors that can be set to either S/PDIF or AES/EBU formats (fixed 0.5 Volt level) and the machine automatically detects AES/EBU sources and switches its track increment mode accordingly. A digital out loop connector enables a number of machines to be cascaded.

The player has both coaxial digital and phono analogue outputs while the record deck has both phono analogue I/O and balanced inputs on XLR (trimmable 0 to +22dB). Digital gain trim of up to +6dB is also possible. Two further coaxial connector may be used used in combination with RC-5 compatible control systems.

The CDR500 will register automatic track increments from start IDs in CD, MD, DAT and DCC sources recorded via the digital input in S/PDIF mode, but not in AES/EBU mode as this carries no start IDs. When using external sources, there's a choice of Rec Ext Disc, which is a CD sync mode picking up IDs from the source material, or Rec Ext Man where the recording must be started manually. If Auto Track is active, tracks will be incremented automatically after a pause of 2.7 seconds or greater. A pause in excess of 17 seconds will end the recording.

Because of the buffering system, the machine can achieve instant sync and begin recording from a standing start (for either analogue or digital sources) without losing the first second or two of the material. Copying from an external source is conventional, but copying CDs internally is even easier — just select Fast Record, then press Record when prompted. You can also programme a different running order for copying, though not in Disc-at-once mode.

After copying, the disc must be finalized and Auto-finalizing is available in the Make CD mode to save time. Real-time recording is possible if you need to listen to the CD as it records and Disc-at-Once mode produces a finished, Red Book compatible master disc. To re-order tracks and then make a Red book CD, it is first necessary to make a CD copy in the correct running order, then to make a further copy of that disc in 'Disc-at-once' mode. As you can use CD-RWs for the interim stages, this isn't too wasteful.

CD Text is supported and text may be edited after recording but prior to finalizing. All the usual playback functions are accessible via the remote control, including the Program mode for track re–ordering, and it's also possible to use the two decks as players such that one starts when the other stops. A further mode allows both decks to play at the same time, feeding separate sound systems.

Summary

I experienced no problems using the CDR500, which I feel is a practical studio tool for anyone who doesn't have a computer editing system. In addition to being able to re-order tracks and make Red Book masters, it's also useful for making small numbers of duplicate CDs from a master. Operationally it is straightforward and considering that it doesn't cost much more than a stand-alone CD writer, it extends the usefulness of such a device considerably. SOS

MARANTZ CDR500
£799

pros
- Easy to operate.
- Can produce Red Book Disc-at-once masters from Track-at-once compilations.
- Double-speed copying.

cons
- Limited copying speed (x2).
- Data copying not supported.

summary
A practical extension of the CD-R concept that should have many uses in the typical home studio.

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PRODUCER, ENGINEER & MUSICIAN MICHAEL BRADFORD

It's hard enough to reach the top in any field, be it engineering, production, programming or playing an instrument, but Michael Bradford has excelled in all of these departments — and often while travelling across America at 80 miles per hour! **Richard Buskin** meets a man who's helped to create massive hit albums for Kid Rock and the New Radicals.

"My mantra is 'It's not my record,'" says Michael Bradford. "You know, my name isn't on the cover. I might have opinions, I might have suggestions, but at the end of the day, when the record is on the shelf, the artist is living and dying by that record. The best I can do is help guide the process. I've seen a lot of big producers approach things as if they're the artist employing a singer, but I don't do that. I mean, artists hire me for a lot of reasons, but what they don't hire me for is my ego."

No, what Kid Rock, Uncle Kracker, Run DMC, New Radicals, Anita Baker, Terence Trent D'arby, Annabella Lwin, Madonna and numerous others have hired Michael Bradford for during the past few years are his multi-faceted talents as a songwriter, producer, engineer, remixer, programmer and musician. Bradford, you see, is also adept on the bass, guitar, drums and keyboards, and while this may sound like a lot of ground to cover, in no way is he the proverbial jack of all trades, master of none. The range of his abilities means that Bradford gets hired in a variety of roles, from collaborating or co-writing to simply getting a good sound on material that has already been written.

"For me it's really crucial to understand what the artist is basically trying to say through the record," Bradford explains. "That is, assuming the artist is actually trying to communicate some sort of deeper message, as opposed to just singing the song. Both kinds of record are valid — some are purely entertainment, whereas others have this whole level of communication going on, and if you're lucky enough to be part of one of those records, I think it's really important to listen to what the artist is trying to say. You can be of maximum use by just helping him or her to bring that out and get their point across. Then you can actually say, 'It sounds like this is what you're

trying to communicate in your song, but this thing is obscuring it. Maybe if it wasn't there it would be clearer.'

"I can sit with a guitar player and suggest other guitar parts, or I can suggest maybe a different position on the guitar that will produce the same notes that he wants but are easier to play. I can help him solve his problems without saying, 'I'm a better musician than you,' because that's not what making a record is about. At least it shouldn't be, although again I do know there are guys who have different methods. They'll say, 'I don't care, I just want the record to sound good,' but that artist has got to go out and perform the thing night after night if the record is a success. He has to live with himself, and no one likes to feel that someone else has made their record for them, unless they hired the producer for that specific purpose."

The Learning Curve

Having played guitar since the age of six, Detroit native Michael Bradford made his pro start as a bassist for reggae band The Heptones during the late '70s. Next switching to jazz, he learned to play a variety of instruments while acquiring an interest in the recording studio, and soon he began writing songs and making demos on his Tascam Portastudio.

"What I really wanted to be was a songwriter," he says. "However, the only way I could get my demos done was to do it all myself, because if I would write a song and ask someone else to play guitar, either they'd start suggesting all of these other parts that I didn't want or they would want to be credited as a co-writer because they played a wah-wah. It was easier for me to do it myself, and necessity being what it was, I became quite adept at doing it fast, because I'd sometimes only have a few hours to work on my own little ideas before returning to my other gigs."

In the process, Michael Bradford learned a lot about multitrack recording, and he also acquired a part-time job as an assistant at Ambience, one of Detroit's top studios at that time, frequented by the likes of Bob Seger and Anita Baker, as well as advertising companies recording commercials. Limited in terms of how much high-calibre work he could do in Detroit, Bradford relocated to Los Angeles at the end of the '80s. By then, as a full-time freelancer, he had already become adept at programming MIDI and using early versions of Pro Tools. "Sound Tools was the first thing I used," he recalls. "Then, as it became more of a multitrack thing instead of just a stereo editing and mastering tool, I grew with Digidesign. Consequently, I was among the first people to really want to record and work purely in Pro Tools whenever I could. You see, even though I had an analogue background, what attracted me to Pro Tools was the fact that, when the plug-ins became available, you could mix in it and have instant recall. I could see how advantageous that would be if you were switching from session A to session B and not have time to re-document everything and reset all of the controls. For me, Pro Tools' ability to reset was just amazing, because you weren't just automating the console, you were automating the outboard equipment; you were automating the mix.

"Even today, I'll be working on something, and suddenly a record company will call and ask me to run a special mix of a record that we've done two months ago for a movie or TV show, and I'll say, 'Sure.' I can literally load that session which will already be exactly the way it was, make my changes, bounce it down, make a DAT or whatever they need, and then return to my other session. If I had to do that on tape it would be bad news. It would be a bad phone call."

The Programmer's Part

On first moving out to LA, Bradford found it easier to obtain work as a programmer. "As a programmer doing MIDI I ended up using Pro Tools to a degree," he says. "So, I was sort of engineering too, and if I was writing the song that I was programming then I might be credited as the ▶

Michael Bradford's 'Chunky Style Gear'

A big, beefy guy with a penchant for making big, beefy-sounding records, Michael Bradford aptly names his production company Chunky Style Music. Accordingly, he also has his own chunky style setup at a post-production facility named Millennium Sound. Mostly MIDI-related or used to run Pro Tools, this collection of equipment is pretty comprehensive:

- Akai S1100 sampler.
- Alesis ADAT digital multitrack w/BRC.
- Apple Power Macintosh 9600 running a Digidesign Pro Tools 5.1 Mix Plus system.
- Casio RZ1 drum machine.
- Clavia Nord Rack and Nord Modular synthesizers.
- CM Automation Motormix.
- Compaq AP500 Pentium III with Windows NT running Pro Tools 5.0 Mix Plus System.
- Emu E6400 and Emax samplers, Orbit and Planet Phatt sound modules, and E-Synth keyboard.
- Korg M1R and N5SR sound modules.
- Line 6 Pod and Bass Pod.
- Mackie HR824 hard disk recorder.
- Mackie HUI control surface.
- Mackie 3304 mixer.
- Yamaha FB01 sound module.

"The common factor with most of my gear is that it happens to work," says Bradford. "All of the stuff that I tend to use is well made, very reliable and very versatile. I don't believe that any one company has a monopoly on sound. Everything is done through Pro Tools, and the Mackie 3304 is basically a 16-channel stereo submixer through which I route all of my keyboards via a patchbay system. I still have to do MIDI tracks before I commit them to hard disk, so I just use the Mackie to monitor what I'm working on, and then two channels of Pro Tools get fed through it too.

"The reason why I have a fair amount of Emu gear is because in my experience it is a lot more versatile, and boxes like the Phatt and the Orbit have good pre-made sounds which you can modify and filter quite heavily. Now, if I'm creating a brand new sound that no one's ever heard before, chances are I'll use a modular synthesizer. That's where my programming background comes in. You see, when I talk about being a programmer, I talk about designing sounds and programming synthesizers, as opposed to what people often call a programmer, which is just a guy with a drum machine. The Emu gear is a lot more programmable than the synths of many other manufacturers — you can actually do things with filters, and assign MIDI controllers to certain parameters and get a lot more versatility out of the unit. As a result, even if you are dealing with a 'canned' sound, so to speak, you can process it to a larger degree on the Emus than on some of the other gear.

"If I had my way I'd always work digitally. When I'm working in Pro Tools, I'm sort of recording and mixing and developing all at once, so that by the time we get close to the end of the recording process, not only does the song sound good but it's pretty much mixed. I've already added EQ, grouped things, and done edits and comps — I don't like to have a bunch of extra parts laying around, so I'll start editing them, decide which takes are the best and put them together as I go. If I do that in Pro Tools, when it's time to mix I'm almost done, whereas if I did that on tape the editing would take another couple of days, and if I wanted to switch from song A to song B then we'd be switching the console and the outboard gear all over again. The ability to switch from song one to song three and have the computer reset just the way it was is a godsend to me."

writer, and I might also become the producer if they used the track that I had built using MIDI."

Then, of course, there were his aforementioned multi-instrumental abilities. Want some keyboards? No problem. Need a guitar? Sure thing. How about some bass and drums? "For the first few years out here I was sort of a Swiss Army knife," Bradford says. "I was able to sneak in a lot more work that way, and also, because I was involved in the session on the programming level, I was seen almost as a second producer."

His best instrument being the bass, Bradford nevertheless views himself primarily as a songwriter and record producer. "The engineering and all of those instruments are just the tools that I use to get the job done," he says. "When I write a song the whole number is pretty much in my head before I ever sit down with an instrument. I've got perfect pitch and I can hear the music in my head before I play it. I can hear the strings, I can hear the whole thing, so for me it's really a case of imagining the way things will sound and then coming up with a lyric that I think will help."

Michael Bradford's most high-profile projects of recent years have included his soundtrack contributions with Hans Zimmer and Terence Trent D'Arby to the 1996 movie *The Fan* — "That was remarkable sounding. We built it from the ground up with MIDI, and the only natural instruments were guitar and bass," — and his 1999 engineering and programming work on The New Radicals' album *Maybe You've Been Brainwashed Too*.

"That was all Pro Tools work," he explains. "A lot of that record was originally recorded on analogue, but then a big part of putting it together came down to assembling different takes from different reels in Pro Tools. At the time, [*New Radicals main man*] Gregg Alexander's general method was to record a basic rhythm track with the band to analogue tape, put up slave reels for a stereo mix, and perhaps have other guitar players come in and add new parts. Then he might make another slave reel for pianos and another slave reel for extra vocals. We'd end up with several reels of tape, although ultimately we could only use 48 tracks, so a major part of getting the actual record together was deciding which tracks of each slave reel would make good additions to the basic tracks. It was a big assembly process, and we did that at my studio here in Burbank.

"The process was confusing to me, but I think Gregg knew what he wanted all along. He was just waiting for the people to play it. As the producer he was always heading towards something, whereas I would sometimes wonder, 'Why do we have all of this extra stuff that we can't use?' I mean, he wrote the songs and he was producing the record, so it was definitely his show. My level of input was to make sure it all lined up where he wanted it to, while as a musician I would also say if the parts were helping or not. The problem to me was that there were so many of them. Depending on which ones you used, you'd end up with a different result, but they were all good parts, so the question was 'Which part do you want?' not 'Is this part good and that part bad?' To me, it was a pretty heavy way of doing it, but I don't think Gregg himself was ever confused."

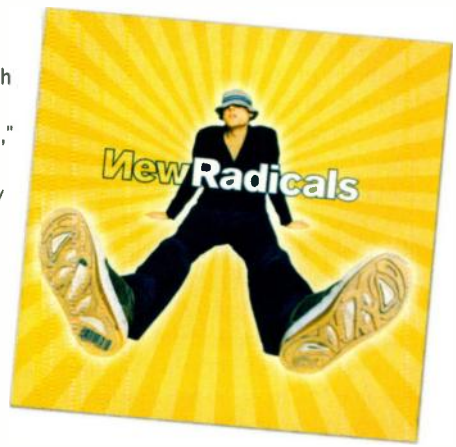
Michael Bradford in the work room at his Los Angeles studio.

Rocky Road

The resultant New Radicals album turned into a major hit, and the knock-on effect for Michael Bradford was that it provided him with *bona fide* rock & roll credibility alongside that which he had already established in the field of R&B. The past couple of years have also seen Bradford enjoying another musical outlet in the form of playing bass on the road with Kid Rock, the fellow Detroiter whose multi-platinum album *The History Of Rock* he co-produced and engineered in a unique 'rolling studio' which they had put together aboard a tour bus.

"I've known Kid Rock for about 10 years," says Bradford, "and when we went on the road two years ago the original reason they brought me along was to help them record Uncle Kracker's *Double Wide* album. That was why we set up the studio on the bus. We took the rear lounge out of one of the buses, providing me with an empty room to work in, so I set up a rack of Pro Tools back there, a rack of MIDI, a rack of outboard, a Mackie HUI, a pair of Mackie HR824 powered monitors, and then we had some guitars and drum machines in the bay of the bus that we could pull out when we needed them, as well as a couple of microphones. The Emu MIDI equipment is rackmountable and it doesn't take up a lot of room, so I was able to have a lot of gear and relatively not take up a lot of space.

"I was programming drum beats while we were rolling along at 80 miles per hour, and if Kid Rock wanted to play guitar or anybody else was playing an instrument — if the keyboard player was putting some parts down or whatever — everything was mounted in the bus and they could



Michael Bradford contributed his engineering and programming skills to the hit debut album by Gregg Alexander, aka The New Radicals.

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just sit back there and do their thing. We had the whole system running and I had everything on battery backup power supplies, so they were getting isolated clean power from the bus, and if the bus's generators did anything erratic we wouldn't be affected. That's the only way to do it if you're going to be on a bus, otherwise you'll be a victim of the up and down effects of the generators."

Not wishing to be away from his children in LA for an extended period, Michael Bradford agreed to help Kid Rock record the Uncle Kracker album as a friendly favour on the proviso that it would only take five weeks. In the event, the gig took just a little longer... 18 months, to be precise. "We did the first five weeks, and then Kid Rock said, 'Well, we're not quite done. Let's go back home to Detroit for a while," Bradford recalls. "Being that I'm from there it wasn't so bad, but I was missing my kids and I'd only get to see them maybe a couple of days a month. Anyway, I stayed there for a couple of months, and then he said, 'Oh, you know we're going on tour again. Why don't you come along? We're not done on the album.' So, we set up the bus again, and this time he said, 'As long as you're here every night, why don't you play bass?'"

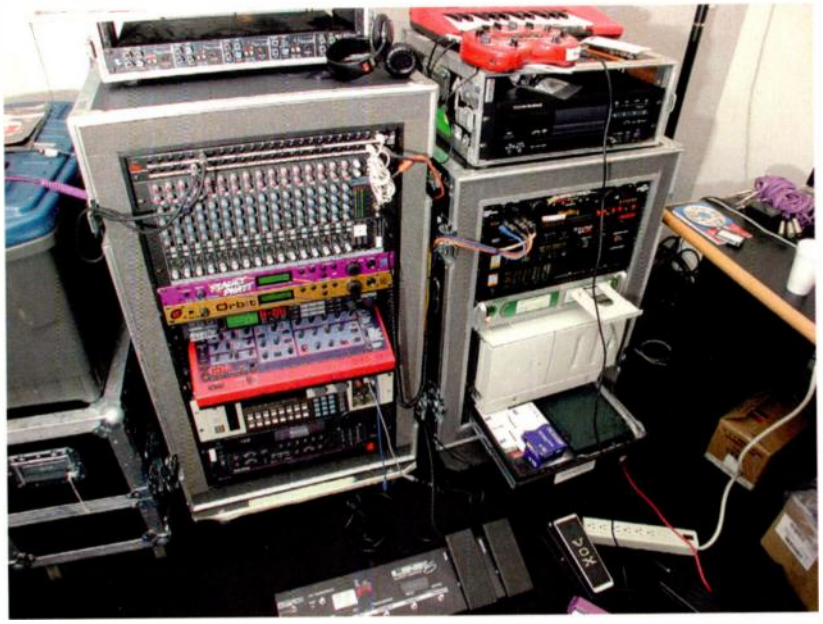
Kracker Barrel

For the first two months Michael Bradford lent his talents exclusively to the Uncle Kracker record, and then when Kid Rock began to execute his idea for the *History Of Rock* album there was a period during which the men worked simultaneously on both projects.

"Depending on which day it was, we'd work on one record or the other, and it was because of Pro Tools that we could do that," says Bradford. "I couldn't imagine being on a bus and switching from project A to project B within the same day any other way. You know, to be able to yank out one hard drive and stick another one in, bring up the previous mix, and keep overdubbing or editing from there; it would have been impossible without Pro Tools."

Uncle Kracker's music is similar to Kid Rock's in that it features rapping as well as singing. However, it also far more laid back and melodious than the in-your-face rock sounds of the Kid.

"Kracker co-writes a lot of Kid Rock's songs, and he just has a natural way with a melody," says Bradford. "He's not a trained musician and neither does he have a lot of experience on different instruments, but it's in his head. He's just naturally musical, and I'm sure that if he had the chance to practise playing the guitar or any other instrument he'd be great at it. If you're a good musician, the music's in your head and you're just looking for an instrument to play it on. Otherwise you're just a good technician.



The main equipment racks in Michael Bradford's studio. The left-hand rack contains, from top: API 3124 mic preamp, Mackie 3304 submixer, Emu Planet Phatt and Orbit sound modules, TC Electronic G Force guitar effects, Clavia Nord Rack synth, Akai S1100 sampler and Emu 6400 sampler. In the right-hand rack are his Clavia Nord Modular synth, Line 6 Pod guitar preamp, Tascam DA20 DAT recorder, a selection of MIDI and audio interfaces and a Glyph removable hard drive.

"People think Uncle Kracker's a rapper or a DJ because they see him at the turntable, but what's really brilliant about him is that he's got a great musical mind, and when you take a hit song like 'Follow Me' which he and I wrote, a lot of that melody he just had in his head. He came up to me one day and started singing it *a capella*, and I said, 'Well, there's a hit song. Thanks for bringing it here.'

"He came to me with the chorus melody: 'Follow me and everything is all right...' and I said, 'Wow! That's a hit!' Then he started singing the verse, and at the time the verse lyrics were very different to what they are now, but the verse's melody that he came up with was really catchy. He would sit there and sing this thing, and I'd come up with chords to go along with the basic melody idea that he had. Then, where the producer part would come in was when I'd say, 'These lyrics are OK, but could they be different?' He would say, 'Well, how about this?' Like the song needed a middle eight, so I wrote chords for a bridge and said, 'How about if the bridge went this way?' and he said, 'Well, we could do that, but how about this, because this is more the way that I sing?' So, the song started out as a sort of *a capella* skeleton of a verse and chorus idea, and then by adding parts and coming up with chords for it we were able to develop it into a real song within a couple of days.

"He already had the basic melody and the chorus lyric in his head, and where I came in handy — aside from writing all of the chords and the bridge for him — was just encouraging him to

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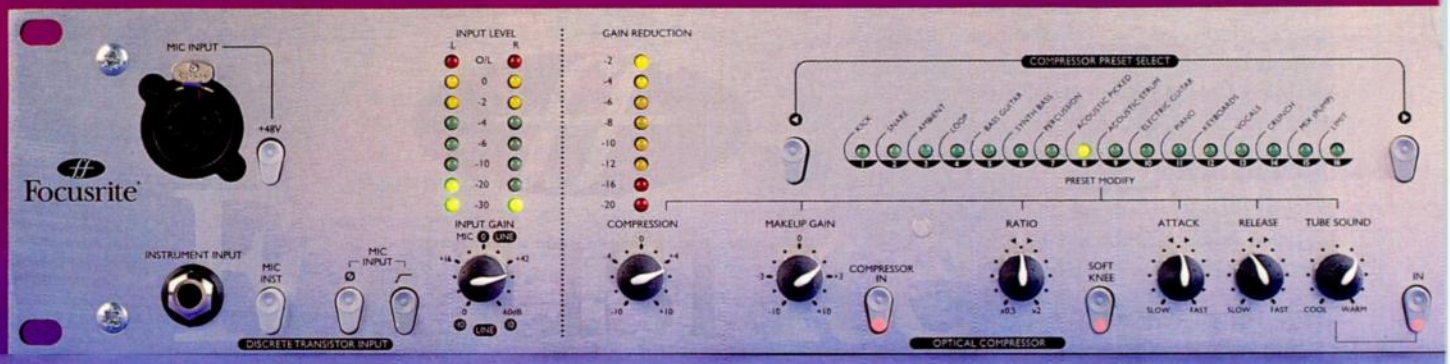

FOCUSRITE PLATINUM PENTA PRESET STEREO COMPRESSOR

The new compressor in Focusrite's Platinum Range offers pre-programmed settings for ease of use, whilst still incorporating extensive manual parameter control. **Paul White** gets to grips with the Penta.

Setting up a compressor is something that still mystifies a lot of people. Even when you do understand the basics, it can take a lot of experience to select the best settings for a particular audio source. A handful of companies have tried to make life easier by offering compressors that include presets optimised for different musical applications, and now Focusrite have developed their own version of the preset-based compressor as part of their Platinum range.

The Penta uses a new optical gain control system that has been optimised for musicality, transparency and tracking accuracy — the latter clearly being important for stereo operation. Focusrite have also included tube-emulation, for those seeking a 'warmer' sound, which uses a new three-tier FET circuit that progressively introduces second, third and then fifth harmonic distortion, in much the same way that valves do when driven hard.

The Penta has been designed to function both as a mono mic, line, or instrument processor, and as a stereo line-only processor. The front panel of the 2U box shares the distinctive Platinum styling, and carries sockets for the balanced Mic Input and high-impedance Instrument Input. Dual balanced line I/O is provided via rear-panel TRS jacks and a further pair of TRS sockets provide unbalanced side-chain access. The outputs can work at +4dBu or -10dBV reference levels, depending on the position of a switch by the output sockets. Plugging into the mic or instrument inputs, or into the left channel's line input, causes the unit to operate in mono, outputting only on the left channel. On the other hand, feeding signal to both line inputs allows for stereo operation.

Front-panel switches select whether

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£299

pros
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- Extremely good sound quality.
- Compressor sounds musically satisfying as well as clean.
- Useful and effective tube emulation
- Surprisingly affordable.

cons
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summary
Focusrite have not only managed to create a preset compressor that really will meet the needs of the majority of users, but also incorporated plenty of flexibility for the more experienced user.

SOUND ON SOUND

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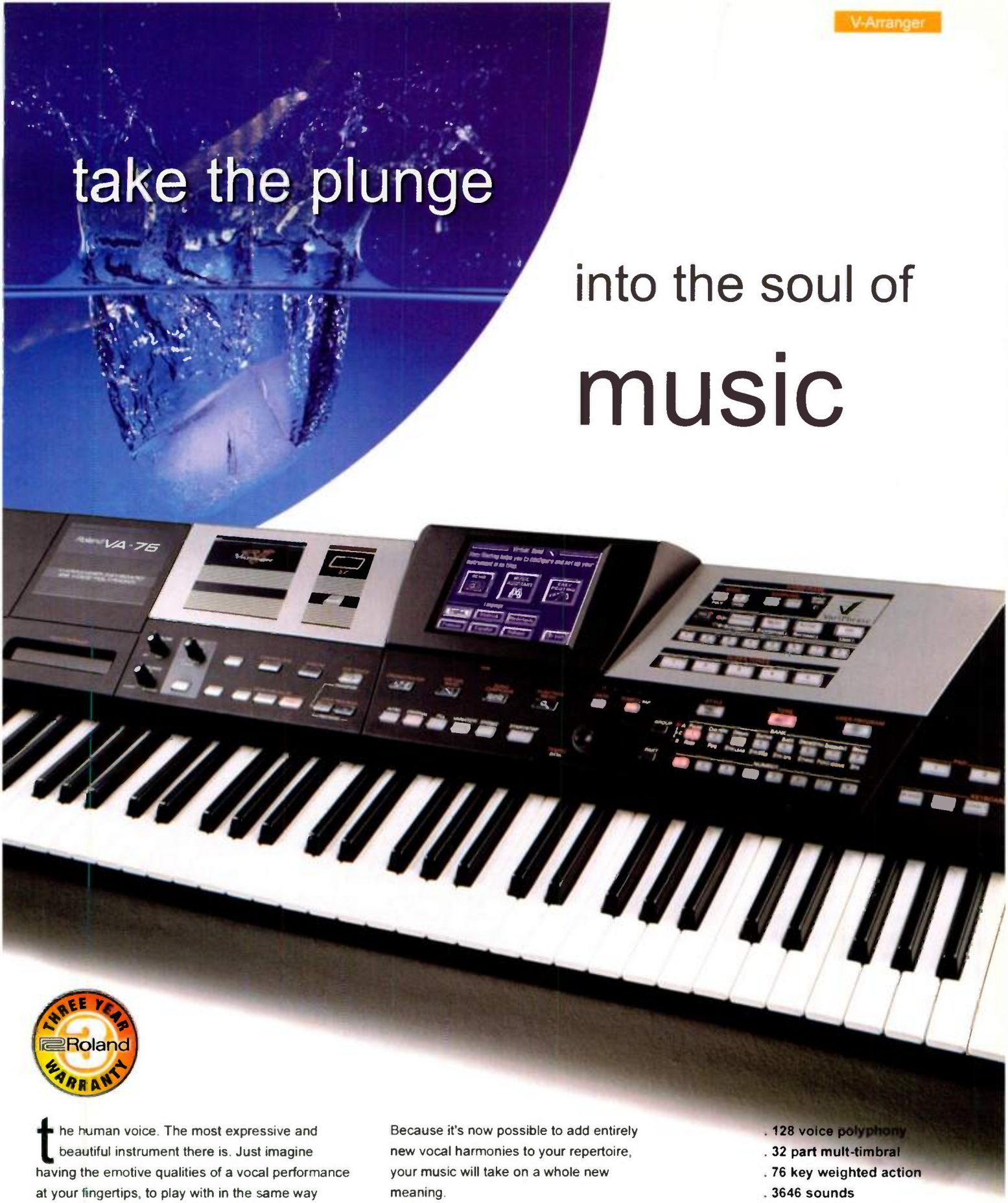

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finish it. A lot of times the producer's job is just to help the guy finish his idea and get the song done. It's easy to get discouraged, and for an artist like Kracker a song like 'Follow Me' was risky because he had this image of being with this hardcore band. You know, he's a rapper and he's got this gold tooth, and then here comes this very melodic, pretty song. What will people think? My answer was, first of all, 'When you've got a hit song nobody complains,' and secondly, 'Who would you rather have in your audience? 13-year-old boys or 18-year-old girls? Personally, I'd prefer the girls.' Having a bunch of kids thinking you're hardcore is cool, but having a bunch of young girls in the audience is cooler. Besides, girls buy more records. So, I encouraged him to finish the song, and I think that was important, because that song obviously made the album a hit.

"For that number I used a guitar to write because I happened to have one laying around. There's always a guitar around and so it's often easier to write that way. There's not always a piano around, and if there's a keyboard it's not always turned on and ready to go, whereas the beauty of guitars is that they're always booted up, they're always running. All you have to do is play them, provided that they're in tune. Anyway, a lot of 'Follow Me' was cut in the basement of the house where I was staying in Detroit at the time. Kracker came over, and I played the guitar, the bass and programmed the drums, and then we had our keyboard player come by and overdub some parts as well as sing most of the backup vocals. The rest of the album was literally recorded on the road while we were travelling, and also in the garage of the guitar player's house in Detroit where the band would rehearse, in my basement, at Kid Rock's house where he had a little Pro Tools setup, and finally at this small studio in Detroit that we set up to do the live overdubs for the *History Of Rock* album."

Metal Kid

The aforementioned Kid Rock opus evolved largely out of previously released material from his pre-Atlantic indie days, transferred onto Pro Tools and spruced up with new instrumentation or cleaner mixes, while other songs were completely re-recorded. Then there were a couple of brand new numbers: 'American Badass', which turned into a big hit, and 'F**k That', which appeared on the soundtrack of the movie *Any Given Sunday*.

"For 'American Badass' we used a sample from Metallica's 'Sad But True' as the basis of the track," Michael Bradford recalls. "Kid Rock's also a DJ, and sometimes he'd DJ at parties and cut between Metallica and maybe a hip-hop song. That's part of why he sounds the way he does, always mixing rock and hip-hop together as a DJ. So, he took the CD of 'Sad But True' to a mastering lab and had it pressed onto vinyl — we couldn't find it on vinyl anywhere — and that way he could scratch it. I dropped the musical sections of the song without the lyrics into Pro Tools and started editing together something that could serve as the basis of the track, and then he started coming up with a rap for it, while band members like the guitar player added a lot of overdubs. There's also a cool middle section with live drums, and those were added in Detroit by Kid Rock's drummer after the tour was over. I played some guitar and bass on it, but the main work that I did on that song was in the editing process, helping put it all together. Kid Rock definitely had a vision of how he wanted the song to go, but that kept expanding. He kept coming up with new parts.

"'F**k That' was different. It was cut in the guitar player's garage. Kid Rock programmed the drum beat, I started fooling around on the bass, the guitarist came up with a part, and that was

sort of the jam of the song which Kid Rock sang to. The environment that we were recording in was kind of fun, plus there was a bar nearby and he wanted a bunch of people to chant the 'f**k that' refrain in the chorus. Suddenly all of these inebriated people showed up and they were all going 'f**k that!' I'm sure they had no idea where they were, they probably don't remember anything, but it was a lot of fun.

"For me it was fun just doing it on the road and in that environment. You read a lot now about people recording on their buses, but I don't think anybody else was really doing it like we were two years ago. Limp Bizkit were on tour with us for a while and they had a little Pro Tools setup on their bus, but it was just a small computer, nothing like what we had. Now a lot of bands are doing it. A lot of bands dropped by our bus on the road, and they were probably all kind of inspired by it. I mean, I didn't consider it to be some type of trade secret. Jackson Browne had recorded on his bus at least 20 years ago, so we didn't invent the concept."

The Engineering Situation

As usual, Bradford took care of the miking, recording Kid Rock's vocals with a CAD VX2 which he describes as "one of the best sounding mics I've ever heard for vocals. It's a tube microphone, it's got two tubes in it, and it's blue. You can't go wrong with a blue microphone. Artists love it because it looks so damned good, and it just sounds great. It seems to capture every little nuance and I love that, because generally when I record vocals I don't use any EQ or compression on the input stage. I work on mic placement and coming up with a good mic pattern, and I tend to record through a preamp straight into the computer. Then, if I do any compression or EQ, it's during the mix.

"So, the VX2 is very good for that, and it's my favourite vocal mic, but the other mic that I use a lot is the Shure SM7. It's like the big brother of the 57 and it sounds great, but it's a dynamic mic, so if you're a singer like Kid Rock or Bob Seger who really put out the volume and are also used to working live with their mouths very close to a hand-held mic, it may not be the right one to use. It's not designed to be a hand-held mic, but it is designed to handle a voice that's right in front of it and it doesn't falter at that point. Those are my two favourite microphones for vocals, and another mic that I use from time to time is the AKG C414, which tends to work for singers whose voices are a little thinner-sounding if the whole idea is to capture that thinness."

As Michael Bradford invariably DIs the bass unless he's presented with a hard rock band in a very large recording space, mic placement on the tour bus was never a problem. Fitting a drum kit on there would have been a tighter squeeze. "We put them in the parking lot for Uncle Kracker's record," he says. "Some of the arenas have huge parking areas for the buses, and sometimes those areas are indoors. At the beginning of 2000, when we were on tour with Metallica, we took a Pro Tools system with us, but at that time it wasn't built into the bus. Instead we would take it up to our hotel rooms, because by then most of the work was done and we didn't want to be sitting on the bus in the middle of winter. Whenever we had an overnight stay we would take the Pro Tools system out of the bay of the bus and roll it upstairs in its big rack, but there were also a couple of times when the record company needed to receive a last-minute mix of something right away.

"I remember one time when we were in an arena parking lot, they needed the mix right away, and there was no time for Fedex unless I did it right then. So, I set up the Pro Tools right next to the bus, ran a power cord into the bus, and while the system was up and running I grabbed a microphone, got a couple of extra drums, and started recording some drums outdoors. When I worked with Terence Trent D'arby we did the same thing for a guitar solo on this song called 'Letting Go', where he wanted to hear the sound of the guitar amps outside. We were at a studio in LA that was owned by Dave Stewart of The Eurythmics, a beautiful old mansion-type house with a guest house down the hill where Seal was staying at the time, and breaking the picturesque silence was a Marshall. I'd therefore done it before, and so I thought, 'This will be fun.'

"During soundcheck in the arena I had a second Pro Tools 5.0 system that was running on Windows NT, and I hooked it up to the front-of-house console, the drummer would play just beats and so on, and I would record them directly into Pro Tools from there, giving me some cool different sounds and ambiences to work with. Plus I was running a DAT during soundcheck, and I could get some drum beats from that too and make samples out of them... Improvisation. That's the name of the game. I mean, if you have plenty of time and nothing to do, and you're in this cavernous cement space, you might as well get busy." SOS

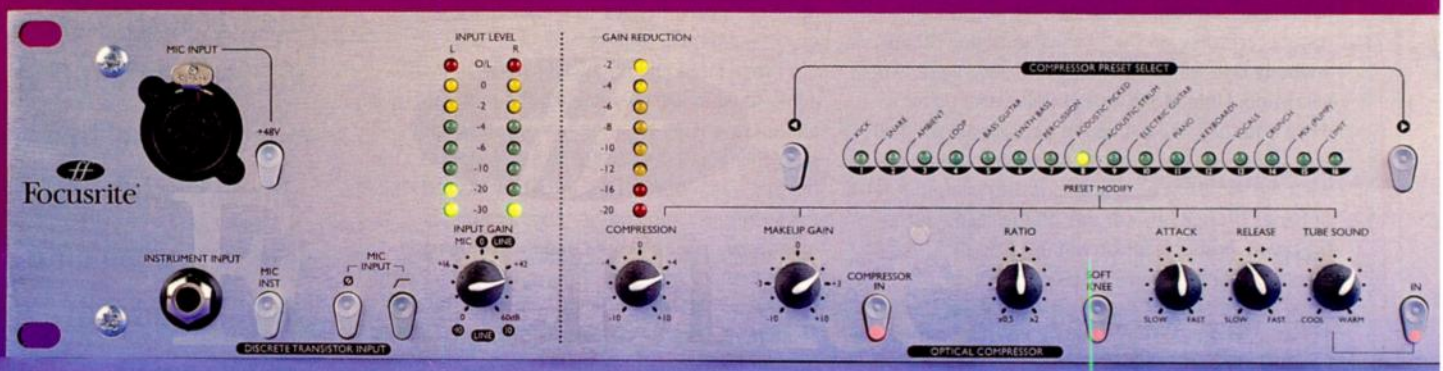
"For 'American Badass' we used a sample from Metallica's 'Sad But True' as the basis of the track... [*Kid Rock*] took the CD of 'Sad But True' to a mastering lab and had it pressed onto vinyl — and that way he could scratch it."

Photo: Mr Bonzo

Michael Bradford's vocal mic of choice is the impressive-looking CAD VX2 valve mic.

FOCUSRITE PENTA

perfect fifth?



FOCUSRITE PLATINUM PENTA PRESET STEREO COMPRESSOR

The new compressor in Focusrite's Platinum Range offers pre-programmed settings for ease of use, whilst still incorporating extensive manual parameter control. **Paul White** gets to grips with the Penta.

Setting up a compressor is something that still mystifies a lot of people. Even when you do understand the basics, it can take a lot of experience to select the best settings for a particular audio source. A handful of companies have tried to make life easier by offering compressors that include presets optimised for different musical applications, and now Focusrite have developed their own version of the preset-based compressor as part of their Platinum range.

The Penta uses a new optical gain control system that has been optimised for musicality, transparency and tracking accuracy — the latter clearly being important for stereo operation. Focusrite have also included tube-emulation, for those seeking a 'warmer' sound, which uses a new three-tier FET circuit that progressively introduces second, third and then fifth harmonic distortion, in much the same way that valves do when driven hard.

The Penta has been designed to function both as a mono mic, line, or instrument processor, and as a stereo line-only processor. The front panel of the 2U box shares the distinctive Platinum styling, and carries sockets for the balanced Mic Input and high-impedance Instrument Input. Dual balanced line I/O is provided via rear-panel TRS jacks and a further pair of TRS sockets provide unbalanced side-chain access. The outputs can work at +4dBu or -10dBV reference levels, depending on the position of a switch by the output sockets. Plugging into the mic or instrument inputs, or into the left channel's line input, causes the unit to operate in mono, outputting only on the left channel. On the other hand, feeding signal to both line inputs allows for stereo operation.

Front-panel switches select whether

FOCUSRITE PENTA
£299

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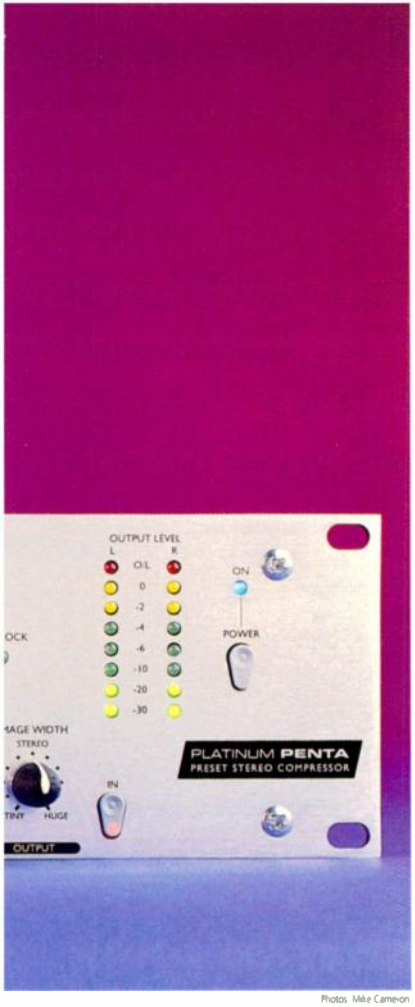
SOUND ON SOUND



Photos: Mike Cameron

mic/instrument or line inputs are used, and activate the mic input's phantom power, high-pass filtering and phase inversion. A single Input Gain control operates on the selected input and a pair of eight-section LED meters show the input level following this control. The preamp is a discrete Class-A design with a frequency response only 3dB down at 85kHz, and with extremely good noise performance, even when I tried it with electric guitars and basses. The preamp architecture is similar to that used in the Focusrite Voicemaster, except that FETs are used instead of bipolar transistors. One advantage of this is that the circuit then behaves much more politely under overload conditions, approximating the soft limiting of a valve. Maximum mic gain is 60dB.

Occupying the centre of the front panel is the main compressor section where a horizontal row of LEDs is used to indicate which preset is active. Buttons at either end of the row allow navigation through the presets, which is all easy enough, though I found the preset names difficult to read in typical studio lighting conditions, especially against the glare of the status LED.

Unlike some other preset compressors, the Penta features a full set of parameter controls with which you can tweak the action of any of the presets. There are rotary pots for Compression (threshold), Make-up Gain, Ratio, Attack, Release and Tube Sound, plus switches for Compressor In, Soft Knee and Tube Sound In. Ingeniously, the Ratio, Attack and Release controls always operate from a detented centre position to provide both positive and negative adjustment — in other words, if these controls are left centred, the preset works exactly as programmed by the designers. The teardrop-shaped switches have integral status LEDs and an eight-section LED meter shows any gain reduction being applied.

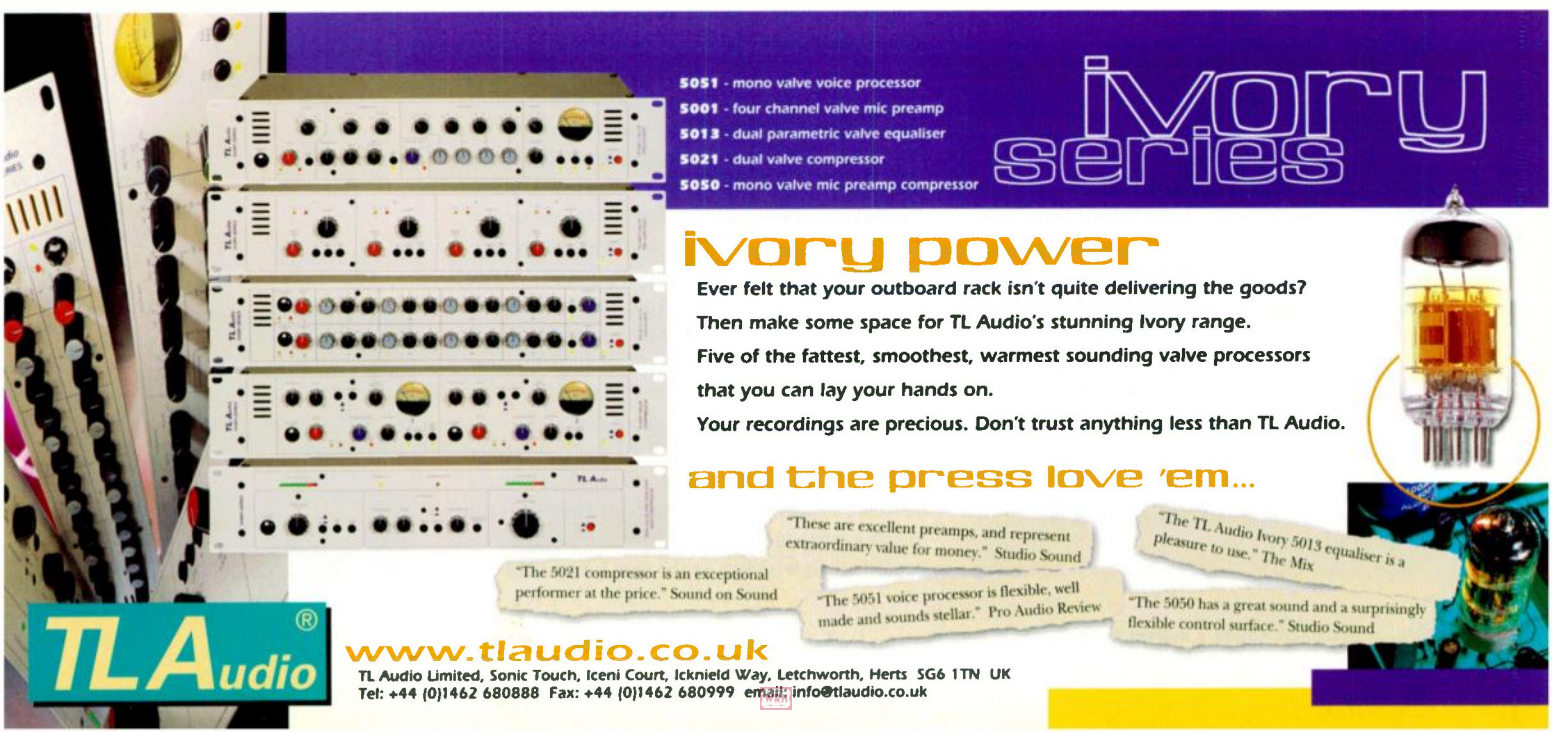
The 16 presets are optimised for the most common musical applications: Kick, Snare, Ambient, Loop, Bass Guitar, Synth Bass, Percussion, Acoustic Picked, Acoustic Strum, Electric Guitar, Piano, Keyboards, Vocals, Crunch, Mix (Pump) and Limit. Crunch is designed for use before guitar overdrive devices. A table in the back of the manual shows the ratio and hard/soft knee status for each of these presets as well as whether the tube simulation is used or not. However, the threshold, attack and release settings are not divulged.

"Depending on the preset used, the compressor can gently and unobtrusively control the dynamic range or it can display a smooth but obvious attitude that is reminiscent of some of the classic tube compressors."

To the right of the front panel lies the Output control section, sporting an Image Width control, with it's own bypass button. This manipulates the stereo width of the audio by feeding some phase-inverted left-channel signal to the right channel, and vice versa. The advantages of this system are that the results are always mono-compatible — any added information is cancelled when the channels are summed. Stereo metering of the output level is via two eight-segment bar-graph meters, and a further LED shows whether the optional digital card is being clocked internally or externally.

Five Live

While it is perfectly possible to create presets for ▶



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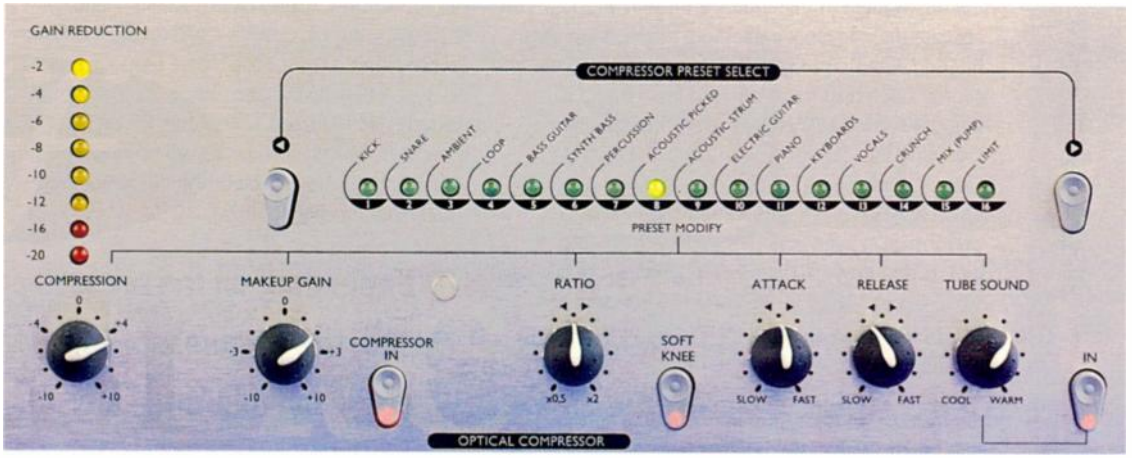

The Penta's presets make it easy to get instant, usable results, but there is also a full set of controls for further fine-tuning.

most compressor parameters, the suitability of these will nearly always rely on the input level to the compressor and the setting of the Compression control. Fortunately, because a lot of work has gone into getting the presets right, in most cases there is little else to do beyond tweaking the Make-up gain control for a sensible output level. Depending on the preset used, the compressor can gently and unobtrusively control the dynamic range or it can display a smooth but obvious attitude that is reminiscent of some of the classic tube compressors. Certainly it's very hard to get a bad sound out of this unit, as even excessive compression still manages to sound musical. I did find that it was well worth trying some of the presets on sources for which they were not primarily intended — for example, the acoustic and bass guitar settings also work well on clean electric guitar.

Mix compression is also handled sympathetically, but again with the capacity to pump up the energy in a more obvious way if needed. Reducing the ratio facilitates more transparent compression, though the presets are fine just as they come for the vast majority of applications. The limiter preset does it's job well enough as a routine limiter, but it's also very nice on vocals for that big, limited rock vocal sound. You can get it so that just about everything from a whisper to a shout sits at the same level, and the inevitable gain reduction artifacts just seem to add to the vitality.

Finally, the tube emulation works particularly well and is great for fattening up vocal or bass sounds without losing the top end or making them seem too muddy. It adds a depth and lower mid-range warmth that EQ rarely manages to replicate, but although it works by adding controlled distortion, it never goes so far as to let you feel that the sound is being processed excessively.

Having a stereo width control on the output is useful when processing stereo masters, though you need to use it sensibly and not try to make things too wide, otherwise sounds in the middle of the mix may get a bit lost. It is a simple and well-established method of stereo width enhancement and can produce the illusion that the sound is coming from a wider stage than the loudspeakers normally encompass.

Five Heads Better Than One?

I've tried all the Platinum units so far and have yet to be disappointed. However, the Penta is just a little bit special in the compression department, with surprisingly authentic-sounding tube emulation. I particularly like the way in which the front panel controls interact with the preset parameters on the rare occasions you do need to make changes.

Overall, the well-designed presets make the Penta very easy to use, and the availability of mic, line and instrument inputs makes it a good choice as a recording channel. It is very quiet and transparent, even on the instrument input, something that is not always easy to achieve, and the wide audio bandwidth is important, as cascading several systems that have merely adequate frequency response can cause cumulative top-end loss. On top of that, the stereo line facility means you can use it for mix or stereo subgroup processing, so those with computer-based systems might find it ideal as both a front end preamp while tracking and as a buss processor when mixing to an external recorder. But, best of all, it costs under £300 in the UK, which is rather less than you might expect for a product of this calibre with the Focusrite name on it. Although it faces competition in the UK from other low-cost, preset units such as TL Audio's Fatman and the Presonus Bluemax, I can imagine many recording musicians adding the Penta to their wish lists in the near future. SOS

"The tube emulation works particularly well and is great for fattening up vocal or bass sounds without losing the top end or making them seem too muddy"

Digital Output Option

A blanking plate on the rear panel covers an expansion bay which accepts an optional digital output module, though this wasn't available in time for the review. This will offer 128x oversampling A-D conversion at sample rates of 44.1kHz, 48kHz, 88.2kHz and 96kHz, and at resolutions of up to 24-bit. Digital output is on coaxial S/PDIF, with a BNC word-clock input provided for clocking the unit externally.

information

£ Penta, £299; digital output option, £109. Prices include VAT.
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KENTON PLUGSTATION

Yamaha's PLG-series synth expansion cards have proved hugely popular among owners of their synths and soundcards, but a new product from Kenton allows up to four of them to be used independently — and with improved sound quality. **Martin Walker** checks out the Plugstation.

card carrier

KENTON PLUGSTATION MODULAR HOSTING SYSTEM FOR YAMAHA PLG SYNTHESIS CARDS

You might be tempted to think that the sales of hardware synths would be plummeting now that so many soft synths are available. However, this hasn't proved to be the case, partly because some models still have an indefinable 'something' that hasn't yet been translated into algorithmic form, but mainly because today's computer processing power is still insufficient to recreate most modern hardware synths in their entirety. It's hardly surprising that hardware synth manufacturers aren't falling over themselves to make their expertise available in software form, either. Roland have released several versions of their Sound Canvas technology in virtual form, including a licensed version for the DirectMusic component of Microsoft's DirectX 6.1, but they are no match for the company's latest USB and MIDI Sound Canvas modules.

The other main synth manufacturers have drawn on their existing expertise to develop hardware that can be fitted into a computer, rather than software. Korg dipped their toes into computer-based waters with the extremely impressive but rather expensive OASYS PCI card. However, it's arguably Yamaha who most wholeheartedly embraced the world of computers with the SW1000XG, essentially an MU100R synth on a PCI card with additional audio recording/playback facilities. One of the reasons for the success of the SW1000XG was the inclusion of a single PLG daughterboard socket exactly like those built in to Yamaha hardware synths such as the CS6X/R, S80, MU100/128, and the new Motif. Unlike expansion cards from most other manufacturers, Yamaha's synth expansion boards don't contain ROM sample data. Instead each card houses a powerful and self-contained hardware synth, providing a guaranteed number of voices — and unlike software synths, zero-latency response with no possibility of clicks, pops, or glitches.

There are now six PLG boards available that attach to this 15-pin socket (see box), including the physical modelling of the VL70m for just £119, a low-noise modern recreation of the famous DX7 for £199, and an emulated Prophet 5 based on the AN1x design, again for £199. The only way musicians could lose was by running out of PLG sockets — which is where the Kenton Plugstation comes in...

Enter The Plugstation

Kenton are already well known to musicians for products such as the Control Freak, and their comprehensive MIDI retrofit service for analogue synths. Spotting the potential for a low-cost PLG expansion device, they came up with the idea of the Plugstation — essentially a breakout box that can contain up to four PLG cards. With the support and backing of Yamaha UK, this simple idea grew during development into a far more versatile product, as we shall see.

The Plugstation itself is a 1U rackmount unit with an attractive if somewhat utilitarian grey and sky-blue paint job. The front panel is very straightforward, with a power on/off switch, a four-digit seven-segment display panel, and a rotary encoder control knob for data entry that doubles as a push button to switch between menu options. The contents of the back panel vary depending on which options you have fitted, but

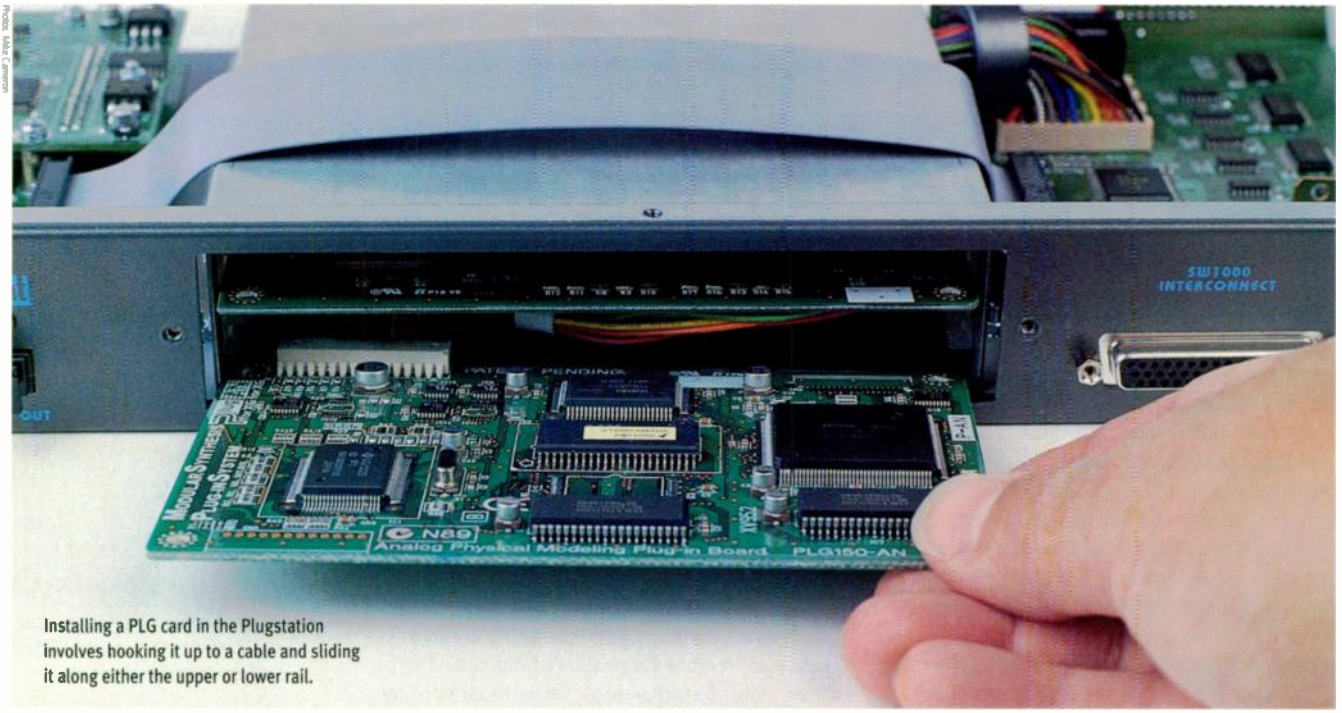
KENTON PLUGSTATION

pros
- The only way to run up to four PLG cards simultaneously.
- Y Board provides excellent audio quality.
- Z Board adds excellent output audio quality to the SW1000XG itself.
- Flexible routing options.
- Stand-alone version doesn't need a computer at all.
- Good value for money.

cons
- Confusing to operate from front panel.
- SW1000XG system can only apply global effects to Plugstation cards.

summary
The Plugstation is an extremely clever design that makes the most of Yamaha's PLG technology and provides superb audio quality (even for SW1000XG sounds) at a reasonable price. However, many musicians will want to wait until computer editing is available before they reach for their wallets.

SOUND ON SOUND



Installing a PLG card in the Plugstation involves hooking it up to a cable and sliding it along either the upper or lower rail.

"Many SW1000XG owners have been wanting to access multiple PLG cards for ages, and I found it wonderfully liberating to have access to four types of synthesis alongside the other sounds of my SW1000XG."

the basic Plugstation has a socket for the supplied universal power supply for worldwide use, MIDI In, Out, and Thru sockets, and a 44-way D-Type connector labelled 'SW1000 Interconnect'.

In the centre is a removable panel, behind which is a cavity large enough to house up to four PLG cards simultaneously, with the aid of two sets of guide rails and four flying cables, each terminated in a PLG connector. To these you can attach almost any combination of PLG cards. The only restrictions are that only one XG card is currently catered for, and only one VH card (which, if present, should be card number four unless it's the only card installed). Yamaha were obviously keen for me to try out the Plugstation 'fully loaded', and sent AN, DX, and PF cards to supplement my own VL daughterboard.

Once all your cards are attached to the cables, you slide one pair of them onto the lower guide rails one after the other, and the other pair onto the upper ones. It's a bit of a fiddle to get all the cables neatly folded in behind each card to make way for the next, but it's not something that needs to be ▶

Front-panel Operation

Kenton originally intended the Plugstation to be faceless and controlled solely from a computer-based editor. This will still be by far the easiest option, but those intending to use the Plugstation in stand-alone mode will need to tackle setup and editing from the front panel alone, using its rotary encoder and four-digit display, unless they invest in a hardware fader or knob controller.

There are four levels of editing, the current one being indicated by the position of a dot across the top of the display, and you can switch between these using the data entry button. The topmost level is MIDI mode, which displays which cards are installed and active, and whether or not they are each receiving any MIDI data. It's handy to leave the Plugstation at this level during use, since you get continuous visual feedback that your keyboard or sequencer is sending information to the correct card.

Pressing the Data Entry button once takes you to the deeper Card level, where you use the rotary encoder to scroll through the four slots to see which card is connected to each one. When you've selected the desired card, clicking once again on the data entry button takes you to the even deeper Parameter level, where you use the rotary encoder to scroll through the various options. When you reach the desired parameter you just press the data entry button once more to enter the lowest level, Value, where you can use the rotary encoder to alter the setting.

Editable parameters include MIDI channel, program change, and bank selection, level and pan for each card in the stereo submix return to the SW1000XG if you have an X Board fitted, and level and pan for the Y Board outputs. You can also route each card to any of the four stereo output pairs. These settings default to the obvious ones of 1-2 for Card 1, 3-4 for Card 2, 5-6 for Card 3, and 7-8 for Card 4, but you can also send multiple cards to the same output if desired, and with the Z Board fitted you can also route the main SW1000XG stereo output to any one of the four as well.

If you have multiple instances of the same card, you can allocate each one a different ID number to send it individual SysEx parameter data. The final two card parameters are used to set MIDI controller numbers and their values to alter specific parameters such as filter cutoff (the default), resonance, or attack time without the need for computer software. Other Card-level options let you alter the eight master Y Board output levels, the master submix return level to the SW1000XG, and set the global device number if you have multiple Plugstations.

Given the obvious restrictions of the seven-segment display, it's still possible to choose preset sounds and set up routing fairly easily, and even perform some basic sound editing using MIDI controller data. However, there's no denying that the majority of users will find using a computer-based editor far easier. You don't need an SW1000XG to do this — all Plugstation systems can be edited from a Mac or PC via their rear-panel MIDI input.

done very often. The blanking panel can now be replaced, and the Plugstation powered up for the first time. During the initialisation procedure the four card slots are each scanned in turn, and any card found will return its signature so that Plugstation knows which model it is. This procedure also confirms that the cards have been connected correctly.

The SW1000XG System

Kenton's Plugstation has been designed as a modular system, and there are currently three optional boards available that each add extra features without tying up any of the PLG card slots. The various possibilities can initially be quite confusing, so Kenton have sensibly decided to offer the Plugstation in four versions, each with a different board or combination of boards.

If you already have one of Yamaha's excellent SW1000XG soundcards in your Mac or PC, the cheapest option is the Plugstation SW1000XG system. This includes the X Board, which is a PLG-format card that attaches to the SW1000XG's PLG socket. The X Board houses a short ribbon cable extending to a new backplate housing a 44-way D-Type connector, which attaches via the supplied 1.2-metre long umbilical cable to the SW1000 Interconnect socket on the back of the Plugstation. With this link cable in place, and your computer powered up, the Plugstation acts like a single deluxe PLG card containing up to four Yamaha synths. You need to switch on the Plugstation shortly after the computer in order that the SW1000XG can recognise the X Board before it finishes initialising and the Plugstation correctly detects the SW1000XG's word clock signal, so that both remain locked together in perfect sync.

The SW1000XG now receives a stereo submix from the PLG cards installed in the Plugstation, each of which has its own level and pan controls adjusted from the Plugstation's front panel (see Front Panel Operation box), while the latter's Global menu also provides an overall level control. Apart from the PLG100XG, which is 16-channel multitimbral, all the PLG cards are monotimbral, and each can be allocated its own unique MIDI channel. Program and bank settings can also be changed from the front panel, along with MIDI controller settings for basic editing of various parameters.

Many SW1000XG owners have been wanting to access multiple PLG cards like this for ages, and I found it wonderfully liberating to have access to four types of synthesis simultaneously alongside the other sounds of my SW1000XG. You can use the SW1000XG's own effect busses to add reverb, chorus, and insertion effects to the entire submix, but sadly Yamaha's PLG specification doesn't allow this to be done for each card individually. Mind you, the PLG150PF card already has its own built-in reverb and chorus, so this won't need separate treatment.

I did find it a little tedious to choose presets from the Plugstation front panel, since Yamaha maps them according to the GM list, but with variations scattered across of host of banks. For instance, the PLG150PF places all its 136 piano sounds on program numbers 1 to 8, but spread across 43 banks. However, the wide range of Mac and PC utilities available, such as *AN1xEdit*, *XGedit95*, *XG Wizard*, and *XG Works*, will allow users to select voices and edit patches in a far more transparent and painless manner. A recent arrival is *XGPad* (from www.xgpad.com), which looks good, and is currently being upgraded to include specific Plugstation support. It should be available by the time you read this, and I'll be looking at it shortly in PC Notes.

The *XGPad* editor is being upgraded to include Plugstation support: this is a prototype version in action.

Stand-alone Operation

The next stage up the ladder is the Plugstation Stand-alone system, which includes the Y Board.

Global Options

Sixty-four Performance Memories are provided for your own setups. They store every current Plugstation setting, and you can load and store them, dump them as System Exclusive data to an external MIDI device for safe keeping, and select them from the front panel or optionally from either the SW1000XG or back-panel MIDI input using program change messages on your choice of master MIDI channel.

I received one of the first batch of official production line Plugstations, and the operating system was finalised just before I finished my review. However, Kenton may still add other features in the future, since the OS is flash-upgradable via MIDI. With this in mind, a Master Setup mode can be entered by holding down the Data Entry knob when powering up, and from here you can reset the Plugstation to its default settings, check the current OS version, load a new operating system, or analyse the MIDI data being sent to the unit. Users will be able to download free updates to the operating system as SysEx files from the Kenton web site. I was sent one update during the review, and it only took a minute or two to successfully install it.

Brief Specification

- Clock: internal 44.1kHz for stand-alone operation, or external sync to 44.1kHz SW1000XG clocks.
- Expansion: four PLG-specification interface connectors.
- MIDI: In, Out, Thru.

Y Board Analogue/Digital Outputs
- Analogue outs: eight, on unbalanced quarter-inch jacks.
- D-A converters: Alesis AL1201, 24-bit, 128x oversampling.
- Dynamic range: 107dB (A-weighted).
- THD: less than 0.003 percent.
- Digital out: 24-bit, 8-channel ADAT-format optical.

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WRH

The Y Board gives the Plugstation separate stereo analogue outputs for each of the four plug-in cards hosted, as well as eight channels of optical digital I/O.

This is installed inside the Plugstation (normally by Kenton, although you can buy it as an upgrade later on and install it yourself), and adds eight user-configurable analogue outputs on quarter-inch unbalanced jack sockets, along with one ADAT optical output. In this configuration the Plugstation generates its own fixed 44.1kHz internal word clock, and is essentially a stand-alone modular synth. Each installed PLG card becomes a self-contained synthesizer in its own right with a single stereo digital output, and you can start playing them as soon as you connect a controller keyboard or MIDI sequencer to Plugstation's back-panel MIDI Input socket.

The internal audio paths in Yamaha's PLG cards are all 24-bit, and for the analogue outputs Kenton have used 24-bit Alesis 1201 D-A converters, which give the Plugstation an excellent dynamic range of 107dB — this probably exceeds the performance of any other PLG host. The ADAT output supplies eight simultaneous channels of 24-bit/44.1kHz digital audio, so you can use this to send the individual stereo outputs of all four cards *en masse* to any other ADAT-compatible device such as an ADAT, a different D-A converter, or a digital mixer such as Yamaha's own O1V, O2R, or O3D. All this in full digital splendour with a signal-to-noise ratio exceeding 112dB!

I was extremely impressed with the analogue audio quality of the Y Board, and had never heard cleaner sounds emerging from a PLG card before — there was simply no discernable background noise at all! You can route each card to any of the four stereo outputs, and it's also possible to send several to the same one to layer sounds if required, although I suspect most musicians will take advantage of the four individual stereo outputs to add separate external effects to each synth.

Fully Plugged Up

A Combined system is available including both X and Y boards, so that you can send one or more of your PLG card outputs to the SW1000XG submix return to add global effects, and the remainder to the dedicated outputs of the Plugstation. After a little lateral thinking I also came up with a way to add individual Effect Send controls to each Plugstation card with this system. If you add an SW1000XG Insertion effect such as a reverb to the submix return, and then turn its Dry/Wet mix control to fully wet, you can use the Plugstation outputs to set dry levels, and the individual submix return levels to set up different effect levels for each PLG card from the SW1000XG output.

For just £45 more than the Combined system, the Complete system includes the Z Board, which is well worth the small extra expense, since it allows the 24-bit internal audio signals of the SW1000XG to be digitally routed back to the Plugstation and out of the Y Board outputs. Like the Y Board, the Z Board is fitted inside the Plugstation (but still leaves all four PLG slots available), and both incorporate a Motorola 56364 DSP chip, as does the Plugstation base unit. It also requires another short ribbon cable to be connected inside your computer between the SI (Serial Interconnect) socket on your SW1000XG and the X Board.

This serial-port connection is designed to pipe

Yamaha PLG Cards: The Full Deck

There are currently six PLG cards available worldwide (although a seventh PLG100SG 'formant singing' card is also available in Japan), and you can run almost any combination in the Plugstation, including multiple instances of the same card to increase polyphony by enabling Overflow mode. For instance, you could install two PLG150PF boards for 128-note piano polyphony, and a couple of PLG150AN boards to get a 10-note polyphonic Prophet 5. The only restriction (as with all PLG host devices) is that only one instance of the PLG100VH Harmony board is allowed, and you can't use this card in stand-alone mode either, since it needs an analogue input provided by the SW1000XG system. The street prices are normally about £30 cheaper than the retail ones I quote below.

- PLG150AN (£199) features analogue physical modelling to recreate a classic 2VCO, VCF, VCA synth, along with extensive options including sync and cross-modulation. It also has loads of other extras including a host of waveform and filter types, four-layer Free EG controller, built-in sequencer/arpeggiator, and 3-band parametric EQ and amp simulator effects. Based on Yamaha's AN1x technology, but revoiced to sound like the classic Sequential Prophet 5, it's monotimbral, but the 5-note polyphony of its Single Mode can be switched to Unison mode for fat 10-oscillator monophonic voices.
- PLG100DX (£199) is essentially a DX7 synth featuring six-operator FM synthesis, but with more friendly computer-based editing, and no background hiss! It has 16-note polyphony, 912 preset voices, and 64 user ones.
- PLG150PF (£229) contains 136 AWM2 piano sounds including acoustic pianos, harpsichord, Fender Rhodes, Wurlitzer, and clavinet, along with some layered with strings and choir. It also features 16 effects including reverb and chorus. Like most of the other boards here this is monotimbral, but its 64-voice polyphony should prevent the note-robbing problems that can plague piano parts. With 16Mb of ROM it provides far more realism and expression than the patches found in most GM, GS, or XG sound sets.
- PLG100VH (£99) provides two extra voices of Vocal Harmony using the same technology as IVL's Digitech Vocalist series, to give 3-part harmony with optional gender conversion and humanisation features. A bit of an oddball this, in a synth context, but handy in conjunction with the SW1000XG's analogue input for vocals and Brian May-style multitrack guitar sounds.
- PLG100VL (£119) contains the single-voice tone generation system of a VL70m physical modelling synth, and although there is no breath control input it's still able to respond to breath control data. This is still one of the most expressive physical modelling synth designs around if you're prepared to provide it with suitable controller data.
- PLG100XG includes a full XG sound set with 480 preset voices and 12 drum kits, and also incorporates its own Reverb, Chorus, and Variation effects. It's also the only card here that provides more than one Part simultaneously, with 64 extra voices available across 16 extra MIDI channels. It probably won't interest MU100/128 or SW1000XG owners, but will those using the Plugstation as a stand-alone expander.

Prices

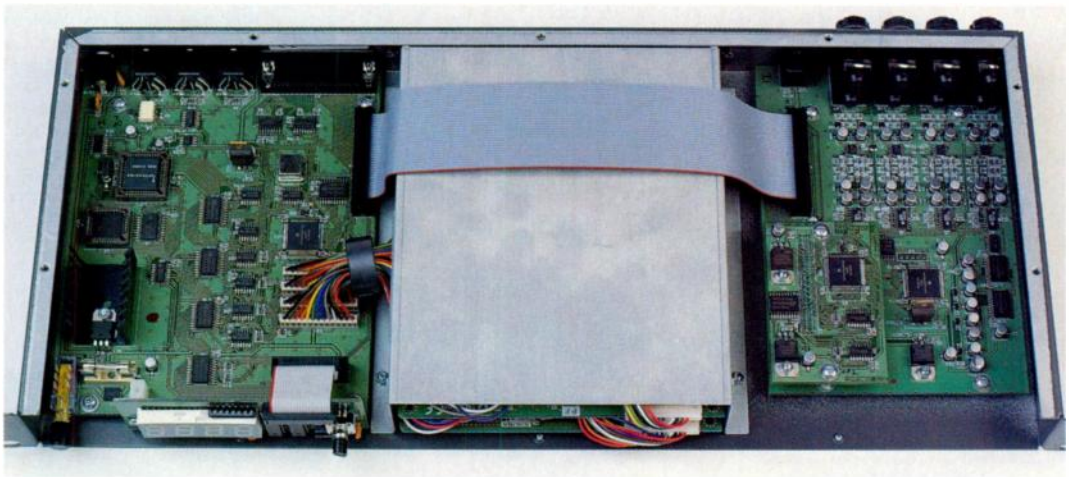
- Plugstation SW1000XG system (includes X Board) £250.
- Plugstation Stand-alone system (includes Y Board) £350.
- Plugstation Combined system (includes X and Y Boards) £380.
- Plugstation Complete system (includes X, Y and Z Boards) £425.
- Plugstation Ultimate Bundle (Complete system plus PLG150AN, PLG100DX, PLG150PF and PLG100VL boards) £995.
- Separate X Board £30.
- Separate Y Board £150.
- Separate Z Board £65.

All prices include VAT.

up to eight discrete channels of digital audio from the SW1000XG to a DSP Factory card. A Serial Thru connector on the X Board lets DSP Factory owners maintain this link, but with the addition of the Z Board you can now route the main stereo buss of the SW1000XG, and your choice of up to six other individual MIDI or audio channels from the SW1000XG, to any of the Plugstation's eight outputs. This means that you can play back both SW1000XG MIDI voices and WAV audio through the 24-bit converters of the Plugstation, for a significantly quieter and cleaner output signal than when using the SW1000XG's 18-bit NEC D-A converter. This also avoids the need for the 'smiley curve' output EQ compensation that I mentioned in *SOS* November 2000 — I tested the Plugstation's outputs, and they are ruler-flat within their designated bandwidth.

If you want to allocate some of the Plugstation's eight outputs to SW1000XG channels, but have the full complement of four internal PLG cards fitted, you can either route these to the SW1000XG submix return and add global effects to them, or send the outputs from multiple cards to the same Plugstation output to create another submix. You can also use my Aux Send trick mentioned earlier, this time with the advantage that both wet and dry signals can be routed to the 24-bit Alesis D-A converters for a squeaky-clean sound.

One setup that worked well for me was using Plugstation outputs 1-2 for a super-clean main SW1000XG mix, 3-4 for the PLG150PF piano board with built-in effects, 5-6 for the PLG150AN to add external effects, 7-8 for the PLG100DX, again with external effects, and then routing the PLG100VL to the SW1000XG submix return for individual effect treatment, so that its signal got added to the main SW1000XG mix. The Complete system provides very flexible routing, and you can create up to 64 performance memories to save setups.



Inside the Plugstation: the PLG synth cards inhabit the middle section, while the X, Y and Z Boards fill the rest of the chassis.

Final Thoughts

Unsurprisingly, there's been a lot of interest in the Plugstation ever since it was first mentioned as a possibility a couple of years back. However, Kenton have turned the original concept of a 'PLG card expander' into something far more powerful. While the SW1000XG system certainly provides SW1000XG owners with a home for up to four PLG cards, the Stand-alone version can be used by any MIDI musician, and also provides each card with its own 24-bit stereo analogue output for cleaner PLG sounds than have ever been heard before, and an ADAT output for direct connection to digital gear. It's also good value — you could easily pay several hundred pounds just for eight digital-to-analogue converters in a rackmount case!

The Combined system is certainly more versatile for the SW1000XG owner, but I suspect most of those who would be interested in this will pay just a little bit more and go for the Complete system. This provides the ultimate SW1000XG expansion option, since all your SW1000XG sounds can now emerge for the first time in full 24-bit glory alongside those of the four PLG synths.

Kenton have made an excellent job of the Plugstation, but the dearth of front-panel knobs means that it is significantly easier to use if you have some means of controlling it remotely, either from the computer or from a hardware controller box. *XGPad* will probably be Plugstation-aware by the time you read this, and as you might expect, Kenton's own Control Freak has already got new presets to control various aspects of the Plugstation.

The various Plugstations are already good value for money considering what's on offer, and for the ultimate bundle, Kenton have put their heads together with Yamaha to offer a 'fully stuffed' Plugstation containing the AN, DX, PF, and VL PLG cards for just £995 inclusive of VAT. This is a serious bargain, since bought separately the bundle would typically cost around £1200. So, if you want a Prophet 5, DX7, 64-voice PF200 digital piano, and VL70m physical modelling synth, all for under a grand, and each with pristine 24-bit outputs, you now know what to buy. And unlike any soft synth this comes with guaranteed 86-note polyphony, zero latency, no drain on your computer resources, and absolutely no clicks or pops! SOS

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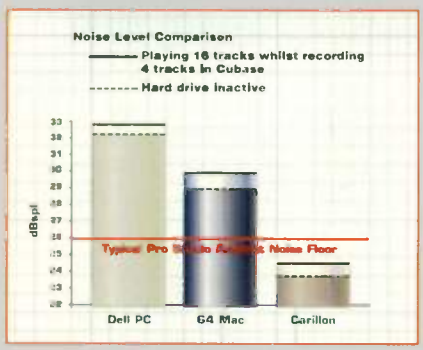

Having reached our final design, a finished unit was taken to be independently tested at the UK's leading acoustic research facility, the Institute of Sound and Vibration Research at Southampton University. We also took along an equivalent spec Windows 98 Dell Dimension PC, and an Apple Mac G4.

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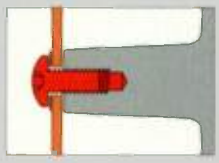

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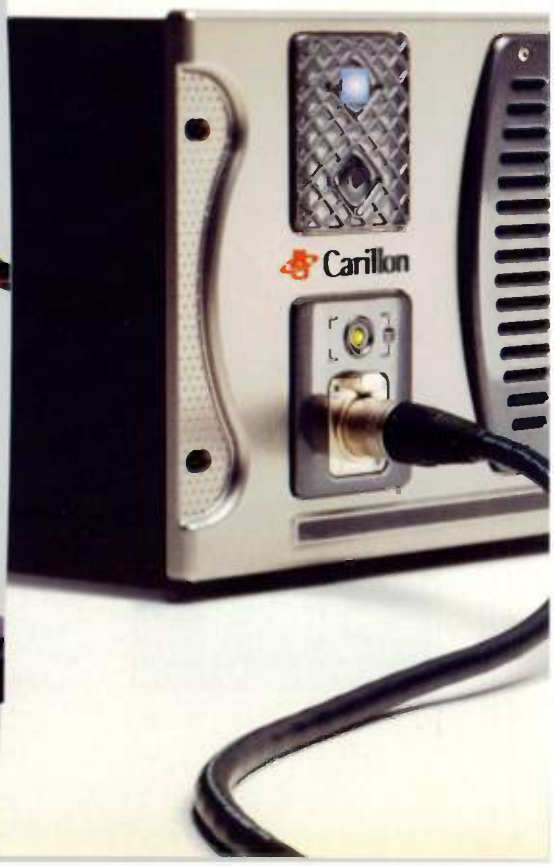

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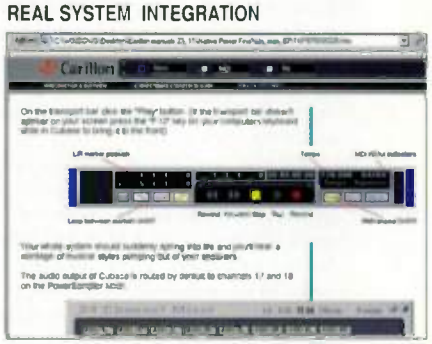

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GIVING YOUR MIDI TRACKS A LIVE FEEL: PART 2

Simon Millward demonstrates how to use the tools for extracting groove templates from audio recordings within most MIDI + Audio sequencers and offers his tips and techniques for using them to achieve more feel in your tracks.

Last month I explored the basics of improving the live feel of your MIDI tracks using the various groove manipulation tools available, with reference to the real-world example of James Brown's classic song 'I Got You (I Feel Good)'. As I've already demonstrated, there are many ways in which to create your own grooves. However, there are times when it is much more useful to fit the groove of your MIDI parts around that of an existing audio recording — for example, if you're building a track around a sampled loop. In such cases, you need to extract a groove template of some sort from the audio recording.

Though many hardware units now offer simple groove manipulation tools, dedicated facilities for extracting groove templates from audio are currently the preserve of software systems. However, these systems can be tricky to get the best out of, so I'm going to walk you through the process of generating a groove template from a loop of James Brown's 'I Feel Good' within Steinberg's *Cubase VST* in order to show you not only how to go about the process in general, but also to demonstrate the extent of *VST*'s capabilities in this area for those of you unfamiliar with this sequencer. For information on other software packages which offer groove extraction, take a glance at the boxes throughout this article.

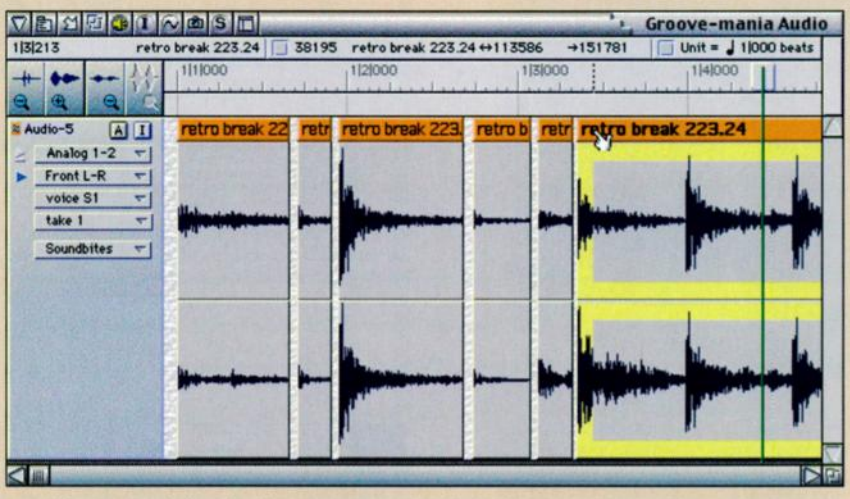
Groove In MOTU *Digital Performer*

Digital Performer doesn't have any dedicated features for extracting grooves from audio files, but there is a workaround possible, providing you're willing to put in a bit of effort. It may not be pretty, but it does work...

You have to make sure, to start with, that the audio from which you want to extract the groove is playing in time with *DP*'s metronome. If it's not, you'll need to use the Adjust Beats function to get the time ruler to line up with main beats in the audio. What you then have to do is cut the audio into little bits corresponding with main rhythmic events. You need to be sure that the edits occur in exactly the right places if the groove extraction procedure is going to work successfully.

From the resulting snippets of audio you can now extract a groove, with a choice of which basic beat division to use. The timing and duration of the sections of audio are translated into timings and durations within the groove file. You can then go in and edit the groove file directly if you wish, and velocity values can also be entered. You can even set the sequencer up so that you can hear the results of any changes you make to the template in real time — a very powerful feature.

The implementation of groove quantising within the application is as advanced as one might expect from a leading MIDI + Audio sequencer, with both off-line and real-time processing available. Multiple real-time groove templates can be used within one song, allowing the flexibility to implement many of the techniques described last month. *Robin Bigwood*



While there's no dedicated audio groove-extraction in *Digital Performer*, its editing provides a workaround.

Choosing Your Groove

The first thing you need to decide is which bit of audio you're going to use for the groove-extraction process. If you're wanting to match your MIDI programming to a sampled loop then this choice won't tax the grey cells, but if you're wanting to impart the groove of a well-known song to your own track then it's worth taking some time to consider which bits of the source material are likely to be most useful. Ask yourself which sections have a particularly pleasing groove, bearing in mind that live musicians sometimes get more settled into a groove the further they get into a track — as we found, in fact, when looking at the tempo changes of 'I Feel Good' last month.

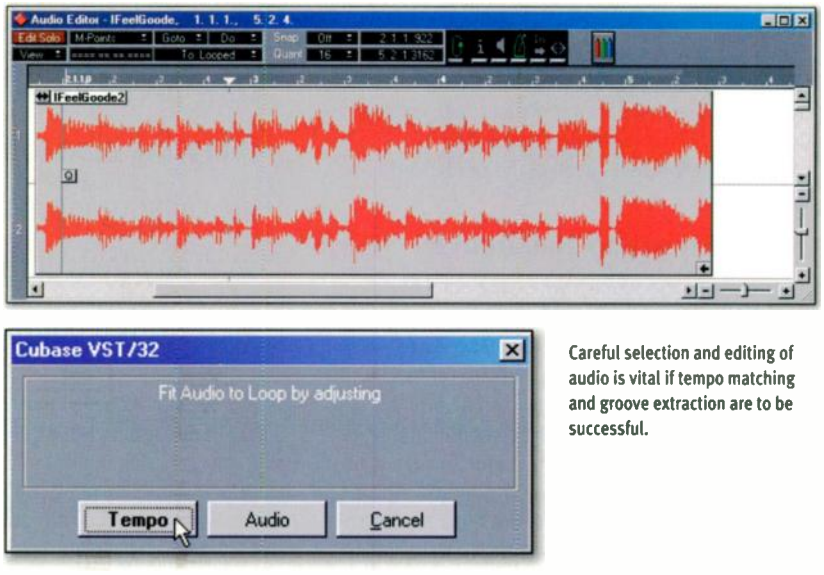
You may find that there are a number of equally pleasing sections of the groove, in which case you should try to whittle down your list of sections in terms of the practicalities of extracting groove information from them. In which of the sections is the definition of the rhythmic instruments particularly clear? If attack transients aren't well defined, of if players aren't tight enough with each other, this can confuse the groove extraction algorithm as to where each beat and division of the audio is meant to be. Another thing to consider is how much the tempo is fluctuating through your chosen sections — if it changes too much, this could make the resulting extracted groove unconvincing.

If you find that you still have several sections of audio which are both satisfying and clearly defined, then it's worth using a number of them for generating groove templates. As I made clear last month, the key to a successful live feel is a constantly changing groove, and this can be achieved quite easily if you have a number of similar groove templates which you can alternate and combine. Finally, on a practical note, it is a good idea to copy the segments of audio you have chosen to separate audio files, allowing a little extra audio on either side of each to keep your options open for the next stage of the extraction process.

Trimming & Tempo-matching

Taking the first of your audio sections, the first thing to do when extracting a groove is to trim the boundaries of the audio so that it loops correctly. Doing this allows you to use the automatic tempo-matching function within many sequencers to superimpose your song's regular metric grid correctly on the audio. In *Cubase VST*, you do this from the non-destructive Audio editor.

First set up by eye an approximate playback loop and then, with the loop playing, tweak it until you get the best-sounding result. Obviously, you needn't pay any attention to any current bar and beat positions given in the editor window at this point, as these will be unrelated to the positions of the bars and beats in the audio at present. It may also help to switch off any snap-to-grid function in order to get the required editing resolution.



Careful selection and editing of audio is vital if tempo matching and groove extraction are to be successful.

Don't be afraid to spend a bit of time getting the loop exactly right, as the precision of the loop is extremely important. Innaccuracies here will result in subtle innaccuracies in the eventual groove, and we have already seen last month how important subtleties are to a great groove. It is also vital to establish a good downbeat at the start of the loop, to make sure that your groove is not 'out of phase' with the sequencer's metric grid later. When you are satisfied that the loop is as good as you can get it, make sure the audio is highlighted and trim the section at the loop start and end points, deleting the unwanted audio outside these points. In *Cubase*, you can use the Snip Loop option within the Audio editor's Do menu.

Next, you mark a time period corresponding to the number of bars you wish the newly trimmed audio segment to fill once tempo-matching is complete. Often, the sequencer's loop markers are used for this. In *Cubase* you select Fit Event To ▶

Groove In *Cakewalk Pro Audio & Sonar*

The groove quantise facilities within *Cakewalk Pro Audio 9* and *Sonar* are a little more limited than those available in some of the other sequencers, in that groove quantising has to be applied as an off-line process. That said, the groove templates are capable of modifying note timing, duration and velocity, and to a degree set by sliders within the off-line processing window, so there's still plenty of flexibility. However, there is no way to directly edit the templates, which is a little limiting.

Groove extraction from audio is currently only included within *Cakewalk Pro Audio 9* and *Pro Suite*, but not within *Sonar*. It is handled by analysing and musically interpreting peaks in an audio track. As you can imagine, this can be a slightly inaccurate operation, and this is apparently the reason for its omission from the current versions of *Sonar*. There are two stages to the process — the first is where you get *Cakewalk* to analyse the pulses or peaks in a chosen section of audio, not surprisingly called Pulse Analysis, and the second is called Timing Synthesis, where you tell *Cakewalk* what to do with the data it has retrieved.

In Pulse Analysis, you set a threshold in decibels, below which pulses are ignored. You also have an option to set a minimum length of pulses recognised, in case you're trying to extract the timing from a track with clusters of pulses that may hinder the process. A further option allows the analysis to ignore confusing syncopations. Once the analysis parameters are set, markers in the window show where the beats are detected, and you can evaluate whether it has been successful. Once analysis has been done to your satisfaction, you then proceed to the Timing Synthesis, where you are allowed to create and save a groove from the analysis data.

Andrew Lewis & Mike Senior

▶ Loop Range in the Do menu, which brings up a dialogue box where you can choose to change the tempo of the Song to fit its metric grid correctly over the audio. Once the tempo has been changed, double-check that the tempo is matched by playing back the audio against the sequencer's internal click.

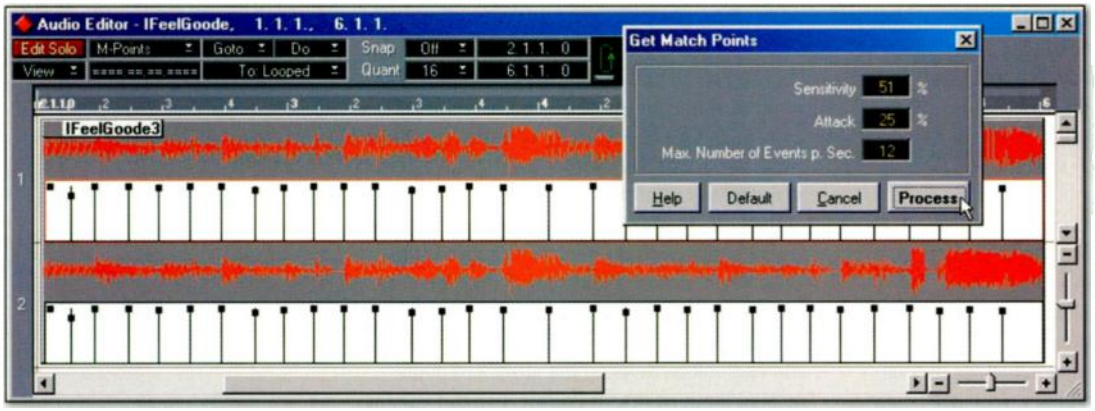
Extracting The Groove

It is now time to establish where the main beats and their divisions occur in the audio material. These are usually the most strongly accented points in the audio waveform, and are referred to as Match Points in *Cubase*. They can be found automatically using the Get M-points option in the Audio editor's Do menu. The dialogue this leads to includes settings for Sensitivity and Attack, which regulate how the analysis software finds the Match Points — when the process is done, you are able to view the Match Points under the audio waveform. Some experimentation is required to find the best settings for the particular audio being processed, and you should aim to get at least one point every eighth or sixteenth note, depending on the smallest beat division in the audio. Even when you've experimented with the settings, you may still find you're not getting the correct number of Match Points, in which case you may need to add or delete some of them manually, which *Cubase* lets you do with its pencil tool.

"Because considerations of note length are often considered irrelevant when processing drums, it is tempting also to forget about duration when processing more melodic material. This is a shame, as many instrumental grooves are heavily dependent on duration characteristics."

Bear in mind that each of *Cubase*'s Match Points has a velocity value, indicated vertically, and that this velocity setting can be used to create a more natural groove. Consider tweaking the velocity values if comparatively unstressed beats have high velocity values assigned to them, or if accented beats aren't registering a high velocity setting.

Once you are satisfied with the number, placement and velocity of the Match Points, it's time to extract the groove from them. Open the Match Audio & Tempo editor from the Do menu. The audio waveform and Match Points are shown in the lower half of the display. In this window's Audio menu is the M-Points To Groove option. This extracts the groove and saves it in the default ▶



The algorithm which assigns Match Points in *Cubase* needs to be carefully set up to produce useful results. However, the points can be tweaked manually if required.

Groove In Emagic *Logic Audio*

The groove extraction and manipulation facilities available within Emagic's *Logic Audio* are among the most advanced in any sequencing package. Groove templates contain timing, duration and velocity scaling, and can applied as flexibly as any other type of quantisation — in other words, each individual segment of MIDI can have its own quantisation template and in-depth parameters, all of which are interpreted in real time, allowing you to tweak settings during playback.

Groove templates can be generated directly from any section of MIDI, and one of the most powerful aspects of *Logic*'s quantisation facilities is that the connection between the MIDI part and the groove template remains, even after the groove template has been added to the list. What this means is that you can edit the source MIDI part during playback and the groove template's parameters will follow these edits. So if you're not quite happy with a quantisation point in your template, you can tweak it to perfection by ear just by adjusting that note's attributes in the source MIDI data.

Extracting a groove from audio is actually a two-stage process in *Logic*, although it is presented as an integrated function. In the first stage it analyses a selection of audio in order to work out where the transients are which will define the quantisation points. The algorithm it uses is quite complex, with a number of obscure parameters which send you scuttling to the manual for explanation — there are presets provided for common applications, but I've never found these much use myself. I also find that analysis of complex material (not just a dry drum pattern) has a habit of producing slews of quantisation points you don't need alongside those that you do. It's usually best to keep the length of such sections to a minimum, for the sake of sanity!

Once you've got the best results you can, *Logic* produces a MIDI section according to the analysis of the audio material, and then uses this to automatically generate a quantisation template. Because the MIDI source data corresponding to the groove template is therefore available for editing, it makes it comparatively easy to sort out any excessive zeal shown by the analysis algorithm in the generation of data... *Mike Senior*

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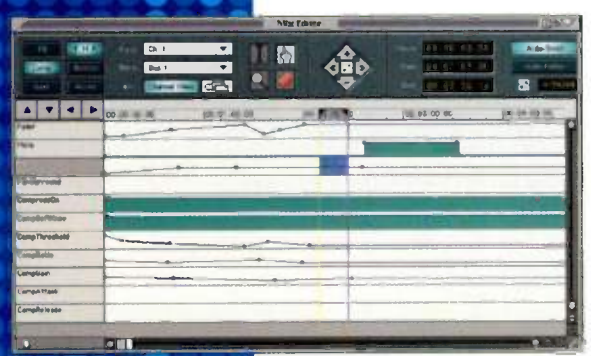

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grooves folder, whereupon it is immediately available within the *Cubase* Groove Control window. This raw groove will often only be usable on selected material, as was the case with my initially extracted groove. After all, as we gleaned from our analysis of the James Brown track last month, grooves tend to be intricately connected to the actual parts within a track's arrangement. However, you can create a more generally usable template by toning down a little of the raw groove's individuality.

To begin with, it can help to manually adjust any notes which are particularly 'out of time' to bring them just a little more into line with the metric grid — it is the most extreme timing variations which most tie a groove to a specific track. However, be careful not to overdo this, or you could upset the flow of the groove as a whole. Once this has been done, you can make the groove even more general-purpose by applying a subtle iterative quantise — I suggest no more than a 25 percent strength to start with — to slightly tighten up the feel.

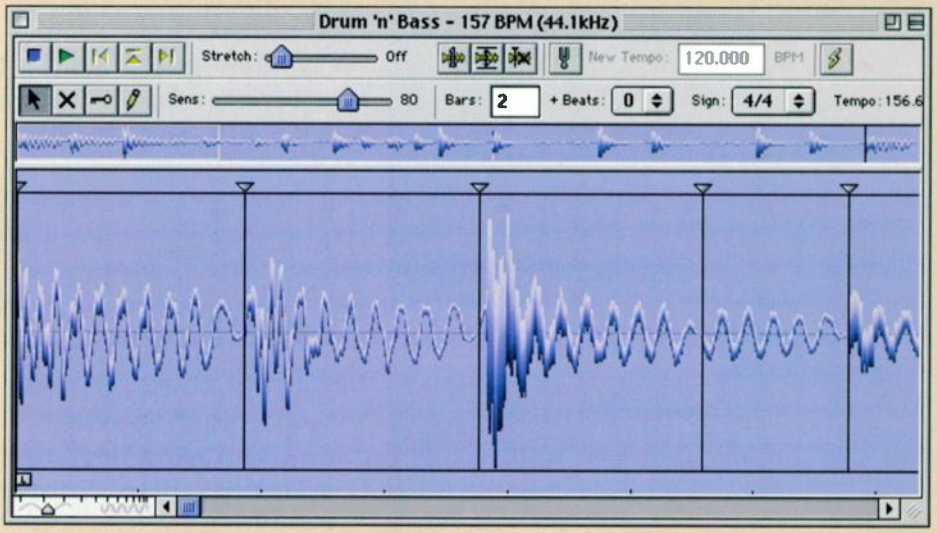
If the track you've analysed is based around eighth-note divisions, and you want to apply it to parts with 16ths, then you're going to have to generate suitable new quantisation points in between the existing ones. *Cubase* allows you to do this easily, because it lets you open up your groove templates in a piano roll-style editor from a button in the Groove Control window. What I do is duplicate the main eighth notes of the groove, drag them all a 16th note later, and then iteratively quantise them to be locked a little more tightly to the beat.

It can be worth saving a number of different versions of your new groove, in which the 16th notes get successively tighter. Not only does this allow you to experiment to find the most applicable groove for a given part, but it also allows you to make a part's timing tighter as the track progresses — a phenomenon which we saw demonstrated in 'I Feel Good'. Another thing to consider is dipping the velocity values associated with 16th-note quantise points, in order to make them lighter and more natural-sounding. As a matter of habit, try to remember to name your grooves according their resolution and character. Therefore the raw 'I Feel Good' groove could be ▶

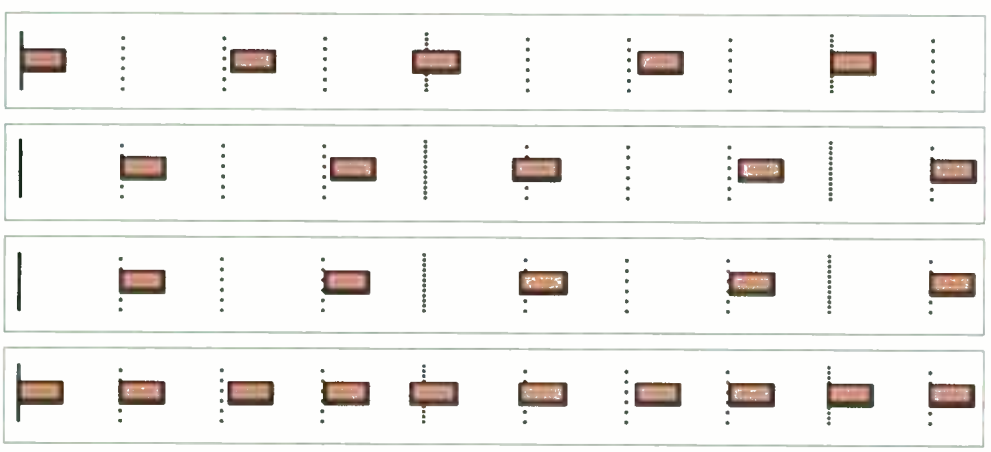
Groove Extraction With Hardware?

If you make your music with a hardware sequencer, or with a basic software application which supports no groove facilities, there are still ways in which you can usefully extract timing information from audio recordings for use in your own music. The most basic way is to use a sampler to edit the required audio section into individual beats, then reassembling the audio by programming a sequence to trigger the individual audio slices in the correct order and timing. If the audio is reconstituted as naturally as possible, the positions of the resultant MIDI trigger notes will represent those of the audio beats, and this information can either be used to trigger new sounds alongside the audio loop, or to enable other sequenced parts to be edited into sync. The final part of Oli Bell's recent article on phrase sampling (*SOS* June 2000) covers this groove extraction technique in detail. Though this approach is rather more time-consuming than the software approach, it might be the only option for the hardware-only studio.

However, there are musicians who use hardware for music out of preference, but who are happy to use a lower-spec computer for off-line editing. In such cases, Propellerheads' *Recycle* can make the above process much less of a chore. *Recycle* chops up an audio loop with only a little help from you, piping the segments to your sampler over SCSI or MIDI, and also generates a MIDI file which represents the timing of these segments. *Mike Senior*



Propellerheads' *Recycle* can be used to extract groove timing data for use with hardware sequencers.



If you have a groove template file which contains only one quantisation point per 8th note (top), you can copy, move and iteratively quantise these points, adding them to the original template to generate a new one with 16th-note resolution (bottom).

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named 'feelgoodraw8', while the 16th-note groove might be labelled 'feelgoodraw16'.

More Grooves For Your Money

You ought now to have a range of natural-sounding grooves which will be good for humanising a wide range of material. However, there is more mileage to be got out of our extracted groove yet! The first way you can adapt this groove for different uses is to push the main quarter-note down beats slightly early, while delaying all the up beats a little. This produces a very subtle shuffle feel which can help enliven uninteresting drum programming. It is best applied to the hi-hat and snare and tends to make the rhythm sound tighter and snappier.

If your groove covers a number of bars, another nice trick is to push the groove's main beats a little early towards its beginning and end, while delaying them a little towards its middle. This cyclic pattern can work well, especially when applied selectively. Using it on just your bass drum and hi-hat parts, for example, can produce pleasant flamming effects between them and the snare. The amount of push and delay you need to use will vary depending on the material to processed — obviously, a tight feel will only be able to cope with a little such tweaking before starting to sound messy.

Another fertile place for experimentation is in the field of velocity and duration. If your sequencer allows you to program these into the groove, then take the time to try it out, as this can make a great deal of difference to the feel. While *Cubase* and other sequencers do tend to be pretty good at extracting natural velocity characteristics, you still shouldn't necessarily take it for granted that the extracted velocity settings are the best for your track. If an extracted groove feels lumpy then it may well require attention in this area.

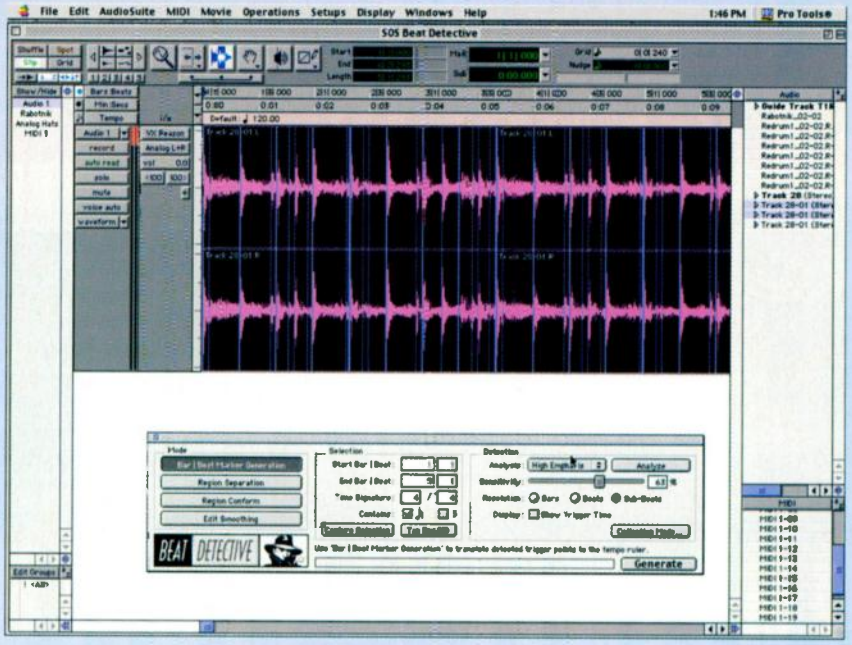
The first thing to realise is that velocity and duration are both responsible for accentuation. Heavily accented notes will usually tend to have a longer duration, for example, and short notes which require accentuation will need especially high velocity values to compensate for their brevity. Manipulating velocity values is a common practice in drum programming when creating variety and realism, and many hardware and software sequencers make this easy to do. ▶

Groove templates within *Cubase VST* can be applied from the Groove Control window, with sliders showing the degree of timing, velocity and duration change.

Groove In Digidesign *Pro Tools*

Groove extraction is one of the things that shows up that Digidesign's *Pro Tools* has only recently acquired MIDI functionality. Unlike some of the dedicated Audio + MIDI sequencing packages, MIDI is aligned with audio by altering the *Pro Tools* project's tempo map and metric grid. This means that only timing information is extracted, and that only one groove is therefore available at any one time.

The groove extraction facilities use the new Beat Detective Tool, which is available within the *Pro Tools* 5.1 TDM version. First you select a section of the audio waveform which accurately corresponds to a whole number of bars and beats. Beat Detective is opened up and told the meter of the recording and which bars and beats it corresponds to. Once this is done, the audio can be analysed to find out how far the actual transients deviate from the idealised metric grid — a Sensitivity control lets you help Beat Detective to determine which audio transients are important. Once all this is done to your satisfaction, you generate the new metric grid. Then all quantising done within that time selection references this new metric grid. The system works well as far as it goes, but may require that you process small sections of audio individually if there are changes in tempo and meter, or if the detection has trouble distinguishing beat transients from background ambience. *Simon Price*



The Beat Detector within *Pro Tools* allows a degree of groove quantising by altering the overall metric grid.

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WRH

However, because considerations of note length are often considered irrelevant when processing drums, it is tempting also to forget about duration when processing more melodic material. This is a shame, as many instrumental grooves are heavily dependent on duration characteristics — take staccato slap bass, for example. And even drums can benefit from subtle duration tweaking, so don't completely reject it out of hand.

A few experiments are worth doing and could produce exactly the effect you're looking for. Try the simple technique of accenting every other 16th note within a groove or, alternatively, try something more unusual, such as accenting the second of every three 1/16th notes to give a kind of continuous off-the-beat feel. Another angle to try is to increase the difference between the accented and unaccented notes in your groove — this usually only requires a single MIDI process and can make MIDI parts more lively and natural. Other options include randomisation of velocities and durations, or the use of undulating patterns of these values.

Testing The Grooves

Most readers will already be familiar with how to apply standard quantise functions within their chosen sequencer, and the use of groove templates is often very similar. In *Cubase VST*, the groove templates you create are available in the Groove Control window, alongside any other grooves you may have in the default grooves folder on the hard disk. From this window you can apply the groove's timing, velocity and duration scaling to any MIDI part in varying degrees, depending on the positions of three sliders. An invaluable element of this is that you get a chance to regulate and test the groove processing in real time before you apply it, and this is something which is excellent for experimentation. Other sequencers are even more flexible, carrying out all their groove processing in real time, which allows even easier tweaking.

I would recommend hard-quantised bass-drum, snare and hi-hat parts for the initial testing of any grooves you extract. A four-on-the-floor bass drum with a standard snare on the second and fourth beats of the bar is a good starting point, with hi-hats at eighth or 16th-note intervals. This allows clearly defined comparisons to be made between straight and grooved versions. It may also be appropriate to test the grooves on other drum and percussion parts you find yourself using frequently. The more characteristic the groove, the fewer types of material it's likely to work with. On the other hand, if you can find which type of part a particular groove does work with, then the pay off can be well worth the effort of finding it.

It is important to remember that the effects of groove quantising are often subtle enough that they can only be picked out consciously by very careful listening. The process of creating and testing grooves requires patience and the willingness to spend time developing an instinct for which kinds of combinations and relationships of groove templates work best. This means doing lots of comparisons and lots of trial-and-error processing. However, with a little practice, the results can be magical.

Groovy Train

The difference between monotonously programmed machine music and subtle performance is like the difference between painting by numbers and great works of art. Fortunately, music software is now beginning to become advanced enough to digitally approach our human analogue reality. Functions such as groove quantising are the cutting edge, which is why the creation and use of groove templates can be so exciting, and why they can teach us so much about what makes musical performances special. SOS

Simon Millward is the author of the successful *Fast Guide To Cubase VST* book, now in its third edition and available through *SOS* Mail Order at www.sound-on-sound.com/shop

information

A variety of groove templates generated from 'I Feel Good' are available on the *SOS* web site, at the following URL:

W www.sound-on-sound.com/sos/aug01/articles/groove2.asp

For more information on the software mentioned in this article, check out the following web sites:

W www.cakewalk.com
W www.digidesign.com
W www.emagic.de
W www.markoftheunicorn.com
W www.propellerheads.se
W www.steinberg.net

Successful Groove Extraction: Key Factors

Groove extraction from audio can be a delicate process, but if you keep the following key factors in mind, you ought to be able to get good results most of the time:

- Choose the target audio segment carefully, making sure that its rhythmic elements are clearly defined.
- Make sure that the chosen section is edited to begin precisely on the down beat of the first bar, and that it is the correct length so that it loops smoothly and in time.
- Take time to experiment with the settings for the groove extraction algorithm in your chosen MIDI + Audio sequencer, and aim to get at least one quantise point per division of the beat.
- Manually edit the groove data after extraction to delete any unwanted quantisation points, and correct any errors.
- If you need more beat divisions in the groove data, generate them from the existing data using a copy procedure, and consider further quantising them if necessary.
- Experiment with editing your groove data in different ways, and create several variations of the same groove to allow for flexibility in use.
- For a general-purpose template, consider applying a mild iterative quantise to the groove data, to even it out slightly.
- Test your groove template on target MIDI parts to make sure that it produces the desired results. Remember that the groove can be applied selectively to different parts of the arrangement — each groove template will not necessarily work well with all types of material.
- Name your groove template meaningfully, according to its resolution and purpose. This makes it easier to use at a later date when you may have forgotten where it came from.

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BEHRINGER MX3242X

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BEHRINGER EURORACK MX3242X MIXER

Behringer's latest addition to their Eurorack compact analogue mixer range offers 16 hi-spec channels, plus the flexibility of an in-line monitor configuration. **Paul White** tests the MX3242X.

Behringer's MX3242X is a four-buss mixer designed to sit comfortably alongside a 16-track recorder or equivalent computer audio system. It uses an in-line design which might best be described as 16:4:16:2, with the 16 channel strips controlling both the 16 main input channels and the 16 secondary monitor channels (labelled Mix B). A stereo 24-bit effects processor, based on Behringer's own Virtualizer multi-effects, is built in to the top right-hand corner of the unit and offers 32 presets including reverb, delay and modulation effects.

Nuts & Bolts

The all-metal construction is sturdy, right down to the jack socket nuts — no nasty plastic here! The mixer follows a classic wedge shape, with all main connections tucked away on the rear panel, and is compact enough to be rackmountable, using the included bolt-on rack ears to replace the moulded plastic end cheeks. Those users who wish to rackmount the MX3242X will be glad to know that the rear-panel with the audio socketry can be rotated through 90 degrees, with the aid of a screwdriver and the Eurorack's manual. The mixer's power supply is a hefty external 2U rackmount unit, which connects via a rugged multi-pin XLR cable. It has an internal cooling fan which, although reasonably quiet, will mean you'll probably want to rack the PSU outside your control room if possible.

The rear panel features 16 main input sections (numbered one to 16) comprising balanced Mic Inputs on XLRs, with globally switchable phantom powering, and balanced Line Inputs on TRS jack sockets. Above each of these pairs of inputs are unbalanced Direct Output and TRS Insert jack sockets. The Mix B line input sockets (numbered 17-to 32) accept either balanced or unbalanced jacks, and their sensitivity can be adjusted globally between +4dBu and -10dBV levels with the Operating Level switch just above socket 32.

The console has six mono aux sends and four stereo aux returns, and there is a block of unbalanced jack sockets for these at the top right-hand side of the rear panel — note that a mono return signal connected to the left input of any return will be split equally to both sides of the stereo return buss. To the left are Subgroup Insert points on four TRS jack sockets and four unbalanced sockets for the Subgroup Outputs. Two pairs of RCA phonos labelled 2-Track In/Out allow a stereo master recorder to be easily integrated with the mixer.

The MX3242X provides several stereo output busses: the main mix buss, with unbalanced Main Insert point and Main Out jack sockets, as well as balanced Main Outputs on a pair of XLRs; the Mix B buss, to which the monitor channel paths are mixed, output on unbalanced jack sockets; and a stereo monitor buss, again output on unbalanced jack sockets. Finally, should the impressive total of 40 inputs available on the MX3242X not be enough for your needs, there are two 15-pin D-Sub connectors which let you integrate an expander mixer.

Channel Strip

The 16 input channels are normally fed from the mic and line inputs (numbered one to 16), and the 16 monitor channels are normally fed from the Mix B line inputs (numbered 17 to 32). However, this assignment can be swapped over on a per-channel basis using the Flip button under the input Gain control. Note that there's no switch for selecting between the mic/line inputs — you plug into whichever socket you wish to use — which might be a problem if you want to wire everything permanently to a patchbay. Inputs one to 16 have switchable 18dB/octave low-cut filters operating at 75Hz.

MX3242X Effects

Above the MX3242X's master section is a control panel carrying the effects controls and a preset patch list. You set the input level to the processor using the channel and master Aux 3 controls, relying on the effects unit's own eight-segment LED bar-graph meter for visual feedback. Patch selection is by means of Up, Down and Enter buttons and the current patch number is shown in a green numeric display which flashes until the patch is selected. No control over the effects parameters is possible other than to vary the amount mixed in. The presets cover various hall, room and plate reverbs, echo, chorus, flanger and a number of dual effects. There are also three special treatments: Radio Speaker, Distortion and Magic Pitch.

Though the implementation here is a simple one, the effects unit sounds quite respectable, with most of its presets sensible and usable — hardly surprising given their proven Virtualizer heritage. These effects would be well-suited to both live work and project studio recording. Some basic parameter control, such as variable reverb and delay time, would have been useful, but getting an effects section at all in this type of mixer can only really be considered a bonus.

BEHRINGER EURORACK MX3242X £938

pros

- Good sound quality with wide audio bandwidth.
- Flexible layout and routing.
- Compact yet uncluttered.
- Usable onboard multi-effects unit.
- Generous metering.

cons

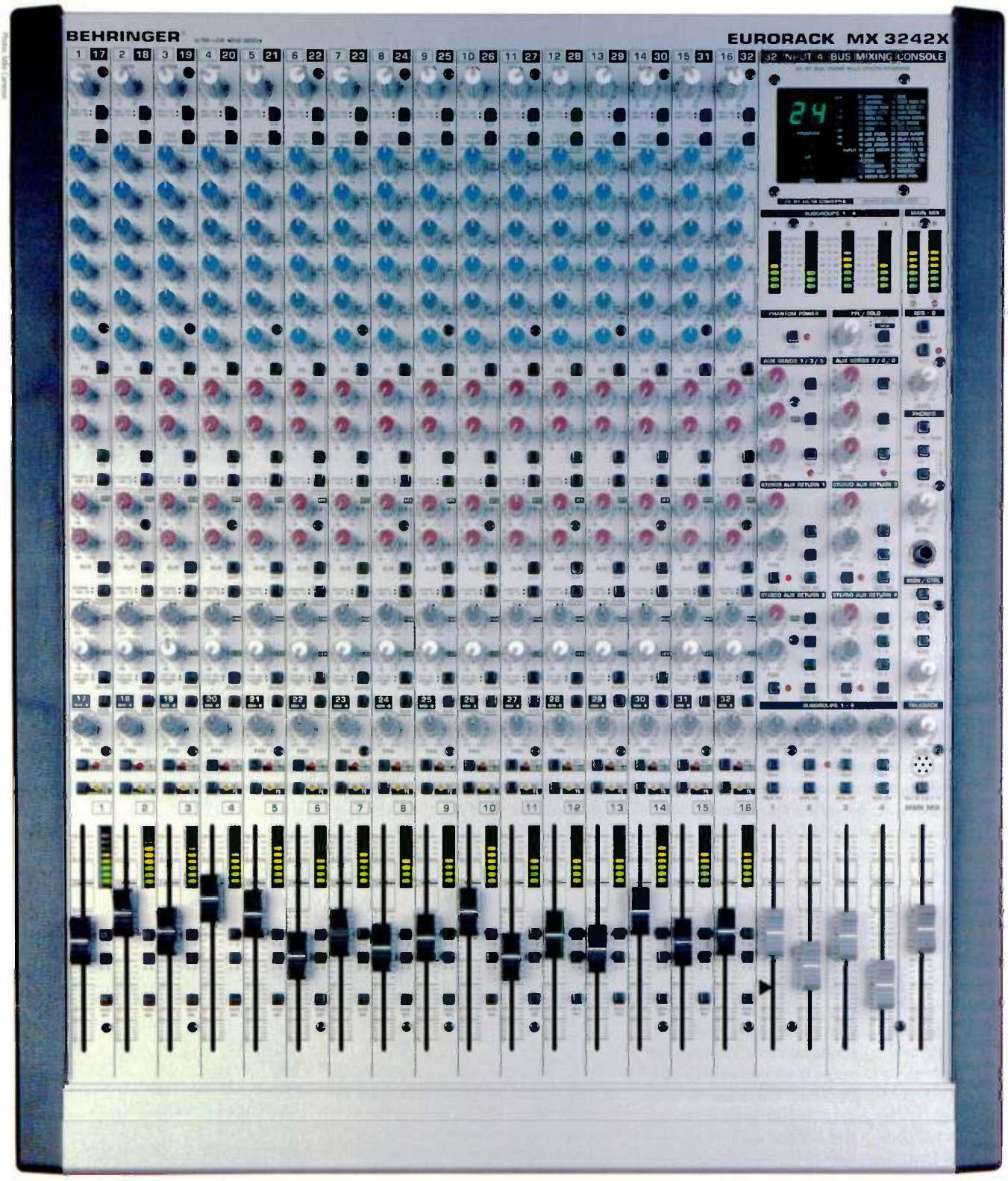
- External PSU less convenient for live use and it produces some fan noise.
- The status of the black switches difficult to see at a glance.

summary

A flexible, compact mixer suitable for recording systems with up to 16 tracks. It has more features than you might expect from a mixer of its price, including long faders, generous metering and built-in digital effects.

SOUND ON SOUND

The MX3242X's PSU contains a cooling fan, and is best located away from your monitoring position.



The next set of knobs on each channel strip control the four-band semiparametric EQ. This comprises high and low shelving filters at 12kHz and 80Hz respectively and two sweepable peaking filters: the high mid-band covers 300Hz to 20kHz and the low mid-band covers 50Hz to 3kHz. All bands have a ±15dB gain range and a single button bypasses the entire equaliser.

Though there are six auxiliary busses available, there are only four send controls. The first pair always access Aux 1 and Aux 2, whereas the second pair can be assigned on a per-channel basis either to Aux 3 and Aux 4 or to Aux 5 and Aux 6. Each pair of Aux knobs has a Source switch, which allows the auxiliary busses to be fed from either the input or monitor channels — useful when you're using all 32 channel paths at mixdown. The Aux 3 buss feeds the internal effects unit — see the 'MX3242X Effects' box for details about the effects processing offered.

Below the Aux Send knobs are the monitor channel's Pan and Level controls. The Mix B channels feed their own stereo mix buss and this can be routed to the main mix. The Source button below the Level control allows the monitor channel to be fed a pre-fader signal from its parallel input channel. A Mute button completes the Mix B facilities.

The input channel Pan control is followed by switches for PFL/Solo and Mute, each with ▶

BEHRINGER MX3242X

associated status LEDs. The channel fader is 100mm long and it is accompanied by an eight-segment bar-graph level meter and routing switches for the mix and subgroup busses. Four subgroup buss outputs might seem a little limiting for multitrack recording, but it's worth also taking the 16 direct outputs into consideration — after all, most recorded tracks are fed from a single source, in practice.

Master Section

The MX3242X's master section provides a further four 100mm faders for the subgroup busses and a stereo fader for the mix buss — eight-segment LED metering for each of these busses is provided just under the effects unit panel. Above the subgroup faders are the Main Mix routing button, the Solo button, and the Pan control, an arrangement more flexible than fixed stereo pairings.

Controls for the four stereo aux returns come next, which include Level and Balance knobs, as well as Solo and routing buttons. Any of these returns may be routed to the main mix or any of the subgroups, and the third and fourth returns can be routed to the Aux 1 and Aux 2 busses if you wish to add effects to foldback signals. The six auxiliary sends have Level controls and Solo buttons. Above these controls are the switch for engaging the global +48V phantom power, a pot for setting the monitor level when soloing, and the Channel Mode button for selecting whether channel soloing is to be PFL (mono pre-fade listen) or Solo (stereo solo-in-place).

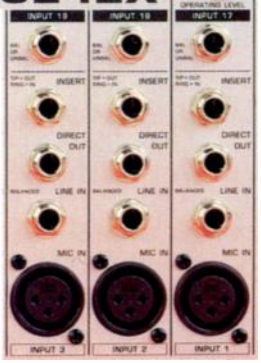
The Mix B buss is provided with a Level control, a Solo button, and a routing switch to mix it into the main mix buss. Below this are the headphone and control-room monitoring sections, each with source-selection switches and Level control. The stereo quarter-inch jack socket in the Phones section can either be set to receive the main monitor signal or can monitor Aux 1 or Aux 2. If both auxiliaries are selected, they are heard as the two sides of a stereo signal. The control-room monitors can be summed to mono if required, and are fed from the main mix buss by default, but can be switched to receive the Mix B buss or the signal from the 2-Track Input.

A small built-in mic handles talkback, nestling just above the master fader. This mic is routed to the first two auxiliary outputs with a dedicated switch, and it has a dedicated Level control.

In Practice

Behringer's manual claims that the mic/line amps used in this mixer are a cut above the norm. The published frequency response of 10Hz to 125kHz (±3dB) is certainly impressive and the signal-to-noise ratio of 125dB is typical of a well-designed mixer. More importantly, my own tests with a capacitor mic showed them to be clean and uncoloured. The equaliser works very well, providing you use it sensibly and sparingly, allowing you to reveal transient detail at the high end, and to warm up the bass without it getting flabby. The mid-bands work nicely both for boosting and cutting, and the wide sweep ranges make them able to address problems throughout the frequency range.

Operation is very straightforward once you have a grasp of the in-line concept, and the controls have a good feel. It was particularly nice to find that the faders were all 100mm long, and that there was such generous metering to accompany them. The EQ, Mute and Source buttons all engaged without obtrusive audio clicks, though it was difficult to tell their status at a glance where they had no LEDs.



Verdict

No mixer is perfect, but Behringer's MX3242X manages to deliver an attractive combination of quality and flexibility at an attractive UK price. This is a mixer which is flexible enough to use in a large variety of studio and live roles, especially where a 16-track recorder can make use of the direct outputs. In the project studio it provides a compact means of monitoring from multiple sound sources, recorder outputs and effects devices, as well as providing 16 good-quality mic amps. The technical performance has improved over the already acceptable Behringer desks of a few years back, so if you're after a small and versatile analogue console, the MX3242X is one to take very seriously. SOS

information

£ £938 including VAT.
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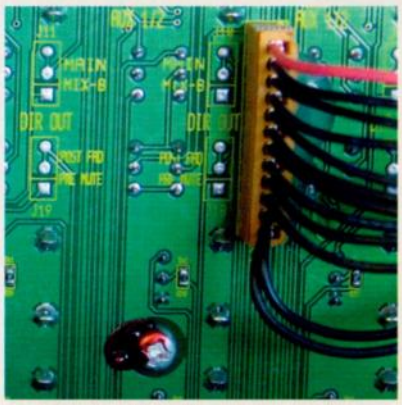
Available User Modifications

Though Behringer's MX3242X is already extremely flexible straight out of the box, there are additional changes that can be made to the way it operates by removing the bottom cover and changing sets of links on the PCB. Note that this should not be undertaken by anyone without adequate technical experience, as it will void the warranty. If in any doubt, get your dealer to make any necessary changes for you. The following alterations to the operation of the console are possible:

- **The first two auxiliary sends on every channel can be fed pre-mute in pre-fade mode. By default, muting a channel also mutes these sends.**
- **Direct outputs can be fed from the monitor channels rather than from the input channels.**
- **The source for the direct outputs can be made pre-mute, rather than post-fader, though this modification is not available if the direct outputs are being fed from the monitor channels.**
- **The source for the monitor channel when the Link button is down can be made post-fader, allowing the monitor channel to be used effectively as a stereo, post-fade send.**
- **The channel level meters can be made to read pre-fader, rather than the usual post-fader, levels.**



To the left of the cables you can see some of the internal PCB links which are used to modify the MX3242X's operation for specific applications.

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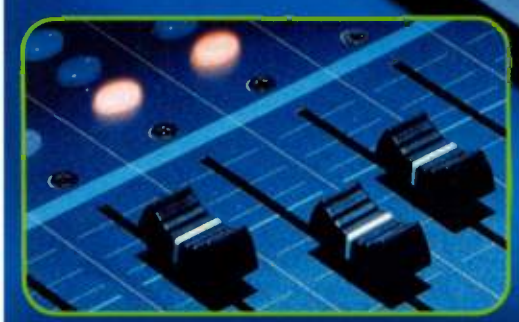

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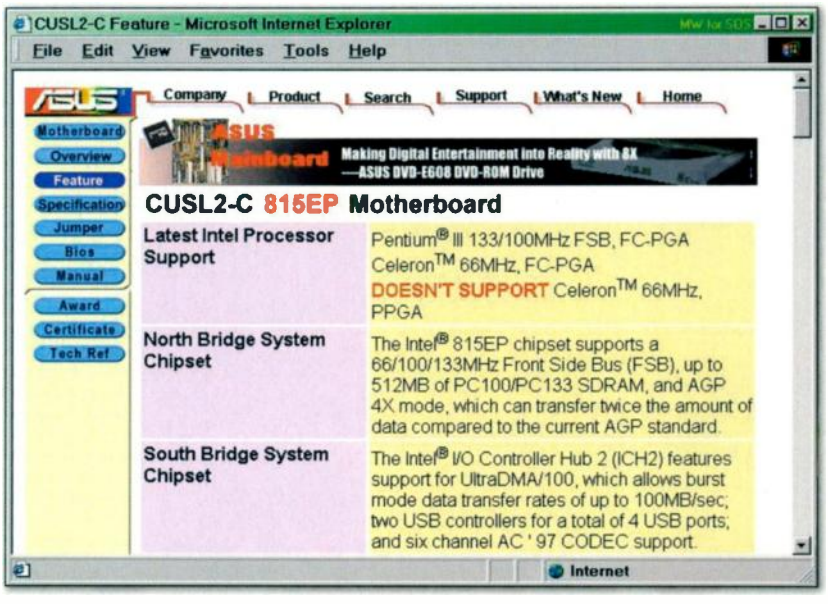
trouble on the cards?

Martin Walker offers some practical advice on choosing soundcards that will work in modern PCs without falling foul of chipset or driver compatibility problems.

CHOOSING & INSTALLING TODAY'S PC SOUNDCARDS



If you're considering buying a new soundcard, you ought to check its compatibility with your motherboard chipset first. Visit the motherboard manufacturer's web site to found out which one your PC uses.

Way back in *SOS* February 1999 I wrote a PC Musician feature explaining how to install and run multiple soundcards in a single PC to add more audio channels, built-in sampling or MIDI synths to your sonic arsenal. It also covered driver restrictions, starting and stopping them in unison, and how to lock multiple cards together to keep them in perfect audio sync. However, a lot of water has passed under the bridge since then, and the range of soundcards available has changed almost beyond recognition, with even entry-level soundcards now offering 24-bit/96kHz capability, so the time is ripe for another look at these issues.

Sadly, the biggest new problem area to discuss this time round is fairly fundamental: the fact that some soundcards refuse to work in certain PCs. So, let's get straight down to a discussion of one of the most frustrating, annoying, and confusing aspects of buying a new soundcard.

Chipset Incompatibility

There have always been some soundcards that have been fussy about what else you had in the computer. However, over the last couple of years a huge number of musicians have run into compatibility problems relating to one specific area — AMD processors. Now before a lynch mob of Athlon evangelists descends on me, let me reassure you that I'm not saying anything against AMD processors *per se*, or that they are the direct cause of soundcard problems. In fact these problems are nearly always due to incompatibilities between the soundcard and the motherboard chipset. It's just unfortunate that the majority of soundcard incompatibilities relate to motherboards with AMD processors, since Athlon floating-point performance — which is very important for audio plug-ins in particular — is now generally acknowledged to be excellent.

Every soundcard manufacturer will, of necessity, test that their products are fully compatible with PCs containing an Intel Pentium or Celeron processor and an Intel-designed motherboard chipset — this is still the most common configuration worldwide, and thus the lowest common denominator. However, a much bigger range of chipsets is available for AMD-based motherboards, which makes it far more difficult for soundcard manufacturers to provide cast-iron guarantees of compatibility across the board with Athlon/Duron systems. Many current soundcard designs were also on the drawing board long before the Athlon appeared, so you simply can't expect them to have taken it into account. There are also a few third-party chipsets from such companies as Via for motherboards featuring Intel processors, and these have had teething troubles too.

Some soundcard manufacturers do test both new and existing models with at least one AMD-based chipset, but others stick to recommending Intel products only, meaning that Athlon owners may get little or no technical support if they do get problems. With at least eight chipsets currently available for the Athlon, and new ones being launched every few months, it would be almost impossible for many manufacturers to keep up with all the options — but

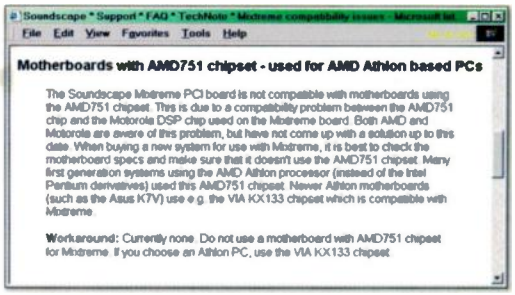
while researching this feature I was surprised at how many still don't mention anything about AMD on their web sites at all. Even if information is provided, you may also have to ferret about a bit: when I did find information it was variously in FAQs, Tech Support, on a separate Compatibility page (possibly the best approach), and in driver release notes for specific soundcards.

Consequently, many Athlon/Duron-owning musicians buy soundcards blind, either because they don't know a possible problem even exists, or because they can't get a definite answer from the soundcard manufacturer. The only answer in many cases is to ask other musicians who've already taken the plunge, so this is quite a common request on the *SOS* forum.

Athlon Motherboard Chipsets

The first step in anticipating possible compatibility problems is to find out which chipset your PC uses. To do this, open Control Panel and then System, and look in its Device Manager; under the System Devices section you will find the names of each chip of the chipset. Alternatively you can open up your PC and look on the chips themselves for a manufacturer's name and part number. However, both of these methods can be confusing, since there are normally two or three chips in a specific set, each with different numbers, so probably the easiest way is to look in your motherboard manual if you have one, or determine the make and model of your motherboard and then find the information on the manufacturer's web site.

So which chipsets cause the problems, and what can you expect? Well, one of the most common incompatibilities is between the early AMD 750 chipset for Athlon processors, and the Motorola DSP chip used on soundcards like Soundscape's Mixtreme, the Echo range, and the Lexicon Core 2. Aardvark soundcards won't work with this chipset either, so I suspect they also use Motorola DSP chips. Some musicians suffered loads of clicks and pops, while others couldn't boot up their PCs at all once the soundcard had been installed. There is no cure, but only early Athlon motherboards used this chipset, and in general AMD's more recent AMD 760 range has been declared compatible with all these soundcards.



Musicians would have a far easier time if only all soundcard manufacturers would provide simple, clear, details of any known incompatibility, as Soundscape do here for their Mixtreme card.

Via have quite a few different chipsets available, including the Apollo KX133, KT133, KT133A, and KT266 for Socket A/Slot A motherboards used with Athlon/Duron processors. The KX133 appeared shortly after AMD's first 750 chipset, and also proved problematic, although Soundscape have publicly declared it compatible with their Mixtreme card, and Aardvark with their range. During my researches I came across reports of M Audio cards getting stuck in infinite loops during playback with AMD-Via combinations, particularly when playing Windows sounds — this can apparently be resolved by running a small patch file. MOTU also report that ▶

Using ISA Cards

Many PC musicians are in the position of having acquired one or more ISA soundcards over the years, and wondering whether to install them in a new PC. Doing so will always win in the value for money stakes, but can give more than its fair share of problems, largely because such cards mostly pre-date Plug and Play. Modern expansion cards get automatically configured by the BIOS and Windows so that they get suitable IRQs and so on. Most ISA expansion cards need this doing by hand, which isn't too much of a problem, except that you also need to enter the BIOS to reserve the IRQs you choose, so that they aren't subsequently grabbed by PCI cards. This reserved IRQ cannot be shared with any other device either (see main text).

If you have an empty ISA slot (and quite a few recent motherboards have done away with these altogether now) then it's only really worth installing such a device if you really do want whatever features it offers, and you're confident that it won't give you problems. I've recently reinstalled an ancient Roland MPU401 ISA-based interface, since this only requires a single IRQ, uses a single Microsoft driver file, and provides me with an additional MIDI In and Out. Other musicians keep old soundcards simply to carry on using Yamaha's DB50XG daughterboard, without using any of their audio features. However, you will still need to install the soundcard drivers to do this, so think long and hard before you take the plunge.

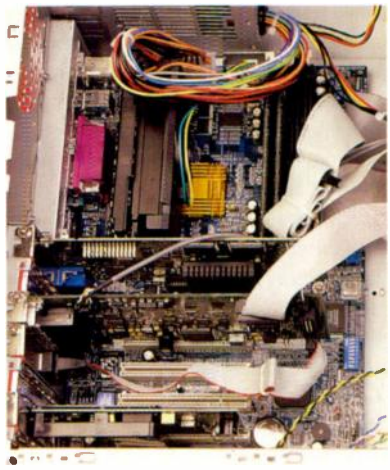
▶ they have been able to get some more recent Via chipsets to work with their soundcards after downloading the 'four in one update' from www.via.com.tw, while Echo have reported that their cards have problems with IRQ routing in Windows 98 with Via chipsets, although many of their customers have solved these by downloading the 'IRQ routing miniport driver' from the Via web site.

If you want to 'go Athlon' then buying a motherboard using the Via KT133A chipset (an update of the earlier KT133) is thought to be the safest bet for musicians, but it's also important to buy a well-known motherboard make and model — cutting corners to save a few pounds off the price can backfire on you. However, a new scare appeared in April 2001, when it was discovered that various Via chipsets caused audio crackling during large file transfers between two hard drives connected to different IDE channels. Soundblaster Live! owners seem to have been particularly affected, and the crackling was apparently caused by a problem with the Via 686B Southbridge controller chip. Unfortunately this chip is not only used with Via's own KT133 and KT133A chipsets, but may also be used with other chipsets including the Apollo Pro 133, KX133A, and AMD 76x chipsets too.

There have been a few temporary BIOS fixes for this involving adjusting various PCI settings, and you can download a third-party patch that performs these adjustments automatically (see **Further Reading** box). However, as I finished this column Via announced that they will be posting a new IDE driver for users of the Soundblaster Live!, and that they haven't found any other configuration that suffers from the same problem. Mind you, users of other consumer soundcards have also reported the same symptoms, so the problem doesn't seem to have been completely solved as yet.

If your Athlon motherboard uses chipsets from other, less well-known manufacturers like ALi and SiS then you're even less likely to get a definitive answer from a soundcard manufacturer. That's not to say that you'll get problems, just that few people will know the answer. SiS have recently released a new 735 chipset for Athlon/Duron motherboards which seems to be outperforming AMD's 760 and VIA's Apollo KT266 and KT133A, but it's just not been out long enough for many real-world soundcard tests to have taken place.

Those with older PCs don't escape either — a few manufacturers have also posted details on Socket 7 chipsets supporting the original Pentium and AMD K6/K7 processors. MOTU state that older SiS and Via MVP3 Socket 7 chipsets are incompatible



It's essential to check that your motherboard chipset is compatible when buying a soundcard, particularly if you're using an AMD processor.

with their PCI 324 card, and Yamaha have also pronounced some older sets such as the SiS 5596/5598 and Opti Viper incompatible with their SW1000XG, but I doubt that this will worry many musicians nowadays unless they are intending to buy a new soundcard and install it in a PC more than three or four years old.

Intel Motherboard Chipsets

If you have an Intel Pentium II or III processor, or an Intel Celeron, then fewer chipset options are available. Most musicians are still likely to have motherboards either featuring the older but very reliable Intel 440BX chipset introduced in 1998, or the newer Via Apollo Pro series for Socket 370 and Slot 1 motherboards, which includes the Apollo Pro 133, 133A, and 266. These had clear advantages over the older 440BX in some areas of specification (see 'Solid Foundations' in *SOS* January 2000 for further details), but in practice the Intel 440BX held its own in performance terms, and is far more likely to be compatible with every soundcard. In my researches I came across a few users claiming compatibility problems between Echo Layla and Gina 24 models and the Apollo Pro 133A chipset, but nothing concrete.

Intel next introduced their i820 chipset, but this could only use expensive RDRAM memory, never really took off, and did apparently suffer some compatibility problems. Far more successful have been Intel's i815E and i815EP (a version without the built-in video support) chipsets for Pentium III and Celeron processors, as used in the Asus CUSL2C motherboard and much praised by musicians. A reliable source who installs different soundcards in PCs on a daily basis told me that the only problems he had found with this were with Lexicon's Core 2 and the Turtle Beach Montego II, so it still pays to be careful, but that the vast majority of soundcards are very happy with this chipset. ▶

Laptop Issues

While many musicians are installing multiple soundcards into desktop PCs, laptop users rarely have such options. Mind you, nearly all laptops are equipped with sound chips built in to the motherboard, and while the audio quality of such chips has increased greatly over the last few years, most serious musicians will want to add a dedicated soundcard. So, you may still face issues related to having two 'soundcards' in the same machine.

Since most of these sound chips are designed around the Soundblaster standard, you are unlikely to run into any conflicts after installing a more professional soundcard like Digigram's VXpocket or Ego Sys' WaMi Box. However, the latter incorporates an MPU401-compatible MIDI interface, and this may well crash if you attempt to use it with a similar motherboard interface still activated. The safest thing to do is to disable the motherboard soundchip before adding your new card.

If you have a laptop as well as a desktop PC, it would be worth considering a USB music peripheral, since you can then use it with a desktop PC at home or plug it into your laptop when on the move, effectively sharing it between both machines.

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This largely brings us up to date with Intel's fairly new 850 chipset, as used by the latest Pentium 4 processor range. Once again this uses RDRAM and is still fairly expensive, but supports the fastest currently available processors — up to 1.7GHz. I've no doubt that a few soundcard incompatibilities may exist, once again because nearly all current soundcards were designed before the Pentium 4 range was released. However, you can bet your bottom dollar that all new soundcards will be tested with the 850 as a matter of course.

Cards Not Recognised

Having dealt with chipset incompatibilities, let's turn our attention to other soundcard installation problems. Occasionally you may find that your new soundcard hasn't been recognised, and you don't get a 'New Hardware Found' message when you reboot. The chances are, in this case, that your new soundcard simply hasn't been pushed home properly in its slot. However, I have also had this happen in isolated cases where Windows gets confused with an existing soundcard and doesn't spot the new one. Here, temporarily removing the other card's drivers did the trick, allowing it to be correctly spotted. Sometimes installing a new card when you already have another model from the same manufacturer in your PC can cause problems, as can installing driver updates that get only partially recognised, leaving a mixture of old and new driver files. Part of the problem here is that Windows isn't very clever at finding files inside other folders during an install, and this is why most manufacturers still recommend copying driver updates to a floppy disk before installing them, so that all files are in its root directory.

If you download new drivers from the Internet and then place them in a nested folder on your hard drive, even if you point to the first file required when prompted, Windows can sometimes ignore subsequent driver files in this folder if it finds older ones already in the Windows\System folder. The best thing to do in these circumstances is to completely remove the existing soundcard drivers as I described in PC Notes January 2001, or if available follow the step-by-step instructions provided by your soundcard manufacturer.

Sharing Interrupts

When your PC is stuffed full of expansion cards it's quite easy to run out of individual interrupts to service them, and this is why Microsoft first introduced Interrupt Sharing in Windows 95 OSR2. I described the process in detail in PC Musician in February 1999, but essentially it allows several expansion cards to poll the same interrupt. However, only PCI cards can share interrupts, so if you still have an elderly ISA card in your system, make sure this gets its own dedicated IRQ.

Since interrupt sharing has now been around for several years, you might expect it to help sort out lots of soundcard installation problems, but it still seems to cause as many problems as it cures. A few have traced these to specific motherboards including for instance Abit's BE6, but they're largely due to the design of individual expansion cards — some will happily share interrupts with others, but others won't, and I suspect this is why there is such confusion out there.

Unfortunately we come back to the same situation as with non-Intel chipsets: some manufacturers tell you if their expansion cards support interrupt sharing, and others don't. For instance, RME and Soundscape are happy to claim 'complete interrupt sharing' in their spec lists, though of course if your Hammerfall or Mixtreme card tries to share with another card that isn't happy about cohabiting you could still get problems. Other manufacturers are open about the fact that their products don't support IRQ sharing: Terratec, for instance, say in their on-line FAQ that the EWS88MT/D models need their own interrupt.

The first advice most manufacturers give in this situation is to try swapping your soundcard to another expansion slot. Not only will this force the hardware to be re-recognised, but the chances are that even if it still ends up sharing an interrupt, it may well be with another card that is more accommodating. A few words of warning here, though: each time you move a card to a new slot it adds entries to the Registry, and if you're not careful you can also get multiple Registry entries when updating drivers without uninstalling the older ones first. This can eventually cause problems, but I described a thorough solution back in PC Notes

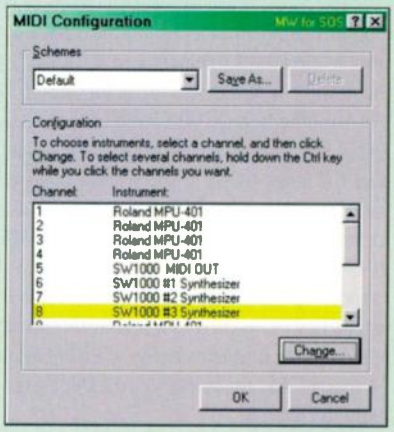
"Since interrupt sharing has now been around for several years, you might expect it to help sort out lots of soundcard installation problems, but it still seems to cause as many problems as it cures."

MIDI Mapper

When you install a soundcard, in addition to the new MIDI inputs and outputs added to your list of drivers, you'll also find another MIDI output labelled Microsoft MIDI Mapper. Many readers have emailed me to ask what this does, since its function is shrouded in mystery. Its existence actually dates back to the early days of PC music when soundcards were in their infancy, and most of us were running Windows 3.1. One of the very first PC soundcards was by Adlib, and used a primitive 2-operator Yamaha FM chip to provide either nine music voices, or six music voices and five fixed percussion ones. Then the first Soundblaster came along, with its then-revolutionary 8-bit stereo sample playback, but the same FM soundchip alongside.

As you can imagine, playing back complete songs on such primitive hardware was a frustrating business, and this is where the Windows 3.1 MIDI Mapper came in. If you selected this as the single MIDI output in your music application, it let you remap the data on each of the 16 MIDI channels with a different scaled velocity, new program change number, note offset, channel, and to any installed MIDI device — you could, for instance, route some channels to the FM synth, and others to an external MIDI synth, to make the most of your limited polyphony.

Nowadays, when 32-note polyphonic GM synths are considered entry-level, the MIDI Mapper is largely redundant, and can be ignored, especially since most modern sequencers already let you send each MIDI track to a different MIDI device if required. Indeed, many sequencers like *Cubase VST* don't even include it in their list of available MIDI devices. However, you may still find it useful with basic Windows music applications like Media Player that can only handle one MIDI device. Open up the Multimedia applet inside Control Panel, click on Custom Configuration on its MIDI page, and then you can route the data on each MIDI channel to a different device.



Although most music software lets you address multiple MIDI ports, choosing Microsoft's MIDI Mapper as an output lets you send each MIDI channel to a different port, even with applications that can only select a single MIDI output device.

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June 2000 using Safe Mode. In essence, if you find any multiple entries for the same device inside Device Manager you should delete every one, and then Windows will re-detect them when you reboot and place a single correct entry in the Registry.

Another potential problem area is when using Creative's Soundblaster Live! series, which includes a Soundblaster Emulation that looks to your PC like an SB16 soundcard. Since this was an ISA-based soundcard, it's unable to share IRQs or DMA with other cards, but at least you can disable it from Device Manager if you don't want to use it.

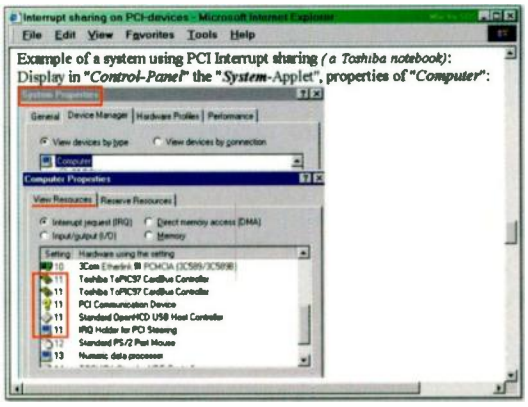
Multiple Cards

Back in 1999, many musicians were being forced to install multiple soundcards to run soft synths, since few multi-channel soundcards had truly multi-client drivers that allowed multiple applications to access separate output pairs simultaneously. Thankfully this situation has improved greatly, partly because of updated drivers and new cards like Echo's Mia that support up to four applications on a single output socket, but also because so many soft synths are now integrated with MIDI + Audio sequencers like *Cubase VST*, *Logic Audio*, and *Sonar*. However, many people still want to add a second soundcard, usually to add more audio inputs and outputs.

If you want to add more audio I/O then the ideal solution is to install an identical soundcard to the one you have already, since every input and output will then have exactly the same latency and sound quality, which makes mixing a far easier proposition. However, this will either work very well or not at all, depending on the way the drivers have been written. For instance, given their low prices, many people have been tempted to install more than one Creative Labs Soundblaster Live! card in their PCs to add more audio channels or SoundFont voices. However, this is normally doomed to failure, since Creative's drivers are only designed for a single card — if you try to install a second set of drivers they will simply overwrite the identically named driver files already sitting on your hard drive. Moreover, since you have two identical cards in your PC, and only one set of drivers, the chances are that either one or other of the cards simply won't work, or your PC might not boot up at all until you remove the duplicate.

Installing multiple identical cards in the same PC will only work if the drivers have been specially written to support this situation, and include a means of uniquely identifying each card. Quite a few of these now exist, including models from Echo, M Audio, and Yamaha, all of which will also let you run various combinations of card together from one set of drivers. However, before you buy another card from the same manufacturer, it's wise to check what's possible and what's not, since some restrictions may apply.

If you're going to mix completely different soundcards to add more audio channels, bear in mind that for best results you'll need to be able to set their latencies to the same value so that all the tracks emerge at roughly the same time. However, all converters have their own small latency, of the order of 1mS or so, which means that the inputs and outputs of different soundcards won't ever be perfectly locked together in sample-accurate sync, even when clocked from the same source. Watch out as well for phase inversion — one make and model of soundcard may not only be slightly time-shifted from another, but its outputs may emerge inverted. Issues like these are particularly important if you're trying to create a surround sound system. You should be all right as long as you use one soundcard for the front channels and another for the rear. The subwoofer channel isn't as critical, since low frequencies are more forgiving in this context.



Sharing interrupts between expansion cards can be a great help in a well-stuffed PC, as shown here, but it will only work when all the devices using a particular interrupt support sharing.

Software And Multiple Cards

The final thing to consider before installing several soundcards is software support. Adding a second soundcard doesn't automatically cause your music software to send audio to appear from both simultaneously; you'll need to choose which audio tracks are routed to which soundcard in your MIDI + Audio application. Nearly all applications, apart from consumer Windows programs like Microsoft's Media Player and a few stand-alone soft synths, offer such facilities nowadays, but there's another important consideration as well.

Multiple cards from one manufacturer all running from a single driver tend to appear inside software as a single larger device, which makes using most music software comparatively easy. However, there may still be limitations. For instance, Nemesys' *GigaStudio* can only currently access the first card it finds with GSIF-compatible drivers. More limiting is the fact that *Cubase VST* still only lets you address a single ASIO device; even if you have multiple soundcards, each with low-latency ASIO drivers, you'll only be able to use one of them unless you revert to the ASIO Multimedia or ASIO DirectX drivers, which of course will greatly increase latency. Here, Cakewalk's new *Sonar* scores highly, since you can get latencies down to 15mS or less even using standard MME drivers, and can therefore happily use several different soundcards side by side with low latency. *Logic Audio* also provides a neat way round this problem, by letting you run one card with ASIO drivers, another with EASI drivers, and even a third Audiowerk card simultaneously.

If you're interested in surround sound mixing then you can use any application that supports the appropriate number of output busses, but dedicated features such as surround pan controls for each audio channel and built-in low-pass filtering for the subwoofer channel will make your life a lot easier. *Cubase VST* doesn't yet offer these (although Steinberg's *Nuendo* does), but Emagic's *Logic Audio Platinum* now has them, as does the latest version of Magix's *Samplitude 2496*. SOS

Further Reading

There are plenty of resources available on the Net to help you track down potential soundcard problems.

Chipset Manufacturers

- W www.amd.com
- W www.intel.com
- W www.sis.com.tw
- W www.via.com.tw
- W www.viahardware.com
- W www.viahardware.com/686bfaq.shtm

(The VIA Hardware site is an independent source of information about VIA chipsets, and offers a downloadable patch file for the Southbridge bug (second URL) as well as some excellent FAQs for the Abit KT7 and KA7 motherboards.)

Unofficial Soundblaster Live! Support & FAQs

- W sfs.homeip.net/personal/cl_faq/
- W alive.singnet.com.sg/

Interrupt Sharing

- W www.lfchosting.com/helmig/j_helmig/intshare.htm

www.music-technology.co.uk

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Korg KAOSS	£219
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Intelligate XR2000	£173
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Ultralink Pro MX882	£142
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Ultra DI Pro DI4000	£150
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Tube Composer T1952	£269
Tube Ultragain T1953	£299
Tube Ultrafex T1954	£299
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Ultra Dyne Pro DSP9024	£299
AES/EBU Option for DSP8024/9024	£82
AES/EBU Option for DSP8000	£60
Shark DSP110	£127
Virtualiser Pro DSP1000P	£99
Feedback Destroyer Pro DSP1100P	£119
Modulizer Pro DSP1200P	£99
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MX18C4X	£316
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Bitheadz DS-1	£www or call
Cakewalk Sonar	£www or call
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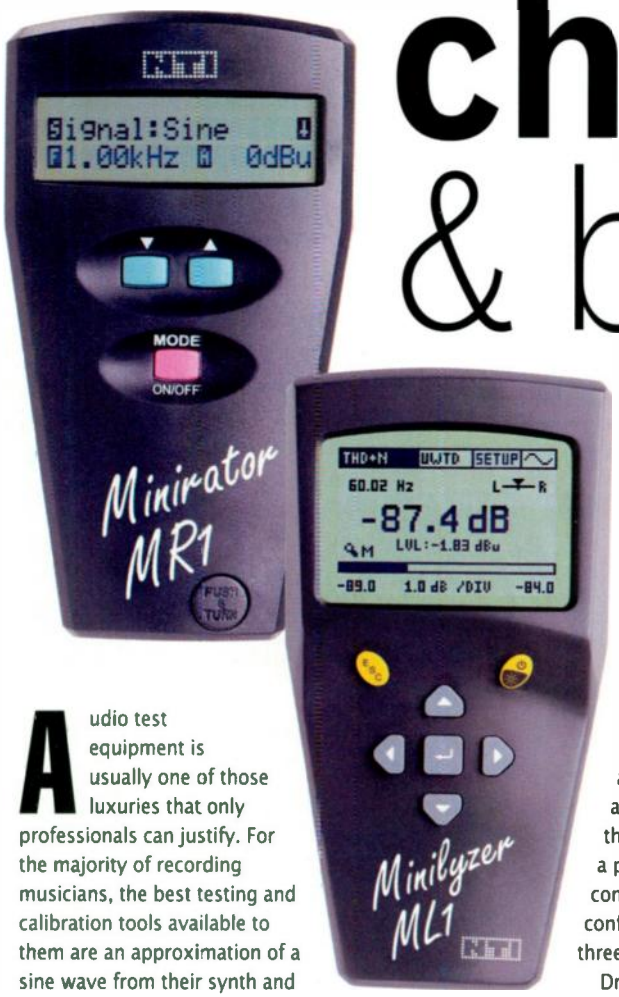


NTI MINILYSER & MINIRATOR TEST INSTRUMENTS

If you thought you couldn't afford audio test equipment, then think again! **Hugh Robjohns** finds out if NTI's Minstruments measure up.

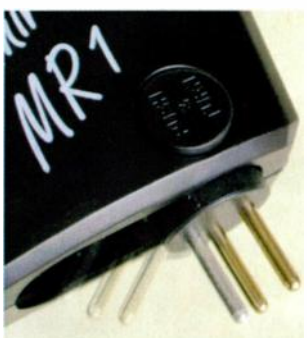
Audio test equipment is usually one of those luxuries that only professionals can justify. For the majority of recording musicians, the best testing and calibration tools available to them are an approximation of a sine wave from their synth and the readings from their console meters. However, Neutrik Test Instruments (originally part of the well-known connector manufacturer, but now a separate company) have produced some very neat and surprisingly affordable hand-held miniature test instruments, the Minstruments series. These currently comprise the MR1 Minirator signal generator, the ML1 Minilyser signal analyser and the MiniSPL, a calibrated measurement microphone designed for use with the ML1. There is news of a DL1 Digilyser digital audio analyser on the way, but this isn't yet available at the time of writing.

Minirator

The Minirator can produce any of a range of sine waves between 20Hz and 20kHz (in 31 third-octave steps), any of a range of square waves between 20Hz to 5kHz (in 25 steps), or a stepped sweep of sine waves from 20Hz to 20kHz (with adjustable step times from 0.05 to 5S) with an identifying 1kHz tone before each sweep. The unit also generates white and pink noise, as well as a polarity test signal of the impulse type which is used in conjunction with the Minilyser. Output level can be set anywhere between -76Bu and +6dBu in 2dB steps (accurate to 0.5dB) and the unit set to display levels as dBu, dBV or RMS voltage.

There are two outputs: an unbalanced option on a phono connector at the top of the unit, and a balanced option on a three-pin XLR at the base, which folds very neatly into the body of the unit. The unit is powered by a pair of AA cells giving around 20 hours of continuous life, and the machine can be configured to power down automatically after three, 10, 30, or 60 minutes.

Driving the machine is very intuitive, with the only controls being a Mode button and a pair of cursor keys. There are two control screens, the first of which selects the output signal type, frequency and level, while the second sets the power-down mode, the level display units and the sweep frequency step time. The Mode key is used to cycle around the various functions and the cursor keys adjust their values. Holding the Mode key depressed for about two seconds switches the power on or off.



The XLR output of the Minirator folds out from its bottom edge.

Minilyser

The Minilyser is physically similar to the Minirator, but slightly larger and more complex. The front panel boasts a set of four cursor keys with a central Enter button, and both Escape and Power buttons. Three inputs are provided: analogue audio on a balanced XLR and an unbalanced phono connector, plus an internal microphone (used only for checking the polarity of loudspeakers). There is also a monitor output on a 3.5mm jack, with a built in compressor circuit to ensure near-constant monitoring volume.

Powered by three AA cells, the unit should operate continuously for around 16 hours, though this will depend on the mode in which the LCD screen's backlight is operating. The backlighting can be disabled or can be configured to come on for three, 10 or 60 seconds whenever the power button

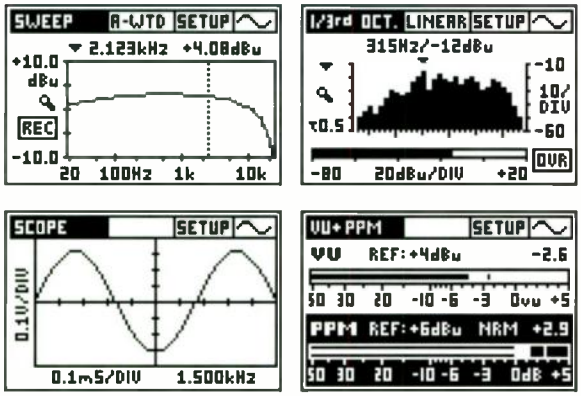
NTI MINSTRUMENTS

pros
- Cost effective.
- Fast, intuitive operation.
- Battery powered.

cons
- No internal speaker on Minilyser.

summary
Cost-effective, portable, fast and simple signal generator and analyser tools. Effective when used together, but also useful as stand-alone units.

SOUND ON SOUND



The Minilyser offers many different analysis tools, including (clockwise from top left) a frequency-response display, a third-octave spectrum analyser, VU and PPM metering, and a self-adjusting oscilloscope readout.

is pressed, and the LCD contrast can be adjusted over a wide range. Automatic power-down facilities, similar to those of the Minirator, are also provided. Four memories allow the user to store useful sets of configuration settings.

The Minilyser offers level measurement, Total Harmonic Distortion (THD) + Noise readings, VU and PPM metering, frequency detection, polarity testing, signal balancing error assessment, sweep frequency response display, third-octave spectrum analysis, and an oscilloscope. Each selected function is portrayed on the large LCD with both numeric and graphical displays. In many of the modes there are several weighting factors available — including A and C weighting; 22Hz, 60Hz and 400Hz high-pass filtering; and a voice band-pass option — as well as fast, slow and impulse time averaging.

Level measurements can be made in dBu, dBV or voltage, the latter either as an absolute figure, or relative to a previously established reference (in terms of dBr, percentage, or scaling factors). The VU and PPM scales can be configured for any appropriate reference and ballistics, while the distortion and noise test can be expressed in decibels or as percentages. The balanced interface 'balance error' can be given as a percentage or as a scaling factor.

The sweep mode can create a standard frequency reponse graph or graphs of level, THD + Noise or frequency against time. In the case of the frequency response mode, the unit is armed and then starts recording and displaying the graph when it detects a 1kHz or 315Hz reference signal. The graphs against time are operated manually, with the user having to input a recording period and the time between each sample. The third-octave analyser display is exactly as you would expect, with options to adjust the averaging time, and the scope display provides a very rough-and-ready approximation of the signal shape. To make life easy, the timebase and amplitude are set automatically. The polarity test, when used with the appropriate MR1 output, provides a simple 'positive' or 'negative' response, when measured either through the XLR or phono input or via the internal microphone.

The MiniSPL option wasn't provided for review, but consists of a calibrated omnidirectional electret microphone which simply plugs into the XLR socket on the Minilyser allowing it to perform a range of acoustic measurements. These include instantaneous, maximum or minimum sound pressure levels, equivalent continuous SPL (used in noise at work assessments), and spectrum analysis of speaker systems.

Conclusion

All in all, these units are excellent. They are extremely easy to use, well-equipped, reasonably accurate, and relatively affordable. The only negative comment I could make is that, although a headphone output is provided, an internal loudspeaker in the Minilyser would have made life easier when a simple aural check was required. Although not intended as laboratory tools for precise equipment alignment, these NTI units will be ideal for many general-purpose applications and will therefore be highly appealing to a lot of musicians who previously considered test equipment beyond their budgets. SOS

information

£ MR1 Minirator, £99.29; carry pouch for MR1, £16.12; ML1 Minilyser, £293.75; carry pouch for ML1, £17.88; MiniSPL, £263.20; carry case for Minstruments system (MR1, ML1 and MiniSPL), £56. Prices include VAT.

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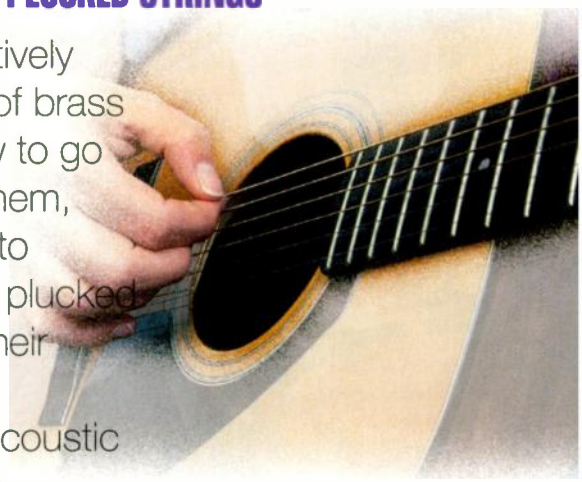
PART 28: SYNTHESIZING PLUCKED STRINGS

Having dealt exhaustively with the mechanics of brass instruments and how to go about synthesizing them, **Gordon Reid** turns to instruments that use plucked strings to generate their sound, taking the complexities of the acoustic guitar as an example...



If you've been following Synth Secrets over the past four months, you'll have studied the physics of brass instruments, and seen how analogue synthesizers can recreate the essence of brass sounds. You're no doubt wondering whether other instruments can be analysed in the same way. The answer is yes, although if you thought brass instruments were complex sound-producing entities, you may be in for a shock this month, as I turn my attention to the principles of plucked strings and resonant bodies, and consider how these principles might help us to synthesize the sound of the acoustic guitar.

Part 1: The String Itself

I'll start, as I did in part one of Synth Secrets, by considering the vibration of a stretched string. By now, you're all familiar with the fact that such a string is capable of vibrating at all the frequencies that comprise the harmonic series, so you may be tempted to assume that this is always the case. It isn't.

Consider Figure 1 (see right). Imagine that the dashed black line in the diagram is a guitar string stretched between the nut and the bridge. You now use your fingertip or a plectrum to stretch the string a short way from its rest position, pulling it at its exact centre so that it becomes the red line in the diagram. In scientific terms, you have displaced the string at every point along its length, although at this instant it has zero velocity. Then you release it.

Each point on the string now starts moving towards the dashed line. Once the string reaches this point, its tension stops accelerating it, and begins to decelerate it as it stretches in the other direction. At some point soon after, the string comes to rest in the position shown in Figure 2 (above right), and at that moment the forces begin to pull it back towards its starting position.

It's tempting to think that a string vibrating in this fashion maintains its triangular shape throughout the cycle, but this is not so. Figures 3(a) and 3(b) (see right), show how two waves — one travelling left to right, the other right to left — combine to produce the wave motion of the string. As you can see, the string loses its triangular shape, and becomes a rapidly flattening trapezoid. It passes through the rest position as a straight line, becomes a trapezoid of opposite polarity, and then re-assumes its triangular shape at the opposite extreme before the forces pull it back again.

But what is the harmonic content of the

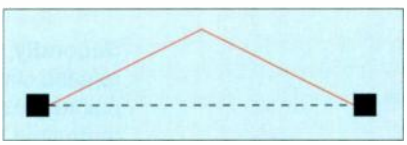


Figure 1: A guitar string plucked at its centre point.

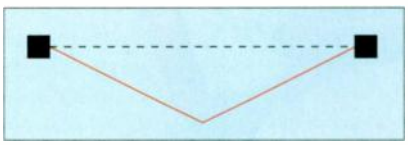


Figure 2: The plucked string a fraction of a second after release.

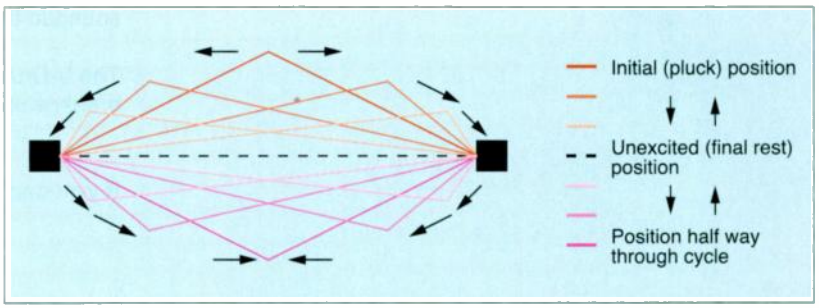


Figure 3(a): How two pulses moving in opposite directions produce the wave motion of the plucked string.

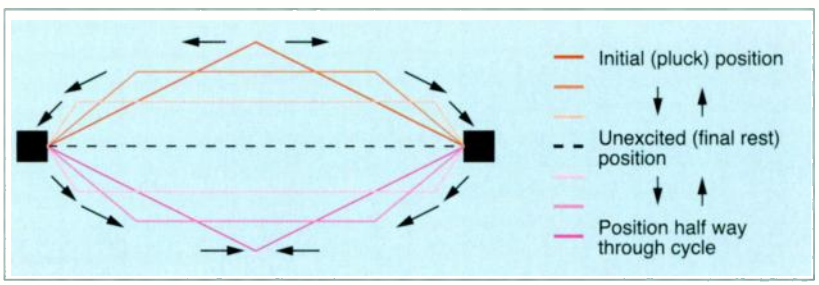


Figure 3(b): How the shape of the plucked string changes over time.

waveform produced by this motion? It's not trivial to perform a harmonic analysis to determine this, but don't worry; I'm not going to do the maths here. However, it's easy to visualise the result, because the starting point is a shape you know well — it's a triangle. This makes things simpler, as you will see.

Imagine that you have at your fingertips an additive synthesizer capable of producing numerous sine waves at the pitches and amplitudes of your choice. Let's suppose that you program it so that your oscillator produces a sine wave of frequency F, amplitude A, and starting phase 0°. Now add a second oscillator, with frequency 3F, amplitude A/9, and a starting phase of 180°. Now add a third, with frequency 5F, amplitude A/25, and phase 360° (which is the same as 0°)... and so on.

You will notice that each oscillator is producing the next *odd* harmonic in the series (or nA, if you like, where 'n' is any odd-number integer from 1 upwards), with an amplitude of $(1/n)^2$ and an initial phase shifted by 180° compared with the previous. Using a simple program such as Microsoft *Excel*, it's straightforward to show that the result of adding these oscillators' outputs is... a triangle wave (see Figure 4, above right).

Now, if the odd harmonics shown in Figure 4 conspire to create the triangle waveform shown, you might conclude that the component frequencies produced by a string plucked at its mid-point are also those of a triangle wave. Again, the proof of this is not trivial, but it makes an intuitive kind of sense. After all, if there were any *even* harmonics in the signal, there would have to be zero displacement at the centre of the string. You can see this in part 1 of Synth Secrets in *SOS* May 1999 (www.sound-on-sound.com/sos/may99/articles/synthsec.htm), where it is clear from the diagrams that all even harmonics on a vibrating string fixed at both ends have a 'node', or zero-displacement point, at the middle. The presence of such a node in the example in Figure 1 this month, however, is clearly impossible; the centre cannot be at zero, as it's the point at which the string is being plucked (see Figure 5, right).

So there it is... a guitar string — which is capable of vibrating at all the frequencies of its harmonic series — does not necessarily do so all of the time. When plucked at its centre, the string initially produces a triangle wave, and this has only *odd* harmonics.

Now let's return to this idea of nodes. If every second harmonic is missing when you pluck a string at its centre, it follows that:

- If you pluck the string a third of the way between its anchor points, every third harmonic will be missing;

- If you pluck the string a quarter of the way between its anchor points, every fourth harmonic will be missing...

...and so on. Again, this is because you can't have a node at the point at which the string is plucked.

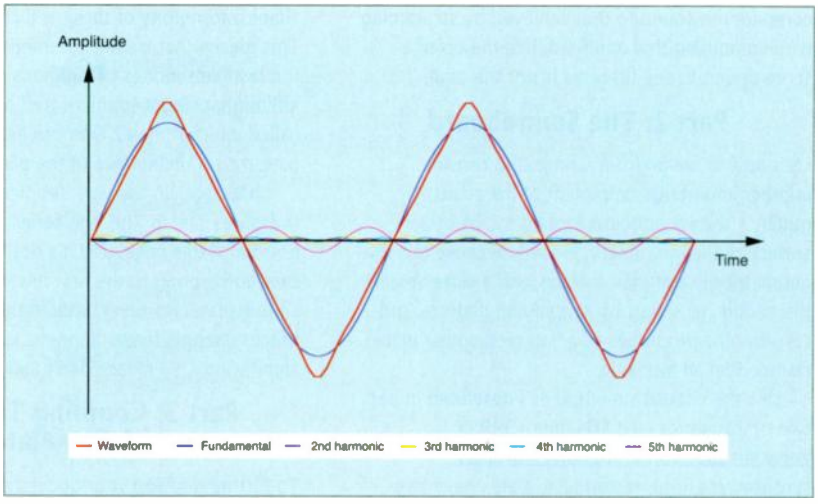


Figure 4: The harmonic structure of a triangle wave.

If you have access to a guitar, you can demonstrate this by moving your picking position up and down a string while holding the same fret. The result is the distinctive flanging sound produced by moving the 'holes' in the harmonic spectrum up and down the frequency spectrum. The generating mechanism may be different, but you're creating the same effect as a swept comb filter.

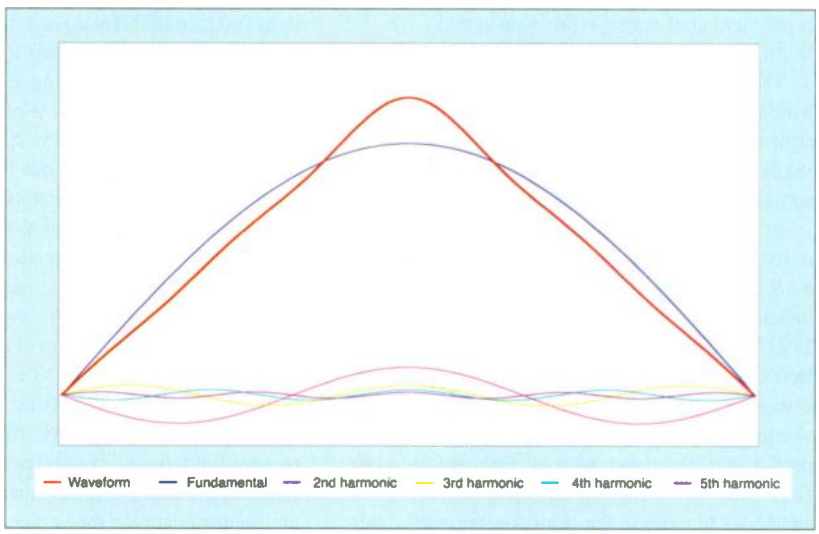


Figure 5: The displacement components of a string plucked at its centre.

So here's the first significant problem you encounter when trying to create a convincing guitar patch: although you might think of the guitar string as a simple oscillator, the plucking position determines its initial waveform and, therefore, its initial harmonic spectrum.

However, there are plenty of other complicating factors. Everything I've discussed so far has assumed a perfect triangular starting point for the string's vibrations. This never happens, because neither your fingertips nor a plectrum are infinitely small and hard. Consequently, the string will start vibrating with a rounded profile at the plucking point. This acts as a low-pass filter, suppressing the higher harmonics. Although you might think that this has an unimportant, or at best marginal effect, you only have to strum an acoustic guitar with something wide and soft (like your thumb) and then ▶

compare the sound to that achieved by strumming with something thin and hard, like the tip of a screwdriver, to see that this is not the case.

Part 2: The Soundboard

Let's now move on from strings and consider another important component of the acoustic guitar... the soundboard formed by the upper surface of the instrument. Indeed, because this is a geometrically complex surface with a large hole in the middle, let's start by simplifying matters, and consider the properties of a flat, rectangular plate clamped on all four sides.

Like the circular membranes I described in part two of this series (see *SOS* June 1999 or www.sospubs.co.uk/sos/jun99/articles/synthsecrets.htm), rectangular plates have two dimensions. This means that they can vibrate in an East/West direction and in a North/South direction (actually, rectangular plates can also vibrate in a circular fashion, but I'm not going to consider this here for reasons of space). This means that I can't talk about single modes of vibration where plates are concerned (n = 1, 2, 3, 4... and so on) but must consider instead (m,n) modes of vibration where, for the sake of argument, 'm' is the number of nodes in the plate in the East/West direction, and 'n' is the number of nodes in the plate in the North/South direction.

This leads to the representations for the first handful of plate modes which you can see on the right of this page in Figures 6(a) to 6(f), where a shaded area is at any given moment 'up' and a white area is 'down' — or the other way around.

At this point, it's tempting to think that the plate is acting like a two-dimensional string and, to some extent, that's correct. The vibrations in the two dimensions are 'orthogonal' which means that the East/West waves are independent of the North/South waves, and the two do not interact. It is then tempting to think that the plate is producing two independent harmonic series of the sort produced by the string. After all, Figures 6(a) to 6(f) show that the vibrations in each direction are analogous to those in the string. Unfortunately, this is where the intuitive approach falls apart, and you need an understanding of wave mechanics to determine the vibration frequencies in each of the m,n modes.

If you do the maths, you find that the frequency produced by each mode depends upon size of the plate and the relative dimensions of its edges. For example, if the frequency of the 1,1 (fundamental) mode of vibration of the plate in Figure 6 were 100Hz, the 2,1 and 1,2 modes would have frequencies of approximately 277Hz and 171Hz. These do not fit any harmonic series, which is why a rectangular plate goes 'boing', rather than producing a note that sounds musical to our ears.

Now, let's return to the acoustic guitar. This has a top surface that is more complex than a rectangular plate, so its modes of vibration are more complex. Furthermore, the surface is supported by an intricate pattern of braces, and the shape and rigidity of these will complicate matters. This means that it's almost impossible to calculate the resonant modes of a guitar's top plate, although, using a sophisticated optical technique called interferometry, you can see them form dense patterns on the surface of the plate.

I have shown the very simplest of these modes in Figures 7(a) to 7(d), the series of diagrams at the bottom of this page, and it's not hard to see how they correspond to the first few vibrations of the simple plate. However, should the pattern of the braces change, these diagrams will be modified significantly, so please don't take them too literally.

Part 3: Coupling The String & The Plate

To further develop your understanding of the sound of the guitar, you now have to consider what happens when you join the string to the top plate. Considered at its simplest level, this is what's called 'a system of couple vibrators', each with its own preferred modes of vibration. Of course, these are not free to oscillate in isolation (hence the word 'coupled') and each affects the other in complex ways. What's more, this coupling is not perfect, because the vibrations of the string are transmitted through a bridge that also responds to different frequencies in different ways. Ignoring the details of these interactions, it's possible to discuss the consequences of this coupling in qualitative terms.

Once you've completed the plucking motion, the plate absorbs energy from the string, thus sucking energy out of some of its modes of vibration. The plate then begins to vibrate at its own preferred frequencies. The vibrating plate then passes some energy back, exciting new modes in the string itself — including modes that were not present in the original vibration. This means that, within a cycle or two, the triangular waveform of the string changes to a new shape. But this isn't the end of the matter, because the modified vibrations in the string now excite the plate in a new way. The plate then responds differently, exciting new modes, and affecting the string in yet another way... and so on, until all the energy in the system radiates away as sound waves.

If this seems too convoluted to analyse, it isn't. However, it is hellishly complex. In synthesis terms, you have an *oscillator* (the string) whose output passes through a *resonator* (the plate), the response of which affects the harmonic content of the oscillator itself. In principle, there's no reason why

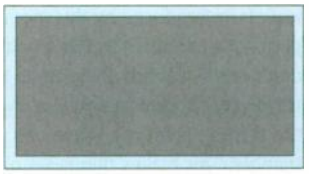


Figure 6(a): A rectangular plate vibrating in 0,0 mode (the fundamental).

Figure 6(b): The plate vibrating in 1,0 mode.

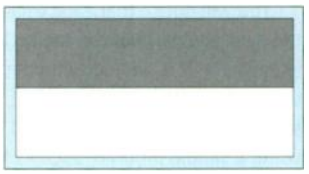


Figure 6(c): The plate vibrating in 0,1 mode.

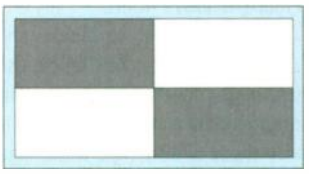


Figure 6(d): The plate vibrating in 1,1 mode.

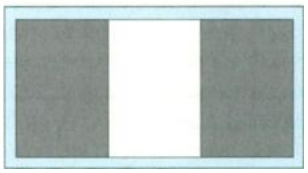


Figure 6(e): The plate vibrating in 2,0 mode.

Figure 6(f): The plate vibrating in 2,1 mode.

Figure 7(a): The 0,0 mode of a guitar plate.

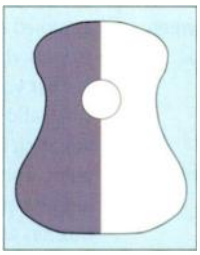


Figure 7(b): The plate's 1,0 mode.

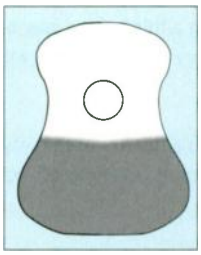


Figure 7(c): The plate's 0,1 mode.

Figure 7(d): The plate's 1,1 mode.

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▶ you shouldn't build a synth that does the same. But in practice... well, that's another matter.

Part 4: The Hollow Body

Now you have to consider what happens when you add the sides and base of the guitar to the top plate, thus producing an air cavity within a hollow body.

You should recall from part 22 of Synth Secrets (see *SOS* February 2001 or www.sound-on-sound.com/sos/feb01/articles/synthsecrets.htm) that a hollow body will resonate at certain frequencies determined by its size and the shape of the cavity. However, the guitar is not as simple as the idealised room. This is because its body is not a perfect, rigid enclosure, and its vibrations are being 'driven' by the vibrations of the string and the top plate.

If, to simplify matters, I first treat the sides and back of the guitar as perfect, rigid enclosures, theory predicts that the air within the guitar body will have a 'comb' response at low frequencies. This is not unreasonable; at some frequencies, the air will flow out of the sound-hole in phase with the inward movement of the top plate, whereas at others, the two will be out of phase. This behaviour is analogous to that of a bass reflex loudspeaker.

However, guitars do not have perfect, immobile sides and backs, so a full analysis of the sound requires that I consider the vibration in each of these, too. The result of this shows that the back of the guitar introduces yet more resonances, as shown in Figure 8 (above right).

At this point, you might think that the guitar is complex enough, but I haven't even neared the end of my analysis. Consider this: when you pluck a string in a direction that is *perpendicular* to the surface of the top plate, the forces transmitted through the bridge are trying to bend the body along its length. However, when you pluck the same string in a direction *parallel* to the top plate, the string is trying to distort the body from side to side as well as bend it. If you look back to Figures 7(a) to 7(d), it should be obvious that the modes in Figures (a) and (c) are most likely to be excited by a perpendicular plucking action, whereas those in (b) and (d) will require some sideways component.

But what are the chances that you pluck a string in these precise directions? Virtually non-existent — so you have up-down and side-to-side components in every note, each exciting different body resonances in different proportions.

Part 5: Amplitude Response

Everything I've discussed so far has described the mechanisms by which the guitar string generates the initial sound of the acoustic guitar, and the ways in which the body modifies the harmonic content of the waveforms thus produced. Until now, I've omitted any consideration of how the amplitude of the sound changes over time.

Perhaps surprisingly, it is possible to reduce the amplitude response of the acoustic guitar to a couple of simple generalisations, as follows: if you pluck a string parallel to the top plate, the amplitude of the resulting sound decays relatively slowly. If you pluck the same string perpendicular to the plate, the initial level is greater, but the sound decays more quickly. These can be depicted in simplified form as the amplitude envelopes shown in Figures 9(a) and 9(b).

Of course, you will rarely — if ever — pluck the string in exactly these fashions, so the true amplitude response will look more like that shown in Figure 10 (shown right). For any given initial displacement and plucking position, the height of the initial peak and the length of the final decay will then depend upon the angle at which you pluck.

Part 6: Other Factors

I wish I could say that this is all there is to the sound of an acoustic guitar, but I can't. Many other factors influence what you hear. For example, I haven't mentioned the sympathetic string resonances that occur when more than one string is free to vibrate at any given moment. The importance of this is something you can demonstrate for yourself. Find an acoustic guitar and damp five of the strings. Then pluck the free one, listening to the tone of the resulting note. Now release the five damped strings, and play the same note on the sixth. It's different, isn't it? The reason for this is simple: after a few cycles, each of the undamped strings will be oscillating at the modal frequencies it shares with the plucked string. This is because the vibration of the plucked string passes through the nut and the bridge to the other five, exciting vibrations in each of these.

However, you now have nine vibrating resonators (six strings, the top plate, the bottom plate and the air in the cavity) rather than four, so the body resonances are excited in different ways, with different amplitudes. Thinking of this in terms of synthesis, you could say that the introduction of the second oscillator changes the interaction of the first oscillator and the resonator. The introduction of the third changes the interactions of the first and the second and the resonator... and so on. Ouch!

Another problem lies in the fact that the strings are not perfect harmonic oscillators. This is because they do not form perfect angles at the nut or the bridge. The finite cross-section of the string ensures that it curves at these points, thus making

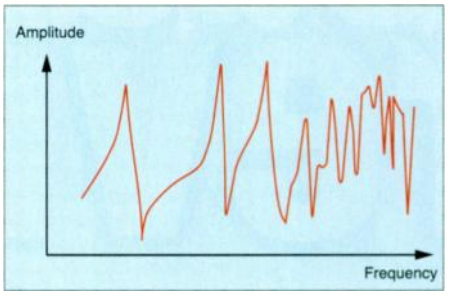

Figure 8: A representation of the low- and mid-frequency response of an acoustic guitar body.

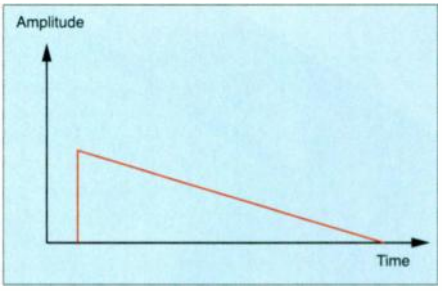

Figure 9(a): The amplitude envelope of a string plucked parallel to the guitar's top plate.

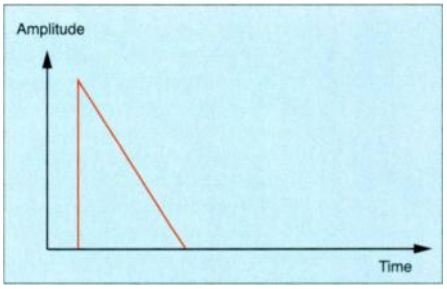

Figure 9(b): The amplitude envelope of a string plucked perpendicular to the top plate.

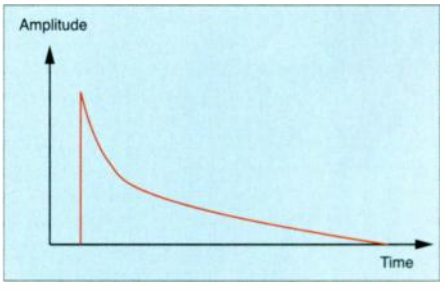

Figure 10: A realistic decay curve for a plucked guitar note.

its active length slightly shorter than the idealised view would suggest. The degree to which this happens depends upon the wavelength and amplitude of the vibration, so the string appears shorter at high frequencies and high amplitudes than it does at low frequencies and low amplitudes. This sharpens higher, louder harmonics, further complicating any analysis of the string's harmonic spectrum, as well as the guitar body's response to it.

Finally, you have to consider the radiated sound pattern of the acoustic guitar. Like all acoustic instruments, the frequency response and the harmonic content of notes differ from one listening position to another. Experiments show that the loudness of some frequencies can differ by as much as 20dB if you shift your listening position. Likewise, if guitarists shift their seating position, or the angle of their guitar, the same dramatic change can occur.

Part 7: Synthesizing The Acoustic Guitar?

At this point, you can start to consider how to patch an analogue synthesizer in order to produce an acoustic guitar sound. But if you don't know where to start, don't worry; neither does anybody else. Let's look at the problems:

- Each string produces a different waveform depending upon the plucking position;
- The shape and hardness of your fingers or the plectrum influences the high-frequency content of the initial waveform;
- The amplitude envelope of the oscillators depends upon the direction in which you pluck the string(s);
- The strings' harmonics are 'stretched' as the pitch increases and/or the excitation increases in amplitude;
- The six strings interact with each other in different ways, depending upon their pitches and the number of them which are free to vibrate at any given time;
- Each string interacts with a system of complex resonators (the guitar body) that absorbs energy and then directs it back to all the strings, exciting harmonics that may not be present in the initial waveform;
- The body has many densely packed resonances and anti-resonances that can not be imitated using conventional equalisers or filters;
- The nature of the resultant sound is extremely dependent on the position of the listener and the angle between the listener and the instrument.

There are other factors, but these eight give you a good idea why you can not create authentic-sounding acoustic guitar patches using analogue subtractive synthesis. This is one occasion when only digital technology will do! SOS

APHEX MODEL 1788 REMOTE-CONTROLLED MIC PREAMP

Aphex have provided an elegant way to avoid the detrimental effects of long cable runs on delicate mic signals. **Hugh Robjohns** evaluates the Model 1788.

from a distance

A couple of hundred feet of cable can make a big difference to the quality of a microphone's output signal — high-frequency losses, poor transient response and increased input noise being the main side effects. Therefore, it makes sense in any situation where there is a large physical distance between mic and mixer to place preamps as close as possible to the mic, allowing the signals to be sent to the mixer at line level. However, to do this successfully, you need also to be able to control these preamps remotely.

The Aphex 1788 is designed precisely for such applications, and offers XLR inputs for eight channels of mic preamplification. Two sets of analogue line-level outputs are available simultaneously, one set on eight XLRs and one set on a 25-pin D-Sub connector. A digital output option can be fitted, and this further bolsters the output count with no fewer than three sets of simultaneously active digital outputs — AES-EBU and TDIF via 25-pin D-Sub connectors, as well as ADAT optical.

The front panel is roughly divided in two, with the left half being given over to status LEDs and metering for each of the channels, under which are Channel Select buttons. All indicators and meters can be viewed over the remote control interface. Selecting one or more channels allows parameters to be modified with the illuminated buttons and rotary encoder to their right. These buttons cater for Mute, +48V Phantom, 26dB Pad, 75Hz Low Cut, Polarity Reverse and Enable Limiter, and a further button allows the encoder wheel to alter either the input gain (from +26 to +65dB), or the maximum peak levels of the main and auxiliary analogue outputs (between 0 and +24dBu). The 1788's peak limiting system is of the same innovative design found on other Aphex mic preamps, providing over 20dB of overload protection, and allowing near-ideal use of available bit resolution if converting to digital.

All of these functions may be controlled remotely, over MIDI, RS232 or RS422 interfaces, although the protocol in all three cases uses a MIDI instruction set. Any equipment capable of generating MIDI data can therefore be used as a remote controller for the 1788, though Aphex manufacture a dedicated 1788R controller panel similar in looks to the Model 1788, as well as a bespoke PC software control utility. A further RS422 output allows up to 16 units to be daisy-chained from a single controller. In addition to the remote control facilities, the 1788 can also store snapshots of its settings internally, usefully extending the facilities of many budget digital desks which don't have the ability to recall analogue input gain settings.

The remaining front-panel controls cater for the eight-channel 24-bit digital output option. The conversion can be clocked internally at 44.1kHz or 48kHz, or from an external AES-EBU or word clock input. An AES-EBU clock output is on a further XLR.

After the digital control section is a headphone socket with level control and channel selector, and an internal test tone generator which may be allocated to any channel output and set to either 0dBFS (peak level) or -20dBFS (nominal signal level).

Verdict

The preamps exhibited a nice clean sound, as you'd expect from the wide, smooth frequency response and low noise floor. Distortion and crosstalk figures were also excellent. The A-D converters were of good quality, and the limiter system was difficult to catch out in normal use. As for the control options, I was supplied with both the PC program and the 1788R panel, and they both worked reliably, with little impression of processing delay.

The Aphex Model 1788 provides a lot for the money, and beyond its obvious live uses, it would also be be useful in large recording installations, such as those recording orchestral music. In addition, the onboard snapshot facilities could be very useful in studios based around digital consoles, especially where a very fast turnaround for projects is required. SOS

APHEX MODEL 1788
£4400

pros
- High-quality mic preamps.
- Innovative and effective input limiters.
- Flexible analogue and digital outputs.
- Multiple remote control interfaces.

cons
- Relatively expensive

summary
This is a great-sounding and flexible option for anyone who's after remote preamplification, though at a price.

SOUND ON SOUND

information

£ Model 1788, £4400; 1788R remote panel, £1449; 1788-1 digital output option, £949. Prices include VAT.
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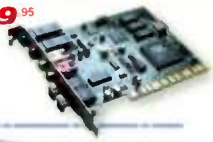

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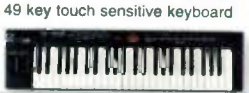

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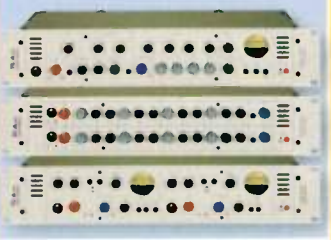

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IZ TECHNOLOGY RADAR 24

wizard of iz

The new third-generation RADAR hard disk recorder is the most affordable version yet, and offers 24-bit recording over 24 tracks at sampling rates of up to 192kHz. **Hugh Robjohns** puts it through its paces.

IZ TECHNOLOGY RADAR 24 MULTITRACK RECORDER

When digital audio recording was still in its spotty adolescence, the only viable 24-track recorders were open-reel digital tape machines such as the Sony PCM3324. Until Otari's Random Access Digital Audio Recorder (RADAR) arrived, that is. At a time when even eight tracks replayed off a single drive was a very big deal, the RADAR became the first dedicated digital 24-track to employ hard drives, and was hailed as one of the best-sounding machines of the time. While computer-based hard disk audio recorders were already well established, none had a significant market in music recording studios, being generally geared up for post-production and mastering applications.

The RADAR quickly established a reputation for excellence, and a good many top studios and musicians invested in the format, even though it cost in the region of £20,000 at the time. Many of these customers were doubtless won over by the familiar tape machine-style ergonomics and the compact physical size. However, the audio editing capabilities which were provided were also a big point in the machine's favour — powerful enough to allow the typical moving and copying operations normally required in the studio, but simple enough to present no serious learning curve.

Today, the sector of the market originally dominated by the RADAR is a very competitive one, with the likes of Tascam's MX2424 and Mackie's HDR24/96 fighting tooth and claw at the lower end of the price scale, while the Euphonix R1 redefines the high ground. Therefore, the RADAR's newest incarnation, the iZ Technology RADAR 24, has been priced ruthlessly in order to retain its market-leading position.

RADAR 24

The RADAR 24 is contained in a 4U rackmounting case, which houses a PC hardware platform running a BeOS operating system with proprietary analogue and digital I/O facilities. The machine is fan cooled and, given the fans and hard drives, is far too noisy to be used in the same room as the recording microphones. Personally, I found it too noisy to be a happy companion in the monitoring room either, and would suggest it is best located in a soundproofed machine room. However, I suspect many users will tolerate the noise, as it is not substantially worse than many equivalent desktop PC or Mac computers.

The front panel of the machine carries a mains power switch, a floppy disk drive (principally for software updates), and two 5.25-inch drive bays configured, by default, with one 9Gb hard drive and a double-speed 9.2Gb DVD-RAM backup drive. The rear panel is festooned with connectors including six 25-way D-Sub connectors for the optional analogue I/O, three more for the standard TDIF digital I/O and another for a parallel port interface. A number of smaller D-sub connectors are incorporated on PC-style interchangeable back plates and these interface with the remote control and RADAR Link (see below) facilities, as well as providing a standard SVGA monitor output port and SCSI connector (complete with active terminator). The RADAR Link facility is a bespoke protocol allowing multiple machines to be operated as if they were a single unit. Other options which may be installed here include Sony nine-pin remote control interfaces and USB ports.

The chassis carries dedicated XLR connectors for SMPTE input and output, a trio of MIDI sockets for MIDI timecode and machine control, XLR and phono sockets for AES3 and S/PDIF I/O, plus BNC connectors for video and word clock sync (though the word clock options were blanked off on the review machine). A standard PC keyboard socket can ▶

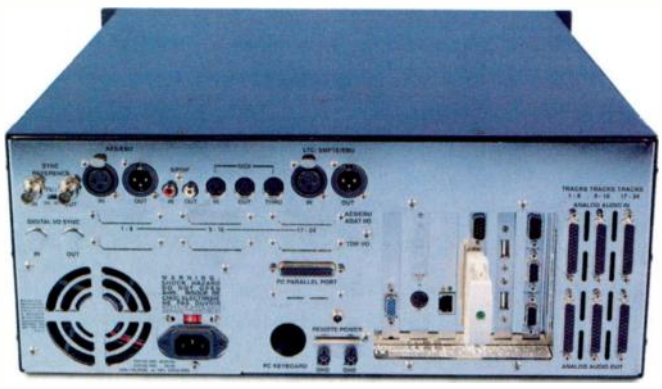
IZ TECHNOLOGY RADAR 24 £4694

pros
- The fast and familiar operation of a mature design.
- Can be used with or without an SVGA monitor.
- Basic but effective editing facilities.
- Custom I/O configurations.
- Excellent analogue converters.
- Attractive Price.

cons
- Noisy drives.
- Slightly unnatural wheel action during audio scrubbing.
- Lacking the flexibility of a conventional DAW.

summary
A thoroughly professional machine designed to do a professional job. Dedicated controllers and hardware ensure total reliability. The radical repricing makes it much more affordable than ever before. If you want a purpose-designed digital multitrack recorder, this is the one to covet!

SOUND ON SOUND



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24 bit
192 kHz
24 track
RADAR 24
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The Session remote controller with 24-channel meterbridge attached.

be provided alongside the DC outlet which powers the remote panel. Mains inlet is via an IEC socket, and a pair of binding posts link the chassis and analogue signal grounds.

The standard 9Gb removable hard drive affords around 45 minutes of continuous 24-track recording at 24-bit/48kHz. Of course, larger and/or additional drives can also be employed — for example, 18Gb Barracuda, 9 and 18Gb Cheetah, and 36Gb Ultrastar drives are all 'iZ-Corp approved'. The standard backup medium is now DVD-RAM, although Eliant 820S or Mammoth tape drives may also be installed for compatibility with the previous generations of RADAR.

If the TDIF I/O connections are not appropriate, 24 channels of AES3 or ADAT optical interfacing can be fitted instead. There is also a choice of three types of analogue converters: the Classic board is the same as that employed by the RADAR II (which has enjoyed widespread acclaim for its sound quality) and offers a maximum 48kHz sampling rate at 24-bit resolution. The Nyquist board is available in two flavours, providing either 24-bit/96kHz or 24-bit/192kHz as maximum sampling rates (the latter known as the S-Nyquist board), and both claim slightly improved specs over the Classic board. With the S-Nyquist board, the RADAR 24 is the first hard disk multitrack to offer a 192kHz sampling frequency.

Although the converters are all capable of 24-bit recording, the RADAR 24 allows recording at 16-bit, if required, and all the standard sampling and timecode rates are supported. The machine is even capable of varispeed, although this is only really of any use when connecting via the analogue interfaces — unless you happen to have a digital console with sample rate converters on every input. In 44.1kHz mode the varispeed range is roughly +12 to -38 percent, whereas in 48kHz mode it spans +3 and -44 percent.

The standard SVGA monitor output provides a useful multichannel waveform display, zoomable in both time and amplitude, and offers a great deal of other useful information including current and locator times, various configuration settings, track

The RADAR Family Tree

The original RADAR was developed by a Canadian company called Creation and launched in 1994 as the world's first 24-track digital audio hard disk recorder. This pioneering machine — as well as its second generation version, the RADAR II — was distributed and badged by the Otari Corporation for over six years. During this time, Creation grew to be a $100 million entity in the custom electronics manufacturing market and, in early 2000, Creation's board of directors decided that the interests of the custom electronics business and the audio business would best be served by them becoming separate companies. The audio division was subsequently acquired by Barry Henderson (founder of Creation) and the employee group that had originally developed RADAR, and the iZ Technology Corporation was born.

Otari's distribution license for new RADAR machines expired last year, though Otari are continuing to market both the RADAR and RADAR II and to support customers of these original machines with software updates and so forth. As a result iZ Technology have chosen to market the new third-generation RADAR incarnations themselves, and it is partly for this reason that they are able to offer the machine now at a much lower price.

RADAR Hall Of Fame

There are literally thousands of RADARs in use in recording studios world-wide, and IZ Technology claim that more hit songs have been recorded on RADAR than on any other 24-track hard disk recorder. Of course, until fairly recently you could count the competing products on the digits of a three-toed sloth... without it losing hold of the tree! Nevertheless, many international artists have produced hits with the RADAR, including Celine Dion, Stevie Wonder, Backstreet Boys, Sarah McLachlan, Eric Clapton, Elton John, Luciano Pavarotti, Paul McCartney, Santana, Barbara Streisand, Garth Brooks, Shania Twain and countless others. The IZ Technology dedicated RADAR web site, www.recordingtheworld.com, contains a full list of users which makes for impressive reading.

names and even repeated bar-graph metering. There is apparently an Enhanced Open Graphics option in the pipeline, though this was not yet available for this review — it will be designed to extend the quality and speed of the monitor feed with an updated processor, more memory and an AGP graphics card. However, as all functions are available without a monitor, there's also nothing stopping you from using the RADAR 24 on its own.

Remote Control

Although a fairly standard keyboard is provided with the RADAR 24 base model, the majority of users will probably opt for the dedicated remote control. This is a familiar-looking machine controller with three main groups of buttons performing specific operational functions, 48 track arming buttons, and a small two-line LCD display. Separate numeric keys, QWERTY keyboard, transport buttons, and a jog/shuttle wheel complete the facilities. One of two meter bridges can be fixed to the rear of the controller, offering 24 or 48 channels.

For the record, iZ Technology are apparently also in the process of making a 48-track RADAR 48, which will be conceptually very similar to its smaller sibling. Its increased capacity will require a double-height rack frame to house its pair of hard drives and the doubled-up digital and analogue I/O facilities. However, the entire machine operation, remote controllers, meterbridge and video monitor facilities are to be identical.

Apart from the basic transport operations, the RADAR is a menu-driven machine with all of the customisable functions and lesser-used operations being accessed in a number of hierarchical menus displayed on the LCD panel of the controller. This is not as cumbersome as it sounds, however, as most of the commonly used menu options are also accessible directly from dedicated keys on the remote controller. The five main menus are accessed, logically enough, by pressing the Menu/Prev button followed by the cursor buttons to find the appropriate page: System, Project, Edit, Preferences, Diagnostic, and Shutdown. I think these are all fairly self-explanatory, and the facilities found in each sub-menu are totally predictable — I certainly found navigation largely intuitive. The Enter button is used to access the sub-pages of a particular menu section and the cursor keys or the jog/shuttle wheel select parameters and alter their values. To exit a submenu, the Menu/Prev key is pressed once again.

Setting Up

Rigging the RADAR is straightforward, simply requiring the

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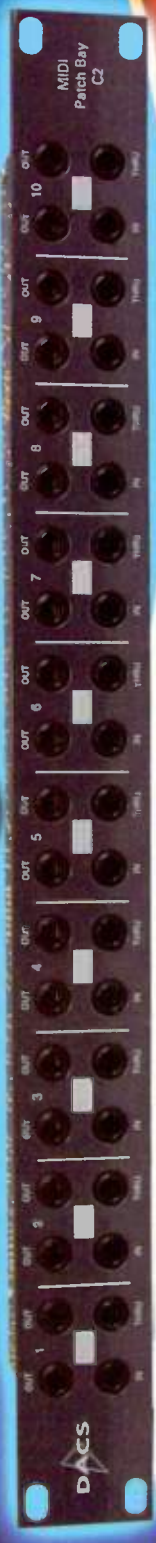

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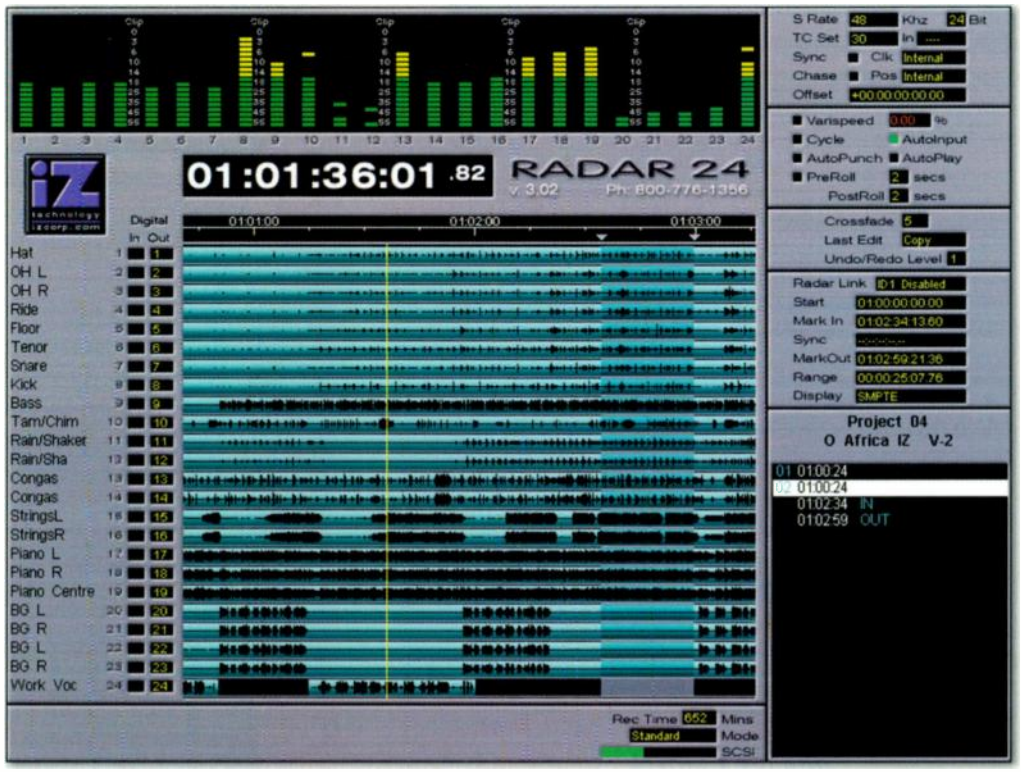
remote control to be hooked up to the main frame (a D-Sub connector and the coaxial power plug), and the meter bridge to be linked to the Controller (more D-Subs). With mains plugged in, the machine is ready to go — although hooking up an SVGA monitor helps to boost confidence that all is well. The machine powers up fairly rapidly, seeking and mounting all connected audio drives automatically.

As with many hard disk recorders, there is a prescribed shutting-down procedure. Here it involves a lot of button pushing to get to the appropriate menu command, but at least it ensures everything is properly saved and that the temporary working files are removed appropriately to avoid fragmenting the disks.



The RADAR 24's clean visual interface is available by simply plugging in an SVGA monitor.

For anyone interested in using the RADAR in conjunction with an analogue desk (and plenty of engineers do just that) the analogue reference level is user-adjustable between +18 and +24dBu, providing headroom above a nominal +4dBu operating level of between 14 and 20dB respectively. On the other hand, if you're working with a digital desk, then you'll have to set up the required menu options for whichever digital interface you're using. This is perhaps the least intuitive element of the RADAR 24's otherwise logical operating system. I managed to turn out an excellent rendition of that well-known hit album, *The World's Best Aliasing Noises... Ever!*, before a quick rummage in the manual got me back on the straight and narrow...

With audio plugged and the machine configured correctly, the process of recording is entirely obvious and completely familiar — so much so that anyone used to working with tape-based multitrack recorders would very quickly feel completely at home with the RADAR. All the normal functions work exactly as expected: transport controls, auto-location, looping, manual or automated drop-ins, and track monitoring. The Record button can be conveniently configured either to engage recording when pressed on its own, or only to do so when pressed with the Play button. Furthermore, the machine can be record armed by pressing the Play and Record buttons, with individual tracks then being dropped in and out with their track arming buttons — all pretty standard stuff.

The remote control's wheel has two operating modes, Jog and Shuttle, which are selected from a neighbouring button. The Jog mode provides an excellent audio scrub facility, enabling precise edit points to be found by ear with the greatest of ease. In fact, I often found myself using this more traditional technique in preference to using the waveform display on the monitor. The only criticism I would raise is that having located an edit point, winding on a few seconds and back again, by way of confirmation, always brought the wheel to a different position. Scrubbing open-reel tapes against the head never suffered from that sort of ambiguity and I think a software update should be implemented to cure this failing in an otherwise exemplary transport. The Shuttle mode permits rapid or slow-motion audio searches.

Locate points can be loaded and edited manually by entering timecode values from the numeric keypad, or they can be loaded on the fly by hitting the Mark Loc button during playback. Additionally, there are two dedicated locate memories for loops and automatic drop-ins, labelled Mark In and Mark Out. Recalling a locate memory causes the playback point to jump instantly to that point, and if the Auto Play button is engaged, it will also enter playback. Pre-roll and post-roll times around automatic drop-in points can also be programmed.

Driving the RADAR 24 was child's play, and I found I was very quickly able to concentrate on the creativity of recording rather than the mechanics of it. The machine is immediate and consistent in its response to commands, encouraging total confidence. Anyone used to handling analogue or digital multitracks from a remote controller will assimilate the RADAR's operation in very short order.

Editing Facilities

While editing two-inch multitrack tape was certainly possible, and many great records have been compiled this way, I think most engineers preferred to edit the mix-downs or transfer material to Pro Tools or other similar systems for any serious audio juggling. However, the RADAR 24 incorporates a

"The process of recording is entirely obvious and completely familiar — so much so that anyone used to working with tape-based multitrack recorders would very quickly feel completely at home with the RADAR..."

lip service for MX-2424

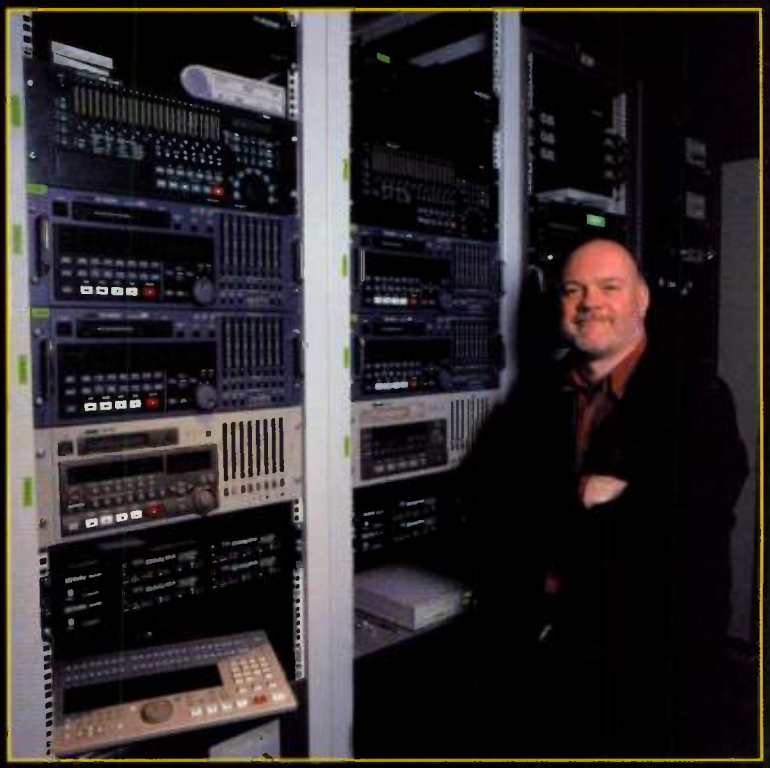
LIPSYNC

New central London post facility Lip Sync Post, has equipped with four new Tascam DA-98HR high performance DTRS recorders and two MX-2424 24-track hard disk recorders – all fully 24-bit.

The new facility offers four comprehensively equipped studios, including two Dolby-approved film rooms with large-format digital film consoles; the 24-track MX-2424 hard-disk recorders were chosen to provide stem layoff facilities for these.

Head of Sound, Steve Haynes: "I used digital tape machines for stem layoffs for some time and although they work well, they are slow to chase when jumping to various locate points. The MX-2424 offers us a more convenient way of laying off the stems.

"The great thing with the MX-2424 is that it still looks and feels very much like a tape machine but offers all the benefits of a non-linear system. The whole mixing process is now non-linear, right up until the final mixdown, which goes to the TASCAM DTRS machines."



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comprehensive set of editing functions which allow much more creativity than would be expected of analogue tape. The facilities, including cut, copy, paste, move, erase, slide, loop and reverse paste functions, can be applied on a per-track basis if required. All edits and drop-ins are performed with a programmable crossfade to avoid clicks — 5mS by default, but adjustable between 0 and 100mS.

Although editing can be controlled very easily from the remote control and its LCD menus alone, especially given the superb audio scrubbing, the VGA screen does make life easier and minimises the potential for error. Being able to zoom into single tracks, and to expand the time resolution, is a great aid to accurate editing. Copying sections of a multitrack — whether a complete chorus, or just a particularly inspiring bass line (*à la* Paul Simon) — is a very powerful tool which permits useful experimentation in the sequencing and structure of recordings, especially as the RADAR 24 can undo the most recent edit if you're not happy with it. Most of the technical limitations — a professional DAW would normally offer a choice of crossfades, for example — are largely irrelevant in this context and actually make the machine far faster to use.

RADAR 24 File Management

The RADAR 24 is very structured in terms of how audio files are stored and managed, much like a DAW. When the machine is first booted the most recently used Project is loaded automatically, or a default Project is created. Up to 99 totally independent projects can be stored simultaneously on a single hard drive, each having independent edit lists, locate points, timecode start times and synchronisation offsets. Incidentally, the system is quite happy if every project starts at 01:00:00:00, or some other house standard time.

The audio recorded on the hard drive is played back according to a particular project's edit list, which points the recorder towards those sections of files which should be played. Thus, if audio material is copied between projects via the audio clipboard facility, only the edit list is updated — no additional hard disk space is used. This also means that an original recording can be copied in its entirety to a new project and experimental editing performed without risking the original material at all. However, edit crossfades are rendered and rerecorded onto the hard drive so a small amount of additional space may be lost along the way. Computer users will be pleased to know that the RADAR stores its audio files in the PC WAV format, and it's possible to import WAV files for editing into a project, if you want.

As the edit list and audio are entirely separate physical entities, deleting one will not necessarily remove the other. By default, the machine engages an Auto Reclaim feature which automatically erases any audio material not used in the current project, thereby maximising disk capacity. Personally, I prefer a recorder to keep everything until I decide to delete unwanted material, but this mode is only a menu option away, if required. A manual reclaim process is also available for when the same audio is referenced by multiple projects, and this checks that only audio not employed in any edit list is removed.

With reel-to-reel recorders, archiving and restoring merely involved a trip to the tape library, but life is not quite so simple with hard disk recorders. While it is possible to swap hard drives, shelving projects on their own hard disk would require a substantial budget. A more practical approach is to backup audio and edit lists onto cheaper, removable media. Until recently, various forms of tape storage were the only option — very cheap but comparatively slow and not always reliable. However, the RADAR 24 capitalises on the DVD-RAM format to enable quick, efficient, and reliable backup. What's more, restoring single projects is much faster, as the DVD enables random access.

A variety of 'backup set' options are available, allowing you to archive all projects, all versions of the current project, only the current project, or any group of selected projects. When restoring, one or more complete backup sets have to be reloaded, so selecting the most appropriate backup strategy can make a significant difference to the speed of archiving and the flexibility of reloading projects.

iZ You iZ, Or iZ You Ain't?

I liked the RADAR 24 very much, and the audio quality was beyond reproach, either via the digital or analogue interfaces. After the odd initial frustration with the digital I/O, I became more and more impressed with this machine. Clearly, the RADAR does not have the flexibility of a full-blown DAW, but it was not designed to compete with the likes of Pro Tools. It is, however, a great deal cheaper, smaller and lighter than a full Pro Tools system, never mind the more comparable Sony PCM3324 reel-to-reel recorder.

The internal editing is simple, but sufficient, and easy to use quickly. In fact, the whole machine is fast in use and, although PC-based, the BeOS platform was rock solid — in a recording studio charging by the hour, that is very good news for everyone. Its overriding strength is that it is not overloaded with fancy functions which would clutter up the menus. Neither is the monitor a mass of miniature buttons, overly detailed waveform displays, and pop-up windows.

Although the RADAR 24 is not the cheapest of the stand-alone 24-track machines available here in the UK, it has had the benefit of a longer evolution, which I think shows in the ergonomic design of its control surfaces and menu structures. The noise of the fans and drives might be a concern if there is no way to put the unit in a separate room, but everything else about this machine is as near perfect as it gets. The RADAR 24 simply does what it says it will, with no glitches, no fuss, and no messing about. SOS

Options & Pricing

- Radar 24 £4694.13. The basic unit with 18Gb drive, 24-channel TDIF interfacing, SMPTE connections and support for Sony nine-pin remote control.
- Session remote controller £1145.63
- 24-channel meterbridge £475.88
- 48-channel meterbridge £762.58
- HICAP DVD backup drive £675.63
- Exabyte Eliant tape backup drive £1286.63

AUDIO I/O OPTIONS:

- Classic 24-channel 48kHz analogue I/O card, £1556.88
- Nyquist 24-channel 96kHz analogue I/O card, £2931.63
- S-Nyquist 24-channel 192kHz analogue I/O card, £tbc
- 24-channel AES-EBU digital I/O card, £951.75
- 24-channel TDIF digital I/O card, £475.88
- 24-channel ADAT lightpipe digital I/O card, £475.88.

All prices include VAT.

information

E See 'Options & Pricing' box.
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This software features 16 Stereo Tracks, real-time DSP an an integrated stereo sample editor. In addition there's a virtual mixing console, linked real-time editors, high timing resolution, real-time quantisation and AVI or QuickTime movie support to allow you to add sound to your home movies. The software can also support Emagic's EXS24 software. Also included is the ES-1 Software synth (Normally £69).

£249
Inc. Delivery
Emagic AW 8 Surround inc Emagic Surround Software

Only applicable to existing NEW stock

Fostex VM04 Digital Mixer

Ideal for use as a keyboard sub mixer, small PA Mixer. Also can be used for digital recording direct to DAT, CDR or MiniDisk due to the S/P-Dif Digital Output. This mixer usually sells for £299. You could even use the desk as a front end to the Fostex VR800 above for "on-location" recording

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Denon PMA100M Hi-Fi Amplifier	£249	£159
DIGIDESIGN ADAT Interface for Session8	£594	£149
Emagic ES1 Softsynth	£69	£42
Fostex D90 inc. 2.5Gig and SCSI	£1299	£699
Guillemot ISIS Card†	£249	£169
HHB CDR800 CD Recorder	£999	£699
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LA Audio PS1 Pro (MicPre/Dess/Comp/EQ)	£599	£299
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MOTU MicroExpress XT 4in6out	£299	£239
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Roland JD800 Classic Synth†	£1199	£799
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Roland U220 Classic Sound Module	£699	£229
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Yamaha PLGDX Board etc	£225	£179
Yamaha S30 Synth	£999	£649
Yamaha SU700 Sampling Workstation	£849	£559
Yamaha VL70M Modelling Synth Module	£599	£315

† Denotes 2nd Hand. All other equipment will be ex-demo or brand new, both with full warranty. Please call for more details on 01925 245422
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Soundcraft FX8 (with Effects)	£399
Soundcraft FX16 (with Effects)	£699
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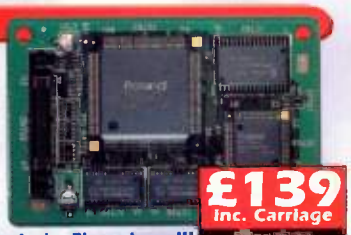

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the link man

Paul Farrer's name has been a fixture in *SOS* for several years, but these days he's best-known as the theme tune composer for top quiz show *The Weakest Link*. **Paul White** asks the questions...

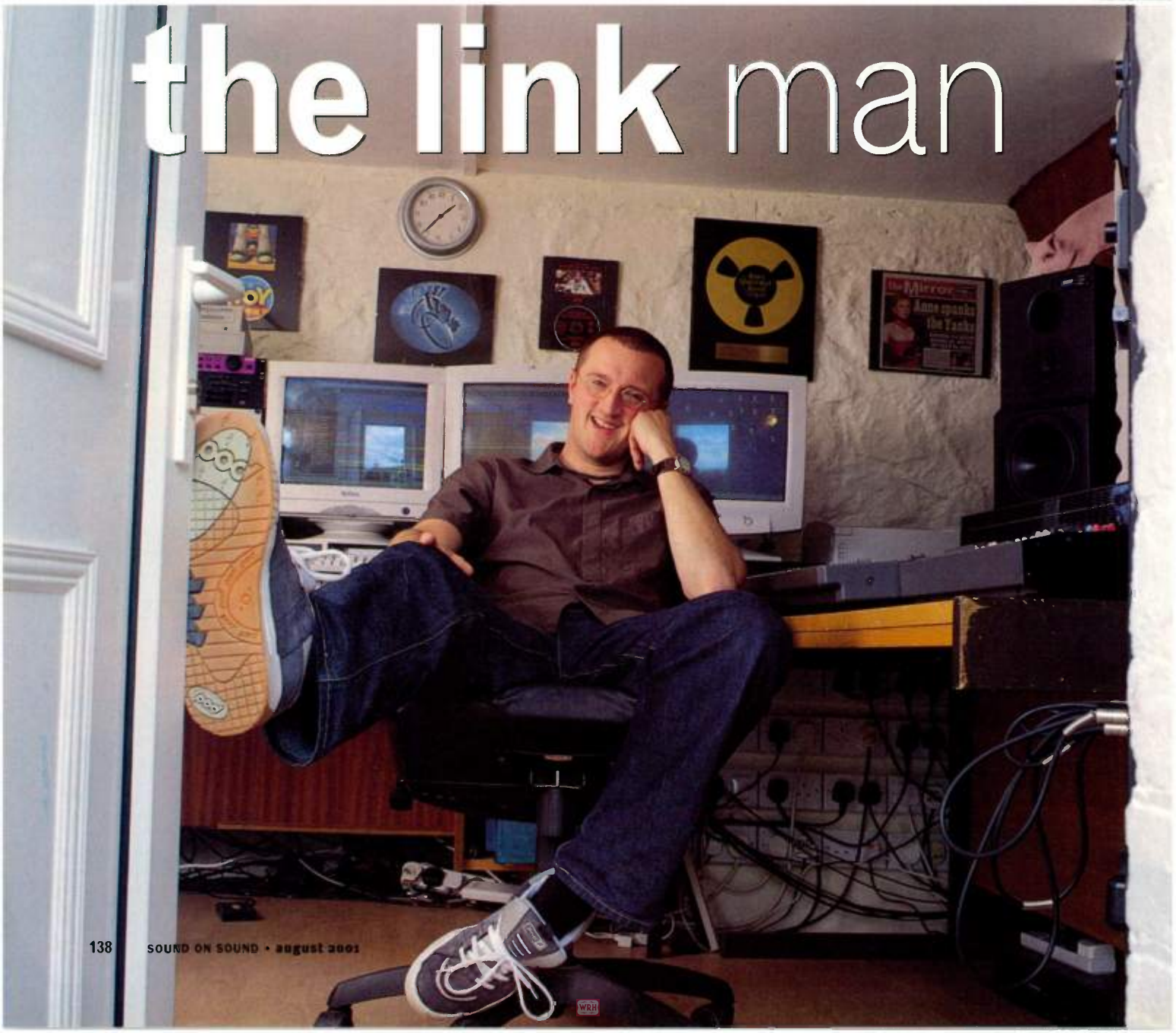
PAUL FARRER • COMPOSING FOR FILM & TV

Paul Farrer is probably best known to *SOS* readers as the guy who does a lot of reviews for Sample Shop. He's also been known to review the odd keyboard and module, but most of the time he can be found in his cosy basement studio at the western end of the Malvern Hills beavering away on music for TV and occasionally film. Most of the time, writing TV music involves a lot of hard work for modest returns, but just occasionally something really lucrative turns up, often when you least expect it. In Paul's case, his lucky break was being asked to submit music for four BBC pilot TV game shows for in-house production. The clients liked his ideas and he was assigned to one of the shows, while other musicians handled the other three. Only one of the three shows survived, and as luck would have it, it was the one Paul was working on. Today, *The Weakest Link* is one of the most popular game shows of all time, currently syndicated to 47 other countries across the world from the US to Australia, and Paul's music accompanies every episode.

But that's now. I wanted to press the rewind button to find out how Paul got into this business, how he escaped slavery in a jingle-writing sweatshop and how he finally made it on his own...

How did you first get into the music business?

"I did it the old-fashioned way, really, and started out as a tea-boy at the Old Smithy studio in Worcester. I'd had a fairly musical upbringing — I played piano and I used to sing in the choir at the



"My standard procedure to make things sound more real was to write something like an orchestral piece with a solo cello, then hire a real cellist to put on the solo part."

Cathedral, so by the time I got to tea-boy status, I already knew quite a bit about music and I was surprised to learn that in a working rock & roll studio, not many other people did! Realising this, they put me on 'musical' duties, which involved making radio jingles and adverts. That meant I had to cut my teeth on the engineering side, and the studio's policy was not to provide any form of guidance in that area — you had to learn in a session under the gaze of the client tapping his toe and paying 25 quid an hour! I was there for about five years, and it provided a great grounding because of the range of work I got to do. There were live jazz bands, solo singers, contemporary programmers — all kinds of stuff. It also gave me a sense of writing music for clients. While I was there, I did some work on the *Gladiators* album, doing extra beds and remixes, and that kind of work gave me a taste for what I do now.

"I left the Old Smithy to work on a copyright-free music library with, another Malvern guy with an interest in multimedia. He had the idea of doing copyright-free music at a time when it was still quite a new concept. It was aimed at mid- to low-end users — wedding videos and upwards — to give them a library they could use without having to bother about MCPS and PRS forms, which most of them didn't understand anyway. By that stage I'd accumulated a bit of recording equipment, as had Bob, so we pooled resources and somehow managed to make about 26 albums in various styles. Occasionally these find their way onto TV programmes, and then you do get PRS from them as their copyright-free applications are limited to non-broadcast uses. We had distribution in Australia and Japan and it's still earning money today, albeit not a lot."

Your big break was getting out of all that private client work and into mainstream media. How did you make the contacts that are so essential to getting on in that area?

"Really it was down to being consistently available. Writing music for TV and film was what I knew I wanted to do, so no matter what other projects I had on the go, I'd always try to make space for anything that was aimed at TV. Word of mouth actually turned out to be much more important than I ever thought it would be, and I've tried to maintain continuity by always living in the same town and having the same phone number. I've also had help from other musician friends who've given me work when they're offered jobs they're too busy to do. Whatever I was offered, I'd run at it and grab it with both hands. They'd ask for two pieces of music and I'd give them eight!

"I was surprised to learn that even in this part of the world there are more companies making TV programmes than you might imagine. You think they're all in London or Birmingham, but that's not necessarily the case. Most of the places that these little independent companies are set up in seem to be out in the sticks. If you get one gig and do it well, word will get around, because people move around a lot in this business and you want them to take your name with them. It was in that way that I got a gig for a company in Stratford called Cromwell Productions, and at that time they were making programmes for the Discovery Channel and History Channel. They were commissioning suites of music from me after briefing me that they were doing a series about the Ancient Britons or the Aztecs or whatever, and then it turned out they were also making a feature film and their composer had dropped out. There was no budget in it at all, but if I wanted to, I could do the music for it — every producer's dream. And so I ended up doing the music for what turned out to be Oliver Reed's last but one film before *Gladiator*. It was great — an entirely British-made, British-funded and, er, British-budgeted film (he laughs).

"After that I did about four feature films for them, including *Macbeth* with Jason Connery and Helen Baxendale, and then a film version of *King Lear* directed by Brian Blessed. They were also low-impact, low-budget British films, but they did pretty well in DVD and video sales worldwide as well as being on limited release. Again, there wasn't much money, but I would have done it for beer, to be honest! Musically, it was great, because I had the challenge of expanding a few samplers and MIDI modules to sound like a real orchestra.

"My standard procedure to make these things sound more real was to write something like an orchestral piece with a solo cello, then hire a real cellist to put on the solo part. The outcome was convincing enough and I don't think there are many members of the public who would have noticed it wasn't a real orchestra. You can get a long way by hiring just a couple of good ▶

This rack houses Paul's DATs, CD players and ADAT multitrack recorders, as well as Alesis Quadraverb and Midiverb multi-effects, Korg M3R and Roland U110 sound modules and an Akai S2800 sampler — the last three soon to appear in *SOS* readers' ads...

instrumentalists, and on the historical stuff, I worked with local musician Phil Howard who has a strong interest in medieval instruments. We did one session and then I'd sample things and chop them up. I managed to stretch out that session across the whole soundtrack."

When you did the music for *The Weakest Link*, it must have been very different to writing conventional music?

"It was slightly different, as I was pretty much on board from the very start, and as the show developed from pilot stage to finished version, so the music evolved with it. The upshot was that the original composition ideas only took around two or three days, but it probably took a further four months to fine-tune the arrangement and timing elements of it all. Even so I didn't realise, until I saw the first show broadcast, the extent to which the music is the framework upon which the show hangs.

"The show essentially comprises discrete chunks or modules, and each of those has a piece of music assigned to it which effectively controls the pace and feel of each section. At the time it was a real pain to get it right, because I didn't really know where the BBC were going. They'd tell me they needed an extra two seconds on the start of a sting or whatever, and I couldn't understand why. There's a reverse cymbal that starts the sting and they wanted it longer to give Anne Robinson time to spin her podium round or for the studio cameras to pan out or whatever. It was infuriating re-covering the same musical ground time and again, and there were a couple of occasions where I though 'I really don't want to do this any more'. But I stuck with it, and a short while after it went on air they commissioned another 180-odd shows including both BBC1, BBC2, and satellite channels, which means the thing is currently on about 16

Paul's studio is based around a Behringer MX8000 analogue desk and a Yamaha Promix 01 digital mixer, with monitoring courtesy of Yamaha NS10 and Klark Teknik Jade speakers.

The PC In Paul's Studio

Paul is one of relatively few music professionals who's chosen to base his current setup around a PC, rather than a Mac computer. I asked him how he ended up as a PC musician, and how he's got on with his system.

"When I started I was just using my own domestic video recorder feeding the Unitor on the side of my Atari, and it worked so well that I was quite late in making the change to *Logic Audio* on the PC. Although I like technology and get off on what it can do, you never really know what you're missing until you make the plunge. At the time, I remember feeling that as the Atari did everything I needed it to do — why would I need anything different? I was speaking from the perspective of somebody who didn't know any different, and OK, the Atari could do everything I needed musically, but I didn't realise how convoluted that process was. Because I'd grown up with it and used it from the age of 15 or whatever, I just assumed that was how sequencers worked. Now, looking back, I'd say that the two biggest revolutions in the way I make music were when I got a stereo sampler and when I moved over to *Logic Audio*. If I meet anyone with an Atari now, I say just ditch it and get a PC or Mac running *Logic Audio*.

"I know some people give PCs a hard time, but I bought mine as a music-specific system from Red Submarine and it's worked perfectly, with the exception that the latency is just too high for playing virtual instruments in real time unless they're slow-attack string parts. That's one reason I don't make more use of my *EXS24* sampler, which is otherwise excellent. In fact you're speaking to me in one of the last stages of PC-dom, because as soon as the PRS fairy arrives later this month, I'm planning on buying a Mac G4 based system with all the trimmings.

"The PC, which is running two monitors and a Delta 66 card, was an appropriate route for me to go down two years ago and for the money I had available at that time. Since then I've had fantastic use out of it, even though it's lumpy and doesn't always do all the things you'd like it to do. I don't have any software on it other than what I need for music, which has paid off because it hasn't missed a beat. I have a second PC for the office work and CD label printing. But the bottom line is that at the time the PC was half the price of the equivalent Mac system, and that's all there was to it. Once *Logic* is running on the PC, it is very similar to running it on the Mac, except for the high latency with my particular system. And if you have too many audio tracks using too many plug-ins, it starts to feel a little stretched, but in a typical project, I wouldn't have more than eight or 10 audio tracks running.

"*Logic* is a fantastic program, and it can handle most of what I need. That's partly because I don't use a lot of external processing — I only have one main reverb, and that's a Behringer Virtualizer! I like the plug-ins that come with *Logic*, though I've also got a few third-party things that I use. *Auto-Tune* is particularly useful to me, and it's probably one of the biggest revolutions in studio technology in recent years. Bear in mind that although *SOS* readers know what is going on, I'd say that 99 percent of clients have never heard of pitch-correction technology, particularly singers, who tend to be the most neurotic and insecure bunch of people you're ever likely to meet. To watch their faces light up when you fix a pitching problem is a real treat! It's such a cheap plug-in, yet so useful. It can be made to sound fairly natural providing you don't overdo it and only apply it where it is really necessary. Turn the tracking speed down so it's a bit slower and also check out the lead vocal carefully to see if it's really necessary to process it all. How will it affect the vocal delivery, and is tuning the most important element of the performance? I remember a quote from Peter Gabriel where he said he's a better musician because of all this technology, not because of what it enables him to do but because of what it teaches him. Just as quantisation makes you think about timing, you really start to think more about intonation and tuning when you've got *Auto-Tune*.

"I've also used it on instruments such as flute — you can reduce the scale to fewer notes and do lots of creative things as well as just pitch correction. I've also found it works extremely well with classical cello — in fact, possibly more successfully than it does with vocals. We hear voices all the time, so we know if there's something not quite right with it, but the difference between a tuned cello part and an uncorrected cello is just something you pick up on an emotional level. I've never had a problem correcting things to the equal-temperament scale when classic players tend to use just intonation — what matters is how you perceive the end result in the mix as a producer and arranger. Again, the secret is knowing when not to use it — don't process everything as matter of course."

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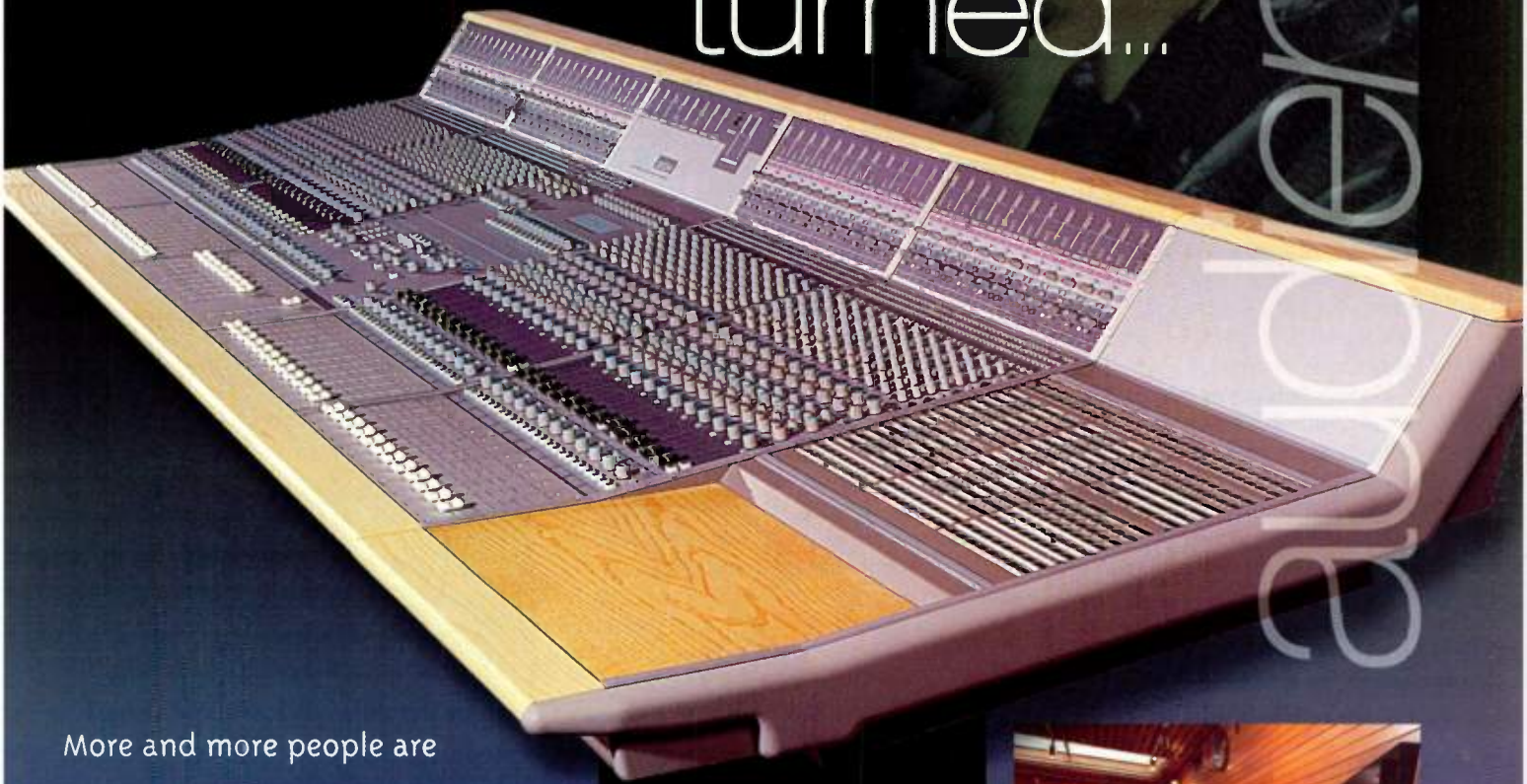

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times a week in the UK for 53 weeks of the year. I remember when I saw the first completed episode, it was 45 minutes long and there was exactly 45 minutes of music in it — the letters, P and R and S suddenly sprang to mind!

"The music is the same in all areas apart from the US, where they wanted a couple of changes to make it busier and to make the segments shorter. I think it's to do with their advertising schedules — they have more rounds and they get shorter quicker. In fact it ended up more like my original BBC submission which the producer felt was too busy for the UK version."

So how would you approach a more typical TV project, such as a documentary or a wildlife programme?

"In the early stages, it's a good idea to make friends with the editors who will be using your material, and talk to them about what they actually need. Probably the first thing you'll get, both for films and TV, is a rough assembly on stereo VHS cassette with extra material — so if it's a half-hour show, you'll probably get about 45 minutes of programme material. It usually has dialogue on one track, but probably no music, or it may have some music tracks that they've included just as a temporary soundtrack. The other track of the stereo VHS cassette may have SMPTE code. Normally, you know what the programme is about before you see even the rough assembly, so I'll try to send in some musical ideas that they can listen to before they start editing. If it's a wildlife show, there's probably going to be a chase scene, some scenic stuff, some dramatic stuff... Even if I just send them five or six pieces on a CD, they can start editing the program — all editors love having music to work to as it gives them a sense of direction and pace. Then when you get the tape back it may have some of your ideas on it, probably edited, so you know what you're working to.

"On Channel 4's *O'Shea's Dangerous Reptiles*, the director has said in a couple of instances that they're off to shoot in New Guinea or the Philippines or whatever and he's asked if I could come up with some ideas by the time they go. I've sent them some music which they took with them, and in some cases, they tell me they've shot it almost like a pop video with the pictures being edited to fit the music rather than *vice versa*. In that respect it's great, because I don't have such a difficult job of trying to make everything fit afterwards. Of course it doesn't always work like that. In fact it rarely works like that, and generally you'll get a final cut after which the hard work really begins because you have to change everything to make it fit. It's at this stage that you get a VHS cassette with burned-in timecode, dialogue on one track

Beneath the Behringer mixer, this rack houses most of Paul's sound modules — Korg O1R/W, Emu Orbit, Alesis D4, Emu Proteus 1 and 3 — and his Red Sound Federation DJ effects unit.

Programming Secrets: *The Weakest Link* Bed And Sting

The main musical signature of *The Weakest Link* is a four-note theme used to transition between rounds, as well as mark the climax of certain other tracks throughout the show. "The main sting initially grew out of the end of the main-round music beds, which had to obviously last the decreasing lengths of each round — the rounds get shorter as the show goes on from 3 minutes down to 2'50", 2'40" and so on," explains Paul. "The bed itself was a tricky task, as the production team wanted mini-climaxes every five seconds with larger steps building every 30 seconds, and the last 30 seconds of each round needed to up the drama to a climax as the time runs out and the contestants stop playing. I really wanted the ticking clock sample to feature in the last 30 seconds as a device for letting the contestants and viewers know that the time is running out, and that required a tempo of 120bpm, but in order to fit a climax every five seconds I needed to force a 5/4 feel over the entire track. So the main bed ended up being three-minute-long sections (each a modulated semitone higher than the last) constructed out of 12 five-bar chunks!

The main bed for Paul's *Weakest Link* theme in *Logic Audio*.

"The end of the bed needed to explode with the four-note theme, which in the key of C minor is essentially G, B flat, E flat and C and for this I used a combination of orchestral stabs from the Korg Trinity and the JV1080. I spent quite a bit of time getting these to sound as punchy as possible, bearing in mind that most people still watch the TV in mono, and experimented with layering them at various levels. I actually ended up resampling the JV stabs in mono and at a lower bandwidth, which seemed to make them leap out of the speakers better for some reason, and they stand out quite well when broadcast. Along with these stabs I included unison lines playing the four notes using all the other instruments featured in the preceding bed. These included timpanis, orchestral percussion, bass, bells, strings, choir and the kitchen sink, basically!"

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Paul's Equipment

RECORDING & EFFECTS

- Akai cassette machine.

"Bought from a pawnbrokers some eight years ago for £25, and by design rules should not still be functioning as well as it currently is. Scientists should reverse-engineer the mechanics of this device and apply the same rules to space shuttles, power stations and aircraft. They would last forever."

- Alesis ADAT XT modular digital multitrack recorder (x2).

"The very definition of an industry standard multitrack format. Great sound, quick transport, cheap media but already looking dated compared to the stand alone HD recorders from the likes of Mackie and Tascam."

- Alesis Midiverb multi-effects.

"Lo-fi and nasty as hell, which means there will always be a place for it in my rack."

- Alesis Quadraverb multi-effects.
- Behringer MX8000 mixing desk.
- Behringer Composer dynamics.
- Behringer Virtualizer multi-effects.
- Emagic Unitor 8 MIDI interface.
- JL Cooper Datamaster sync unit.
- Klark Teknic Jade II monitors.
- 450MHz Pentium III PC with Midiman Delta 66 soundcard and dual monitor card, running Emagic *Logic Audio*.
- Tascam DA20 DAT recorder.
- Yamaha NS10 monitors.
- Yamaha Promix 01 digital mixer.

SAMPLERS & SOUND MODULES

- Akai S2000.

"Nice to have as a 'spare' sampler but an absolute dog to use at anything other than a very basic playback-only level."

- Akai S3000XL.

"A near-perfect sampler and until the ESI appeared my most frequently used bit of kit."

- Alesis D4 drum module.
- Emu ESI2000.

"My first Emu sampler and I must admit that everything they say about Emus having a warmer and more detailed sound compared to the Akais I've found to be true. The lack of waveform editing is a pain but pound for pound in terms of RAM expandability, polyphony, and features for the price it's hard to beat."

- Emu Orbit sound module.

"Perhaps a bit dated now, but still full of some great analogue dance drum and bass samples."

- Emu Planet Earth sound module.

"A sort of updated Proteus 3 with knobs on — literally."

- Emu Proteus 1 sound module.

"My first ever synth module. It's got a dicky power supply but is much loved and used every single day."

- Emu Proteus 3 sound module.

"A good resource for some more off-the-wall effect sounds."

- Korg 01R/W sound module.
- Korg TR-Rack.

"My 'desert island module' — packed full of great noises. If I only had to have one MIDI instrument, this would be it."

- Korg Wavestation SR sound module.

"A soundtrack writer's dream. Switch it on and phone Channel Four."

- Red Sound Federation BPM FX Pro effects unit.

"A unique British-made DJ based effects unit that everyone should play on at least once in their lifetime."

- Roland JV1080 with Orchestral expansion board.

"A reliable and easy-to-use workhorse which forms the backbone of a good deal of my work."

▶ and SMPTE on the other. The dialogue tracks may also contain any musical ideas they've had.

"At that point I sync up my Emagic Unitor 8 to the SMPTE track and use this to lock up my PC system which runs *Logic Audio*. I prefer to get a locked programme later on than have something that isn't quite finished sooner, because there's nothing worse than getting something back where the editors have made a few small changes that mean you're going to have to completely rework your music. I was amazed how fluid the process of making films was — they were still making editing tweaks right up until a couple of weeks before the premiere. Those tweaks obviously impacted on the music and very often an edit that changes just a couple of seconds at the start of a scene can completely throw out your rhythm and pace. That's when you have to apply all your sequencing skills to get everything to fit again and to get back on the beat."

Compared with most of the studios I visit, yours seems very much MIDI- and computer-based, with relatively little outboard equipment.

"That's true — I have a Behringer Composer as my main compressor. It's laughable really, but it's the compressor I've always had and I'm quite happy with it. I have never heard anything esoteric that would make me think otherwise, and I get a big kick out of the fact that the music for *The Weakest Link* was mixed and mastered through an 80 quid compressor. It's the same with the Virtualizer. The reverb is perfectly fine for the work I do and I prefer it to my old Quadraverb, which is better at delays and flanging effects but noisy as hell. I've also got a Lexicon Reflex which I have a love/hate relationship with (mostly hate) and an original Alesis Midiverb, the plastic one that looks like a soap dish! I use that for one patch only, number 48, which is written in Chinagraph on the front. It's only used when I need a low-bit, cavernous reverb.

"The rack also includes a couple of ADATs, which I use less and less for my own material, but I still need them occasionally for use with clients. There's no point in getting rid of them because they're not worth much second-hand. An old Yamaha Promix 01 is used as a submixer for the ADATs.

"Of my hardware synths, the Korg TR-Rack and the Roland JV1080 get used for the bulk of the sounds, with a Korg Wavestation SR used for pad sounds. Hold down a low C on just about any patch and you've got the makings of a soundtrack! I'm also a great fan of the Emu stuff — their new rhythmic models such as the Mo'Phatt and Planet Earth are right on the button. There are limitations such as the restricted number of outputs, but they're good 'quick fix' instruments with lots of loops that you can use in a busy production environment. Even the Yamaha DJX home keyboard, which you can now buy in Dixons for £110 or so, is extremely useful. I've been a big fan since I reviewed it for *SOS*, and though it's a bit lo-fi

The instruments bursting from this rack include Emu Mo'Phatt, Roland JV1080, Korg TR-Rack and Wavestation SR sound modules, along with Akai S2000 and S3000XL and Emu ESI2000 samplers.

and grainy, the quality of the loops and the way they're put together is good. I've used it a lot on the Channel 4 reptiles thing for drum loops, little grooves and so on. It's just stuff you don't have time to program, like a sample CD. In fact it's cheaper than most sample CDs!

"At the bottom of my rack is a Red Sound Federation which I only patch in when I need it. It's more of a DJ tool but it has some very interesting sounds and effects that you can't get on anything else. It's also great for feeding drum loops through for processing, then you can resample them back into *Logic*. I haven't fully exploited its potential, but it is good.

Paul is a big fan of Yamaha's 'toy' DJX keyboard.

"Any studio like mine is built up over a number of years and evolves in a way that isn't necessarily the same as you'd buy if you had to start again from scratch. Take my master keyboard — it's an old Roland D5, which was the first MIDI instrument I ever bought and I'm still using it because it happens to fit on the desk! I'm still using the old Proteus modules and I have three different types of sampler."

What other things would you like to buy when the PRS fairy comes?

"I'd like to consolidate my samplers rather than have assorted Akai and Emu models. To me, the S3000 is a perfect sampler, except that it's limited to 32Mb of RAM, which these days can be used up with one sample program. The ESI is expanded to 128Mb, but even that looks a bit frugal today. Interestingly, there's a noticeable difference in sound quality between the Emu and the Akai when you load the same sample CD. I always thought that stories about the differences in converters were old wives' tales, but the Emu definitely sounds better to my ears. But long-term, I have a feeling that most of my MIDI gear will eventually become virtual, especially when you see how powerful Emagic's *EXS24* software sampler is. Also, you have a full screen to edit it with rather than an LCD the size of a stick of chewing gum.

"It's much easier to use, and you can't do any serious sample editing on an S2000. My bedside alarm clock has a more comprehensive user interface! There's also the advantage that soft samplers are easier to set up for multitimbral operation, the samples load faster, and when you open a song you were working on earlier, it comes up with the samples loaded and ready to play. That could be important to me as I tend to use a lot of stock orchestral samples, so being able to load them all in one default song is very appealing. What I do and other people like me do is based quite heavily on sound sample libraries. I don't think I've recorded a sample into a sampler for about three years now — they're used purely as playback machines.

"I did wonder whether to get into video capture and DVD, but you find that TV companies are perfectly happy to give you a VHS tape, despite the fact that the onscreen movie facilities in *Logic* look as though they would be fine for the job if I ever needed to work that way. Every TV production company in the world has a VHS recorder, yet few have DVD authoring facilities. Maybe it'll be different in five years time, but I'll see what's needed then. Ideally you'd get a complete movie file down the phone line in the morning and you'd send it back to them with music in the afternoon, but that's probably a little way off yet."

What work do you want to do now that your profile has gone up a notch?

"I'm concentrating almost exclusively on TV work now. The BBC asked me to write the music to their new Saturday night gameshow *Dog Eat Dog*, and I've just finished a new series presented by David Jason called *Infested*, which was a real musical challenge and was in many ways more filmic than many films. It's all about the horrid things you find infesting your house, and there was an awful lot of music that had to be written to picture — every beat of the woodworm moving or the rat poking his head out of the skirting board. It was a bit strange to do because I don't actually like spiders very much, and there was one scene where a woodlouse spider stalks a woodlouse in extreme closeup. It was like something out of a horror movie, and I spent two whole days trying to time the beats of this thing's jaws snapping the woodlouse in half and sucking its juices out with fairly wild orchestral music!

"That sort of stuff is really interesting, though, and I'd like to stay on that kind of level where yes, they are bigger deals and there's more pressure on you, but obviously the musical satisfaction is greater. In fact it's ironic that *The Weakest Link* is probably financially the most successful thing I'll ever do, yet projects like these are so much more musically challenging. I'd like more of that kind of quality work, and of course I'd like another chance at film work, perhaps writing a piece for a full orchestra to perform. I've written for all the instruments before, just never all together!"

Finally, the question on every reader's lips must be, when that PRS cheque comes in, will you still be writing pieces for Sample Shop?

"Of course... although it might be from a beach house in Mauritius!" SOS

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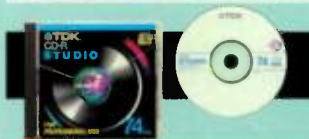

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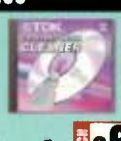

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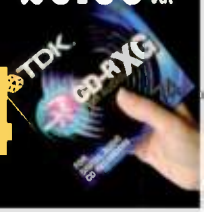


WRH

While physical modelling preamps may take the hassle out of recording electric guitars, you're still going to need to reach for a mic when recording acoustic guitar. **Paul White** shows you how to get the best recorded sound, and offers a few of his favourite tricks of the trade.

recording acoustic guitar

The advances in digital technology over the last few years have brought a whole range of usable electric guitar sounds within the reach of even the most cash-strapped home studio owner. Preamps from manufacturers such as Digitech, Line 6, Roland and Yamaha have managed to physically model the sounds of desirable amp and speaker combinations, allowing many musicians to record their electric guitars without having to plug in a single mic.

However, things haven't yet got so advanced that the same can be said of acoustic guitar. A few people have tried physically modelling the acoustic guitar, but with only limited success — these sounds are convenient to have when playing live, but aren't really good enough to stand up to scrutiny in the studio. In fact, better results could probably be attained with a good MIDI sound module and some clever programming, though this approach rarely produces truly natural results either. And using sampled phrases isn't ideal either, given that the chords of acoustic parts usually need to change with the track.

It is for this reason that most home recordists still have to mike up an acoustic guitar when they want one in a track, even when they do their best to generate most other parts artificially. Recording an acoustic guitar is a complex task, however, and there are a number of different miking and processing techniques available which can be brought to bear. The aim of this article is to show you how to get the best recorded sound, and also how to go about slotting it successfully into your mix.

Preparing For Recording

This may sound rather obvious, but it really is important to make sure that the guitar sounds as close as possible to how you want it to sound, before you bother thinking about miking anything up. Deal with the basic things first: is this the right guitar for the job? If not, then consider borrowing another for the session, or even investing in another yourself. There are engineers who buy guitars in order to get the sound they want, even though they're not really guitarists themselves, so don't rule this option out if the right guitar sound is important to you!

Choose an appropriate type and gauge of string for the instrument and for the kind of sound you're after, and make sure that the guitar's action is set up correctly so that it plays without buzzing. There are many different types of steel-cored wound string, all of which have subtly different properties. The most commonly used types on acoustic guitars are bronze, phosphor bronze and nickel wound. An instrument with lighter guage strings (perhaps an 11 to 50 set) will generally be easier to play, but the sound will be thinner. On the other hand, very heavy strings (perhaps a set begining with a 15-guage top E) can sometimes sound tubby and lacking in overtones on the wound strings. The best compromise is usually the heaviest set of strings which are still comfortable enough for the guitarist to play. Accurate tuning is paramount so check the tuning using an electronic tuner between every take.

If the guitarist is using a pick, it is always worth trying one of a different thickness — generally, thin ones work best for layering multiple tracks of 'acoustic guitar bed' parts. Don't be afraid to spend half an hour or more getting the right sound at source, because time spent at this point has the potential to make every subsequent stage of recording and mixing much easier.

Another thing to bear in mind is that the sound of

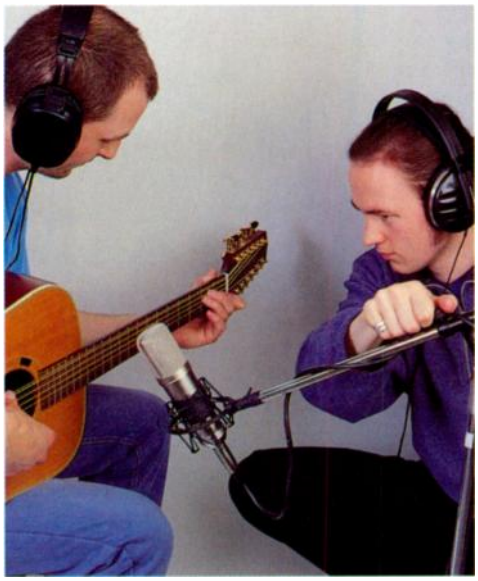
The guage and condition of the strings makes a big difference to the sound of an acoustic guitar — new strings are always significantly brighter.

Dress Code

Bear in mind that anything which has the potential to tap the body of the guitar can ruin an otherwise perfect take. Common offenders include belt buckles, jeans rivets, and buttons on a shirt or jacket, but the guitarist's watch can also sometimes cause problems as well. *Mike Senior*

acoustic guitar recordings can depend a great deal on the environment in which the instrument is played. Acoustic guitars thrive on live acoustics, and insufficient natural reverb is a common problem when recording them in small home studios. While artificial reverb can be used to liven up the sound of a dead room, getting a sympathetic natural acoustic always produces better results, even if you are wanting to add more artificial reverb later. Obviously you can have too much of a good thing here, and too long a reverb time will sound muddy and confused, but this is usually less of a problem in small studios.

To get a more live sound out of your room, try to position the guitarist so that the instrument is played close to some reflective surfaces — hard floors, doors and solid furniture can all help here. If carpeting on the floor of your recording room is dampening the sound too much, then a simple solution is to place a sheet of hardboard, plywood or MDF on the floor beneath the instrument. It may actually be worth the effort of running long cables out to another, better-sounding room, if you have one, if the sound simply isn't working in your normal recording room.



Moving the mic whilst monitoring on headphones is the most effective way to fine-tune the position.

Using a capo will significantly change the tonality of the guitar and is a useful way of achieving a brighter recorded sound from a darker toned instrument (provided your player can make the necessary transposition). Doubling a part using a capo is also more effective than a straight double track.

If you are willing to experiment with the instrument and the room, listening carefully at each stage, then you should be able to arrive at a situation where the guitar sounds good both to you and to the performer. If you can do this, then the most important task has been accomplished — you're now ready to select your mic.

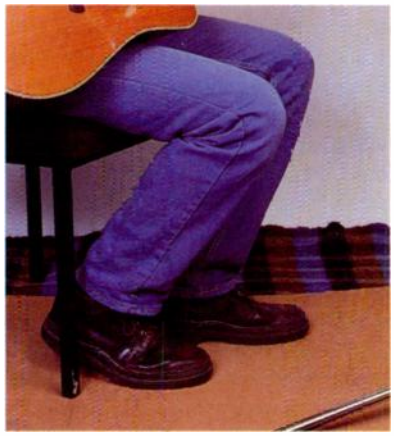
Miking Up

Large professional studios will have a broad range of different mics to choose from, but many home recordists are faced with a much more limited choice, so the decision is usually fairly straightforward. The first thing to realise is that there are few dynamic mics capable of doing justice to the acoustic guitar, other than perhaps the Sennheiser 441, because of their inherently limited high-frequency response. High frequencies are vital to acoustic guitar sounds, and therefore you'll probably need a condenser mic to get the best results, as these are more sensitive and pick up much more high-frequency detail.

Whether you choose a true capacitor model or a cheaper, back-electret design may well be determined by your budget, though manufacturers such as Joemeek, Rode and Audio Technica are now making capacitor designs available at ridiculously low prices. This is not to say that back-electret mics aren't capable of turning in a good performance, but be aware that those models that are powered by batteries may have lower sensitivity and headroom than those models which will only run off phantom power — some are little more sensitive than a good dynamic mic!

Purists will often pick a small-diaphragm capacitor mic for its greater high-frequency accuracy, and one with an omni polar pattern for a more transparent sound than can be achieved using a cardioid. However, if you're one of the many people who have one or two large-diaphragm cardioid mics only, that doesn't mean that you should have trouble getting good results. For a start, omni-pattern mics usually require a recording room which sounds significantly better than most home studios, so a cardioid pattern will usually suit smaller rooms better.

Whichever mic you choose, the positioning of it is crucial. In a live situation its normal to see mics placed very close to the sound hole of an acoustic guitar, because the important considerations are level, separation, and the avoidance of feedback. In the studio, however, you're after a more natural sound, and such miking is therefore less useful. It is true that a lot of the sound energy of an acoustic guitar comes directly out of the sound hole, but much of that is heavily coloured by the body resonances of the instrument. This boxy and boomy sound usually needs heavy EQ'ing to render it usable even when playing live, and this really isn't the way ▶



Photos: Richard Ecclestone

A reflective surface placed underneath the guitar can produce a better sound in carpeted rooms.

Accurate tuning is vital when recording, so you should make sure that you have an electronic tuner always available to make this vital task quicker and easier.

Nashville Tuning

One way to get a bright, jangly acoustic guitar sound, which can cut through cluttered pop mixes, is to take advantage of a technique referred to as 'Nashville' tuning. This is where the bottom three strings of a conventional steel-strung guitar are replaced with strings designed for the upper three positions. The new strings can then be tuned to pitches one octave higher than the strings that they replaced.

Mike Senior

to go when recording. If you've got your guitar sounding right at source, you shouldn't have to be using drastic processing during recording.

Natural guitar sounds balance the different vibrations from all over the instrument with each other, and with sonic reflections from the player's surroundings. If a mic is used too close to the guitar, the direct sound from the part of the instrument it is nearest to will dominate the sound from other parts of the instrument and from the room. You risk miking up only a part of the instrument when what you're really after is the bigger picture.

On the other hand, if your mic is too far away from the guitar, you can end up with a lot of room ambience, leaving the original sound distant and unfocused. You may also find that your mic exhibits unacceptable levels of noise when you apply the level of preamp gain which distant miking requires, especially if you're using a less sensitive model.

As for the specifics of mic positioning, a common approach is to set up the mic around 40cm from the guitar, with the capsule aimed at the point where the guitar's neck joins the body. This will usually produce a well-integrated sound — the levels of direct and reflected sound will be about right, and the sound hole's contribution will be controlled because the mic doesn't point directly at it. If you have a pair of enclosed headphones, then you can easily experiment with tweaking this mic placement while listening for the best sound. If you find a promising sound in this way, remember to check it out on your monitors before committing yourself — headphones can sometimes be rather misleading. As a general rule, moving the mic further towards the neck will brighten an excessively bassy sound, while moving closer to the sound hole will bring more warmth and fullness to the sound. Moving the mic further away from the guitar will increase the proportion of room ambience overall, while moving in further will dry the sound up. Alternatively, if you like a closer-miked sound, but would prefer more room ambience with it, try using an omni-pattern mic instead of a cardioid, if you have one.

Even though the basic mic placement described above is by far the most commonly used, it doesn't *always* produce the best results. For example, if you're after the sound that the guitarist hears, then a single mic or a pair of mics set up to look over the player's shoulder at about head height can often capture a convincing tonal balance, particularly when using a large bodied guitar that is excessively boomy miked from the front. It can also be educational to point the mic in even less obvious directions, such as at a nearby reflective surface, or even at the underside of the guitar. Such alternative placements are often quick to try if you're wearing headphones, and can sometimes turn up a brilliant sound that no amount of theory would have predicted.

Motion Sickness?

The way some guitarists move as they play can be vital to the sound they produce. However, any movement of the guitar in a studio environment can play havoc with carefully tweaked mic placements. If you find that you are often encountering this problem, then you might consider investing in a miniature microphone which can be fixed to the guitar itself. A number of companies manufacture miniature mics for this use, though a cheap lavalier mic might do the trick if you're on a budget. *Mike Senior*

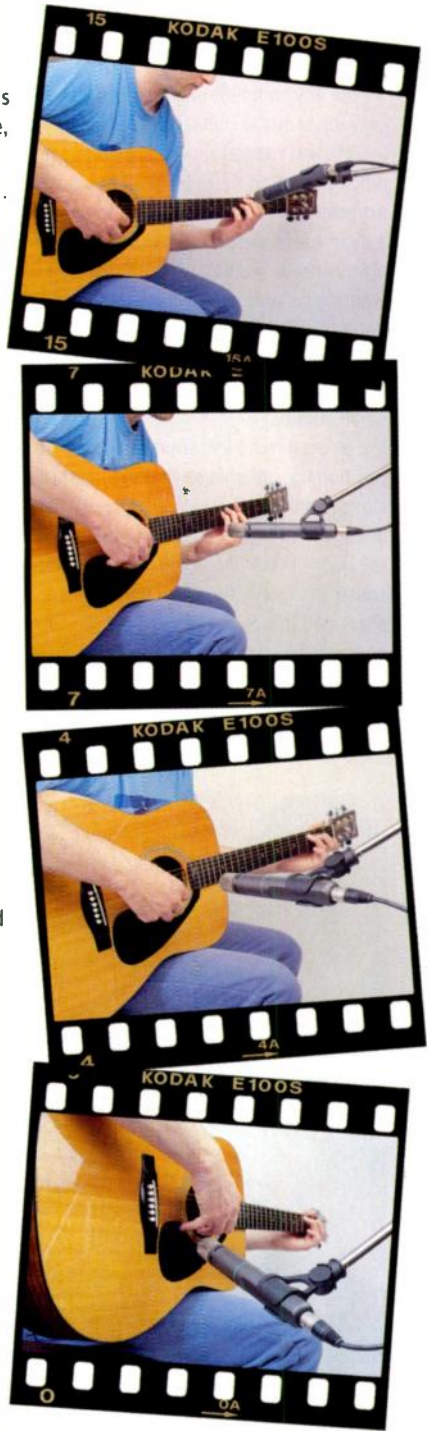
Using More Than One Mic

So far I've described mainly mono miking, and in a lot of cases that's as far as you need go, even when the guitar is a major part of the mix. However, there are a number of multi-mic techniques which can be of use. Because much of the art of recording acoustic guitar is concerned with blending the tonalities of the guitar's body, strings, sound hole and neck into one cohesive sound, one approach is to use different mics to capture individual elements of the sound. These individual elements can be mixed to create the overall tonal balanced you're after — almost like a sort of natural EQ. A mic at the sound hole could provide warmth, where one on the neck could provide extra brightness, for example.

The main challenge when using such a technique is to make sure that all the different signals are in time with each other when mixed — if there are delays between signals, this could cause phasing problems. Some engineers get around this problem by placing all the different mics at exactly the same distance from the guitar's sound hole, and this can be successful. However, others record each of the mics on a separate track and then attempt to match their phases when mixing down — this is a very similar technique to that described in detail last month by Craig Anderton in his article on aligning mic and DI signals.

Many acoustic guitars now incorporate a piezo tranducer under the bridge saddle and can therefore also produce a DI feed. While it might be tempting to simplify the recording task by recording only this DI signal, the result is usually disappointing when compared to the same instrument miked up properly. An under-saddle transducer, however, effectively only picks up vibrations from the strings, albeit that their vibration is influenced by the rest of the instrument, whereas a microphone, suitably placed, will pick up vibrations from every part of the instrument, combined with audio reflections from the immediate environment, making for a much more natural sound. Having said that, pop records don't always demand accuracy and sometimes you can get a sound that works well within a mix by combining the harsher DI'ed sound with miked sounds, in which case the techniques in Craig's article will be even more relevant to you.

Multi-miking is also used for recording guitars in stereo, or for creating pseudo-stereo effects. For solo guitar recitals and small ensemble work, stereo miking can be an interesting alternative, though itcan make the location of the guitar in the stereo image



The mic placement in the top picture normally gives a bright sound, with a good deal of fret noise, whereas that in the bottom picture tends to allow the boom of the sound bole to dominate. A placement in between these two, opposite the neck joint (middle picture), usually provides a more balanced tone. An interesting variation is miking around the bridge, as in the lower picture.

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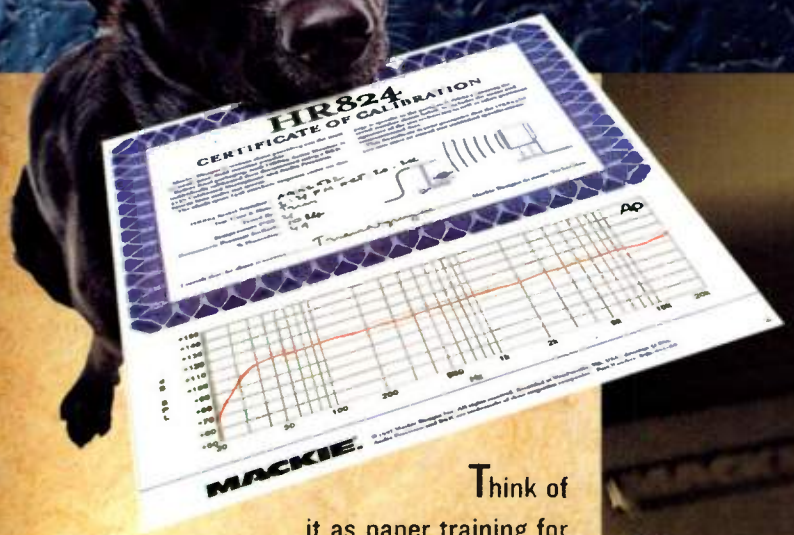

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less solid, and more difficult to pan precisely when mixing. It is possible to use any of the range of stereo mic recording techniques — I covered these in detail in *SOS* March 1996. However, a number of engineers favour pseudo-stereo effects, such as panning mics pointed at the body and neck of the guitar to opposite channels. Alternatively, you could use one mic over the guitarist's shoulder and another 20-30cm from the middle of the guitar neck. The advantage of this approach is that the neck mic produces a bright, detailed sound with very little bass end, and will cause less low-frequency phase cancellation if the track is ever played in mono. Having different tonalities at either side of the stereo image can provide a wider, more interesting stereo image, though you'll probably want to avoid extreme panning unless you're after the illusion of a guitar three metres wide!

As with any studio recording, the composition of the cue mix you feed to the guitarist will be extremely important, so be prepared to take a little time over it — the article on basic overdubbing in *SOS* March 2001 goes into this in detail if you need a few pointers. One thing to particularly bear in mind is that, given the sensitivity of the mics traditionally used in acoustic guitar recording, it's easy to pick up obtrusive spill from the cans. Solo the recorded track to check for this, and if there's a lot of spill coming through (from a click track, in particular) then consider turning down the overall cue mix level or using a different pair of headphones — closed-back models are obviously best in this application.

Processing Acoustic Guitars

Even if you set up the guitar and the mics with the utmost care, recorded acoustic guitar sounds will usually still benefit from a little processing. This should be kept to a minimum while recording, so that you leave your options open for the mix. As a rule, it's always safer to leave EQ until the mixing stage, especially as you ought already to be pretty close to the final tonal balance. Compression can be used when recording, but err on the side of caution, as it's difficult to undo the effects of too much compression later on. A compressor which sets its time constants automatically works well here, but if you don't have that option, try a release time of around 300mS and an attack of around 10mS. Use a ratio of between 2:1 and 4:1 and adjust the threshold for no more than about 6dB of gain reduction during the loudest peaks.

Doubling a rhythm part with different chord inversions can make the overall sound more harmonically interesting.

Once recorded, the sound may benefit from equalisation to adapt it to the other sound sources in your mix. The first thing to try is just rolling off some bass using a shelving equaliser at 80 or 100Hz, as this can help the sound sit better in many types of track. It can make a big difference, for example, if other sounds in the mix have strong low mid-range components, and if you listen carefully to rock or pop mixes that include acoustic guitar, you'll notice that the low end is quite often played down in this way. Any obvious resonance can be tackled using your equaliser's peaking filters. Boominess can be countered by searching the 100Hz to 250Hz frequency range and then applying just enough cut to tame it, while zing and air can be added by using a wide-band boost at between 12 and 16kHz. Gain of a couple of decibels ought to be enough in these cases if you've taken care while recording.

In the right room, this mic placement can produce a sound similar to what the guitarist is used to hearing.

Additional reverb may be needed if the recording was made in a small room or studio, or close-miked or DI signals dominate the recorded sound. Mono recording can also be given a sense of space and width by adding a little stereo reverb. Ambience settings with pronounced early reflections are particularly effective in adding life and sparkle to acoustic guitar, though plate and room settings can be used as an alternative where you want a more obviously spacious sound. The main objective is to get a well-balanced tone with enough ambience or reverb to match up the guitar sound with the rest of the mix. Where a DI signal has also been recorded, a pseudo-stereo sound can be produced by panning the miked sound to one side and the DI'ed sound to the other, and here a little added reverb or ambience can help 'glue' the two sounds together.

Golden Rules

I've recorded and mixed more acoustic guitars than I care to remember, the most challenging of which was a memorable album featuring Gordon Giltrap, Bert Jansch and Vikki Clayton, among others. In my experience, it doesn't matter what type of instrument you're using — a steel-strung or nylon-strung guitar, even a 12-string — the same basic principles apply. The best results are always achieved by working with the natural sound of the instrument rather than trying to make it something it isn't. Mic choice and placement always work better than EQ. And unless you're after something unusual you should only need to add the bare minimum of EQ and compression to add the final polish — this really is a case for applying the old maxim, 'If it ain't broke, don't fix it'. SOS

Adding Extra Attack To Rhythm Guitars

The attack phase of each strum in a rhythm guitar part is often more important to a track than the sustain portion. In such cases, use a gate or expander to duck the level of the less important element of the sound when it comes to mixdown. You'll need to use short attack and release times, if you're going to catch each individual strum, but the amount of gain reduction between peaks need only be small to make a significant change in punchiness. *Mike Senior*

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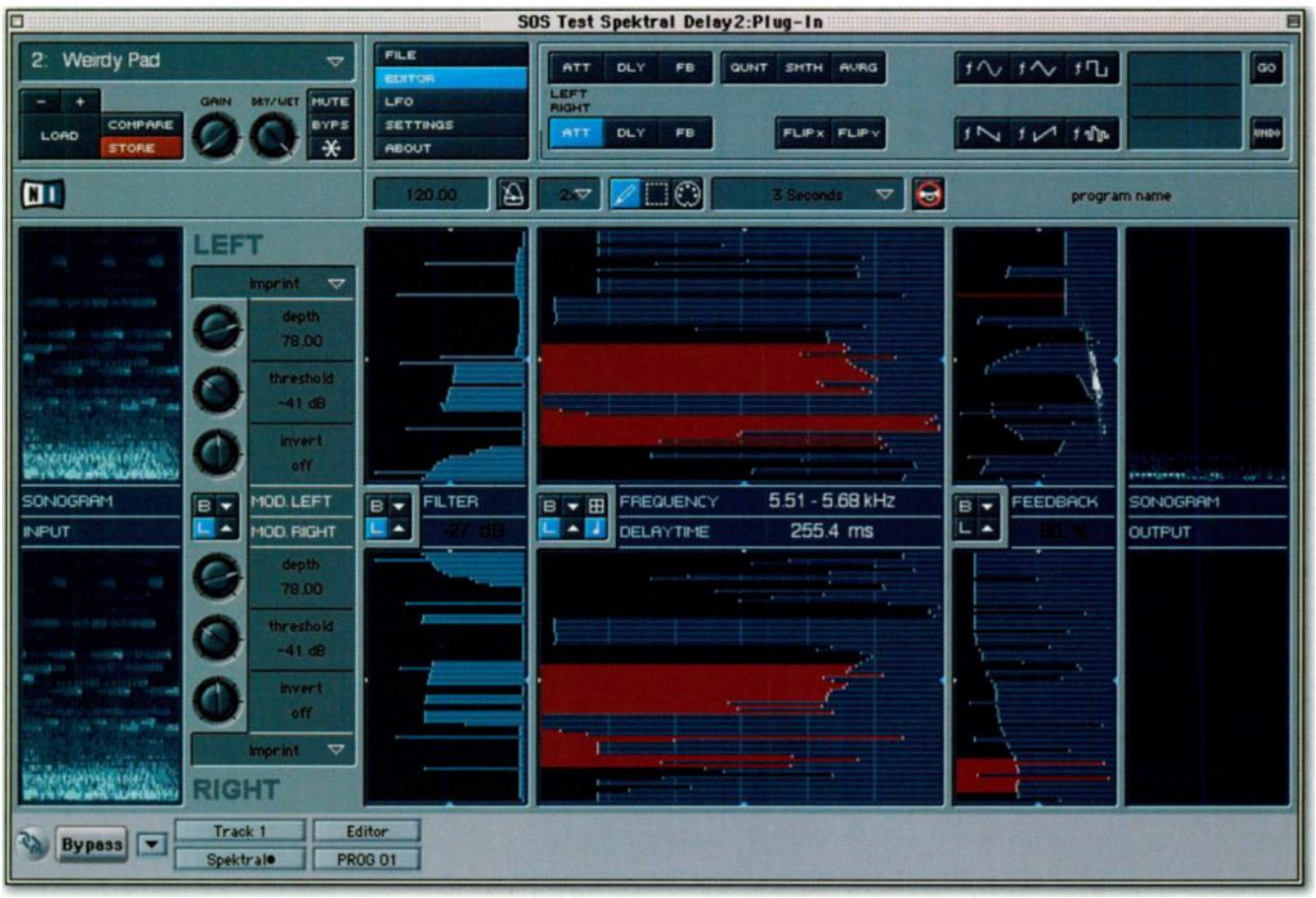
NATIVE INSTRUMENTS
SPEKTRAL DELAY

Most software plug-ins fall into categories that are comfortably straightforward to define, but that's not true for NI's *Spektral Delay* — unless 'weird' happens to be one of your categories! To put it extremely simply, the program uses Fourier mathematics to split standard time-domain mono or stereo audio into up to 1024 frequency bands, which it can then process and delay in various ways before recombining them. Despite its mathematical complexity, the user interface is fairly intuitive and largely graphically controlled, though the correlation between the user's intuition and the audible end result is often pretty loose!

Paul White explores the dark side of effects processing with this innovative software from Native Instruments.

NATIVE INSTRUMENTS *SPEKTRAL DELAY*
FREQUENCY-BASED DELAY PROCESSOR FOR MAC & PC

weird science



Available for both Mac and PC platforms, *Spektral Delay* can either operate in stand-alone mode or work as a DirectX or VST plug-in. Either way, it needs a fairly frisky computer to run: PC users should use at least a Pentium II, while Mac users should use a 300MHz G3 or faster. Those wishing to use *Spektral Delay* as a stand-alone processor will find ASIO drivers included, though to make use of the program's real-time MIDI control facilities on a Mac, you'll need to install the application that dare not speak its name (oh, all right, it's OMS) or MOTU's FreeMIDI. Installation is directly from a copy-proof CD-ROM, and the copy protection works by asking to 'see' the master disc on occasions.

Input Modulation

On opening *Spektral Delay*, you'll see upper and lower windows corresponding to the left and right signal channels, along with a small modulation section, three graphical editing windows and spectrogram displays of both the inputs and outputs.There are, in fact, four separate processing stages, comprising Modulation, Attenuation, Delay and Feedback. The input signal is first analysed into

Other Features

Among *Spektral Delay*'s many other features, it's worth mentioning the 'MIDI plug' icon which can be used to dynamically automate effects. When it is moved, MIDI controller data is transmitted so that it can be recorded to recreate the same performance later. If the output ever gets too chaotic, a single button-press will purge the delay buffer, and of course there's a global bypass alongside the gain and wet/dry mix knobs.

Yet another neat feature is a Freeze button (cunningly disguised as a snowflake) which mutes the input signal and feeds 100 percent of the delay signal back into the Delay Matrix so that the memory contents loop indefinitely. This is very useful for creating long textural washes.

its frequency-domain components, whereupon it negotiates each of the processing sections in turn, and anything that survives is turned back into 'normal' audio at the output. The processing sections in the two channels can be linked or set up independently, and up to three key parameters at a time may be modulated by means of an onboard, multi-waveform LFO. There's also an Editor panel, which allows you to perform certain functions on the six edit matrices (graphical windows) by simply selecting the one you want to change, then pressing the button corresponding to the transformation you wish to inflict upon it. For example, settings can be flipped vertically or horizontally, drawn values can be smoothed, averaged or quantised, or the drawn patterns can be modified (by percentage) using waveform function generators.

At the input, the analysis section breaks the audio into very short sections or frames, each of which is analysed and then represented by amplitude and phase values for each frequency band. The user can choose the number of frequency bands from a selection ranging from 64 to 1024. It's possible to make various changes to the way the signal is analysed and resynthesized, but the factory defaults are fine until you get a little more familiar with what's going on. In the plug-in version, audio tracks are treated directly, while for stand-alone use the software needs either a live input or an audio file to chew on.

The first level of processing is the Input Modulation stage. Like all the other stages, it has its own bypass button and can be linked to the adjacent channel if required. The other common feature is a pair of up/down arrows, which allow settings in the upper window to be copied to the lower window or *vice versa*. Further controls in the master section enable the settings to be inverted. The Modulation effects are definitely not of the ordinary chorus/vibrato/flange flavour. They are all preset frequency-domain treatments with a maximum of three user-adjustable controls per channel, which may be left fixed or set to vary under control of the master LFO. The treatments on offer are:

- Deterioration, which leaves spectral holes in the material;
- Jello Mold, which is spectral inversion linked to a threshold level;
- Pitch Roll, which shifts the frequency bands up or down to produce atonal modulation effects;
- Smear, which blurs the phase structure of the incoming signal;
- TimeSponge, which interacts with the input buffer to produce time distortion effects;
- Foam, which affects the envelopes of the spectral frames;
- Lime Twist, which randomises the order of the frequencies of the incoming spectral frame over time;
- Horse Tail, a frequency-domain comb filter;
- Mini Pulses, which modulates the levels of the frequency bands like a tremolo or pulse gate;
- Imprint, a 'spectral sieve' where frequencies exceeding a threshold are allowed to pass through

NATIVE INSTRUMENTS SPEKTRAL DELAY £100

pros

- Affordable.
- Easy to get interesting results.
- Creates effects unavailable elsewhere.

cons

- Currently 'disagrees' with Emagic's *Logic Audio* when used in virtual instrument tracks, though this may be resolved in a future version of *Logic*.

summary

Spektral Delay is fun to use and capable of producing some extremely interesting and unusual effects. It won't suit all musical styles, but anything with an experimental edge to it could benefit enormously.

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NATIVE INSTRUMENTS
SPEKTRAL DELAY

— although you can also invert the operation to suppress loud frequencies and boost quiet ones;
- Phase Blaster, which scrambles the phase information within each spectral frame.

The results of these processes vary from strange flanging and comb-filtering effects to treatments resembling granular synthesis, so when you first use *Spektral Delay*, it's probably a good idea to bypass all the other stages and just experiment with these for a while.

Attenuation Matrix

Next up is the Attenuation Matrix, which essentially provides level controls for each frequency band — like a really big graphic equaliser. Clearly, changing up to 1024 bands one at a time would be crazy, so in common with the other windows, there's a pencil drawing tool that lets you sketch in curves and spikes very quickly. The display looks like a graphic equaliser tipped over on its side, and using the keyboard modifier keys, different drawing tools are called up. Now, even a 1024-band graphic equaliser doesn't guarantee fun, but the LFO modulation facility allows either the levels and/or frequencies of the bands to be modulated, creating some very dynamic filtering effects. Placing the mouse pointer anywhere in the window displays the attenuation amount and the frequency at the current position. If the two channel windows are linked when drawing takes place, the same shape is drawn into both windows, but it's also possible to draw different shapes into both windows, then link the channels afterwards so that both are modulated by one LFO even though they are set differently. Conversely, you can set different modulation options for the two channels, within the limitation that *Spektral Delay*'s LFO can only modulate three destinations at a time.

Another feature common to both channels and to all three graphical processing sections is that a lasso tool can be used to select a section (or several sections if you use the Shift key) of the spectrum, which can be modulated while the rest is left static.

Into The Matrix

So, the Modulator has chewed up your signal, the Attenuator is applying either fixed or moving filtering — now what? Next comes the section that gives the program its name: the Delay Matrix. Here, the graphical interface lets you draw in separate delay amounts for each frequency band. The maximum delay time depends on your computer and how much RAM you have, but 3 seconds is typical, with 12 seconds being a maximum. There's a quantisation grid (with variable note value) that can be switched on to create tempo-related delays, and the tempo may either be adjusted manually or sync'ed to the host application if it is fully VST 2 compliant. Discrete steps produce interesting spectral echoes, whereas curves or other non-rectangular, non-quantised shapes tend to really mix up the delayed signal, turning entire audio tracks into bells, ambient beds or swirling pads. Again, the LFO can be used to modulate either the delay time and/or the frequency band values.

Finally comes the Feedback editor, which works with the Delay Matrix to provide adjustable feedback levels for the various frequency bands. The closer you draw to the right-hand side of the window, the more feedback is introduced to that frequency band, and yes, you can modulate the feedback depth and/or the frequency band values. With everything being modulated, the screen can end up looking like the jaws of a demonic car crusher, which is quite appropriate given what's being done to your audio!

Ear Of The Beholder

I had no trouble finding my way around the program, though I was stumped at one point by the program's tendency to lock up *Logic Audio* if I tried to use it following a virtual instrument in the signal chain. This is apparently a *Logic* foible that may able to be sorted out in a future version. In any event, it's most likely that the program would be used to treat an audio track, and this caused no problem provided I gave *Logic Audio* a little extra memory. I also tried *Spektral Delay* with TC's *Spark XL* 2.0, and it worked fine.

Spektral Delay is extremely versatile, and used subtly, it can create wonderfully ethereal washes out of just about anything you feed into it. At the same time, rhythm loops can be treated by quantising the delay processing so as to get the effects to reinforce the original rhythm — a great way to 'repurpose' old loops. Some of the more extreme effects can turn drum loops into ethnic bells or conventional musical instruments into granular chaos, and voices can be made to sound very electronic and robotic. The effects often have a resynthesized quality to them, which adds just the right atmosphere for trance-style music, sci-fi soundtracks and atmosphere beds. In fact the musical applications are enormous and the great thing about *Spektral Delay* is that it makes anything you feed into it sound a lot more complex than it really is.

Though it doesn't take very long to find out roughly what type of setting produces what kind of effect, a lot can still be discovered by trial and error. The LFO is the key to the dynamic nature of the effects, and to this end, having more than one LFO feeding more destinations might have been useful, though I suspect the designers were conscious of the amount of processing power needed. However, I would have liked to be able to sync the LFO to a multiple of the tempo, which doesn't seem possible at the moment.

I have a weakness for weird effects, so it should come as no surprise that I like *Spektral Delay* very much. Despite its internal complexity, it doesn't take long to become well enough acquainted with the program to start creating your own effects, and to start the ball rolling, there are a number of factory presets that show off the versatility of this package. If you're growing tired of the usual chorus/echo/flange/pitch-shift/reverb stable of effects, *Spektral Delay* will delight you with its capacity for strange beauty. Go on, you know you want to! SOS

Patch Storage

Setup snapshots can be stored as you go along, and if you're using *Spektral Delay* as a VST Instrument, these are transferred to your sequencer Song so that they are automatically recalled when you reopen the song. Up to 64 presets can be stored in the host application depending on its capacity. In addition to the presets system, it's also possible to save patches conventionally to disk, where they are stored as programs and banks. An integral Bank Browser shows 16 patches at a time, while buttons A, B, C and D flip through four sets of 16 patches. Patches may be freely copied from disk to the active memory using the Store button in the global control panel, making it easy to construct custom banks of effects.

"The effects often have a resynthesized quality to them, which adds just the right atmosphere for trance-style music, sci-fi soundtracks and atmosphere beds."

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BOSS SP303

sample surgeon

BOSS DR SAMPLE SP303 PHRASE SAMPLER

Boss were one of the first companies to make a compact, budget phrase sampler, in the form of the Dr Sample SP202. Similar products soon followed from other manufacturers, but now, three years on, Boss are making their bid to regain the lead. **Chris Carter** examines this newly qualified Doctor...

The Dr Sample SP303 is an updated version of the original SP202, which I reviewed for *SOS* back in 1997. Although it seems like only yesterday that I was unpacking the SP202, three years is a long time in the changing world of electronic music gear, and as with many pieces of kit that are upgraded after a few years, some features on the new SP303 have improved while others have been omitted, presumably to save on production costs. Gone, therefore, are the built-in microphone and battery-power option of the 202, but the overall capabilities have been greatly enhanced, and now include resampling, a sequencer, more effects and real-time controls; and all of these are presented in a smaller, neater unit.

Though all samplers can sample, the SP303 belongs to that distinct variety known as phrase samplers. Fully featured samplers can play back loops and phrases like the SP303, but they can also map samples of individual notes chromatically across a keyboard to emulate a real instrument. The SP303, like the SP202, is not capable of this, and is therefore clearly aimed at users who are content to play back sampled loops or phrases at the speed at which they were sampled.

Appearance

Although this Dr Sample has roughly the same footprint as its predecessor, it is less brick-like, with a noticeably slimmer profile. The busy top-panel control surface utilises Roland's now-familiar illuminated rubber multi-function buttons for sampling, editing, bank selection, sequencer functions and general housekeeping duties. The lower section of the top panel includes eight large sample pads, which also double as sequencer Pattern selectors, while the upper half contains the output and effects section. In addition to a Volume control, the SP303 sports three additional real-time controller knobs (pictured below) labelled Cutoff (Ctrl 1), Resonance (Ctrl 2) and Drive (Ctrl 3) for tweaking the standard 'Filter+Overdrive' effect, but whose functions also vary depending on the current mode of operation.

Compared to the control panel the rear connections are minimal but functional, with just two pairs of stereo phonos for line input and output, a single MIDI input socket, an On/Off switch and a 9V socket. At the front end of the unit are a quarter-inch microphone socket, a small recessed Mic Level control, a headphone socket, and a SmartMedia memory card slot. ▶

BOSS SP303 £299

pros
- Expandable memory.
- Excellent sound quality.
- Improved effects.
- Useful resampling feature.
- AIFF and WAV compatibility.

cons
- Only one effect at a time (although you can resample with effects).
- Limited three-digit display.
- Basic sample- and pattern-editing options.
- Doesn't include the SP202's built-in mic, battery option or sample CD.

summary
Although it loses a couple of the SP202's minor features, the SP303 has greatly improved memory options, effects and sample editing. Additional features such as the Pattern Sequencer, more real-time control knobs and its neater size make this a cost-effective and attractive desktop phrase sampler. Just don't expect too much from the limited LED display.

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A couple of useful extra features are the lockable cover for the SmartMedia card, and the slot on the rear for attaching a Kensington security cable. These are relatively basic security features, but should help to deter chancers from walking off with your precious Dr Sample and its contents.

Memory & Sample Storage

The sample and sequence memory is divided across eight pads using two internal banks and two card-based banks, giving a total of 32 samples when a SmartMedia card is in the slot (see the 'Specification' box opposite). Using just the internal memory, which is less than 1Mb, you get approximately 30 seconds of 44.1kHz mono sampling. However, slip in a 64Mb SmartMedia card (which cost between £50 and £70 in the UK from high-street electronics or camera retailers), and sampling times jump to an incredible 33 minutes of 44.1kHz mono sampling (around 15 minutes in stereo). This is an astounding amount of sampling time for such a small and relatively basic sampler — although as on the SP202, the samples you store are data-compressed by a proprietary Roland algorithm. With such sample capacity, you can hold sway over banks full of high-quality loops or, equally, have complete stereo mixes at your fingertips.

A useful memory-related feature is the SP303's ability to import AIFF and WAV audio files from the memory card. To achieve this, you need a SmartMedia card reader for your PC or Mac. These are available in various forms, the most popular being USB readers for desktop computers and PCMCIA types for laptops. A card reader shouldn't cost more than £40 to £50 in the UK, but could save time in the long run, as you could then use a software editing package to trim, tidy and normalise samples on your computer (these are all features that the SP303 isn't great at), and then import the finished work to the SP303 via the SmartMedia card. This would also allow you to keep sample backups on your computer.

However, there is a significant limitation on the import feature; samples can't be shorter than 100 milliseconds or longer than 30 seconds. This is because the import process works by copying standard AIFF or WAV files from the card into the SP303's small internal memory, while simultaneously converting them to Roland's proprietary compressed sample format. This process is slow — up to 10 minutes for a full-length sample — but once converted, the sample can reside in the Dr Sample or be saved back onto a SmartMedia card in SP303 format for instant playback and manipulation.

Sampling, Resampling, & Effects

Sampling itself is straightforward and relatively logical. Connect an audio source (for example, CD or mixer) to the rear phonos or a microphone to the front socket, press the Rec button, choose a bank and a sample pad, press Rec a second time and you are sampling. Sampling options include mono or stereo and normal or long/lo-fi quality. There is also an Auto setting that only commences sampling when the input detects an audio signal.

Sample playback and editing options have seen improvement since the days of the SP202. Apart from the usual Reverse, One-shot or Gate, Looping and Non-looping sample-playback modes, the SP303 also offers adjustable sample time, tempo, level and start and end points. Sample editing is carried out by ear using the Ctrl 1 knob for the Start point and Ctrl 2 knob for adjustments to the End point. A separate start/end-point Mark button also allows trimming while looping 'on the fly', although this can be a bit of a hit-and-miss affair.

Each sample has its tempo in bpm displayed when triggered, calculated from the sample length. Unfortunately, as a loop is topped and tailed you can't see its new tempo until you exit Edit mode.

Time/BPM is a nice sample-editing feature, a time-stretch facility that works in real time (even the stretched tempo is displayed in real time!). Unusually for a budget sampler, the SP303's time-stretch option is independently adjustable (from 50 to 130 percent) for each sample. Used with the right material and in moderation, it can sound quite passable, and although the effect can get lumpy at extreme settings, this is not a bad thing for certain effects.

A new Dr Sample feature making a welcome appearance is resampling, an underrated sampling option in my opinion. Resampling allows you to re-record existing samples to a new sample pad, but with added effects or at a lower sampling quality to save memory, or after you have applied sample-editing options such as Time and Tempo. This is also a useful way of applying different effects to different pads — something the SP303 isn't normally capable of. And because you can resample multiple pads at once, it's possible (with a SmartMedia card) to use this function as a crude form of multitrack recording, mixing down your pad playing onto an empty pad in a similar way to track bouncing.

Resampling on the SP303 is almost as easy as ordinary sampling. You prepare and edit your samples and add any effects, then select an empty pad to resample onto. After hitting the Resample and Rec buttons, you simply play away to your heart's content. And you still have all the usual sampling options, such as Lo-Fi or Normal quality, and mono or stereo. The only noticeable limitations are that you can't resample across banks (as you can on ▶

Spec Check

BASIC SPEC
- Polyphony: Eight mono voices (or four stereo voices).
- Effects: 26 types (see separate box).
- Connectors: Left and right line in phono sockets; left and right line out phono sockets; stereo quarter-inch headphone jack; mono quarter-inch microphone jack; MIDI input.

INTERNAL MEMORY
- Sampling capacity: 16 samples (in two banks of eight); 16 patterns (in two banks of eight).
- Pattern capacity: 7500 notes; 16 patterns (in two banks of eight).

CARD MEMORY (8-64Mb SMARTMEDIA)
- Sampling capacity: 16 samples (in two banks of eight); 112 samples (in two backup banks of seven).
- Pattern capacity: 7500 notes; 16 patterns (in two banks of eight); 112 patterns (in two backup banks of seven).

The front-edge panel allows convenient access to the headphone jack, lockable SmartMedia slot, mic level control and mic input.

The rear panel, from left to right: the 9V power socket, Kensington security cable slot, Power On/Off switch, the solitary MIDI In, and the Line Out and In phono sockets.

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▶ Roland's SP808) and you can't play the sequencer and resample at the same time. Now that *would* be fun...

The effects bank is a major improvement on that of the SP202 and includes 26 effects rather than the 202's measly five (see the 'Effects' box opposite). The effects can be applied (albeit only one at a time) to individual samples, or globally, or to the input signal — so you could use the Dr Sample just as an effects unit. Five effects have dedicated buttons (Filter, Pitch, Delay, Vinyl Simulator, Isolator) while the 'MFX' button allows you to access the remaining 21; a handy numbered list printed below it reminds you which number relates to which effect.

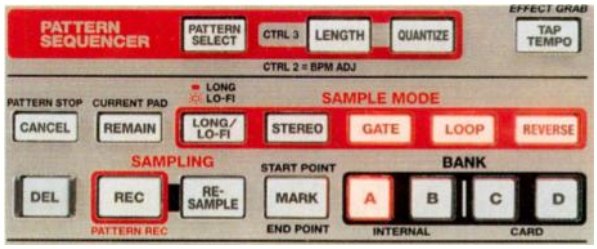
As I mentioned above, each effect has three adjustable parameters using the Ctrl 1-3 knobs. The effects cover fairly standard but useable budget types, as well as a few specialist effects like Voice Transformer, Slicer and Centre Canceller. The Voice Transformer effect is a (very) slimmed-down version of the Roland VP9000's much over-used keyboard effect. This version has a distinctly lumpen quality; it tries hard and does the job, but only just. Other effects include an Effect Grab feature for momentarily switching effects in and out of a mix and a Tap Tempo button, so you can sync effects to the tempo in real time.

The somewhat inscrutable three-digit display, together with the five direct buttons for accessing effects. The other 21 effects are handily listed on the panel underneath for reference.

Pattern Sequencer

The 7,500-note Pattern Sequencer is relatively basic and functional but a useful addition nevertheless. Up to 32 patterns (between 1 and 99 bars long) can be recorded and saved across the four banks. The sequencer can be started and stopped by, and sync'ed to, an external MIDI sequencer. Step-time recording, however, isn't an option.

Pattern recording is carried out in Loop mode (the number of bars per loop is programmable) and achieved by playing the sample pads in time to a metronome click and using one of four quantise values. Pressing the Pattern Record button activates the metronome and a four-beat countdown in the display, which then shows a continual count of the current position in the bar loop. Editing finished Patterns, as with sample editing, is a bit of a hit-and-miss affair; it has to be done in real time, and it can be all too easy to lose track of your current position when editing long loops, as the display isn't detailed enough to indicate exactly where you are.



The pattern sequencer, sampling and bank selection (card and internal memory) controls.

Thankfully, pattern playback is straightforward, being accessed via the Pattern Select button, and changing from one to another is literally just a matter of selecting the relevant pad. A nice touch is that if a pad is flashing, then it contains a sequencer pattern. It is also possible to play samples manually (via pads or MIDI) while a pattern is playing, including samples from another bank.

Conclusions

I'm not as blown away by this Dr Sample as I was by the first, but that's really only because there wasn't anything else quite like the SP202 around three years ago. I can think of at least half-a-dozen people to whom I personally recommended the SP202, and most of them bought one and were happy with it.

However, the new SP303 is now also competing with the Korg Electribe-S and the Yamaha SU200, which are both fine budget samplers with lots of features. The SP202's three-digit display is unchanged on the SP303, and its limitations are particularly apparent alongside the newer machine's improved sampling, sequencer and editing features. But then again, both Korg and Yamaha's budget samplers also have this cost-cutting display. I would like to have seen velocity-sensitive pads on the 303 (although it does respond to velocity over MIDI), as well as the ability to play samples chromatically across a MIDI keyboard. Mind you, even the SP303's big daddy, the Roland SP808, doesn't have these features.

Having said all that, I do like the new Dr Sample. Using SmartMedia for expandable sample and pattern memory storage is a brilliant idea, as is the option of AIFF and WAV sample import on a sampler in this price range, even if it is a bit slow. Sampling quality at the highest 44.1kHz, stereo setting, while not quite at CD standard due to the use of data compression, comes very close — in fact, for me there is something about Roland's data-compression technique that lends sounds a certain punchiness that I like. Finally, pretty much every function is never more than a few button pushes away, and apart from when using the display for editing, it is easy to figure out what's going on at any time, even in darkness, thanks to the highly illuminated front panel (DJs take note!).

Overall, then, I would be happy to recommend the Dr Sample SP303 as a good-quality, budget phrase sampler. SOS

Approximate Mono Sample Time

Capacity	@44.1kHz	@22.05kHz	@11.025kHz
8Mb	4 minutes	8 minutes	25 minutes
16Mb	8 minutes	16 minutes	50 minutes
32Mb	16 minutes	33 minutes	101 minutes
64Mb	33 minutes	66 minutes	202 minutes

Effects

- Filter+Overdrive.
- Pitch.
- Delay.
- Vinyl Simulator.
- Isolator.
- Reverb.
- Tape Echo.
- Chorus.
- Flanger.
- Phaser.
- Tremolo/Pan.
- Distortion.
- Overdrive.
- Fuzz.
- Wah-Wah.
- Octave.
- Compressor.
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- Ring Modulator.
- Chromatic Pitch-shifter.
- Voice Transformer.
- Centre Canceller.

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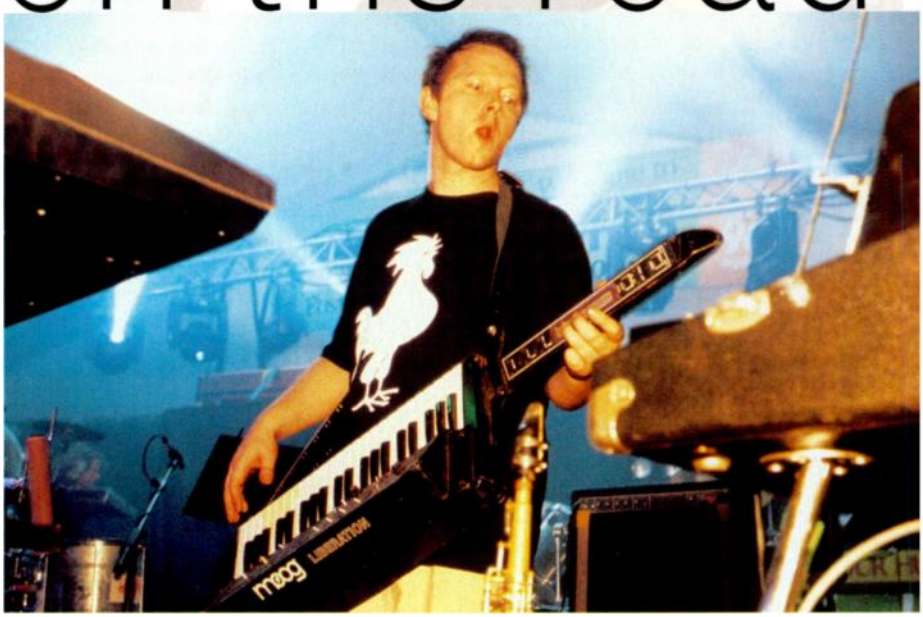
midi on the road



PART 1: DESIGNING THE RIG

Being a MIDI-based musician doesn't mean that you can't get out and play live gigs; you just need to plan more carefully than the average pub band. Grizzled live MIDI veteran **David Harman** explains the pitfalls and outlines some of the preparation you need to take your show on the road.

If you were to wander around any medium-sized town centre on a Friday night, moving from this live music venue to that and observing the gear used by the bands, you might be forgiven for concluding that the MIDI revolution had never happened.

The technology that we all know and love has allowed us greater production flexibility and a wider sonic palette than ever before, resulting in the creation of innovative music in hundreds of darkened bedrooms and project studios around the country. However, with every piece of new hardware we add to our rigs, it seems we are less and less likely ever to venture out of the studio with that kit. Indeed, the very idea of tearing a studio MIDI rig from its comfortable moorings and shoving it in the back of a van for later reconstruction in the local village hall is enough to make some people dive behind the sofa and refuse to come out.

The positive side of live MIDI is all very well: you get to stand on stage, pumping your electronica to an adoring crowd through a gargantuan sound system. Unfortunately, for most of us this exciting thought is tempered by the nightmare vision of a sequencer stopping mid-song, resulting in a silent stage and you looking a complete herbert.

This fear of embarrassment and/or disaster is what prevents many MIDI musicians from performing live, and this is a great shame, since, with some careful preparation, many of the common pitfalls can be avoided. This article aims to identify and address some of those pitfalls, and to offer some practical hints and tips that should make the big day go as smoothly as possible. Of course, depending on your style of music, the makeup of your band and the type of gig at which you'll be performing, you may choose to ignore some or all of the ideas and suggestions in this article. Hopefully, though, the topics covered here are sufficiently generic to help you, whatever your musical preferences.

Whether you're heading out there to get noticed, explore new musical avenues or just to have a laugh, the same basic principles apply:

- Anything that can go wrong will go wrong;
- Even things that absolutely *cannot* go wrong will have a damn good try.

You should also take it as read that when things do go wrong, they will do so at the worst possible moment. It is extraordinary how equipment that has provided many months or years of happy service will suddenly decide to go feet-up in front of a festival crowd.

Given that this is the case, your mission in preparing a live MIDI rig is to identify in advance the possible failure points, 'design them out' of the system where possible, and prepare viable live workarounds for those failure points that cannot be avoided. Rather than stopping you from going out live, the fear of disaster should fuel your preparations.

Consolidating Your Gear

The starting point for the mission is to select the gear that is going to accompany you on to the stage. Although this may seem an obvious choice — you're going to use your *own* stuff for a gig at the Bull & Gate, not hire Pink Floyd's PA, after all — it may not necessarily be a case of simply taking

"The starting point is to select the gear that is going to accompany you on to the stage. Although this may seem an obvious choice — you're going to use your *own* stuff for a gig at the Bull & Gate, not hire Pink Floyd's PA, after all — it may not necessarily be a case of simply taking the gear that was used in the original creation of the songs."

the gear that was used in the original creation of the songs. While you *could* just bundle your entire studio into the back of a Nissan Sunny, this is rarely a good option, for two reasons: first, the time available for setting up at the venue is usually at best a few hours, but often significantly less than that; and second, every additional element in your rig is a potential risk, and increases the probability of something going horribly wrong.

The main goal of any live MIDI rig is to achieve, in a reliable and transportable manner, the required sound with the minimum of equipment. Only once that criterion is satisfied should you move onto the much more interesting business of choosing any extra gear that either looks cool or is fun to use. The key to achieving this goal is *consolidation*.

First, consider your sound-generating devices. It's important to take a step back from your close involvement with the tracks, and approach this issue from the point of view of the punter in the audience — it's what *they* hear that's critical, not how it is created. At the same time, you have to balance this against a sense of what the minimum gear for your requirements could be. If you can consolidate your system down to a master keyboard, sequencer, sampler and a rack synth and still have your set sound good, that's great.

One obvious way to proceed down the path of consolidation is to put as many as possible of the parts which are played by multiple synths in your studio into a smaller number of multitimbral synths. When doing this, consider how many memory locations you intend to use in total. If it's possible to keep the number of patches required on the night within the RAM capacity of the unit, and store all the patches required in a single Bank, that will reduce the amount of SysEx uploading required from track to track, and make backup of the data much simpler.

If you intend to use a synth multitimbrally that normally produces just one sound in the studio, take care in selecting and building the patches for each song, as you could end up inadvertently making life very difficult for yourself. Just how difficult will depend on the synth in question.

The ideal scenario is a unit that can sit in a MIDI multitimbral mode (often called Multimode), and receive independent MIDI Program Changes on each MIDI channel (even this can be limited, though, as you are usually restricted to basic patches, rather than the more complex layered incarnations of those patches which may exist in single-sound mode). If a Multimode is not available, you may find that you have to make special Combination presets that contain the various patches you require for each song, and recall that Combination on the unit's global MIDI channel.

To avoid unfortunate problems, decide in advance which method best suits your equipment and live requirements, and stick with it for the whole set. You may find yourself sacrificing some finesse in places, but this will be compensated for by retained sanity later on.

Problems can also arise when moving parts from one synth to another. Overloading the polyphony of a synth will obviously cause note-stealing. Using too many sounds from one unit can also result in certain sounds no longer getting their original effects, since many multitimbral synths have only a limited effects capability when in multitimbral mode.

One way around these problems is to get yourself a multitimbral sampler, if you do not already own one. The workhorse of the live MIDI rig, a modern sampler enables complex sound structures to be recorded and replayed as a single note. For example, four bars of programmed percussion, complete with effects, dynamic information and continuous controller data could be recorded as a single stereo sample and retriggered as necessary with a single Note On command, saving not only a huge amount of note data, but (if the percussion sounds were originally in that same sampler) also freeing up a significant amount of valuable sampler polyphony. To take another example, a sampled vocal hook that was ▶

The Hard Way — Using Hardware Sequencers

Since all you require from a sequencer on the live stage is that it stores MIDI data generated in the studio and plays it back, hardware sequencers can be the ideal choice for live MIDI playback. They're physically sturdier than their computer-based counterparts, and their dedication to MIDI playback also tends to make them less susceptible to timing glitches.

You may already have a hardware sequencer in your rig, integrated into a synth workstation. Although these may not be as instantly user-friendly as some of their stand-alone counterparts, most will still do the job required of them live. The only criteria are: sufficient memory capacity to store your single most MIDI-intensive song, the ability to record and play back multiple MIDI channels simultaneously, built-in support for Program Change and Continuous Controller messages and the ability to send selected tracks from the workstation's MIDI Out, on the specified channel, to other kit in your rig.

If you do not already have a hardware sequencer, and intend to play live on a regular basis, it might be worth buying a second-hand unit. A decent dedicated multitrack hardware sequencer can be picked up for around £250. If buying for this purpose, make sure that the unit you choose can handle simultaneous multi-channel recording (ideally onto multiple tracks), or import MIDI files (ideally the multitrack Type 1 kind). If you need to send patch information via System Exclusive messages, it will also need to support that data type.

If you find that the limitation of your hardware sequencer is its maximum note capacity, consider sampling some complex parts, especially note-guzzling percussion patterns. Apart from easing the stress on the sequencer, this has the added benefit of freeing up valuable sampler polyphony for the 'ghost' track duties described in the main article.

You could also consider a MIDI data filer, which does not think in terms of MIDI sequencer 'tracks', but simply records the whole MIDI data stream for later playback. This can simplify the transfer of data into the unit, but the downside of this approach is that you have very little control over the playback of MIDI data live — the filer either plays or it doesn't, and the resulting lack of individual track muting can rule out some of the more cunning backup techniques described in the main article. Furthermore, most data filers only have a single MIDI Out, so 16 channels is their limit. If you're driving more than that, you'll need to go for a multi-port hardware or software sequencer.

▶ sent off through a cascading chain of effects in the studio can be sampled and triggered as bar- or note-long blocks, as appropriate.

There is a trade-off, of course. Every time you resample a section of a track, you lose some creative control. To take the example of the percussion, you will have general level control of the complete sample, but will no longer be able to mix the individual elements of the track against each other. Another problem is that, however carefully you sample the original sounds, you will inevitably lose some character, particularly from analogue devices or heavily filter-swept sounds. Furthermore, sampling sounds with effects and looping them can be problematic, as tails can be cut off.

Aside from the purely technical issues, there's a moral one, too: that nagging feeling that in sampling the frantic thrashing of your beloved monosynth you're 'cheating' the audience. The synthesizer purist in you knows that it will never sound quite the same, but does the success of the song really hang on the difference between the original sound and a sampled imposter? Everyone's view on this will differ; if it's a problem for you, you'll have to take more gear to reproduce the parts you consider crucial. But remember; generally speaking, the less gear you use live, the better.

Live Sequencing

For most MIDI musicians going out live (ie. those of us who aren't Rick Wakeman, and won't be playing 17 synths at once by ourselves), there is a fundamental question that I haven't yet addressed: what kind of sequencer should you use to run the backing? The majority of today's studio musicians use software sequencers running on PCs or Macs. In MIDI playback terms, of course, a software sequencer will perform the required tasks for a live concert admirably, but there are other considerations...

The live environment is not computer-friendly: the gear on stage can experience extreme heat (lighting being the usual culprit), intense vibrations, dust, liquid spillages, and rough treatment. Synths and samplers are designed with these threats in mind — most computers are not. Add to that the transit risks and the ever-present possibility of a software crash, and the computer-based option sounds ever-less attractive.

And the reasons for the decline of the studio-bound hardware sequencer in favour of the software alternative are precisely the reasons why they are great for live work. They have no complex graphical editing capabilities, and so have no need for a monitor. They depend on loading songs into memory from floppy disks (although some will also spool from floppy if memory is limited) and thus do not require a hard disk. Of the few dedicated controls on the front panel, at least two are always Stop and Start, and they're usually pretty chunky — ideal for the stage. If your material allows, therefore, I would always recommend a hardware sequencer over a software alternative.

However, the sequencer in your studio may not be handling MIDI note data alone. It might also be acting as a complex, multi-channel MIDI router, for example. Moreover, you may be using the sequencer for audio recording in the studio. If so, you could consider using live vocalists (they tend not to crash so much) or think about transferring the audio to a sampler for MIDI triggering. Depending on the type and intensity of audio recording, this may prove impractical, and you may end up taking the PC after all. Using a PC is not ▶

Live Case Study 1 — David Harman

My early experiences of using MIDI gear live were undertaken with little or no regard for the risks. The first time I put a live rig together was in the early '90s, when our (then) three-man electronic group was asked to perform at a local multi-band gig. As it was our first time playing live as a band, we thought the easiest way of recreating our sound was to take our entire studio with us.

The sequencer in our Roland D20 drove its own internal sounds, plus an external sampler in my kit, and a Yamaha RX5 drum machine and Ensoniq Mirage sampler in the other half of the rig. Bizarrely, the D20's sequencer would only send MIDI data to its MIDI Out to drive external units if the appropriate sequencer track was *muted*, so every song began with me faffing about setting some tracks into mute and some open. Also on stage was a Roland SH101 analogue synth whose internal step sequences were being triggered by the pulse clock output of the RX5 drum machine.

Flush with the exuberance of youth, we not only had faith that the SH would chase the drum machine accurately, but also thought nothing of one of the band reprogramming the step sequences live on stage between songs, while I manually sorted the D20 on the other side of the stage.

It was utter, utter madness, but thanks to the stoicism of the poor soul programming the SH, we somehow made it through the night, and only later did we realise how daft we'd been. However, with the exception of a clarinet sound unexpectedly replacing a synth lead for a couple of bars, and our Mirage deciding to ad-lib a short sampled electric guitar note at regular intervals during one of the load times, the set worked, and we all tasted for the first time that unique thrill of playing live.

How Live Is Live?

When designing your rig, consider carefully how much real-time control you might require over the elements in each of your tracks. That long filter sweep and those resonance tweaks that you performed manually when going down to DAT — do you want to 'perform' them live on the night, or could they be sequenced? For some artists, frantic live tweaking of their analogue synth arsenal is an inherent part of their live persona and stage appearance, and the challenge of getting it all there in one piece and making it work is part of the fun. Although configuring those types of rig has caused me an enormous number of headaches in the past, I have to say that they do end up looking and sounding fantastic, and ultimately reward all the effort.

Even if you shy away from this all-out approach, it's a good idea to keep at least one part live in each track; it keeps you focused on the job at hand and keeps the adrenalin flowing. Furthermore, it's amazing how just a single live part plus a live vocal can bring even a heavily sequenced or pre-recorded backing 'alive'.

Having said this, if you intend to play stuff live, it is recommended also to sequence the parts you intend to play on a muted track on your sequencer, so that you can free yourself up in case of problems.

From a rig-design point of view, then, decide early how much live input you wish to have, and the form that input is to take. Will you play some synths directly as and when necessary, or will you just be playing notes from a single master keyboard, and repatch or rezone that unit from song to song?

If so, do you need to move around the stage during the performance? If you do, it's worth considering a remote strap-on MIDI keyboard. Whether these look seriously cool or utterly ridiculous is a matter of personal opinion, and depends in part on how they are used, but they do at least offer some freedom.

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impossible, of course: with careful flightcasing and intelligent handling, software sequencers can be fine, but it's worth considering the hardware alternative at the planning stage (for more on this, see the 'Hard Way' box elsewhere in this article).

If you *do* choose the software option, I would strongly recommend a UPS (uninterruptable) power supply (about £100 for a typical computer unit). These are essentially large rechargeable batteries that sit between the mains supply and your computer (or any other gear that has load or boot time, such as samplers). In the event of temporary power failure, the UPS will keep your machines alive for the few crucial moments or even minutes until power is restored. In addition, most units also offer mains filtering that helps protect against spikes and surges.

Covering Load Times & Emergencies

Those of you lucky enough to own a sampler stuffed with RAM may be able to load your entire set into memory and never need to load again. For those with more modest samplers or single-song sequencers, there will be loading time during the set. Although this may only be a minute or so, every dead second on stage feels like an eternity. To counteract this, it's a good idea to have some filler material ready to cover these gaps.

If you have a second, less-capable sampler in your studio, one way to fill the gaps on stage is to load a small group of looped samples into that unit at the start of the evening, and trigger them manually on stage by holding a key as required. Your choice of filler material will depend on the style of your music — you could use an ambient swirl, some distorted half-speed dialogue, or perhaps a slow, grooving drum break. With a little creativity, what starts as a covering exercise can become a distinctive part of your set. As long as *something* is coming through the speakers, you've got a good chance of holding the crowd.

If you have a vocalist, then they should also be able to help fill the gaps. If they've only worked with you in the studio before, make sure they know exactly how long your loading time is expected to be, so they don't keep turning round to you with a weary expression and asking whether you're ready yet.

A related issue is what preparations to make to guard against emergencies. I have found that if you have critical sounds in a track being generated by analogue synths, then (providing your sampler polyphony and memory allows this) it's worth sampling these elements into spare sampler channels. You can then create 'ghost' MIDI tracks in the sequencer that play exactly the same data as the main analogue synth track but are muted when the sequence loads.

This covers you in the event of one of the analogues refusing to perform — you just unmute the ghost sampler tracks on the sequencer and carry on. Sure, what emerges may not have quite the character of your original song, but it certainly beats having to assemble an acoustic guitar version of your stomping dance classic on the spot.

This is a neat trick for safeguarding against the loss of individual units, but (moving up the scale of disasters a notch) what if the sequencer or any critical item should fail to load or run as expected, or indeed fail completely? Firstly, you're going to need some time to address the problem. How long you can keep the crowd happy in these situations depends upon the ad-libbing and/or street-entertainer skills of your vocalist (if you have one), or on the effectiveness of your load-time fillers.

To cover this eventuality, it is a good idea to carry an audio duplicate of your rig's output on DAT or CD. Note that this should contain the *rig output* only, not your whole set, since if you have a vocalist on stage, they should still be up and running even if the sequencer's died.

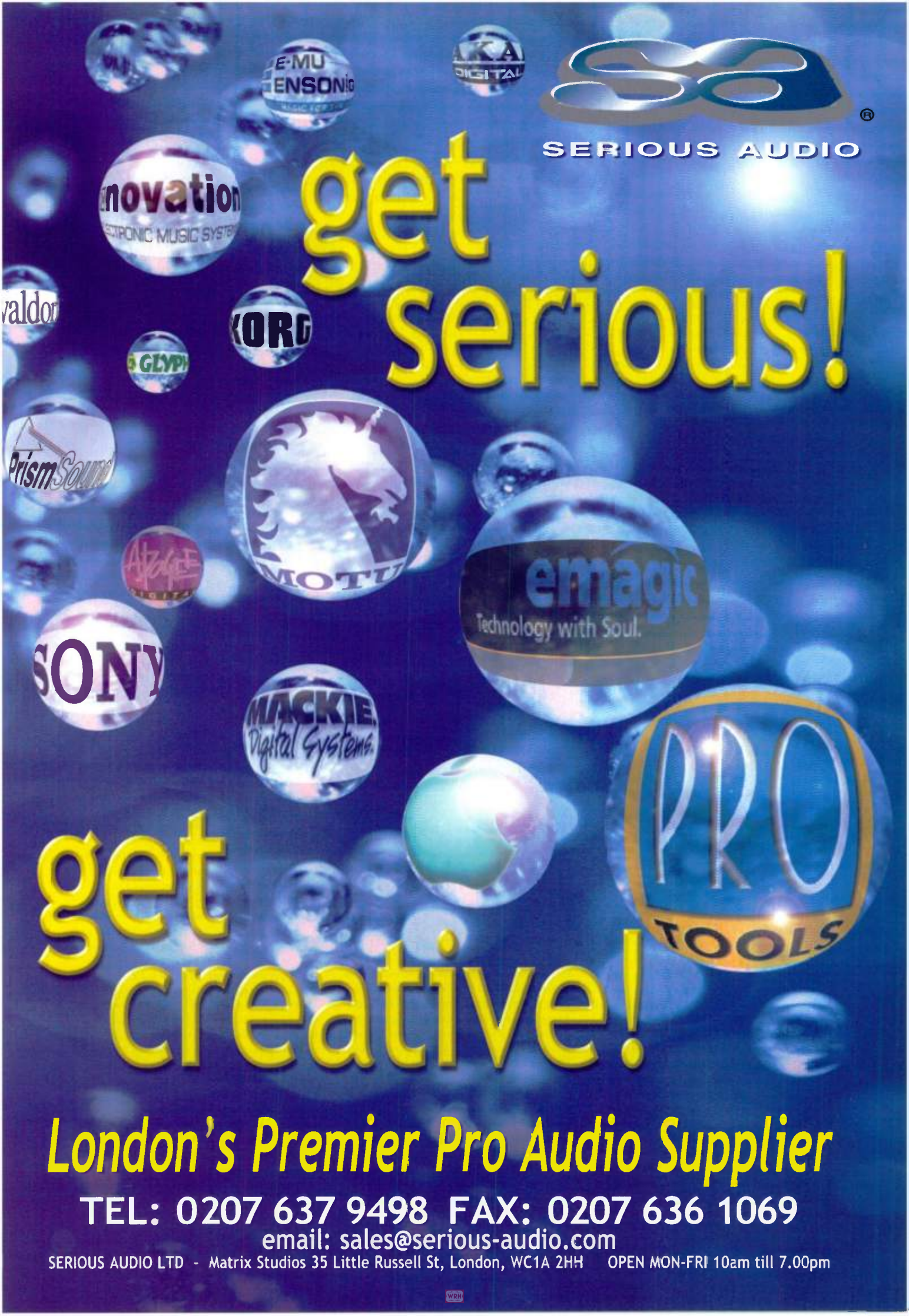
However, even if you carry such a life-saver, you're still going to need some time to recognise and deal with the problem — in this case, by noticing your ailing sequencer, scooting to the appropriate backing track on your CD and hitting Play. If you are on stage with others, agree on a subtle hand signal that you can give them to make them aware you have a problem, and on a course of action to take in those circumstances. Potentially, if it's been pre-agreed amongst you, the vocalist can then continue the set with the backing CD while you investigate the problem, and the audience may never even realise (although they might spot the problem when you smash the sequencer to the floor and jump up and down on it). Whether you feel that this is 'cheating' is entirely up to you. If it's the kind of gig that can be stopped, and you would rather do so, then go ahead — the above is a workaround only for those gigs that have to happen there and then.

The playback device (CD or DAT) could also be employed for playback of an appropriate intro piece. If you want a minute or so on stage to check stuff or prepare your playing position, an intro track can be a useful way of keeping the crowd happy and setting them up for your musical style.

Mixing Issues

At some point, all your signals are obviously going to have to be mixed together. If it's a gig of reasonable size, there may be a front-of-house sound engineer (more about this next month) with their own mixing console, but since most of their work will be for more conventional bands, their console will usually have space only for a single

"The general rule is to presume that you are handling all music submixing unless invited to do otherwise. This is ultimately a good thing, as you retain complete control over your music mix at all times."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stereo keyboard pair, or if you're very lucky, two stereo pairs. They will be none too chuffed if you appear at the console explaining that you'd like them to mix down your 32-channel synth extravaganza.

The general rule here is to presume that you are handling *all* music submixing unless specifically invited to do otherwise. Although it means more equipment, this is ultimately a good thing, as you retain complete control over your music mix at all times. You will therefore need to include in the rig a mixer with sufficient input capability to handle all of your sources and mix them down to a single stereo pair.

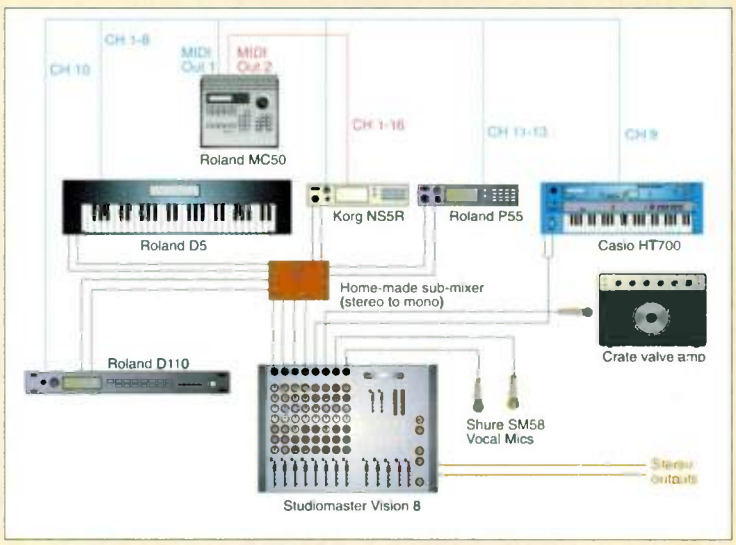
Live Case Study 2 — *SOS* Assistant Editor Tom Flint

The Afterthought live, 1998: Colin Williams on vocals, and Tom Flint on guitar.

I was in a two-man group, The Afterthought, which performed a sort of indie rock, with me supplying live electric guitar, my friend Colin Williams on vocals, and the rest of the backing made up of programmed drums, bass keyboards, piano and sound effects.

We had always intended to take our music out live, but didn't have the money to buy separate studio and live gear, so all of our recording equipment was chosen with the intention of using it in both situations. A lot of our material was sequenced to make up for our lack of band members, so we made sure we could use the same sequenced material live that had been programmed for recording our demos.

At the heart of the setup was a Roland MC50 hardware MIDI sequencer, which drove the drums and all the keyboards. For drum sounds, we used the rhythm sounds in a Roland D110 sound module. Although not perfect, the rhythm programming section on the MC50 (a cut-down version of the pattern-based rhythm-programming interface from Roland's R8 drum machine) provided enough control for our needs, so we did without a separate drum machine. The bass, organ, synth sounds and most other mid-range MIDI parts were from a Roland D5 keyboard (originally, we did most of our sequenced work exclusively on the D5, but getting the D110 and assigning the drums to that freed up more D5 polyphony). Piano and harpsichord came from a Roland P55 piano module, and a Korg NS5R handled additional sounds. We also used a Casio HT700 home keyboard, which has just one MIDI channel, but some useful sound-editing facilities. Our modules and sequencer were fixed into a portable rack which also contained a Studiomaster Vision 8 eight-channel powered mixer.



A diagrammatic representation of The Afterthought's dual-purpose live/studio setup.

In our home studio, all of the keyboards and modules, plus vocals, backing vocals and my guitar were routed through the powered mixer and then to speakers, which enabled us to practise and record live demos. Having just eight mixer channels on the Vision 8 mixer (six mono and two stereo) to cope with stereo outputs from the HT700, D5, NS5R, P55 and D110, we had no choice but to sum left and right keyboard channels to just one mixer channel for the majority of the keyboards, so we built a small submixer ourselves to do this. When playing live, our vocals went straight into the venue PA and the guitar cab was miked straight to the desk, so there were three spare channels which could have been used for keyboard stereo pairs, but we decided to keep our routing the same as in the studio to cut down on the possibility of making mistakes. In addition to the home-made submixer we also had a small Phillip Rees MIDI port expander hidden in the back of the rack to serve the sound modules. All of the rest of the leads were tidied away permanently inside the rack along with plug banks and power supplies. Thankfully, the rack had a back-access hatch, removable lid and front panel and wheels. At gigs, it was just a matter of wheeling the rack in, removing the panels and then plugging in a few leads.

However, neither the Roland D5 nor the Casio HT700 would fit in the rack, and their power supplies and MIDI leads were always a physical liability when gigging. The only way to extract the Casio from the setup would have been to sample its sounds, but that would have meant buying a sampler... In the end, we built a wooden cradle to hold both the D5 and HT700 and all their power supplies. Setting up was then just a case of finding a wall plug and taking audio leads across to our powered mixer inputs.

When preparing our sequenced material for live gigs, we found that subtle programming of the drums didn't work very well live; reductions in the level of drum parts, which we had carefully programmed to introduce dynamics, simply sounded like dropouts. Nor did the smoother drum samples from the Korg NS5R, which we tried to use at one point, cut through the mass of guitars and vocals. The best effect was achieved by increasing all the snares and kicks to maximum MIDI volume and using miscellaneous snare beats, rolls and other hi-hat and percussion parts to add rhythmic colour, rather than dynamic changes.

As the D5 was our main multitimbral keyboard, but had just a single stereo output, we had to balance all of the relative volumes of its sounds within the keyboard itself. Despite its 32-note polyphony, we also had to exercise caution. Each Partial in a D5 sound uses up one note of polyphony, but some of our more complex sounds used the maximum of four Partials, which meant that note-stealing was a concern. We used the D5's Partial Reserve feature to ensure that each multitimbral Part had enough polyphony to cope with the note data being sent to it, but even so we had to be careful with our arrangements, so as not to exceed our polyphony limits. Typically, we reserved eight partials for one Part and ran all the most complex, Partial-hungry sounds on that Part.

All sound setup information for each song, along with panning and volume settings, was stored in the MC50 as MIDI SysEx dumps in the intro bars to each song. All the songs were ordered with the MC50's performance function and could be cued using a remote footswitch which Colin operated.

The D5 and the rest of the keyboards were given an EQ balance, pan position and volume level with the Vision 8 mixer. Once set, these levels only needed minor adjustments for each venue. The Casio was again a little problematic here, as we couldn't control its volume via MIDI. Fortunately all of its sounds were very evenly matched in volume, so it was just a case of finding a master volume setting on the keyboard, marking it off with tape and then balancing the output with the other sound sources through the mixer. The main left and right outs from the Vision 8 were handed to the front-of-house engineer, who was therefore only responsible for balancing the vocals and guitar with the pre-mixed stereo pair containing all of our sequenced backing.

I'm pleased to say our setup worked extremely well live. The only problems we ever had were down to human error, like forgetting to plug the Casio into the mixer! *Tom Flint*

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When choosing which outputs to use on a device, go for balanced connections where possible, and look for a mixer with balanced inputs. Briefly, balanced audio connections offer better rejection of interference fields such as lighting and mains, which might otherwise cause hums and buzzes in the system. Although your gear might be beautifully quiet in the studio, the live environment is electronically hostile, and unbalanced connections can pick up all sorts of unwanted noise. Fully balanced links require a three-pin connection at both ends (usually a quarter-inch TRS jack or XLR connector), although unbalanced gear can be connected to balanced kit.

Since you'll probably be re-orchestrating your songs anyway, try where possible to bring the same type of sounds onto the same mixer channels from song to song. So, on multi-output devices, choose certain outputs for pads, others for drums, and so on. This serves two purposes: first, if an element of a track is missing or too quiet, it's much quicker to locate the problem (since you should always know where, for example, the bass will appear on the mixer). Second, for users of analogue consoles, this makes it very easy to make general EQ adjustments on the fly, such as taking a little bottom end out of all the pads without affecting the percussion. This level of control can be invaluable in cleaning up a live mix.

Those lucky enough to own a digital mixer with snapshot capabilities will find mixing even easier. Just add a snapshot for each song, put an appropriate program change into the sequencer to set the desk, and savour the situation as all the levels automatically set themselves before each song.

Digital mixers can offer another advantage; certainly most of the recent wave of compact digital desks allow their audio faders to be switched to operate as programmable MIDI Continuous Controller faders. With some careful planning, this feature can be used to transform the audio mixer from an annoying necessity to an exciting control platform for sound modulation.

If, on the other hand, you're using an analogue desk, you can achieve a similar effect to digital snapshots by placing appropriate MIDI volume and panning messages at the front of each song (this process will be described in more detail next month). Don't presume that you will remember to make all the necessary level, panning or switching adjustments to the mixer yourself in the pressured live environment — you'll have plenty of other things to worry about on the night.

Vocals & Effects

Although this series is primarily concentrating on MIDI system issues, if you are using a vocalist, there is a major system design point to consider: do you need to run the vocal through your mixer on stage, or can you let the sound engineer take it direct? It is generally best to leave the house vocal mix to the sound engineer, but this may not be simple if you have specific effects planned that are run locally in your rig (such as MIDI-controlled pitch-tracking or -shifting, or doubling, harmonising, or vocoding).

This might sound obvious, but bear in mind that if the front-of-house engineer takes the vocalist's mic straight to their desk, you'll never even get any of the signal to process in the first place unless you can persuade them to run you a dry, line-level copy of the mic output back to your rig.

With this in mind, you might be tempted to mix the entire vocal yourself along with the music, but be warned that even with a good pair of monitor wedges, it is very hard to mix vocals sympathetically from on stage, against loud music. However, if you are processing heavily, or there is no sound engineer and you have time to rehearse with the vocalist, you can program effects levels and process balances in advance, insert a compressor/limiter, feed the vocalist a clean monitor mix and leave the faders pretty much where they are. Be ready to fight feedback, though....

Until Next Time...

Hopefully, the above considerations will have helped you select an appropriate range of equipment for use on stage. If you are intending to play live frequently, you may find over time that your live rig *becomes* your studio rig, with more esoteric kit patched in when you're at home. If you're like *SOS*'s Tom Flint, you may even plan your studio gear to be suitable for stage use from the start (see the 'Case Study 2' box elsewhere in this article). This approach has the added benefit of making the gear transportable between studios, should you ever work with other artists.

Next month, we'll be looking at the physical assembly of the rig, and some of the practical ways in which the equipment can be prepared for use in the dark. So bring your torch... SOS

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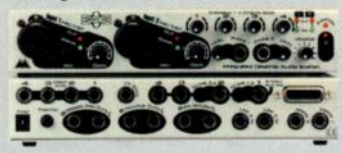

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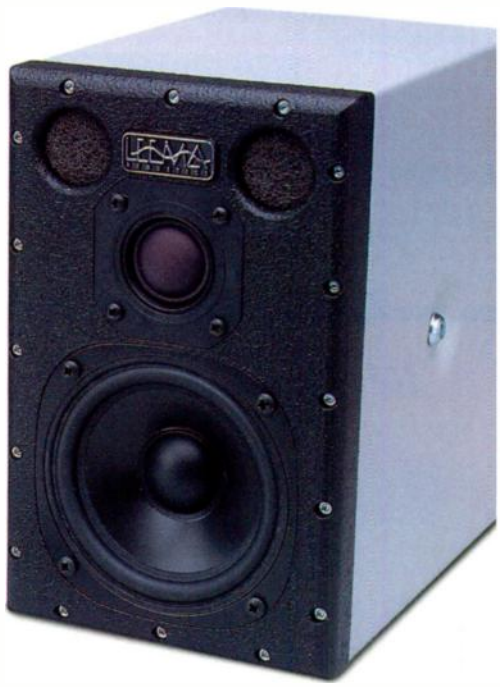
LEEMA ACOUSTICS XEN



xen master

LEEMA ACOUSTICS XEN ULTRA-COMPACT REFERENCE MONITORS

The Leema Acoustics Xen monitor is seriously small. The front panel is only fractionally larger than an A5 sheet of paper, measuring 140mm wide by 220mm high. The cabinet is 205mm deep and only encloses a total volume of around five litres. Yet this speaker has been cleverly designed to deliver the sort of SPL, power handling and frequency response associated with a monitor twice its size.

The Xen uses a two-way passive design, with both drivers being Seas devices: a 100mm bass unit and a 27mm soft-dome tweeter. The latter is ferrofluid-cooled and has been modified according to Leema's specifications in order to alter its resonance characteristics. Also the standard grille for that model of tweeter has been removed to improve stereo imaging. The tweeter is capable of an impressive 1.5mm throw — huge in comparison with most designs — bestowing it with power handling of over 70W RMS and phenomenal headroom. In fact, both drivers are capable of astonishingly high SPLs for speakers this small, but they betray no hint of stress or strain at high levels, or even power compression.

It is a good general rule that miniature monitors are rarely of reference quality, but Leema Acoustics claim to have created an exception. **Hugh Robjohns** evaluates the Xen.

Breath Control

To achieve such high SPL, the speaker has to be able to 'breathe' well — in other words, it has to be able to move large quantities of air in and out of the box very quickly. Consequently, the Xen employs a pair of 30mm ports which exit at the top of the front baffle above the centrally placed tweeter. For a small cabinet these represent a relatively large vent area, and the ports are much longer than normal, with an elbow joint three-quarters of the way back into the cabinet. Conventional cellular foam is used to damp the port exits.

Apparently, during the early design stages, Leema discovered that the industry-standard computer programs used to calculate port area, length, loading and air-speed — the critical parameters for achieving an accurate low-frequency performance in reflex loudspeakers — became significantly inaccurate when calculating the parameters for small cabinets, largely because of mathematical rounding errors. So Leema designed their own high-precision computer program to derive the parameters for the Xen.

The front baffle is 24mm MDF, but only about three-quarters of that is visible, as there is an internal slot which supports the cabinet's sheet-steel sides. The early prototypes were constructed entirely of MDF but this presented two problems. Firstly, for a small external cabinet size the thickness of MDF reduced the internal volume; and, secondly, the MDF had a recognisable 'box sound' which Leema wanted to avoid. In contrast, the damped steel case impacts negligibly on the internal volume and, surprisingly, has no distinct sound of its own at all.

A steel bracing bar runs across the centre of the cabinet and its external ends act as mounting points for either a hanging suspension or Leema's own unusual Xenith cantilevered studio stands. The internal surfaces of the metal cabinet are damped using a double layer of a bitumastic material, and the remaining volume is packed with a long-fibre natural lambs wool, which is apparently audibly

LEEMA ACOUSTICS XEN £893

pros
- Unparalleled sound for such a diminutive monitor.

cons
- Price

summary
An ultra-compact nearfield speaker that thinks it is a conventional midfield. Stunning performance with true monitor accuracy and dynamic resolution.

SOUND ON SOUND

information

£ Xen, £893 per pair; Xenon Lite, £1351.25 each; Xenon Heavy £2026.88 each. Prices include VAT.
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superior to man-made fibres. Polyurethane foam fixed to the inner side of the crossover helps to prevent acoustic reflections within the cabinet.

Connections are via two pairs of 4mm binding posts on the rear panel, allowing bi-wiring or bi-amping. However, removable links are fitted between the woofer and tweeter binding posts to facilitate conventional single cabling. Unusually, these are strips of normal fibreglass PCB, gold-plated and clamped under the screw terminals.

The crossover components are mounted on the rear panel, using air-cored coils, audiophile capacitors and high-power resistors, separating the frequency ranges of the two drive units at 3.8kHz. The crossover is capable of handling very high power (over 600W), which is another important factor in the design's total lack of power compression. It also presents a very uniform impedance of 6Ω and has been designed to minimise group delay, which Leema claim to be around half that of comparable speakers at low frequencies. Accurate timing means good transient response, and precise, stable imaging — both of which are obvious strengths of the Xen.

The on-axis frequency response of the Xen is printed on the rear panel, but is no manufacturer's propaganda! The plot was obtained by independent measurement and shows a well-defined low-frequency corner of 57Hz (at -3dB and measured in half space), with a trace which lies within 2.5dB all the way up to 20kHz. There is a very mild suck-out at around 1kHz and a smaller peak at around 15kHz — both the result of inherent drive-unit characteristics — but their amplitudes are so small as to be all but irrelevant.

Listening Test

Used in a free-standing position, well away from walls, the Xen comes across as a very slightly bass light. However, it is phenomenally clean, clear and detailed, with wonderfully natural dynamics and realistic volumes. It also displays razor-sharp, three-dimensional imaging — one of the undeniable benefits of small enclosures — when driven by a competent and powerful amplifier. The lower mid-range and upper bass are fast, detailed, tuneful and accurate, though without the weight necessary in a true reference monitor.

However, move the Xen closer to rear or side walls and the bass really begins to fill out, providing an overall performance which is simply stunning for a box of this size. The first time I heard the speaker, at the AES convention in Amsterdam earlier this year, I simply could not believe what I was hearing — I even started looking around the stand for cunningly concealed extra speakers! Even so, I suspect that users wanting a full-range system will require one of the Leema subwoofers, designed to complement the Xen. Both designs feature 7.1 bass-management facilities. The smaller unit, the Xenon Lite, employs a 120W amplifier and is claimed to produce a usable low-frequency output at 30Hz. The larger 240W Xenon Heavy apparently reaches 18Hz.

God Of Small Things?

The Xen is the most impressive miniature monitor I have ever heard. To call it a nearfield is to do it an injustice, as it is perfectly capable of working as a true reference-quality midfield unit with one of the matching subwoofers. For surround-sound systems, the Xen would also make a very elegant choice. This monitor is definitely worth an audition if your budget can stand the UK price — just make sure that you can also afford an amplifier good enough to live up to the Xen's capabilities. SOS

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WIN Hoontech computer recording systems

Reader's of last month's issue of *Sound On Sound* may have come across our review of the Hoontech Soundtrack Audio DSP24 & ADC/DAC2000 PC Recording Interface. The product is one of a range of computer recording systems made by South Korean company Hoontech. Most significantly, their systems deliver 24-bit/96KHz processing at an extremely competitive price, and that has been enough to generate plenty of interest from those people who want professional quality without the professional price tag.

UK distributor of Hoontech products **SES Computers** have been kind enough to provide us with three Hoontech recording systems, worth over £1500 collectively, to give away as competition prizes. First prize is a Hoontech DSP System III, second a DSP2000 (reviewed in the July issue of *SOS*), and third a DSP24 Value with Bracket. The prizes have a VAT-inclusive retail price of £986, £433 and £163 respectively.

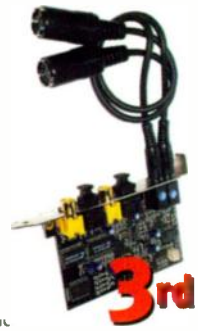
The DSP24 System III has a very professional specification with its 24 bit/96kHz processing, comprehensive I/O options and software recording facilities. At the heart of the system is a DSP24 PCI host card which fits into a standard computer PCI slot and provides interfacing between the computer and the system's external I/O modules. The majority of the system's I/O is provided by the ADC III A-D and DAC III D-A converter rack units which house eight balanced XLR inputs and outputs. The ADC uses Crystal semiconductors and has an A-weighted signal to noise ratio of 116dB, while the DAC delivers a signal to noise ratio of 110dB. Also part of the system is an XGDB1 daughter board which, like the DPS24, fits a standard PCI slot. The board provides extra S/PDIF and AES/EBU I/O interfacing. Supporting the hardware is *Logic SoundTrack 24* software which has been customised for Hoontech's systems by Emagic. *SoundTrack 24* provides facilities for mixing and recording as well as audio and MIDI editing.

The system III allows the use of up to 10 inputs and outputs simultaneously at 24-bit 96kHz, making it a very powerful recording tool. High-quality microphone pre-amplifiers have been used on all inputs and each has its own gain control and switchable phantom power. Other features include a one in/one out 16-channel MIDI-interface port, and support for both internal and external sync via the S/PDIF input.

Driver support for PCs includes Windows 9x/ME, 2000, ASIO 2.0, DirectSound and GSIF. System III is compatible with *Logic Audio*, *Cubase VST*, *Cakewalk*, *Samplitude*, *Cool Edit*, *Acid* and *Vegas*.

The second prize, a DSP2000 C-Port system is also a 24-bit/96kHz multi-channel recording package. Like the System III, the bundle comprises DSP24 PCI and XGDBI boards, and Emagic's *Logic SoundTrack 24* software, but the ADC III and DAC III I/O boxes are replaced by the ADC/DAC2000 external converter unit.

The ADC/DAC2000 provides eight unbalanced analogue inputs and outputs on quarter-inch jacks and a pair of in and outs on balanced XLRs. Like the System III, the XLRs have microphone preamplifiers with gain controls and switchable phantom power. Also common is the XGDB1 board which has optical and coaxial S/PDIF and AES/EBU I/O. Once again, the DSP2000 has comprehensive driver support and software compatibility.



The DSP24 Value with Bracket also offers 24-bit/96kHz processing, but provides its I/O on the mai PCI card rather than using breakout boxes. Two chan A-D and two of D-A are provided via RCA connectors. Even on this budget card the converters provide over 100dB dynamic range. *Logic SoundTrack 24* is also provided, as is driver support for most common audio applications.

The Value Bracket is an option for anyone buying this product, but SES have included it with the prize. The Bracket provides MIDI I/O ports and digital I/O via S/PDIF.

You don't need a PhD in pure logic to enter this competition, but we have set a few questions and a tie-breaker, all of which must be completed before you can stand a hope of winning. We also require you to fill in your full name, address, email and **daytime** telephone number. Once you have done the above tasks you should post your form to the usual *Sound On Sound* address included at the foot of this page. Entries must arrive with us by the closing date of **28th September 2001**.

questions

Which one of the following most accurately describes the Hoontech prizes?

a. Computer recording systems ☐
b. Computer recording cisterns ☐
c. Computer recall systems ☐
d. Computer symptoms ☐

What is the name of the software which comes with all three prizes?

a. *SoundsGood 22* ☐
b. *SoundLink 24* ☐
c. *SoundTrack 24* ☐
d. *Soundalot 21* ☐

What is the name of the daughter board common to both the System III and DSP2000?

a. AEIOU ☐
b. YMCA ☐
c. XMCIA ☐
d. XGDB1 ☐

Hoontech Tie-breaker

Every company wants their products to appear stylish, futuristic and uniquely recognisable, but that's not so easy to do for products which come in the form of PCI cards and 1U breakout boxes. What aesthetic measures do you think soundcard and computer peripheral manufacturers should adopt to give their products that extra something, and why? Answers in 30 words or less please.

.....

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Would you like to receive more information on Hoontech products? If yes, please tick this box. ☐

Post your completed entry to: **Hoontech** Computer System Competition August 2001, *Sound On Sound*, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ, England.

WRH

the small print

1. Only one entry per person is permitted. 2 Employees of SOS Publications Ltd, SES Computers, Hoontech and their immediate families are ineligible for entry. 3. No cash alternative is available in lieu of the stated prize 4 The competition organisers reserve the right to change the specification of the prize offered 5. The judges' decision is final and legally binding, and no correspondence will be entered into 6. No other correspondence is to be included with competition entries 7. Please ensure that you give your DAYTIME telephone number on your entry form. 8 Prize winners must be prepared to make themselves available in the event that the competition organisers wish to make a personal presentation.

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using equalisation

Paul White and **Mike Senior** explain how to get the best practical results from equalisation by understanding the true frequency ranges of most instruments and voices.

A n understanding of the variety of different equalisation tools at your disposal can help in choosing the most suitable type of processing for any situation. However, using equalisation is about much more than just selecting the correct unit and this month, we will be looking at how best to employ equalisation techniques in music production.

The first challenge when equalising musical sounds is in deciding which area of the frequency spectrum corresponds to which element of a sound's timbre. If you're wanting to emphasise the click of a bass drum, where should you boost? Alternatively, if your guitar sounds boxy, where can you cut most effectively?

Pitch & Frequency

One thing that can help a little in deciding this is to know what frequencies correspond to the fundamentals of each musical pitch. For a start, this allows you to define the lower limit of the range of frequencies generated by pitched sounds. Figure 1 shows how the pitch ranges of various common instruments, and hence how the ranges of their fundamentals, relate to frequency. You can see from this that you're not likely to get much in the way of useful tonal change if you try to EQ a violin part below about 150Hz, for example. The most noticeable effect of boosting most instruments below their fundamental frequencies will probably be an increase in the level of any noise lurking in the depths. Indeed, there is a lot to be said for using a high-pass filter to cut any unused low-frequency range, in order to prevent unwanted noise from obscuring other recorded parts in your mix.

Knowing the frequencies corresponding to certain pitches can also be useful when attempting to remove unwanted pitched elements, such as hum, from sounds. If you know the frequency of your mains hum (50Hz in the UK) then you can apply cut with a narrow peaking filter to notch out the 50Hz fundamental or its most prominent harmonics. In such cases it's worth bearing in mind that real-world pitched sounds usually have appreciable levels of harmonics, and that

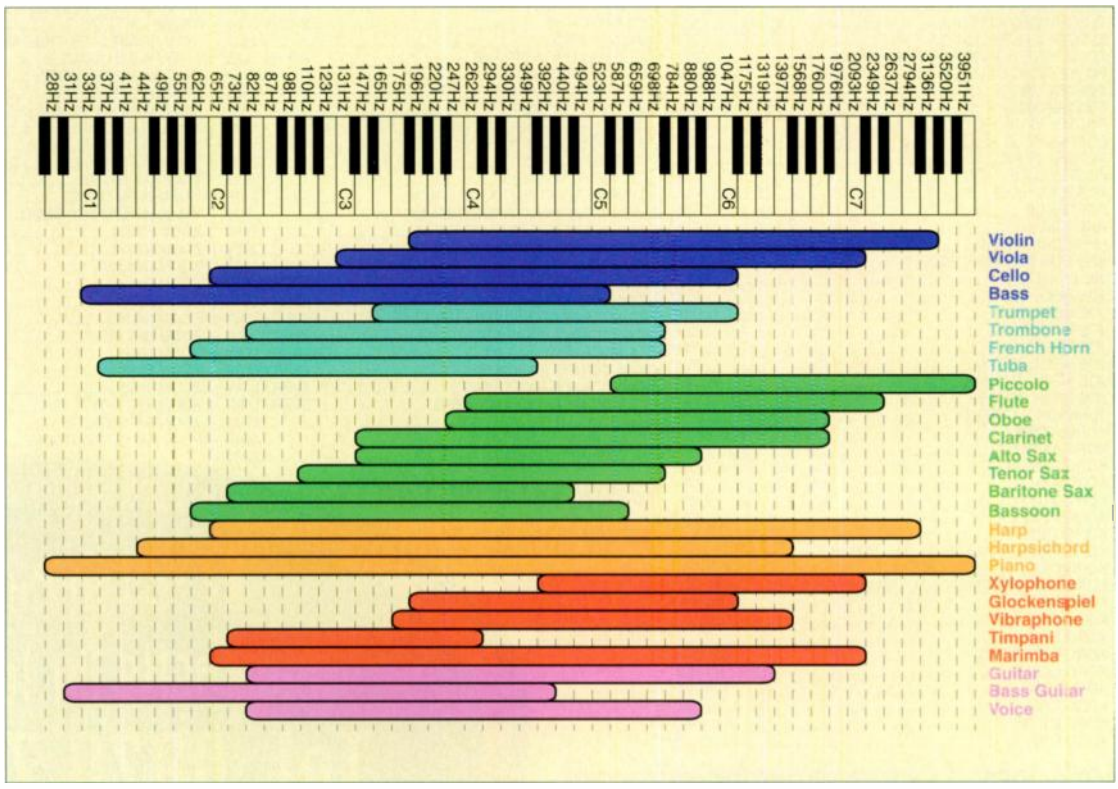


Figure 1. The pitch ranges of common instruments.

"EQ'ing techniques can be used to emphasise pitched elements in percussive instruments — some producers find that this can lend these sounds greater punch."

these occur at multiples of the fundamental frequency, so you'd want to experiment with notching at 100Hz, 150Hz and 200Hz as well, if you were going to seriously reduce the hum in this example. (Having said this, serious hum problems are very difficult to solve even using multiple peaking filters, as their EQ notches are often insufficiently narrow to avoid damaging wanted components of the sound. In these cases, a dedicated digital noise removal device or software package will probably be more successful and produce fewer audible side effects.)

Similar EQ'ing techniques can also be used to emphasise pitched elements in percussive instruments — some producers find that this can lend these sounds greater punch. The trick is to decide what pitch the instrument suggests most strongly, and then to array a set of very narrow peaking filters to boost the fundamental and harmonics of this note.

Exploring Instrumental Timbres

However, there is only a limited amount of practical use for the table in Figure 1 when learning about how to EQ. It's not the pitch associated with a given EQ frequency which is normally of primary concern, but rather the tonal change which is associated with boosting or cutting in that region. And the only way to learn about this effectively is through running some sounds through an EQ unit or plug-in and experimenting.

The easiest way of identifying the frequencies corresponding to particular timbral characteristics is to crank up the boost control of a peaking filter, with its Q value set to about three or four, and to sweep it through the spectrum listening as each element of the range is boosted. It can also be useful to stop the peak over a particular area and then to switch the EQ in and out to get a feel for the effects of boost in that region. With a little practice using different sources, you ought to start getting a feel for the unique characteristics of each sound.

As a guide in learning about the effects of different EQ frequencies on different instruments, check out the boxes which appear throughout this article. These compare the frequency balance of similar instruments within different well-known commercial tracks, and therefore can provide a point of reference for you when recalling which frequencies you need to address for your own recorded sounds.

Setting EQ Gain

Getting to know the frequency ranges associated with different elements of an instrument's timbre is useful, but what you really want to know is how to use that information to best effect when applying EQ to real signals. Perhaps the first basic piece of advice to take on board is that it's best to apply as little EQ as you can when sorting out tonal problems, especially if you don't have access to a really nice-sounding equaliser. Any processing you use has the ability to degrade the sound just by dint of the extra processing components within the signal path, so it's important to make sure that the cure is better than the disease! If you only have access to budget equalisation (whether hardware or software), it is usually worth taking extra care to get sounds right at source, rather than having to rely on dodgy-sounding processing to fix anything in the mix.

Consider trying out different equalisers if you have a choice. All equalisers sound subtly different even with the same nominal settings, and you will find that different models respond in different ways to the same signal. The difference between digital and analogue equalisers is a good case in point. Because good analogue equalisers induce musically ▶

The Drumkit

BASS DRUM

The punch component of most bass drums lies between about 80 and 100Hz, and meaty kicks such as those in AC/DC's 'Back In Black' and Britney Spears' 'Baby One More Time', tend to have a lot of energy in this range. Below this area, you'll mostly feel, rather than hear, any boost, and it's easy to overdo. Warmer kick sounds, such as those in James Brown's 'I Got You (I Feel Good)' and Stevie Wonder's 'Sir Duke', major on the 200-300Hz region. Where the kick needs to cut through on smaller speakers, then you might also consider a boost in the region of 2.5-6kHz, which will tend to emphasise the click of the beater. As an illustration of the sort of effect this has, compare the lack of any bass-drum click in the James brown example with the aggressive kick sound in the Madness single 'My Girl'.

SNARE DRUM

The fatness of the snare tends to reside between 120 and 400Hz, and the aforementioned AC/DC and Britney Spears examples are both powerful in this area. A boxy sound, such as that on the Guns & Roses song 'Sweet Child Of Mine' is indicative of comparatively high energy in the 800Hz-1.2kHz range, whereas the resonances of the drum's ringing reside above this, between about 2-4kHz — a frequency region showcased in the snares of Bob Marley's 'Get Up Stand Up' amongst many other reggae tracks. The crispness of the drum's attack tends to reside more in the 4-8kHz region, and the Sister Sledge track 'We Are Family' heavily emphasises this frequency on its otherwise fat snare sound.

TOM-TOMS

Floor toms can be made fuller around 100Hz, while rack toms respond in a similar way up to about 300Hz — the 'Sir Duke' toms are characteristic of boost in this range. The ringing or rattling of the skins occurs at about 1-3kHz, as is evidenced on Iggy Pop's 'Lust For Life' and the drum solo in the Beatles 'The End'. The Iggy pop example also emphasises the attack of the toms, which is higher up the frequency range between about 4 and 8kHz.

CYMBALS

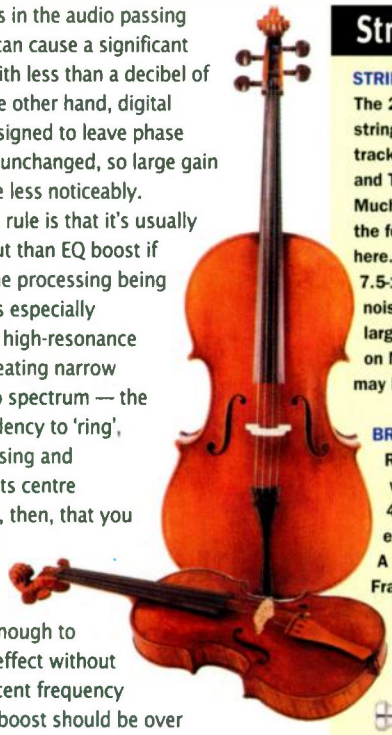
Although Cymbals are associated with high frequencies, a boost between 100 and 300Hz can help to emphasise the clunk of the stick on a ride cymbal or hi-hat, something particularly noticeable in Donovan's 'Mellow Yellow', for example. The ringing overtones of crash and ride cymbals can be brought up within the 1-6kHz area, an area characteristic of the sound in Led Zeppelin's 'Rock & Roll', while the sizzle of any of the cymbals can be emphasised in the 8-12kHz range — check out Metallica's 'Enter Sandman' or Michael Jackson's 'Billie Jean' for examples of this.

useful phase changes in the audio passing through them, they can cause a significant tonal change even with less than a decibel of boost applied. On the other hand, digital equalisers can be designed to leave phase relationships almost unchanged, so large gain settings can be made less noticeably.

A second general rule is that it's usually better to apply EQ cut than EQ boost if you want to avoid the processing being too obtrusive. This is especially relevant when using high-resonance peaking filters for treating narrow sections of the audio spectrum — the filter will have a tendency to 'ring', unnaturally emphasising and extending sound at its centre frequency. It follows, then, that you should try EQ cut to solve localised problems, using a bandwidth narrow enough to achieve the desired effect without unduly altering adjacent frequency ranges, whereas EQ boost should be over wider bandwidths and using as little gain as will suffice. For example, getting rid of an unwanted vocal resonance may need several decibels' cut with a fairly narrow bandwidth, whereas adding high-end gloss to a mix needs only about a decibel of high-frequency boost with a wide bandwidth setting.

Boosting with EQ is best kept to a few decibels if you're after natural results, but narrow-band cutting can be made much deeper to get the desired result. In fact, if the maximum cut provided by a single peaking filter is not enough, you can even set a second peaking filter to simultaneously cut the same frequency for a deeper notch. It is worth mentioning here, however, that EQ cut has just as much impact on the internal headroom of your equaliser circuitry (or algorithm) as EQ boost, so a poorly designed equaliser might well produce undesirable sonic artefacts if you layer two peaking EQ bands in this way.

As we saw in last month's Equalisers Explained article, a filter can affect the levels of frequencies well beyond its centre or cutoff point. If you find that a deep notch at one frequency is also attenuating nearby wanted components, then try applying a little ▶



Strings & Brass

STRING SECTIONS

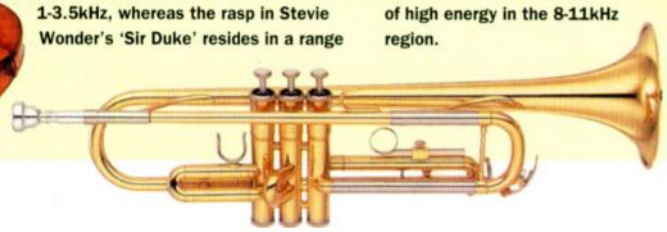
The 200-300Hz range is great for giving a string section a fuller sound, characteristic of tracks such as The Beatles 'Eleanor Rigby' and The Rolling Stones' 'As Tears Go By'. Much of the mid-range timbre will depend on the forces used, so it's difficult to generalise here. However, in the high-frequencies, the 7.5-10kHz range emphasises bow and string noise, as in The Beatles 'Yesterday', and larger, smoother string sounds, such as that on Massive Attack's 'Unfinished Sympathy', may benefit from cut in this area.

BRASS SECTIONS

Recordings of brass sections can be warmed up by boosting between 200 and 400Hz, and Donovan's 'Mellow Yellow' exhibits a sound characteristic of this. A more honky sound, such as on Aretha Franklin's 'Respect' can be found at 1-3.5kHz, whereas the rasp in Stevie Wonder's 'Sir Duke' resides in a range higher than this, at about 6-8kHz. Swing Out Sister's 'Breakout' also has a lot of rasp, but with additional shrillness in the 8-12kHz region as well.

SOLO TRUMPET & SAX

The warm sound of the trumpet in The Kinks' 'Dead End Street' has a lot of energy in the 200-400Hz region, as does the warm sax solo in James Brown's 'I Got You (I Feel Good)'. By way of contrast, the solo sax in The Stereo MCs' 'Connected' is lacking in this region, with extra boost in the nasal 1-3kHz range. The solos in Dire Strait's 'Your Latest Trick' demonstrate the brightness that can be added at 6-8kHz, while Touch & Go's 'Would You' is almost painfully shrill as a result of high energy in the 8-11kHz region.



Guitars & Basses

ACOUSTIC GUITARS

Boosting at around 80-120Hz gives a low-end weight, such as in The Beatles' 'Yesterday', whereas the sound gets more of a boom to it a little higher at 200-300Hz, as in Nirvana's' 'Polly'. This latter song is also a good example of boost in the 2-5kHz range, which is good for clarity in rhythm guitars as it brings out the strumming. The 1-1.5kHz area, prominent in The Jam's 'That's Entertainment', can tend to sound a little nasal, while the 5-10kHz range emphasises the jangle or sparkle of steel-strung guitars in particular, Natalie Imbruglia's 'Torn' being a notable example.

ELECTRIC GUITARS

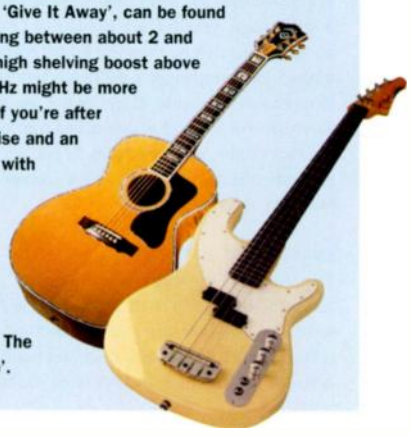
Electric guitars are rather a law unto themselves, as their tonal balance varies so drastically from style to style. However, there are a few general principles to bear in mind. The first is that there will be little other than hum and noise below the guitar's fundamental frequency, so it's often worth filtering below about 80Hz. However, most guitar sounds can be warmed up with a boost at around 125-250Hz, as you can hear from the guitars in Metallica's 'Enter Sandman'.

The other main thing to take into account is that the frequency response of most guitar speaker cabinets rolls off pretty steeply above 4kHz, and so your best choice for emphasising the crispness and attack of guitar sounds is a boost at 3-5kHz — frequencies to the fore in Nirvana's 'Smells Like Teen Spirit' and Chuck Berry's 'Johnny B Goode', for example. Any boost well above this is likely to increase only noise levels, so if you want an even more cutting lead sound, such as that in Guns & Roses 'Sweet Child Of Mine', you might consider using a psychoacoustic enhancer as well.

BASSES

Basses get most of their weight from the 80-100Hz region, and pop ballads such as Shania Twain's 'Still The One' will usually pack a punch in this range. For a more overtly warm sound, the 100-300Hz region can be boosted. Extreme examples of this quality include the electric bass parts in The Beatles 'Come Together' and Bob Marley's 'I Shot The Sheriff', as well a the upright bass in Ben E King's 'Stand By Me'.

Greater attack, though not without a little boxiness, is available at around 500-1500Hz. The Temptations 'Papa Was A Rolling Stone' and The Strangler's 'Peaches' exemplify boost in this region for fretted bass, while Paul Simon's 'Graceland' and The Cure's 'Lovecats' show it off on fretless and upright basses respectively. A more jangly sound with emphasis on string and fret noise, such as in Nirvana's 'Lounge Act' or the Red Hot Chili Peppers' 'Give It Away', can be found by boosting between about 2 and 5kHz. A high shelving boost above about 2kHz might be more suitable if you're after string noise and an airy tone with upright bass parts, though, as in Lou Reed's 'Walk On The Wild Side'.



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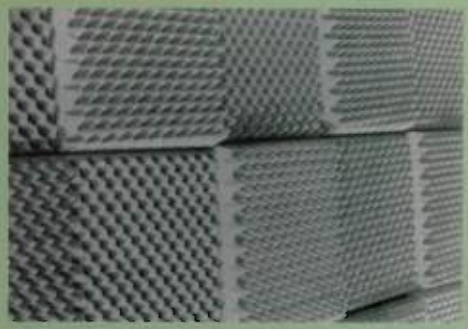

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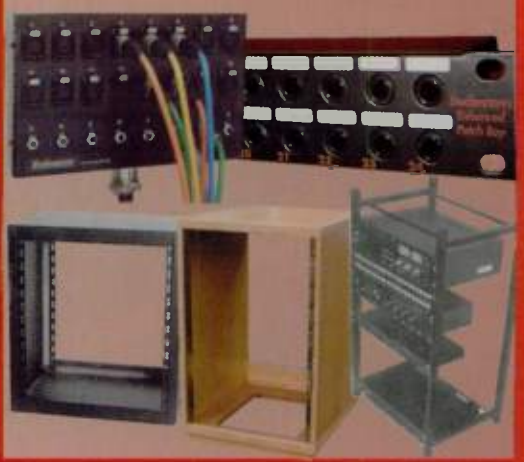

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boost with another fairly narrow peaking filter to the affected area as a way of compensating.

While you're working towards the best possible setting, keep using the equaliser's bypass switch to compare the sound of your processing with the unprocessed original sound. If you're EQ'ing at mixdown, you'll also want to evaluate your EQ changes in the context of the mix, rather than while the sound in question is soloed. After all, it's no use getting individual parts sounding brilliant in isolation if they don't work together in the mix. Bass guitars are particularly prone to disappearing in the mix even when they sound amazing on their own.

Equalisation Or Enhancement?

A mistake often made by newcomers to recording is to try to brighten an inherently dull sound by applying large amounts of treble boost. This rarely achieves more than an increase in background noise and grittiness. The finger of blame is then often pointed at the equaliser when the real problem is a lack of understanding. An equaliser can only boost high frequencies where they exist in the first place. A synthetic sound with no top end, or a miked Fender Rhodes piano played through a dull-sounding amp with limited bandwidth speakers, will not respond well to high-frequency boost because that frequency contains mainly noise and interference.

In such cases, using a psychoacoustic enhancer may yield better results, because it processes the frequencies that are present in the original signal (usually via compression, filtering and controlled distortion) to produce extra high-frequency harmonics designed to augment the existing signal. Because the added harmonics are related to the existing signal, the ear accepts them as being 'real', and a part of the sound as a whole. Although enhancers need to be used sparingly, to avoid producing a harsh or unnaturally abrasive result, they can often rescue sounds that EQ cannot deal with.

Loudness & Distance

Many musicians don't realise that equalisation can also affect the apparent loudness of an audio signal, especially when you're EQ'ing submixes and complete mixes. This is because the frequency response of the human hearing system changes depending on the overall level of sound reaching the ear. Take a look at the graph in Figure 2, which shows curves of equal loudness on a graph of sound intensity (in dBSPL) against frequency (in Hz). The plots show that, for example, a 1kHz tone at 100dBSPL will be heard as being subjectively as loud as a 100Hz tone at about 103dBSPL, while a 1kHz tone at 50dBSPL will be heard as being subjectively as loud as a 100Hz tone at 60dBSPL. The lowest points of each curve are where the hearing system is most sensitive, and you can see that our ears are noticeably more sensitive to mid-range sounds than to frequencies at the extreme high and low ends of the spectrum, though we don't actually notice this because the brain compensates for it.

The important thing about the curves of equal loudness is that they show that the hearing system's frequency response changes with intensity. On a general level, this means that it's important to monitor at a realistic volume when applying EQ, because the perceived effect may be quite different at higher or lower listening levels. However, the fact that the ear gets more sensitive to high and low frequencies the higher the intensity of the sound, means that the brain tends to interpret any sound which is comparatively rich in these frequencies as loud. Therefore, if you want music to sound louder at low listening levels, then it makes sense to boost at the extremes of the frequency range — exactly what the Loudness switch on some hi-fi systems is designed to do. This is the reason why you so often see graphic equalisers in playback systems set up in a 'smile' curve — with a dip in the mid-range and a little boost at the frequency extremes. However, if you're going to use this type of overall EQ, it's best to leave it to the mastering stage, and then to add only a couple of decibels at most.

Another psychoacoustic effect which can be manipulated with EQ is the perception of distance. This is because the air damps high-frequency sounds more than low-frequency ones. If a sound source is very close, this effect is negligible. However, the further a sound has to travel through the air, the more the high frequencies are damped. Therefore, if you roll off a little high end from a sound, it seems further away. This technique is often used to bring a lead vocal to the front of a mix otherwise dominated by backing vocals, for example. The backing vocals are cut a little above 10kHz or so, while the lead vocal is given more energy above this frequency.

Mixing With EQ

When it comes to the mix, equalisation has two main functions. The first of these is to adjust the tone of each sound to your own tastes, though this should mostly have been sorted out during the recording process. The second function of EQ in the mix is to make sure that everything that needs to be heard

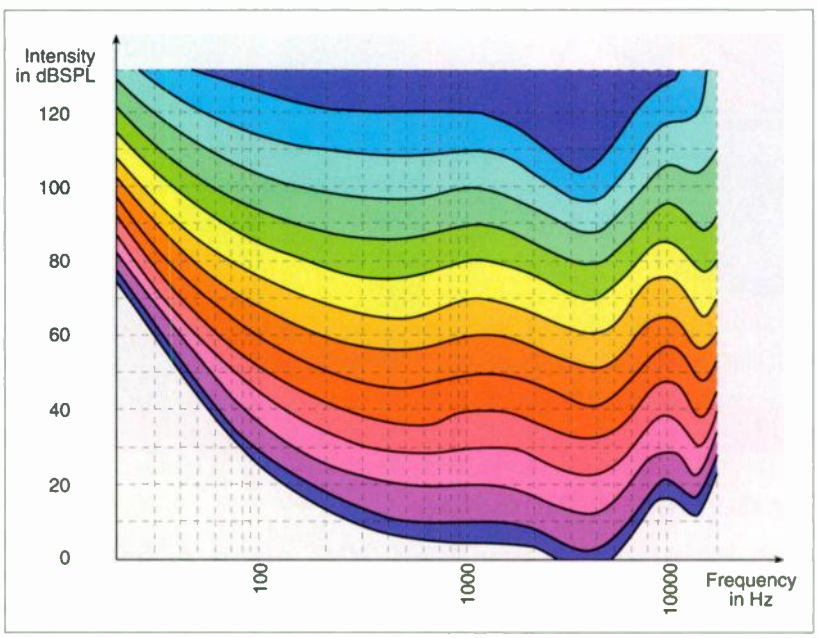
Vocals

Vocals tend to boom when boosted around their fundamental frequencies, with 'Exit Music (For A Film)' by Radiohead and 'Peach' by Prince exemplifying the effects of such processing. Plosives and handling noise can be reduced by cutting below about 100Hz, though this improvement needs to be balanced against the side effects for the rest of the vocal sound.

Nasality can be addressed at around 1-3kHz, while the 4-5kHz range can be boosted for more presence. If the extremes of the frequency spectrum are removed to leave only these tonal areas, then you can get the 'telephone' special effect which will be familiar from tracks such as White Town's 'Your Woman' and Space's 'The Female Of The Species'.

The 7-12kHz region will emphasise sibilance and breath noise, a characteristic trait of Sheryl Crow's voice in 'If It Makes You Happy' and Seal's backing vocals in 'Kiss From A Rose'. The 16-18kHz region, on the other hand gives a crispness to vocals that helps pull out details in the recording. The Radiohead vocal, while boomy, also has a lot of energy in this region as well. Shania Twain's voice on 'Still The One' is another example of a vocal with lots of extreme high-frequency energy, though this is more likely to be due to psychoacoustic enhancement; a common processing choice for pop vocals.

Figure 2. Curves of equal loudness.



"If you have an instrument that doesn't need to be at the front of the mix, try rolling off a little high end so that it doesn't compete with the sounds that really need to stand out."

can be heard. Much of this type of EQ is concerned with cutting away unimportant areas of the frequency spectrum from individual recorded parts, so that important frequencies in other parts can be heard. This can be as simple as using a high-pass or low-pass filter on specific tracks to remove any unwanted noise or hum, or it may require subtle cutting and boosting on every channel. The ease with which this can be done will often depend on how well the track has been arranged.

It is not uncommon to find that you need to take a lot of bottom end out of acoustic guitars or synth pad parts, for example, otherwise the low end of your mix can get muddy. Usually you can get away with taking quite a lot of low end away from such sounds before they start to sound thin in context, and this can allow important bass instruments and kick drums to come across much more clearly.

Similarly, if you have an instrument that doesn't need to be at the front of the mix, try rolling off a little high end so that it doesn't compete with the sounds that really need to stand out. You could use a shelving equaliser to do this, or a steep low-pass filter if you're after more surgical removal. This can be particularly successful on rhythm guitar parts, as it focuses the guitar sound and leaves more space for other instruments.

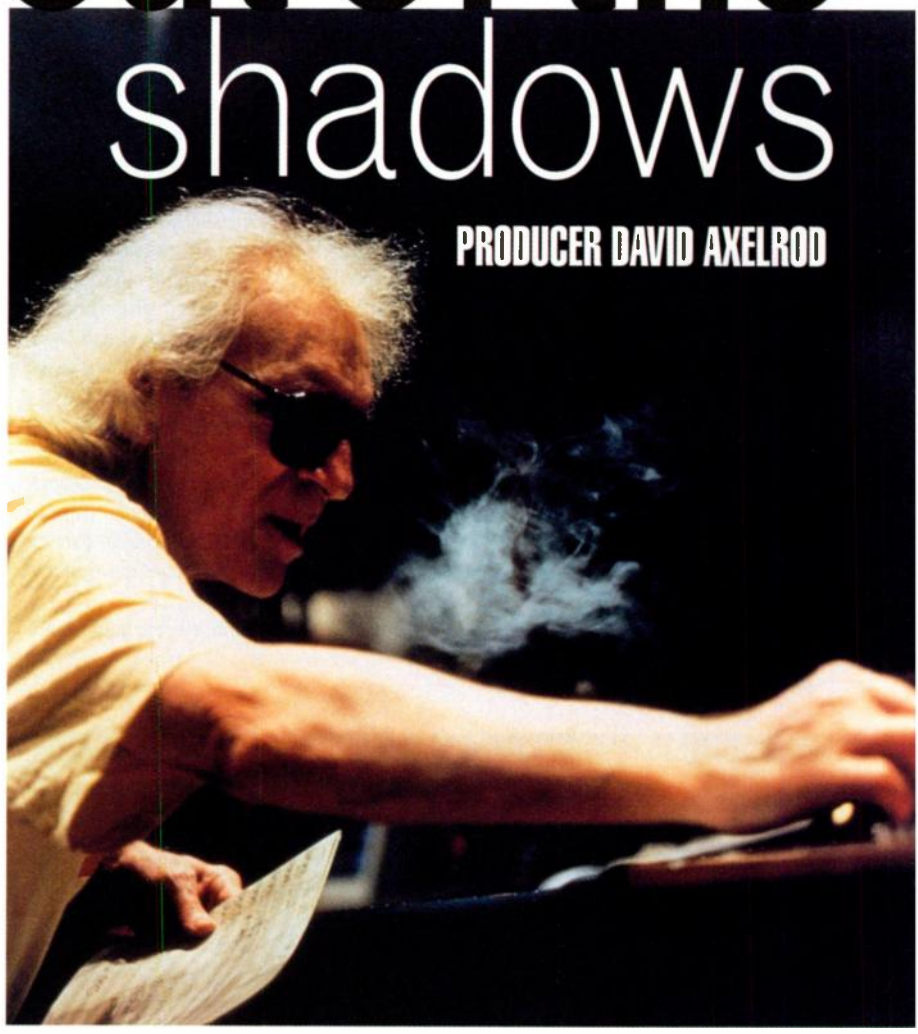
As a general rule of thumb, electric guitars and synthesizers usually cope pretty well with being shaped to fit in with the mix, because they have no inherently 'natural' sound of their own. Even if EQ places heavy emphasis on a particular frequency range, it may not be a problem, as pronounced resonances are characteristic of both these families of sounds.

Finally, it's worth mentioning that stereo mixing can confuse matters a little in terms of equalisation during mixdown. This is because panning, like EQ, can create a certain amount of separation between sounds. However, there are still plenty of environments where playback systems work pretty much in mono, and in such cases your mix will lose the benefit of any panning separation, and may sound confused. It is for this reason that it's a good idea to check the tonal balance of your track in mono as well as in stereo, so that you don't get caught out.

Practice Makes Perfect

There are no hard and fast rules regarding the successful use of EQ. However, the advice set out here ought to have you well on the way to proficiency. With practice you'll not only be able to get the sounds you want when you record, but you'll also be able to make them work together to produce a more polished mix. SOS

out of the shadows



For a man who likes to work quickly in the studio, David Axelrod's new album has taken an awfully long time to make — 33 years, to be precise. Meanwhile, his groundbreaking '60s and '70s productions have become a crucial resource for the biggest names in hip-hop. He talks to **Sam Inglis** about productions old and new...

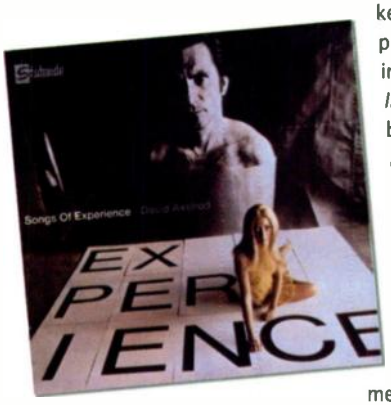
"When people started calling me the king of the drum breaks, I didn't know what the f**k a drum break was!" says David Axelrod. "I called a very good friend of mine who's a drummer, and he said 'I'm not sure what that means either. Do they mean notes of some kind?' I said 'That's what I'm trying to figure out.' I hadn't realised until this started, when I started listening to my stuff again, but I have a habit of breaking up phrases — I hadn't noticed that before. I'll break up a melodic phrase, and then all of a sudden I'll have a two- or four-bar drum break, or a bass fill, or sometimes it's drums and bass — but that phrase is broken up. And I don't know why I do that! Before, it seemed spontaneous — you write what you hear — but now that I've become conscious of it, I'm going to try and maybe not do that."

If Axelrod carries out his threat to stop including drum breakdowns in his distinctive arrangements, it's going to be bad news for a lot of contemporary record producers. The king of the drum breaks has seen his work sampled by an amazing array of hip-hop and dance music's great and good, including Lauryn Hill, Dr. Dre, A Tribe Called Quest, and most famously DJ Shadow, whose use and knowledge of Axelrod's work borders on the obsessive. "If I want to know something, if somebody asks about something, I call Shadow," laughs Axelrod. "He has everything I've ever done, and if I hum it, he'll tell me what album it is. I can't remember back to 1968! I can't remember my own things. He and I got into a little thing about a guy named Ray Brown. I said 'I've never made an album with Ray.' He said 'But there's an album called *Ray Brown*, and your name is on the back.' I said 'I don't care, I didn't make it!' So he sent me a copy, and then I remembered it the instant I saw the guy's face on the cover."

Rise And Fall

David Axelrod began his career as a jazz producer in Los Angeles, hanging out with the likes of Gerald Wiggins, Art Tatum and Oscar Peterson, as well as the arranger and producer H. B. Barnum, with whom he would later form a close working relationship. Wiggins acted as Axelrod's mentor, helping him on his rise through the West Coast's small jazz labels to the job where he would do his most famous work, as a house producer at Capitol Records. He was hired initially to work with saxophonist Cannonball Adderley, a partnership that would endure until the latter's death in 1975, but swiftly branched out into rhythm and blues, and in the late '60s, to the expansive orchestral pop projects for which he's know best known. In the '80s, however, Axelrod fell on hard times: production work dried up, his own albums suffered from distribution troubles, and he seemed destined to be forgotten. The '90s saw his work rediscovered by a new generation of producers, led by Shadow, who would scour second-hand shops for anything bearing Axelrod's credit.

In his time at Capitol, David Axelrod quickly established a distinctive style of his own. Without formal training, he had learned classical composition and harmony with the aid of books and lessons from jazz pianist Bill Green, and began to apply the results to his production projects. The resulting dark, melodramatic orchestral arrangements were often wedded to unfeasibly groovy rhythm tracks, laid down by the hottest session musicians in LA — Axelrod sessions would often feature Carole Kaye on bass, Howard Roberts



David Axelrod: "You get people that don't know music, and they're taking days, weeks, years to do their albums, and spend two million dollars doing it. Don't they get bored?"

on guitar, Earl Palmer on drums and Joe Sample on keyboards. As Axelrod's reputation grew, his projects became more ambitious: highlights included the Electric Prunes' concept album *Mass In F Minor*, as well as two albums of his own based on the poems of William Blake, *Songs Of Innocence* and *Songs Of Experience*.

"Right from the beginning I was always hearing for groups or orchestras. That's why I studied composition. I used the most common text book in the US, Walter Piston's. I remember Bill Green telling me to read each chapter, and at the end of each chapter there's a test. Then I met a guy named Marle Bruno, and he taught me how to take the harmony I'd studied and use it to analyse scores. He told me to get a book by a man named Schenker — the Schenker system is the most commonly used system for analysing scores. Schenker claimed that it could be used to analyse atonal music, but you can't; it doesn't work. But for tonal music it's perfect, and I learned a lot about it. Then I got to the point where I couldn't give a damn about what they were doing — it was the voicings."

Even Axelrod's most elaborate projects were, he says, rooted in the discipline he learned producing jazz music. "I have been using 24-tracks ever since there were 24-tracks, but I love that when I started, you couldn't come back and EQ. You made two-track masters in the '50s right then in the studio — so you'd better be right, because you can always add on, but you can't take off. That was the motto. You had to be especially careful of the way you used reverb, and it was great training. You get people that don't know music, and they're taking days, weeks, years to do their albums, and spend two million dollars doing it. Don't they get bored? All the guys I know, after three takes we'd do another tune. F**k it, why should there even be three takes? Usually the reason would be technical. You'd do one take to get it so you could play it back and hear if there's anything wrong. Next take, do it. That's it. Maybe a third take. If we went past three takes, I would start going 'Why the hell are we doing this?' Why I am I going "take four?"' Damn, that sounds terrible just saying it, 'take four'.

"You don't go in to the studio until you know what you want. My mentor Gerald Wiggins always told me 'School is out when you go into the recording studio.' You can mess up in a club, but you can't in the studio, because the union rules are three-hour blocks, and it's expensive. The studio is expensive, the musicians are expensive — everything is expensive. Tape is expensive. So when we do it, I'm never in a hurry, I just know what I want, and I get it."

It was with this approach and the crack Kaye/Roberts/Palmer/Sample band that Axelrod entered Capitol B Studios in 1968 to begin the recording of another projected Electric Prunes album. Their records had always been largely concocted by session musicians, and by this time there were no original Prunes left. However, Axelrod's then manager Lenny Poncher owned the rights to the name, and wanted to milk it for one more hit album. The plan was that Axelrod would create another selection of orchestral backing tracks, while Poncher's son wrote the lyrics: a rock opera based around *Faust*.

"I wrote the rhythm parts out — that's how we recorded everything," explains Axelrod. "You'd go in and record the rhythm section, and then go home again and start listening to the tracks, and decide how you're going to sweeten them. Strings, horns, whatever — what are you going to do? And then you figure that out, and you bring in your strings and horns and everything and record them. Then the singer comes in last and the singing is recorded last. Even though we used ringer musicians, the Prunes did the singing. The guy that did 'Holy Are You' on *Release Of An Oath* had a terrific voice.

"Well, we did the rhythm tracks, and Lenny made a deal with the president of WEA, and he bought the tracks. I don't know what happened, ▶

but they just never got around to it, never did anything with it."

Something Old, Something New...

Given the patchy state of Axelrod's memory even for his own hit albums, it's unsurprising that he soon forgot about the half-finished tracks. "I didn't know about them until 1999, when I got a call from Lenny," says Axelrod. "He'd come across an acetate. We didn't have cassettes then — I'd had the acetate made so that I could listen to the rhythm parts and work out the orchestral arrangements.

"When he sent it to me, I didn't even listen to it, but the following day, when B Plus — the photographer who does all the hip-hop and rap acts — was over, he spotted it, and he said 'What's that?' I said 'I don't know yet, they're tracks I did in 1968.' He said 'My God, let's hear it!' So I put it on and he went crazy."

A unique plan was soon hatched in conjunction with Mo'Wax label boss and Axelrod fan James Lavelle. The rediscovered rhythm tracks would form the basis of a new David Axelrod album on Mo'Wax, to be completed by Axelrod himself in conjunction with both old collaborators such as Barnum and Lou Rawls, and some of his newer acolytes from the hip-hop world. "The acetate was already shot when I first got it, from listening to it to write to, because I actually had written all the horns and strings and so forth, but I lost the scores. It's a shame, but I think it worked out better, because I didn't have anything to lean on. The melody is the central point of a song, but I had no melody lines. So I had my copyist take down the chords for me. I didn't want to see the rhythm section lines or anything, as long as I had the chords. And then I started thinking about how to make it contemporary. That's why I'm glad I didn't have the scores, because I might have been too influenced by them.

"To record the album, we had to have a clean two-track from the acetate. We ran the acetate at Capitol through a computer that takes 50 minutes to clean one minute of music, so it took quite a while before we had a clean two-track. They sent me a cassette from the two-track and that's what I worked from. The strange thing is there were a couple of tracks missing, which I couldn't figure out. There must've been another acetate somewhere, because there's only a certain amount of time on an acetate. So I wrote two new tunes to replace them, and that's when I got the idea I want to do a rap [*the album's opening track 'The Little Children' features rapper Ras Kass*].

"This album was cut in three days. Wednesday was double sessions, three to six, seven to 10, Thursday was the same thing — all the music was cut. Friday, the singers came in at 12, I think we were done by five. That gave me Saturday and Sunday to listen, to see how I was going to sequence it, because that's difficult. Sometimes you can spend just days sequencing albums. I don't like that fast, slow, fast, slow thing, it drives me crazy. The only thing I knew about this album was I knew I was going to start with 'The Little Children', because I wanted it to end with the story of a boy, my son [*closing track 'Loved Boy' is about the son Axelrod lost to drugs in 1971*], and it kind of hooks in to the lyric of that rap. So you figure out what order they should be in, and then on Monday that's how you start remixing — in order."

The resulting album, simply entitled *David Axelrod*, has been attracting rave reviews, and should remind the world that Axelrod is very much alive and has lost none of his powers. The funky rhythm tracks are indeed perfect sample fodder, while Axelrod's jazz-tinged, largely instrumental arrangements provide a sharply contemporary alternative to whatever the Electric Prunes' *Faust* might have sounded like.

The Future Of Rap

Now that he's a cult name within the hip-hop world, David Axelrod feels that he has much more to contribute than his impressive back catalogue. The future of hip-hop, for Axelrod, is one in which sampled beats and breaks are left behind, and where composers and arrangers such as himself are directly employed to create new music: "I love rap. Hip-hop will be here forever. That rhythm's just here, that's it, it's part of music. But a guy as talented as Diamond D will know what he wants, he will work with an arranger that can give him what he wants — and think of the millions of dollars they'll save on sampling. I have to admit it's been very good to me. But they have to get permission from the label to use a certain piece of music, and then they have to pay for it — a percentage. It's all worked out on the amount of time used. Then a percentage to the publisher, and it's a lot of money. If you get a big hit out of it, it's a lot of money you're shelling out. This way, there'll be one fee, and that's it. That's what it'll go to, and I think they'll realise that too. The great rap producers will go, 'I don't need to cut and paste, I'll just do it with musicians.' I've got a feeling Diamond D will do that, I think Dre would too, I think Puff Daddy will. And others. They have all sampled me, and I really liked what they did — but rap has to evolve.

"I have an idea now of what I want to do next. And I'm telling you, it's going to be a motherf**ker." SOS

Production Or Direction?

"Producing anything is all the same," insists David Axelrod. "I could go in and produce a country & western record, and I'm not very good at country music, but it's just music. The phrase 'record producer' is really an oxymoron. It got started by Norman Granz. He was the first person to put 'produced by' on an album. Van Morrison has been putting 'directed by' on his albums for years. It hasn't caught on yet, but it really should, because what is it that you do? You look for songs. Let's say I'm recording Lou Rawls, and I need songs. That takes up 90 percent of the time. Really good songs are very difficult to find. So you get them, you bring in an arranger or you arrange it yourself. The arranger takes that song — that's a screenplay. He takes a story and turns it into a screenplay. The singers and musicians, they're actors. The engineer is your cinematographer. You're the director. You're responsible for it all. There's nobody else going to take the heat."

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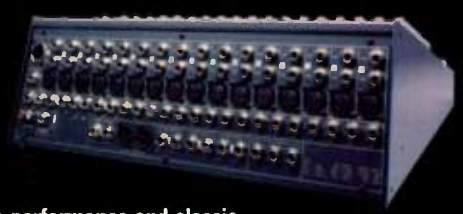

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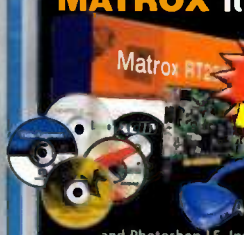

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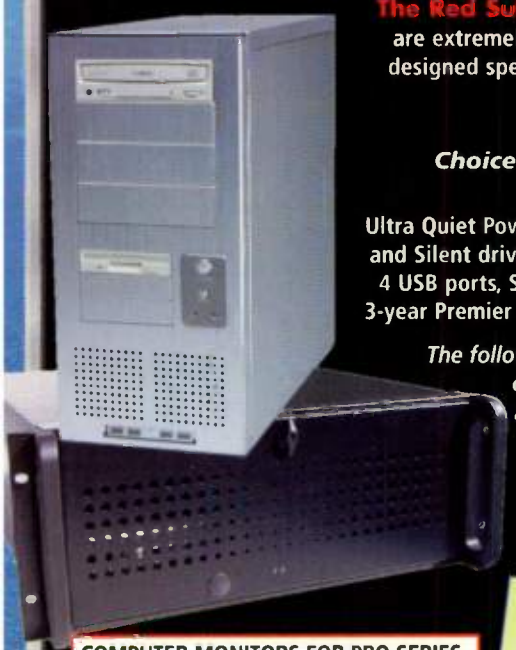

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Photo: Mike Cameron

Paul White tests two new models which make large-diaphragm capacitor and valve microphone sounds more affordable than ever.

UK manufacturer and distributor Pure Distribution have added two microphone models to their XIX (pronounced 'nineteen') product range — a solid-state design, the Pure 1, and a tube model, the Pure Valve. The units are built by a major Chinese microphone manufacturer and because of the lower cost of overseas manufacturing, Pure have been able to set very attractive prices for the two mics. The solid state model sells for under £130, with shockmount, flightcase and cable, while the tube model comes in at under £400, with case, shockmount, power supply and two cables.

Both mics are based around the same large-diaphragm cardioid capsule, which has a nominally flat response between 20Hz and 18kHz, with a moderate 3dB presence peak centred at around 8kHz. The roll-off at the high end is gentle rather than sudden, and the bass response rises below 30Hz until the graph finishes at 20Hz. Empirical tests show the cardioid pattern to be reasonably tight with a healthy degree of rear rejection. However, off-axis the presence peak moves down to 5kHz and increases by almost 10dB.

The shockmounts secure to the bodies of both mics using a circular lock nut, and the adjustable stand connector is stiff enough to resist drooping. Having shockmounts like these included at this price is certainly an asset, given the extended bass response of both mics.

XIX Pure Valve

Housed in a chunky cylindrical body of machined brass, the Pure Valve is based around a modern dual triode, soldered directly to the circuit board. The tube feeds a balanced transformer output stage, with workmanlike engineering that gives no cause for concern.

The capsule sits in its own shielded compartment, topped with a tough basket arrangement comprising a perforated metal outer layer and a fine mesh inner layer. A small cardioid logo denotes the 'hot' side of the capsule. There are no filters or pads, and a seven-pin XLR cable links the mic directly to the power supply. The PSU has only mains inlet and power switch, a seven-pin socket for the feed from the mic, and a balanced XLR audio output socket. The absence of a low-cut filter isn't unusual at his price, though the lack of a pad may not make the Pure Valve suitable for close miking very loud instruments, given that the maximum SPL which the mic can handle is 128dB. However, many potential users want a valve mic such as this primarily for vocals, which easily fall within its SPL capability.

With a sensitivity of 32mV/Pa, the mic compares well with its peers, while the equivalent noise figure of 18dBA is also typical for such an affordable tube microphone. What these figures mean in practice is that there's plenty of level for recording vocals and close-miked acoustic instruments without noise ever becoming a problem, though it might be a different matter if you're recording tree frogs at 500 metres...

XIX Pure 1

The design of the Pure 1 also has the benefit of an output transformer, which some audiophiles feel produces a more musical sound. As with the Pure Valve, there are no pad or filter switches on the casing. However, peeking inside the Pure 1's body revealed a 100Hz low-cut switch fixed directly to the circuit board (something I didn't find in the tube model). This isn't the most accessible place for a low cut switch, I'll grant you, but at least it gives you the option to decide how you'd like to use the mic.

This model is slightly less sensitive than the tube model at just 14mV/Pa, but it still compares well with other large-diaphragm cardioid mics. The equivalent noise level is some 4dB higher than for the tube model, at 22dBA, though noise still won't be an issue in normal usage.

XIX PURE 1 & PURE VALVE

pros
- Inexpensive.
- Good range of included accessories.
- Both mics sound a lot more expensive than they really are.

cons
- No external pad and filter switches.

summary
A pair of studio capacitor mics at a very low price point, which are capable of producing a professional sound.

SOUND ON SOUND

In The Studio

If anything, the flattish frequency response of these mics gives the impression of a lack of specific character, but that means they generate more consistently useful results with different sources. Because the presence peak is gentle, the high end is smooth and natural rather than being artificially airy.

The Pure Valve acquitted itself particularly well. It exhibits the warmth and solidarity of image characteristic of tube mics, but doesn't take the art of flattery as far as some. The Pure 1, on the other hand, while tonally similar, is somehow less solid sounding. One thing I did discover was that both mics are prone to popping quite badly unless used with a pop shield, though this is common to many capacitor microphones.

In all, these mics are capable of extremely good results and they provide a way for the recording enthusiast on a budget to experience the quality of capacitor mics. In fact, the UK pricing is lower than I've seen even for directly equivalent models, and you still get a shockmount and a case thrown in, which looks like great value for money. SOS

information

- £ Pure 1, £129; Pure Valve, £399. Prices include VAT.
- T Pure Distribution +44 (0)20 7328 0660.
- F +44 (0)20 7372 7660.
- E sales@pure-distribution.com
- W www.pure-distribution.com

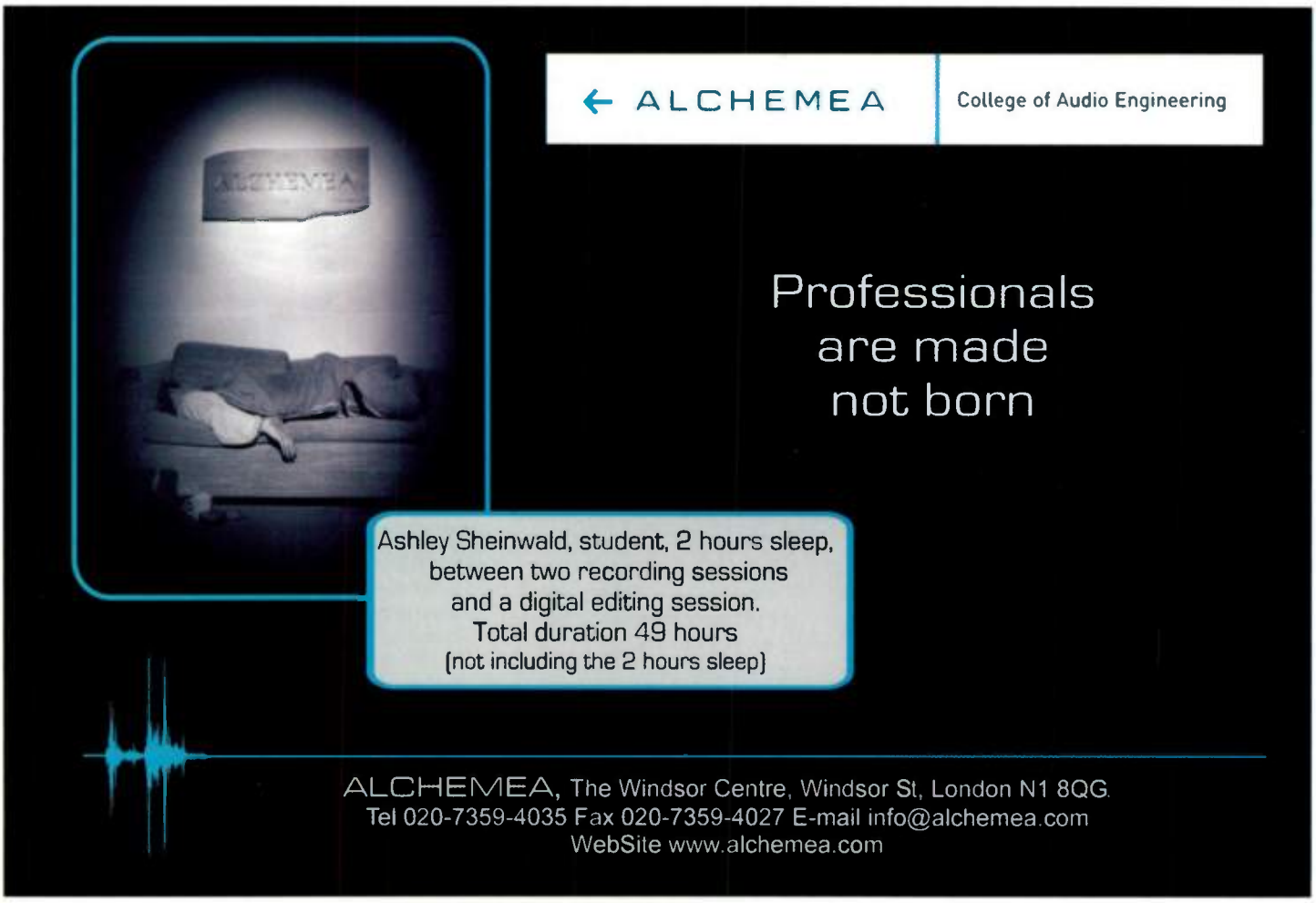
Second Opinion

To check out the two XIX mics, I recorded four vocal performances of the same song, via a digital recording system, using similar settings and no compression: one with the XIX Pure Valve; one with my new Rode NTK valve mic, for comparison; one with the XIX Pure 1; and one with my large-diaphragm AKG C3000. I also recorded two passes of the same strummed acoustic guitar part, one with the C3000 (which I often use for acoustic guitar) and one with the Pure 1.

Both XIX mics came out very well from the test. I found the Pure Valve model had a nice open sound with a punchy edge, and was easy and enjoyable to sing with. It's got a breathy quality when you want it, but is capable of being solidly up-front when you sing with more conviction. I'm a sucker for that ego-boosting valve magic, and this XIX mic has it. Compared to my NTK, I thought it a little more brash and rocky in character, where the more expensive NTK sounds smoother and more sophisticated in tonality to me, but it strikes me that the XIX is therefore likely to be well-suited to more aggressive vocals — not at all a bad thing.

I actually preferred the sound of the XIX Pure 1 to that of my C3000, which came out sounding a bit harsh and middly by comparison. The XIX mic has a quality of smoothness and delicacy, yet it seems quite honest. It's clear and transparent in tone, with no fizz or hardness, and it captured the HF detail in the acoustic guitar noticeably better than the C3000. I had to watch my plosives when singing through this one, though. If I didn't already have my studio mics pretty much sorted, and was looking for a nice vocal and general-purpose mic to start off with, I'd be very tempted by this one, especially in view of its price and bundled extras. My only niggle would be with the rather basic nature of the cosmetics of both mics, but, to be realistic, this probably won't deter anyone from checking out what are two impressive and extremely good-value new contenders.

Debbie Poyser



upwardly mobile

NOVATION NOVA OS V4

Photo: Mark Ewing

In these days of flash-upgradeable operating systems, it's easy to forget that a free OS tweak can give your synth completely new features. **Paul Nagle** investigates Novation's newly enhanced Nova module...

It's not often that a review starts with a thud, but then it's not often that a courier delivers at 6:45 on a Saturday morning either. The thud turned out to be the sound that a boxed Novation Nova makes as it is dropped over a six-foot gate and onto my garden path. Fortunately, the Nova's sturdy construction and first-class packaging saved the day — no thanks to the couriers...

As the Nova was reviewed comprehensively in *SOS* September 1999 (see www.sound-on-sound.com/sos/sep99/articles/novation.htm), I've focused my attention in this review on the features added in the new operating system update, which takes it to version 4.0. This update is free, it's installed via a standard MIDI file and any existing Nova owners who haven't heard about it should grab it from Novation's web site right away.

Baby Blue

The Novation Nova was initially regarded as a slimmed-down version of the virtual analogue Supernova, although it did have two audio inputs to process signals through its filters and effects, and not even the top-of-the-range Supernova had those at the time, although the recent upgraded Supernova II has done away with that advantage. The desktop design of the Nova and its external power supply resulted in a very slim, chic-looking module which nevertheless concealed an impressive multitimbral synth engine. Novation have set the standard for multitimbrality in the virtual analogue synth world — not by offering more parts than any other manufacturer, but by offering truly multitimbral effects. In other words, in multitimbral Performance mode, each synth Part retains the effects it has been assigned in Program (single-sound) mode. To make better use of this, Nova owners must have been yearning for more than the synth's original 12-note polyphony... so the news that the OS upgrade boosts the Nova's polyphony to 16 notes will be most welcome. Consider for a moment how cool this is — it's something that could never happen with a genuine analogue synthesizer without some major (and expensive) surgery, and yet, almost two years after we first reviewed the Nova, four more voices have materialised out of thin air (well, a thin MIDI updater file, anyway).

I found plenty of other surprises in store, too. Remember those 'Special' buttons that seemed less than thrilling in the past? They now allow access to several important new features — the most significant of which are a new 'Doublesaw' waveform and nine extra filter types.

Wave Hello

The Doublesaw waveform cleverly simulates two detunable sawtooth waves, and if you set all three oscillators to use it, the super-thick result does indeed sound like six. You'll probably never need to reach for the new Unison settings (where between two and eight voices can be assigned to each note) — although you can if you want to! Pushing the Width button in the Oscillator Modulation section allows you to use the knobs to set the difference in phase and tuning of the 'two' virtual sawtooth waves, or even detune them using an LFO for some lush string textures.

Having a new sound source is great, but to further enrich your sound palette, no less than nine new filter types have crept under that Special button in the filter section: resonant low-pass, resonant high-pass, resonant ▶

NOVATION NOVA OS V4

pros
- It's free!
- Polyphony up from 12 to 16 notes.
- Doublesaw waveform for even more fatness.
- Unison mode.
- Knob pickup mode.

cons
- Non-intuitive menu navigation.

summary
This new operating system breathes extra life into an already impressive module. It will be invaluable for existing Nova owners and an extra sweetener for those as yet undecided.

SOUND ON SOUND

Stop Press — OS v4.1

As this review was going to press, I received another update to the Nova OS, this time v4.1 (the version, incidentally, that should be shipping with the synth by the time you read this). The update is minor in the extreme, adding just one feature, 'Vocoder Freeze', which works in multitimbral Performance mode only. It allows a sustain pedal connected to audio input 2 to capture an instant picture of the frequency characteristics of a Modulator signal from audio input 1, and superimpose them on the Carrier. An example Performance (A119) is included in the latest soundset — you need to set the sustain pedal to 'voc freeze' for it to work.

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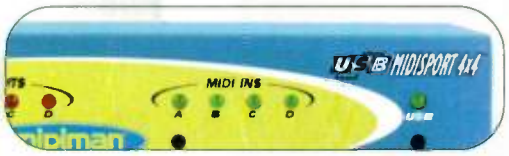

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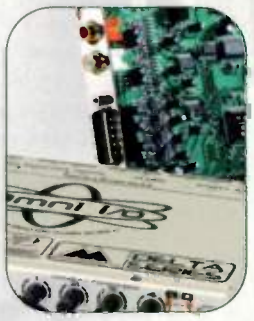

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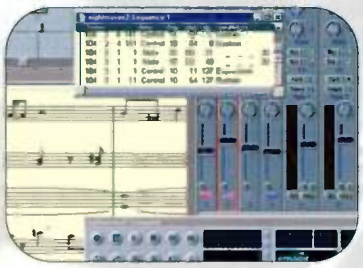

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band-pass, notch, low-pass *plus* low-pass, band-pass plus band-pass, high-pass plus high-pass, low-pass plus low-pass, and band-pass plus high-pass. While these don't include every combination you might think of (I'd have liked a low- plus high-pass pairing), they provide enough scope. The first three in the list, the so-called 'Hyper-resonant' filters, work as two filters in series with a separate Width parameter, so that each filter block can be set to different frequencies. They sound very similar to the original filters, until you play with the Width or crank up the resonance (at which point there's an increased 'fizz' — welcome but not too radical).

The notch filter behaves as you'd expect, and the remaining dual filters work in parallel, the Width parameter again providing an offset of cutoff frequencies. Carefully adjusting the Cutoff and Width knobs can create vocal-like formant textures or an impressive array of sharp, nasal sweeps. The Width parameter is calibrated in preset intervals, but if you wish, you can modulate it freely in the Filter Mod section. Of course, you can't see a destination button for it, because these special filters have only just become available with this upgrade; instead, you use the resonance modulation destination instead. There had to be some kind of compromise for these filters, and I think Novation made the right choice.

Knob Pickup

One of the cons from the original *SOS* review was that there was no 'knob pickup' mode (no giggling, please). This is a feature present in an increasing number of modern synths with patch memories as well as physical control knobs. Basically, when you recall a stored patch, and the physical positions of the top-panel controls no longer match the stored parameters, the Nova will make no change to a parameter until you move its control past the stored value in the new patch. This prevents sudden glitches when you select a patch and start tweaking.

I could go on about OS v4's other improvements, such as the new delay ratios, or VCO/DCO mode, which introduces random, analogue-style variations in pitch, but in all, they're pretty straightforward. You'll find concise notes on them in the box below.

Conclusion

This review is not a reappraisal of the Nova itself. Instead, it concentrates on the extra features which Novation have coaxed from the existing DSP. Therefore my pros and cons are based on this, rather than on the instrument as a whole. However you wouldn't expect me to leave without offering some kind of overall impression, would you?

Although sometimes I wished for just a few more knobs and more choice in terms of modulation options, generally I found this synth a doddle to use; its menu system is straightforward, with only a few idiosyncrasies that I soon adapted to.

Soundwise, I found the Nova to have a rather 'all-purpose' character. Other virtual analogues, such as the Waldorf Q, Clavia Nord Lead and Access Virus, have their own very distinctive timbres, but I feel that Novation have produced something far more generic, applicable to almost any situation where you would want analogue-style sounds. Time and again I hear words such as 'smooth', 'warm' and 'rounded' used to describe Novation's sounds, and I can't really disagree with any of these. However, perhaps that's also why I personally haven't found that special something that grabs me and makes me reach for my credit card. However, having had the Nova here for a while, I can attest that it sounds as full and rich as the best of the virtuals, especially with the Doublesaw waveform. And it can also cut it with some powerful leads — its Oscillator Sync is especially impressive. In fact, all the new features plus existing gems such as the arpeggiator and carefully-considered multitimbral design makes the Nova one of the most flexible virtual analogues. If you don't yet own a Nova but were considering one, the new additions might just tip the balance. SOS

The New Soundset

The Nova's factory soundset has also received a fresh lick of paint, and now includes many programs which show off the new features. Of special note were:

- **A026: 'I'**
This uses the new filters (in this case, two band-pass types together) to vocalise an 'i' sound. With a little tweaking, the patch can also be persuaded to say 'ee'.
- **A032: 'SpectraPad'**
Doublesaw is employed on all three oscillators here, creating a very dense pad.
- **A037: 'SoftBritSound?'**
A very hard, raunchy example of the Nova's newly improved distortion. A wild, dirty arpeggio.
- **A046: 'ItsKindaPhasedWh'**
Here a low-pass and band-pass filter combination is used while Envelope 3 and the mod wheel modulate Cutoff and Width parameters. The result is a warm, rich phasing effect.
- **A112: 'Talker'**
Another vocal pad using two band-pass filters, whose Widths are modulated by two LFOs.
- **B030: 'DualFiltStringWh'**
A simply delicious string pad using three Doublesaw waves. You'd *swear* it was real analogue...
- **B072: 'NeedleBleep'**
This sound makes great use of the resonant low-pass filter and the arpeggiator.

You can hear and download MP3 files of all these sounds (as well as A40, 'Unison', which also demonstrates the Doublesaw waveform) by surfing to the on-line version of this article, and following the links to the sound files there. A little mod wheel was used on some of the sounds, but there has been no other processing. Simply point your browser at: www.sound-on-sound.com/sos/aug01/articles/novaosv4.asp

information

E OS v4 is a free download.
T Novation +44 (0)1628 678520.
F +44 (0)1628 671122.
E sales@novationuk.com
W www.novationuk.com

OS v4 Enhancements In Brief

- Polyphony boost from 12 to 16 voices.
- New 'Doublesaw' waveform — essentially two detunable sawtooth waves for each of the three oscillators.
- 'Knob pickup' mode.
- New filter types — nine of them including notch, 'hyper-resonant' filters and various parallel combinations.
- Velocity-sensing mode (hard or soft — for different controller responses).
- Improved MIDI transmission (controllers and Bank/Program changes).
- Improved arpeggio user pattern editing .
- New Unison mode — two to eight voices per note.
- DCO/VCO mode — simulates perfect and imperfect oscillator tuning.
- More aggressive distortion.
- New delay ratios plus stereo-width control for delay.
- Pannable effects — useful for placing stereo effects with your main signal, or perhaps taking the entire sound to one of the six single outputs.
- Extended sustain pedal options, now including arpeggio latch, arpeggio mute, Part mute, Program number up or down, arpeggio pattern number up or down. And, in OS v4.1, a 'vocoder freeze' function (see separate box).

An updated manual for the extra OS4 features is available from Novation's web site.

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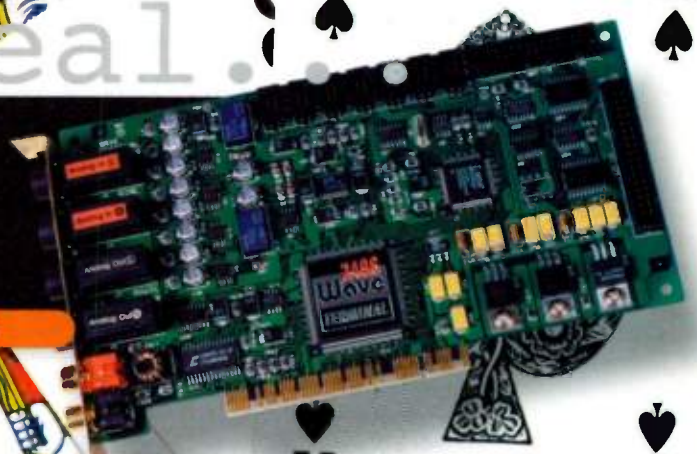

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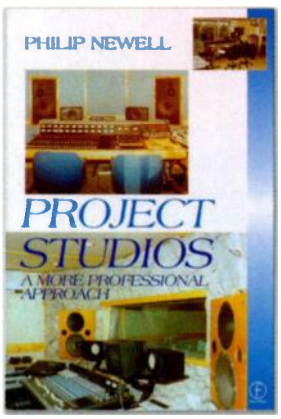
- *PROJECT STUDIOS: A MORE PROFESSIONAL APPROACH*
- DIGITAL RECORDINGS *CD-CHECK* CD

Project Studios: A More Professional Approach

The growth of the project studio has been one of the major changes in the recording industry over the last 15 or so years. However, many of the individuals working in such studios are primarily musicians, rather than recording engineers or studio design specialists, and this can mean that a number of studio setup problems go unnoticed and detract from the quality of the recorded output. Philip Newell's book attempts to identify some of the key issues that need to be addressed if a project studio is to produce truly professional results. The author's CV suggests he is very well placed to do this, and includes recording credits with artists such as Mike Oldfield, and design work in studios such as the Manor and the Townhouse.

The author pulls no punches when it comes to describing what is required to maintain audio standards. Over the course of 17 chapters, he provides a combination of technical discussions and anecdotal stories based upon his own experience, all of which are designed to carefully define what a 'professional' facility should be. For example, Chapter 2 discusses recording equipment and presents a very frank view of what is professional, and what is merely domestic. Equipment reliability and company technical support failings are two issues that come particularly under the spotlight here. Other chapters cover such topics as equipment interfacing, mains supply, recording levels and metering, dealing with small control rooms, mastering, the 'illusion' of stereo, and mixing for surround sound.



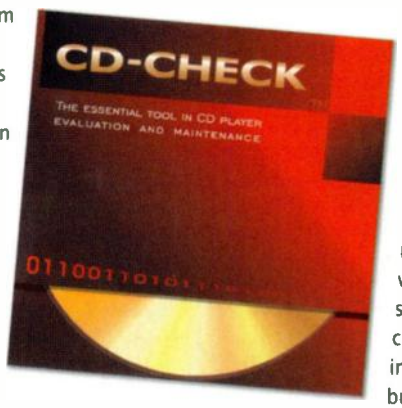
An issue that is emphasised throughout the book is that budget studio equipment is often both more difficult to use and less tolerant of being pushed to it's limits than truly professional equipment. He therefore argues that it requires much more of the engineer if a professional result is to be obtained from such low-cost gear.

This book is extremely well written and, while not always a light read, presents even the most technical material in a clear and accessible fashion. As such, it will undoubtedly open some people's eyes to problems in their own studios that they might rather wish they could ignore. While financial constraints mean that many *SOS* readers have to take a pragmatic attitude to the quality that can be achieved in their own studio facilities, being aware of the kinds of compromise that are having to be made is essential if their effects are to be kept to a minimum. This book will help you do that, as long as you are prepared to read it and weep! *John Walden* SOS

***Project Studios: A More Professional Approach*, ISBN number 0-240-51573-0, is published by Focal Press and is available in all good bookshops.**

Digital Recordings *CD-Check*

Many recording musicians working on a budget, and without a computer, often turn to a stand-alone CD writer as their master recorder. In such an application, the ability of the player to handle burst errors from scratches or grime on the surface of the CD medium will be very important if archived tracks and parts are to be faithfully restored. Small errors can be easy to miss in a complex recorded mix until it's too late, especially when listening back over a limited-range speaker system. As a result, it is useful to be able to measure how resistant a given CD player is to errors in the playback data stream.



This is where the *CD-Check* can help out. It is manufactured by the Canadian company Digital Recordings, and is itself an audio CD. It contains an introductory vocal explanation of the simple testing procedure and then a set of five tones at around 200Hz, each lasting 20 seconds and separated from the next by a period of silence lasting 15 minutes. The tones are faded in and out to prevent any inherent clicks in the audio.

So far, so ordinary. However, a glance at the underside of the CD shows the difference between this CD and a normal one. Wafer-thin strips of black plastic have been stuck to the underside of the disc, such that they introduce burst errors into each of the tones, with the exception of the first, four times per revolution of the disc. The width of each of these strips of plastic has been carefully measured to introduce a specific size of burst error, and the strips get progressively wider from the second tone to the fifth. The best CD players can correct for even the largest of these errors, providing flawless playback of the tones without any audio clicks. However, I found no such player during the review period, with even the best players failing to correct the errors in the final tone.

What was interesting was that the *CD-Check* CD revealed that the quality of error correction often fails to correlate with the perceived quality of the player. For a start, the cheapo CD ghettoblaster in my kitchen outdid my first-generation stand-alone Philips CD-RW. What's more, a hand-held portable CD player, which I find often copes with scratched CDs other players reject, failed only on the fifth track, equalling the performance of a recent professional Tascam CD-RW machine.

This is exactly the sort of information that musicians on a budget, and therefore without dedicated test equipment, are usually denied, and it is a credit to the Digital Recording product designers that they have been able to come up with such a simple, yet revealing, test product at such a low price. If you rely on CD recorders and players for serious recording work then the *CD-Check* CD is an almost essential purchase. *Mike Senior* SOS

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Top photo: Extasy Studios, North Hollywood, CA, courtesy of Genelec, Inc.

Jez Wilkinson is a busy man. Not only is this likeable 32-year-old a full-time psychiatric nurse, he also juggles running a fledgling hip-hop label, Aerosolik Records, with producing and playing bass for the label's in-house band. Oh, and he's got an impressive studio setup in his basement.

Aptly nicknamed Daddy J, Jez heads up a large body of collaborators. Taking in friends and band members, label signings, graffiti writers and DJ contacts, the whole Aerosolik vibe is one of family and community. So, on arriving in a sunny but windswept Scarborough, I wasn't too surprised to find the living room of Jez's three-storey semi filled with people. It seems that a visit from *SOS* provided a good enough reason to get the majority of the extended Aerosolik crew together. After a quick stroll down the street for a few photos, the Aerosolik massive are duly shipped off to the pub and I corner Jez, co-producer Jon Land and engineer Ketch in their extensive basement studio.

Photos: Richard Ecclestone

readerzone

JEZ WILKINSON • AEROSOLIK RECORDS

Underground Music

Into music from an early age, and heavily influenced by his jazz-loving father ("music was there from the moment I woke up to the moment I fell asleep, seven days a week"), Jez started piano lessons as a child, only to give them up — "I hated them" — and learn the double bass instead. After discovering the joys of funk, electro and hip-hop, Jez began to DJ, travelling to regular gigs in Brighton, and even broadcasting for a pirate radio station in Leeds. But it was making music that really interested him: "It was always my dream to have a dedicated space for music. Like most people, I started in my parents' back room and built my kit up gradually." And when Jez and wife Laura started looking for a new house, his plans for a project studio were at the forefront of his mind. "I bought the house because of this space," he says, gesturing around the studio. "Also, I wanted to buy something in town so everyone would know where we were and could be involved."

Consisting of a control room and separate live room (complete with two-way talkback and monitor), the Aerosolik studio is an impressive achievement, of which Jez is justifiably proud: "I live here, I built it, I put everything into it. All my wages go on it — it's been sweat and blood.

"The studio wasn't like this in the beginning. This room was just rubble, basically. We stripped it all down, re-bricked it, and insulated the dividing wall with a rock-hard setting rubber solution, so that next door wouldn't suffer any noise." But the fledgling studio only consisted of one area, which is now the control room. "We used to play here, the whole lot of us. We had the drum kit set up and eight people in this one room." "It used to be outrageous," laughs Aerosolik's engineer Ketch. "It was so crammed, and there I was stuck in the middle, trying to record all these mics."

Something had to be done and Lady Luck was just about to present Jez with a welcome surprise. "We had heard a lot of rumours, from old neighbours and people who lived in the local area, that there was an extra room in the basement. So we looked around next door, and at a couple of similar houses in the area, and discovered they had a kind of coal room that ours was missing." Desperate for space, Jez knocked a small hole in the basement's dividing wall, so that a camera could be inserted to see what lay beyond. "What we saw was loads of rubble but there was definitely a room." Overjoyed with their discovery, they enlisted the help of friends to knock through into the room, clear the rubble and install a

Left to right, above: Jez Wilkinson, co-producer Jon Land, and Aerosolik engineer Ketch.

Main Equipment

- Apple PowerMac 7200 computer
- Akai S2000 sampler
- Roland VS1880 digital recording workstation
- Emu Mo'Phatt sound module
- Soundcraft Folio F1 16:2 mixer

report by: oli bell

double-glazed door. Jez laughs: "We had to shut off the studio and totally seal it for two weeks. All my kit was sealed in here and we were out there. It was murder."

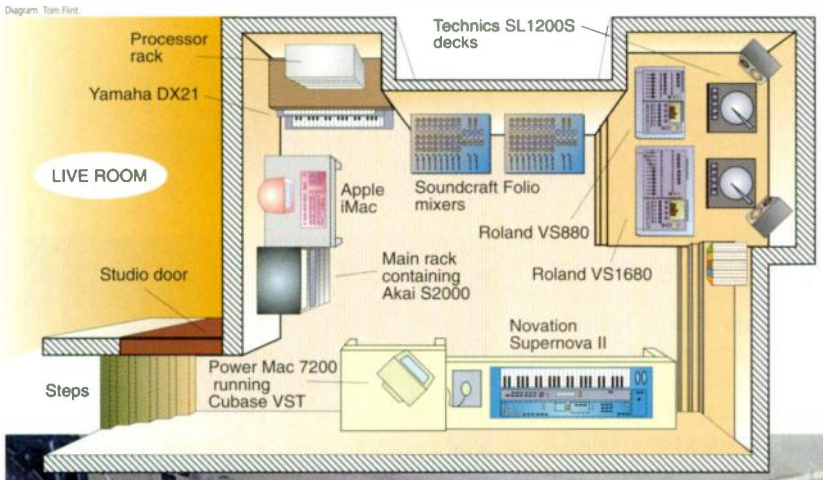
Although a newly discovered live room was a welcome solution to the space problems, it still managed to cause a few hiccups of its own, as Jez explains: "We only realised that there's a chimney going into the room last year, when a couple of gallons of water came through it — so we had to have it capped off." It was also a strange thing to explain to his insurers. "I called them to say I had found another room to include on the policy and their response was: 'What do you mean you've found a room? You can't just *find* a room!'"

As far as its sound qualities go, the live room is still undeveloped. "We haven't really done any proper acoustic treatment to make sure that the waves are right, so it's still got a sound of its own," says Ketch. "It's a bit too 'live' at the moment, but it's only just been done and we haven't had time to get in there and put dampers in the right places. We'll never get a totally dry, 'in ya face' drum sound as it stands, but it's decent enough." Jez agrees: "We've ordered a load of carpet tiles and we're going to start messing about doing some sound checks and recordings, but basically it's all about time and money. We're learning new stuff constantly."

Big On The Mac

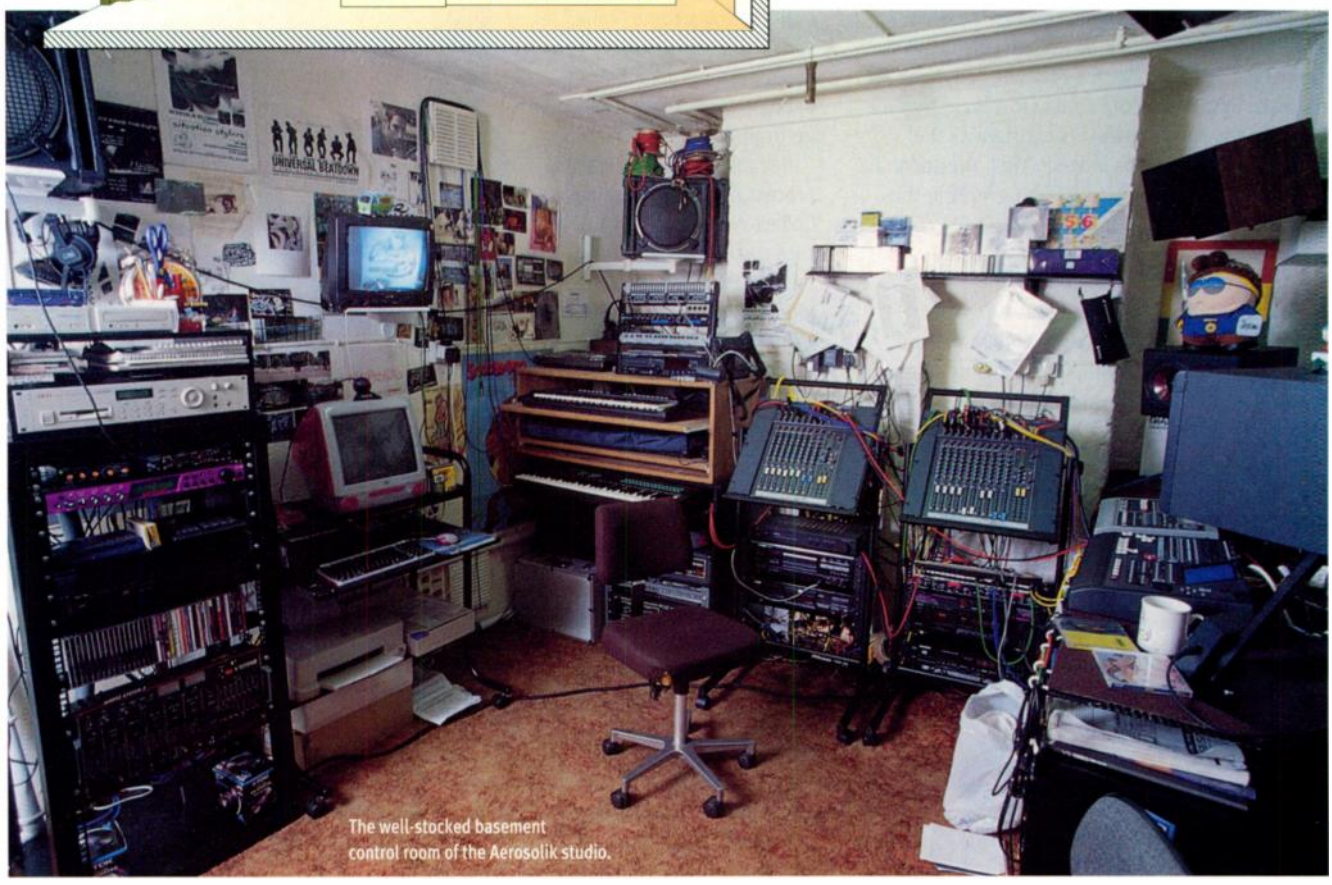
For sequencing, Jez uses a Power Mac 7200. I asked him why he chose a Mac over a PC.

"When I started getting into producing music seriously, a close mate of mine introduced me to his Mac setup. I loved the way it ran, and I basically decided to go down that route. I've been a Mac man ever since. I've got *Logic* installed on the iMac, and I've been dabbling about with it, but I recently cleaned up the Power Mac and all I have running on it is *VST*, which I use just for sequencing — all the audio is outboard." When I ask why he doesn't use the software's audio capabilities, Jez laughs: "I've enough stuff to manage as it is!"



Mics, Solder, Action

A good example of the Aerosolik DIY attitude can be found in the three converted Realistic PZM mics that Jez still uses today. Bought from Tandy when money was tight, the mics were adapted using directions from an article found in an old recording ▶


The well-stocked basement control room of the Aerosolik studio.

magazine. Ketch takes up the story: "I converted those mics from the magazine diagram. They cost 30 quid each and they ran on a 1.5V battery. If you shove the voltage up to 12V, using two 6V batteries, the dynamic range almost doubles.

"So I thought, 'I've seen the jump from 1.5V to 12V, so how would the dynamic range increase if put it up to 48V?'" Stripping the mics down, however, proved to be far from easy. "Inside, the case is about three-quarters of an inch long and not even half an inch wide. The actual mic capsule is less than the size of a cigarette in diameter, with an outer ring for the earth and two signals in the centre. I had to bridge the earth to the centre with one strand of wire, while trying to hold the mic, the case and a soldering iron. It was totally ridiculous; we thought there was no way it would work — but the mics do. The noise level's gone down, the top end is smoother and more natural, and the dynamic range is massive." Worth the burns, then? "Oh definitely," Jez affirms. "We got all three mics for £90. We used to use them to record vocals in the hallway before the live room was installed, but now we've two overhead on the drum kit and one on the hi-hat. Until we get a bit more cash to pump into better mics, we're still happy to use them."

Having a fully working studio in your basement would be a dream come true for many of us, but it can also throw up some unexpected problems that have to be dealt with, as Jez points out: "Because we're underground, we have to have two de-humidifiers going 24 hours a day to keep the moisture out. One is in here (the control room) and the other is in the live room, to keep the drum kit and instruments in good condition. I also have a special gas fire fitted with a catalytic converter — we leave that on 24 hours a day to ensure that the temperature down here stays constant all the time." Wise precautions indeed. "Well, I've spent a lot of money, and every bit of kit I own is in this studio."

Collective Responsibilities

Programming and production duties for GR Collective, Aerosolik's in-house band, are shared jointly by Jez and Jon, with Ketch coming in to man the faders during any live recordings or mixdowns. Jon has been a house and techno DJ for over ten years, and continues to gig regularly (he also plays a mean didgeridoo), while Ketch has played in and recorded bands since his teens. I asked Jon what he thought his techno background brought to his style of production for Aerosolik. "I tend to work a little more on the structure of the tracks," he says, "how they work on a dance floor, as well as adding acid lines or synth noises to give a bit more crossover appeal." "Jon will layer and layer until the cows come home," Jez adds, "whereas I'm more of a minimalist. Bringing him onboard gives the tracks a more up-front edge."

Jez talked me through the process of putting together a GR Collective track: "First, we get a click track going in *Cubase*, and then we'll get the whole band together and just jam away. We'll have Phil [*drums*], Gav [*guitar*], AD-1 [*vocals*], Jon [*keys*] and myself [*double bass or keys*] all in the studio, with maybe DJ Kista or The Boy Webb on the decks. Everything gets recorded straight to DAT, and I'll go back over the tapes after a couple of days to see what worked and what didn't. Then we'll call the crew back in individually to re-record their parts." As you can see, GR Collective are comfortable using live instrumentation alongside the turntable trickery and sequencing. Combining the two elements is a crucial part of the collective's 'sound' as Jez explains:

"As a producer I like to use a combination of live instruments and samples. I give Phil a click or a sampled loop to play along to, and we'll record the result. Then I'll listen back over the session

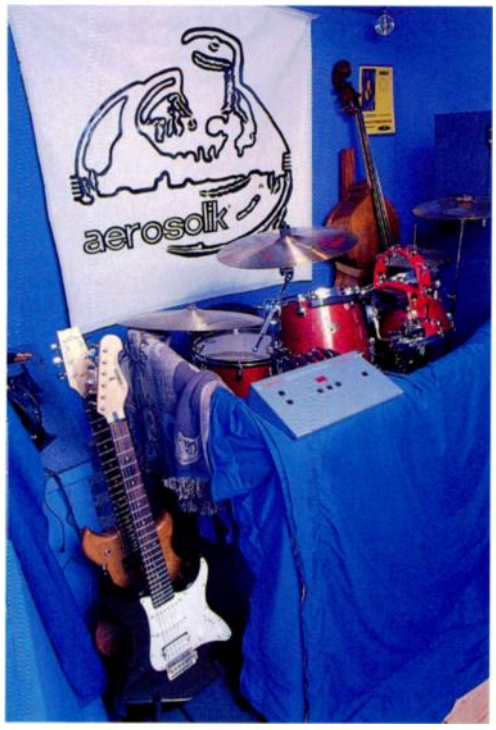
Complete Gear List

CONTROL ROOM

- Akai S2000 (32Mb) with Zip and CD-ROM drives
- Alesis Nanobass sound module
- Apple iMac computer
- ART Multiverb LT effects
- Behringer Ultra Patch patchbay
- BK Electronics MSF400 amp and speakers
- Boss DR550 drum machine
- Casio RZ1 drum machine
- Dbx 266XL compressor/gate
- Denon cassette deck
- Emu Mo'Phatt sound module
- Evolution MK149 controller keyboard
- Focusrite Voicemaster voice channel
- Lexicon MPX100 effects processor
- Power Mac 7200 running Steinberg *Cubase VST* sequencer
- Philips DCC recorder
- Roland VS840 and VS1880 digital recording workstations
- Rolf Harris Stylophone
- Rotel amplifier and CD player
- Sennheiser HD25 headphones
- Soundcraft Spirit Absolute Zero monitors
- Soundcraft Folio F1 14:2 and 16:2 mixers
- Studiospares patchbay
- Tascam CDR700 CD recorder
- Tascam DA20 DAT recorder
- Technics SL1200S decks (x2)
- Technics SH-DJ1200 DJ mixer
- Yamaha SU10 mini-sampler
- Yamaha DX21 FM synth

LIVE ROOM

- Aria bass guitar
- Assorted percussion
- Beyerdynamic headphone splitter
- Cheetah programmable MIDI triggers
- Crafter acoustic guitar
- Cry-Baby wah-wah
- Double bass
- Didgeridoo
- Hohner melodica
- Joemeek JM47 Mic
- Realistic PZM mics
- Sennheiser E604 snare mic
- Sennheiser E602 bass mic
- Scanner Cadet radio mic
- Tama Starclassic drums
- Westone electric guitar
- Yamaha EG112 electric guitar



The Aerosolik sound relies on traditional instruments, such as the guitars and drum kit stored in the live room, as well as electronic gear.

Aerosolik Discography

- GR Collective: *Hyena* EP (1999 CD)
- Various: *Situation Stylers* (label compilation 2000 CD)
- Aerosolik All-Stars: *Aerosolik All-Stars* (forthcoming four-track 12-inch)
- Fat Robert: *Stone Age Man* (forthcoming seven-inch)

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▶ and pick out the tightest bits, or those loops that work well, and send them to the sampler, compress them, or import them into *VST*, whatever they need."

The newly installed live room makes the whole job of working with such a large band much easier, as Jez points out. "The way things were set up before, if Gav wanted to come in and do a bit of guitar work, or Phil wanted to jam on the drums, everything would have to stop. Now we have the live room we can get on with programming, and they can practice to their hearts' content; they can even become a pub band if they want, once that door's shut [*laughs*]."

The actual job of recording the various live elements falls to Ketch. "I've always been interested in recording and I'm not biased about what type of music I work on. I don't actually take part in the writing side of GR Collective so that frees me up objectively; I'm not dealing with the musicality of the track — just the technical side. I just try and get the maximum signal into the recorders without them overloading it. To me that's the whole point — to ensure that the signal gets in as clean as possible and comes out as clean as possible, with nothing in the way to colour it."

All Geared Up

With my time in Scarborough drawing to a close, and the rest of the crew due back for what would turn out to be a rather worse-for-wear Internet radio show, I asked each of the lads about their favourite piece of kit. Ketch had no doubts: "The Focusrite Voicemaster mic preamp. It's so clean, you can put your guitar through it and it'll sound amazing. Vocals come out thick and full-range and you can abuse the sound if you want, bung on a bit of distortion, and see what happens. I'd read about it in reviews and suggested to Jez that we bought one. We originally tested it out on vocals using the PZMs, but we didn't really know how good it was until we got the Joe Meek mic and ran that through it." Jez nods in agreement: "I run the double bass through the Voicemaster with a PZM stuck on the bridge. It just adds a whole new warmth to the sound."

Jon's favourite, perhaps unsurprisingly with his techno background, is a synth: the Novation Supernova 2. "It's the ease of use, the fantastic analogue sounds, and the hands-on control — being able to manipulate the filters. We use it for bass lines. It's got some hellish bass on it."

Finally I come to Jez, who is moaning about only being able to pick one piece of kit so, feeling generous, I let him pick two: "I've got to choose my S2000 first. It was my first bit of serious kit and I know it inside out. If I come up with an idea I can sample it in straight away." And the other? "The Emu Mo' Phatt. This is one of the best sounding modules that's come onto the market. All your classic drum sounds are there. It's been made by musicians for musicians. If you get inside the machine — and you should do — it's got real power."

As I prepared to leave, Jez was in full Daddy J mode, setting up for the impending radio show, but before heading south I asked about Aerosolik's plans for the future. "Basically we're looking at getting away from the town and into the sticks, maybe converting a barn into a studio. That's our kind of five-year project." He laughs. "I'm called Daddy J because of my extended 'family', but without everyone pulling together things just wouldn't work. It's hard, but we love it." SOS

The rack above holds both of Jez's 'favourite gear' choices: his prized Akai S2000 sampler and his Emu Mo'Phatt sound module.

Label, With Love

As if Jez wasn't busy enough, Aerosolik are preparing to press their third release, a four-track vocal 12-inch featuring the crew's resident rapper, AD-1. As a label, Aerosolik prides itself on a surprisingly eclectic view of the hip-hop genre. Their last release, a CD compilation showcasing the label's roster of talent, entitled ***Situation Stylers***, includes a mixture of downbeat instrumentals, up-front vocal cuts and more left-field breaks. I asked Jez why he wanted to start a label, on top of everything else. "As an independent hip-hop label based in the north of the UK it's been a struggle, but I've always been business minded, and I see Aerosolik as the only productive way of getting our music out to the public." However, Jez is still realistic about the UK hip-hop market. "All of us involved in Aerosolik work hard, but we're all aware that there just isn't the money in the UK scene at the moment. We're just a small blip in the abyss, but at least we're having a go."

Webbed Beats: Internet Radio

Like most new or up-and-coming labels, Aerosolik have fully embraced the Internet as a promotional tool. Their extensive web site (www.aerosolikrecords.co.uk) allows Jez to preview forthcoming tracks, sell direct to the public, and promote a nifty line in label merchandise, including T shirts, caps and the (in)famous Aerosolik mug. The site is also home to Aerosolik web radio: four pre-recorded shows that stream in RealAudio. The 45-minute shows are updated regularly and range from mixes by established artists like Skint Records' Scratchy Muffin to their very own relaxed, in-house showcases of UK hip-hop/beats talent, both signed and unsigned. Jez explains how the shows come about: "Firstly, we like to work in a relaxed atmosphere. We have a laugh and never want the shows to become a chore.

"Each show is recorded live, straight to the Tascam DA20. The only processing we use is our dbx 266XL compressor/gate, which puts a subtle limiter on the mix. Then if we're happy with the show's levels and content we'll burn it on to an audio CD and pass it onto our web designer, Tye Brown." The audio CD is then converted to AIFF format, then again to RealAudio. This file (of about 30Mb) is uploaded to Aerosolik's RealAudio server, that allows multiple audio streams to be downloaded at the same time. In fact, it was after seeing an earlier *SOS* Readerzone feature (December 2000, featuring UK Garage FM) that Jez settled on a server based in Atlanta USA. "Apart from a few teething difficulties, such as the time difference, it all seems to work perfectly."

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Roland TR727 *(Latin Drums)*	£149
Roland R8 *(top of the range)*	£249
Roland R8 Card *(Various Available)*	£25
Selmer Rhythm *(70's rhythm box)*	£75
Yamaha RY10 *(samples, MIDI)*	£99
Mixers	
GEM Minipower 8 *(powered mixer fx)*	£349
GEM Powercase 12 *(powered mixer fx)*	£399
GEM Powercase 16 *(powered mixer fx)*	£449
LEM Twin 10 *(powered mixer)*	£399
LEM LPS12 PA speakers *(pair)*	£399
Mackie CR1202 *(the original 12 in to 2)*	£169
Phonic BKX8600 *(6 into 2)*	£49
Phonic BKX8800 *(8 into 2)*	£85
Phonic PMC2402B (24 into 2)	£299
Phonic PMX1600a *(16 into 2 rack mixer)*	£299
Yamaha MV802 *(8 into 2 rack mixer)*	£175
Effects/Recording/Amps/Misc	
Akai EX75 *(Noise reduction)*	£49
Akai ME80P *(8x10 MIDI Patchbay)*	£99
Alesis Microverb II *(Multi FX)*	£69
Boss RRV10 *(micro rack digital reverb)*	£85
Digitech VHM5 *(Harmonizer)*	£149
Emagic Logic Silver	£125
Emagic Logic Gold *(V4.7)*	£199
Kawai PM102 (Powered speakers)	£49
Midiman Bi-Port *(2in/4out)*	£70
Samson MPL1502 (15 2)	£199
Tascam DA 20 *(DAT Machine)*	£299
Tascam 32 *(2-track Reel to Reel)*	£149
Zoom 1204	£99

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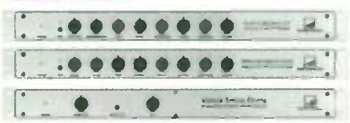

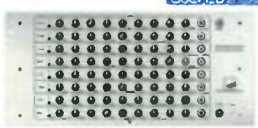

End Of line Clearance - While Stocks Last!!!

DRM-1	Analogue Drum Module *(8 sounds, 73 controls)*	£399
DRM-2	Mini Analogue Drum Module *(single sound)*	£99
ACM-2	Analogue Clap Module *(single hand clap sound)*	£99
VSR-3	Vintage Spring line Reverb *(stereo reverb)*	£99

We do not claim to be the cheapest, but we are cheaper than those that do!

All the latest synths in one place

Access Virus B, Indigo
Alesis Andromeda A6 (when we can get them)
Clavia Nord II, Nord II Rack, Nord 3
Clavia Nord Modular, Micro Modular
Doepfer A-100 modular system and sequencers
Emu Virtuoso, Planet Earth, Proteus 2000, B-3
Emu ESI2000, E-5000 Ultra, Xtreme Lead, Mo'Phatt
Generalmusic Equinox 61, 76, 88, WK series, Pro 1/2, PRP piano's
Kawai MP9000, ES-1, CN Home Pianos
Korg Karma, MS2000, Triton, Triton Rack, X5D
Korg Electribe ER-1, EA-1, ES-1, EM-1
Kurzweil Stage Piano's SP76, SP88X, Micro Piano Rack
Novation Nova, Nova II, Supernova II, Supernova Platinum
Roland JV101, JV1080, XV3080, XV5080, RS5/9, XP80, SC8850
Waldorf Micro Q, Q XT (all in Keyboard or rack)
Yamaha FS1R, S03, S30, S80, CS1x, CS2x, CS6x, MU50
Yamaha QY70, QY700, SU10, SU200, A4000
Yamaha AN200, DX200, Motif, RS7000 (coming soon)
BCK, Fatar and Roland Master Keyboards

Virtual Synth Plug in's

Native Instruments range
Gmedia M-Tron & Fender Rhodes
Steinberg (Houston now in stock)
Emagic
Creamware Pulsar cards

Bargain clearout corner (all new products)

Alesis Microverb IV	£139	Roland MC80 EX	£599
ART FXR *multi effects*	£99	Roland XP80	£999
Casio MZ2000	£799	Waldorf XT-K	£899
DXB 262 *Compressor*	£129	Waldorf Q Rack	£899
Dod R512 *multi effects*	£99	Yamaha A4000 sampler	£649
Electrix EQ Killer	£159	Yamaha DJXII Box	£125
Electrix Filter Queen	£169	Yamaha MD4s (ex Demo)	£399
Emu ESi 2000 (Last Few)	£549	Yamaha RY9	£139
Event Gina *(20-bit card)*	£249	Yamaha SU10	£149
LA Audio GX2 *(gates)*	£149	Yamaha SU200	£249
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End of line clearout special:

MIDI Controlled volume for any instrument £49

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ANALOGUE SYNTHS

System A-100

The most powerful real analogue modular system available, offering a choice of over 60 modules. Systems can be custom built to any specification with modules starting at just £18. Pre-configured systems are also available such as the 10 module mini system for £649, the 23 module system for £999 or the 22 module MIDI system for £1079.

MIDI CONVERTERS

MCV24 £349

MIDI-CV interface with 24 outputs, each having an LFO and Envelope. Fully programmable for any application.

CTM64 & MTC64	*MIDI Kits to fit MIDI to any non MIDI synth*	£89
MCV4	*MIDI-CV with 3 CV's & Gate*	£79
MSY2	*MIDI-Sync 2*	£59
MMR4/4	*4 in/4 out merge and 4 way Mult*	£99
MMR4/4 Rack	*19" rack*	£125

MIDI CONTROLLERS

Pocket Control £89

The best value MIDI controller available, with 16 knobs, MIDI merge and snapshot function. 128 programmable configurations including soft synths, GM/XG controller, MIDI mixer and editors such as the Kawai K5000. Supplied with a PC editor.

Now Available.....

Pocket Fader £125

Same as the Pocket Control, but with 16 faders

REGELWERK £499

Programmable MIDI controller and analogue sequencer with MIDI and CV/Gate. 128 memories.

DREHBANK £325

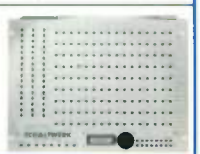
Programmable MIDI controller with 64 knobs, 8 CV inputs & MIDI Merge. Rack mountable.

SEQUENCERS

MAQ16/3 £499

The only analogue sequencer with MIDI and CV/Gate outputs. 3 rows of 16 steps with pattern memories.

SCHALTWERK £949



8 track pattern based sequencer optimised for improvisation. The Schaltwerk is the most powerful realtime improvisation tool yet with over 200 switches and 184 LED's!

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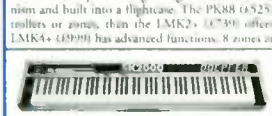
The most compact and lightweight masterkeyboards with 88 note hammer action mechanism and built into a flightcase. The PK88 (£525) is designed for simplicity with no controllers or zones, then the LMK2+ (£749) offers controllers and 4 zones and then the LMK4+ (£999) has advanced functions, 8 zones and 128 performances.



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iFX VOLUME 1 - MIDGET GEMS (ZERO-G)
Designed from scratch with the internet and multimedia in mind, Midget Gems is a collection of over 2000 samples designed specifically for sonifying the your designs! Button pushes and clicks, dissolves, ambiences, games, splats. Everything the multimedia & web designer would ever need!
Wav / Aiff CD-Rom - £59.95

iFX VOLUME 2 - MATINEE (ZERO-G)
Created by top UK design consultancy Matinee Sound & Vision. Possibly the ultimate collection of sounds and music for your web design needs. Over 1500 samples covering Ambient FX, Atmos Loops, Button Pushes, Clicks, Events, Mechanical, Music Loops, Reverse Events, Rollovers, Sweeps and Whooshes.
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BRUTAL BEATS (ZERO-G)
Brand new from the producers of the Key Buy and Five Star award winning Chemical Beats! BRUTAL BEATS is loaded with the most intense and aggressive drum grooves ever. There are also multi-velocity hits, so if you're into programming your own loops, you can give them the Brutal Beats edge!
2 Audio CDs + Wav CD-Rom - £59.95

TECHNO IDENTITY (BEST SERVICE)
2 CDs containing over 115 minutes of DJ tested techno/rave material for your next production. Drum arrangements of up to one minute long, FX classes, breaks, noize, tribal, beatz loopbines, alien vox and vinyl FX ... is the techno terrorist this sample CD is an awesome stash of atmospheric weaponry." Future Music
Audio+Akai CD-Rom - £59.95

XX-LARGE PADS 2 (BEST SERVICE)
This compilation includes 600 pad sounds, layers and single chord pads, orchestral strings, ambient and multimedia atmospheres, dance pads, etc. The best multisamples and single sounds of the newest synthesizer generation were used for this sampling CD.
Audio CD - £59.95
Akai S1000 CD-Rom - £99.00

DANCE MEGA DRUM KITS (BEST SERVICE)
Part 3 of the world's greatest drum sample collection includes over 5000 different drum and percussion samples assigned to 569 'ready to play' drum kits for all modern dance music styles. 150 bassdrums, 1500 snares, rim shots and claps, 1000 hi hats and cymbals and more than 1000 percussion sounds.
Audio+Akai S1000 CD-Rom - £59.95

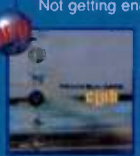
ELECTRIC GHETTO (BIG FISH AUDIO)
Electric Ghetto is the toughest Rock Rap/Industrial disc ever produced and followers of Limp Bizkit, Korn, NIN and Zombie will be pleased by the groove grinding madness of these sounds. Two full discs of construction kits, guitar, synth, bass, hip hop beats, female and male vocals, creepy atmospheres and crazed mayhem!
Audio CD + Wav CD-Rom - £59.95

DRUM'N'BASS: JOURNEY... (BIG FISH AUDIO)
When it comes to Drum'n'Bass, Jamie Myerson needs no introduction. America's premiere D'n'B producer has finally made a sample CD, and it slams! The disc features a variety of construction kits and loops, ranging from hard two-step to dreamy 'Lookin' Good' style beats. A must for all Jungle and D'n'B fans.
Audio CD + Wav CD-Rom - £59.95

BLACK BUTTA 3 (BIG FISH AUDIO)
If you thought the first two were great... you better sit yourself down. Mad Jet is back! Black Butta 3 busts out with two CDs of brand new Hip Hop and R&B loops. Beats, separate kicks, snares, hats, hits, wet, dry, scratches, basslines, guitars, percussion, keys, synths, Rhodes, FX and more.
2 Audio CDs - £59.95

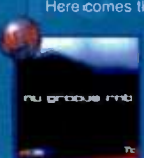
DOWNTOWN BEATS (POWER FX)
The ultimate collection of hip hop, r'n'b and nu pop beats! Created as a compliment to 'Downtown Strings' and tempo matched to provide seamless interactivity or it also functions just as well as a stand-alone beat library. So if you need the latest beats or a perfect partner for Downtown Strings, this is for you.
Audio CD - £59.95

DOWNTOWN STRINGS (POWER FX)
This beautifully recorded collection features string arrangements written for today's urban producers. String quartet construction kits, full string ensemble passages, killing upright bass grooves, unique and useful Harp loops and a selection of multisamples. "...a studio essential for a number of musicians." FM
Audio CD - £59.95



CLUB TRACKBUILDERS (POWER FX)
Not getting enough variation from your sample CDs? Club Trackbuilders uses 6 producers from 4 countries to create an unparalleled double CD of the latest breaks, sounds and samples of kicking club music. Construction kits in 2-step, hard house, techno and drum'n'bass styles with extra loops and sounds.
2 Audio CDs - £59.95

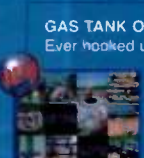
ABSTRACT HIPHOP (E-LAB)
Finally, a deeper and more diverse Hip Hop CD, made with 100% soul and integrity. Abstract Hip Hop is simply jam packed with inspiring, deep, jazzy grooves and moods, will surely make any producer of experimental HipHop fall in love with this CD. "All in all, Abstract Hip Hop deserves to be a firm favourite with those who like their beats laid back, funky and lovingly constructed." SOS
Audio CD + Wav CD-Rom - £59.95



NU GROOVE R'N'B (E-LAB)
Here comes the follow up to the highly rated Strictly R'n'B. This disc finds its inspiration from Timabaland - the genius future funk guru. If you're into the sound of the current R'n'B charts - you can simply NOT afford to miss this groove euphoria. Comes with both and Audio CD and a Wav CD ROM. REVIEW "Infinite flexibility..... this will serve you well." Computer Music
Audio CD + Wav CD-Rom - £59.95

MONSTER BEATS (ZERO-G)
The mother of all powerful, driving, Kick you in the head new generation loop CDs. Chunky breaks both clean and dirty, processed and raw to suit any music genre. Well developed diverse patterns in usable lengths including fills and variations. "All the loops are extremely tight, presented both dry and processed, and are classified by tempo. All in all, an inspirational collection." Computer Music
Audio CD + Wav CD-Rom - £59.95

PLAY THE TANGO (BIG FISH AUDIO)
The beautiful energy of the Tango, is now available in this incredible collection of Tango phrases and multi-samples. Beautiful phrases, openings and endings of bandoneon, piano and guitar. A huge section of chromatic bandoneon multi-samples in left and right hand, short, long and tremolo plus a section of bellows and fills. Recorded by musicians from Argentina!
Audio CD - £59.95



GAS TANK ORCHESTRA (BIG FISH AUDIO)
Ever hooked up a hose and saxophone mouthpiece to a gastank and blown as hard as you can? Gas Tank Orchestra has! If you're bored with standard electronic bleeps and bloops, but are looking for something innovative in your music, this is just what you need. Honking, clanging, barking, squeaking - your music will never be the same!
Audio CD + Wav CD-Rom - £59.95

GUITAR STUDIO (BIG FISH AUDIO)
The "swiss army knife" of guitar loops and performances. Guitar Studio gives you everything you need to make authentic guitar-based tracks. Whether you're looking for cutting edge alternative rock grooves, or retro jazz riffs, you'll find them here. And not just static loops, you get intros and endings too, so you can make the most realistic guitar performances.
Audio CD + Wav CD-Rom - £59.95

TRANSLATOR (CHICKEN SYSTEMS)
Universal sampler file convertor and sampler tool. Translates Akai, Emu, Roland, Kurzweil, Ensoniq, Giga, SoundFont and many other pro formats. For example, take any Akai S5/6000 CD-ROM, and Translator can convert a Sample, a Preset, a Bank, or even the entire CD-ROM, into Akai S1000, S2/3000, Creamware Pulsar, EmuEOS, IESI, Emax, EPS, ASR, Giga, Triton, Kurzweil, Reactor, Reality, Roland, Samplecell, SoundFont, Wav or Aiff format! Program parameter information is translated as well as the samples and structure - keymaps, tuning, looping, envelopes, velocity cross-switching/fading, wavedata, everything! Translator pays attention to the small details, faithfully replicating your sounds, unlike other programs on the market. New file formats are being added to Translator on a daily basis and updates are available FREE for download, using the easy-to-use updating method from the program itself. Translator is presently available for Windows, the Mac version is under development.
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SKUNKWORKS (EAST WEST)

Skunkworks features rhythm guitar grooves and solos from legendary Steely Dan guitarist Jeff "SKUNK" Baxter. There are guitar licks for all musical styles from acoustic to heavy metal, and everything in between. For the small price of this disc you can have Jeff "Skunk" Baxter on your next track!!
Audio CD - £59.95
Akai S1000 CD-Rom - £149.00

Q.L. RARE INSTRUMENTS (EAST WEST)

Featuring 16 groundbreaking, ethnic multi-sampled instruments, Quantum Leap Rare Instruments is the most expressive ethnic library ever, including up to 54 variations for some instruments including: Taiko Drums, 23" Thai Gong, Middle Eastern Fiddle, Highland Pipes, Uilleann Pipes, Irish Low Whistle and much more.
Akai S1000 or Giga 3-CD-Rom Set - £329.00

HOT STEEL BLUES (ILIO)

Following in the footsteps of our legendary Fingerstyles guitar library, Hot Steel Blues reveals a soulful blues attitude. Contains 800 phrases divided into Patterns, Melodies and Endings and arranged into construction kits. "A thoroughly well deserved five stars." SOS
Audio CD - £59.95
Akai/Emu, Roland, Kurzweil CD-Rom - £119.00

RIZING DRUM N BASS (TEKNIKS)

TJ Rizing brings you the latest in drum'n'bass. 30 construction kits plus extra sounds and multisamples. "This is a fine collection; it sounds great and will quite happily help you create D'n'B heavies..... This will certainly offer variety and adaptability and stand proud in your sample collection." Computer Music
Audio CD - £59.95

METAMORPHOSIS (SPECTRASONICS)

Eric Persing's latest creation comes from deep experimentation with hundreds of cutting edge sound manipulation tools. If you're a fan of Persing's creative groove processing on Distorted Reality, Liquid Grooves and Ethno Techno, prepare yourself to be knocked out!
Audio CD - £59.95
Akai/Emu, Roland and Giga CD-Rom - £119.00

ANALOG MELTDOWN (ILIO)

Analog Meltdown has the brains of one synth and the body of another. An array of mod wheels, faders etc. have been added to each program. "Some of the sounds could be described as pads, but most are out and out leads - solid, edgy sounds that can be guaranteed to elbow their way to the front of any mix." SOS
Akai/Emu or Kurzweil CD-Rom - £119.00

UNDERGROUND GARAGE (TEKNIKS)

Here are the latest and freshest samples for 2-Step and Nu-Step garage! Containing 36 construction kits filled with the toughest beats, basses, keyboards, single & multisamples. "This is one of those CDs that you sense has been lovingly crafted - and it shows in the quality of what's on offer here." Computer Music
Audio CD - £59.95

YELLOW TOOLS - PURE GUITARS (BEST SERVICE)

This collection of high quality sounds gives you utmost control over all aspects of the recorded instruments. Nylon guitars, steel-string guitars, 12-string guitars and acoustic basses. "The sound quality is amazing..... Superb, and an absolute must for EXS24 owners." Computer Music
Akai S1000, Giga or EXS24 format - £99.00

YELLOW TOOLS - PURE DRUMS (BEST SERVICE)

Pure Drums contains 17 different drumkits, dry and compressed, different mic positions, 16 different samples per note, left/right hand, effect volumes like flames and rolls. Layout as GM kits. "Superb stuff. It's possible that for 'real drums', this one disc could be all you ever need." Computer Music
Akai S1000, Giga or EXS24 CD-Rom - £99.00

DAN DEAN SOLO WOODWINDS (NEMESYS)

This library features multi-sampled Bassoon, Clarinet, Contrabassoon, Bass Clarinet, Flute, Piccolo, Alto Flute, Bass Flute, Oboe and English Horn - created using the incredible power of Giga Technology. Every note of all instruments has been sampled in up to 6 layers of dynamics for realistic performances.
Giga 10 CD-Rom Set - £379.00

DAN DEAN SOLO STRINGS (NEMESYS)

Multisampled Solo Violin, Viola and Cello, recorded in stereo in various articulations. There is no pitch-shifting or unnatural transposition artifacts commonly found in other string libraries. The bow and instrument body resonances and the overtones are true throughout all of the instruments.
Giga CD-Rom - £129.00

GROOVEMASTERS DRUMS (DUBLAB)

5 CDs - nearly 1Gb of true stereo acoustic drums. Over 900 loops in styles of rock, pop, funk and disco featuring a huge choice of kit sounds with more than 650 single hits and 3 entire drum kits and cymbals. "This package would be a welcome addition to your armoury." SOS
Audio CD - £59.95
Akai or Giga CD-Rom - £149.00

ULTIMATE ORCHESTRAL PERCUSSION (NEMESYS)

The Ultimate Orchestral Percussion library is the first sample library dedicated to giving composers orchestral percussion sounds with capabilities unmatched by anything else. Due to revolutionary micing techniques, the samples were recorded with the natural acoustics of a professional hall built in which allows sounds to melt into your work with little or no additional spacial placement.
Giga CD-Rom - £199.00

ULTIMATE TIMPANI LIBRARY (NEMESYS)

This six-disc library contains every performance nuance to allow the most realistic timpani imaginable. Five mallets from a warm legato cartwheel to world have been recorded at eight velocity levels for amazing flexibility and playability. Adding to the realism, both right and left hand samples are included to make fast articulate passages flow seamlessly and realistically.
Giga CD-Rom - £249.00

ULTIMATE MARIMBA & VIBES (NEMESYS)

This two disc library is the most indepth of its kind. With 4 sets of mallets to choose from for each instrument your composing possibilities are endless. The marimba patches include four velocities strikes, rolls, muted strikes, rattan handle strikes, resonator strikes, glisses, various runs and more. The Vibe patches include 3 velocities strikes, pedal up strikes, bowed vibes, and many ethereal sounds.
Giga CD-Rom - £149.00

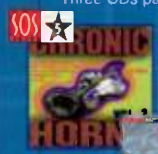
VOCAL PLANET (SPECTRASONICS)

Gospel, Jazz/Blues, World, R'n'B/Dance, Vocal FX and much, much more! REVIEW "This is no ordinary set of samples. The sheer amount of material is breathtaking... the price for so much material is surprisingly modest... this has to be the Encyclopedia Britannica of vocal samples!" SOS
Akai/Emu, Roland or Kurzweil CD-Rom Set (includes Data CD) - £299.00 or 3 Audio CD Set - £99.00 - selected phrases.

ETHNO TECHNO (ILIO)

Ethno Techno is an explosion of metallic impact and strenuous playing. REVIEW "ET manages to surprise, delight and inspire from the first bar and doesn't let up. As a resource for cutting edge yet richly authentic percussive material this one comes rated very highly indeed." SOS
2 Audio CDs - £79.95
AkaiS3000/Emu, Roland or Kurzweil Multi CD-Rom Set - £199.00

CHRONIC HORNS 2 (CHRONIC MUSIC)



Three CDs packed with all the horn riffs and patches you'll ever need. "This is a remarkable and meticulously produced 3-CD set featuring a five-piece brass section, comprising trumpets, trombone, sax and baritone sax!... a traditional slice of brass section playing that gives you an accurate set of chord and unison recordings." SOS
3 Audio CDs - £59.95 (Akai S1000 coming soon)

XX-LARGE CLUB EDITION 1-4 (BEST SERVICE)

These latest additions to the XX-Large series, take you on a journey through dance. XX-Large Club Edition Vol. 1 contains 850 drumloops and 350 sounds for classic hip hop, classic r'n'b and pop; tempos range from 60-120bpm. Volume 2 contains 800 drumloops and 400 sounds for new r'n'b, soul and hip hop; tempos range from 60-120bpm. Volume 3 contains 1350 drumloops and 350 sounds for disco, house and dance; tempos range from 115-140bpm and finally, Volume 4 contains 1300 drumloops and 400 sounds for 2-Step and Garage; tempos range from 115-140bpm. All drumloops are perfectly timed and sorted into bpm groups for ease of use. These are an excellent addition to any sample collection, providing you with the latest genre specific dance sounds and loops. Each XX-Large Club Edition is available as an audio CD or a 500Mb Akai S1000 CD-Rom.
Special Introductory Offer: All 4 volumes in Audio - £199.00
Audio CDs - £59.95 each, Akai S1000 CD-Roms - £99.00 each

All prices include VAT. UK delivery is usually within 48 hours when you pay by credit card. Orders received before 3.00pm will usually be sent the same day.

WRH

demo doctor

The main demos featured this month can be heard in both RealAudio and MP3 format at www.sound-on-sound.com/sos/aug01/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 adress, will enable anyone who is interested in your material to contact you.

top tape

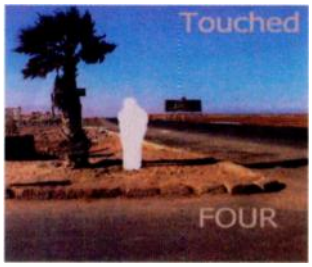
Purple Jaguar

Recording Venue: Home.
Recording Equipment: Apple Mac G4 running Emagic *Logic Audio* sequencer and IK Multimedia *T-Racks* mastering software, Quad Amp, Tannoy monitors.

This is a good choice of name for a world-dance CD, and on it musician/engineer Simon Strange demonstrates that he can put together arrangements with humour, as well as producing more standard dance mixes. On 'Below The Reef', he creates a complex arrangement that moves from an excellently mixed low drum and ethnic vocal intro into a pseudo-underwater Busby Berkeley-esque world, complete with Hawaiian guitar, vibes and double bass. And it's not over yet. Via distant harp, the track moves into dance territory, with a sampled and looped chant over a heavy beat, before fading out on floating jazz trumpet. It's not going to be a dance-floor smash but it's very entertaining and cleverly constructed.

For an arrangement that lasts just over five minutes I think you'd agree that this sounds pretty complex. But it's just the sort of thing that audio sequencers excel at — this kind of musical collage, especially the well-handled crossovers between sections, would be a nightmare to achieve manually, even with the aid of razor and tape! Overall, the arrangement demonstrates a professional approach to the sample-editing features and automation capabilities of *Logic Audio*.

Also worthy of note is Simon's dedication to creating the watery reverb, and the slight muffling and altering of the sound, as if it was being heard below the surface. After some 'normal' reverberation on the introduction, we take the plunge with the last sung word and the bandwidth of the reverb drops. This may have involved a change of reverberation on *Logic Audio*'s plug-ins, which don't take too kindly to having their parameters altered during recording (at least on my version). However, I have discovered that high cut is one parameter which can be changed and recorded as controller information without creating any unwanted clicking noises, and this may have been the one used. ■



Touched

Recording Venue: Home.
Recording Equipment: Steinberg *Cubase VST* sequencer, Behringer Composer compressor, Oktava microphone.

The four tracks on this CD were written for singers wanting songs in the style of well-known female vocalists, and I've concentrated on the first, a Sade-influenced production.

Sade productions are generally smooth, with a medium-paced groove which suits the vocal delivery, and this is something that producer John Williams has emulated up to a point. Long reverbs and compression are a major feature in the originals, and John has used an in-tempo pre-delayed reverb (a sixteenth note behind the beat) on the sidestick snare rhythm of the verses and a subtle delay on the vocal. The former enhances the groove and is clearly audible in the sparse verse arrangement, while the latter attempts to float the sophisticated vocal across the backing track. I found the gated nature of the reverb slightly uncomfortable, and its sudden decay cut emphasised the early reflections part of the reverb sound. I understand that it's intended to stop at this point, to avoid running across the following beat, and therefore reducing clarity, but a slightly longer, more dense reverb with a heavy HF cut on the tail end of the reverb decay would have worked.

More could have been made of the vocal effect. For example, the delay effects-return level could have been higher in the mix. Sometimes it can compromise vocal clarity if the first repeat of the delay is too close to the dry signal, though, so in these cases a suitable length of pre-delay can be introduced to the send signal path, so that the repeats are far enough away from the dry sound ▶

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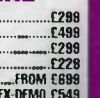

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▶ not to interfere. Some delay effects contain pre-delay as part of the program, but not, as far as I am aware, the plug-ins for *Cubase VST* (or *Logic Audio*). The simplest way to achieve it is to copy or ghost the vocal track, pre-delay that by the right amount and send it to the effect. Failing that, use two delays on the send signal path, one short for pre-delay, followed by one for the actual delay.

Some instrument levels in the mix need attention. Both the chordal keyboard (verses) and the congas (later verses) are too low in level, even when played on my NS10s, which tend to emphasise such mid-range sounds. Increasing the level (and making more use of the percussion) would bring much-needed vitality to a pleasant but uninspiring mix. I also seem to remember that the early Sade material featured some neat jazzy electric guitar, and I missed that human element in the production.

Two other points about the mix concern the heavier bass sound on the choruses and the fade-out. Larger monitors reveal the bass as overpowering, especially at lower listening levels. For this kind of pop/soul production, I'd suggest rolling off some of the really low frequencies using a high-pass filter. However, at louder listening levels the whole mix sounds better and the bass, in particular, works a treat, dynamically lifting this section of the arrangement. What a shame that the fade-out is rather clumsy (suffering from a sudden drop in level) and hurried. This suggests a manual approach, but you may as well take advantage of *VST*'s automated mixing to get it right. On a mellow groove like this, you need to take the listener out with you gently. ■

Lemon Kids

Recording Venue: Home.
Recording Equipment: Allen & Heath System 8 24-channel mixer, Allen & Heath GS1 16:8:2, Pentium 3500MHz 320Mb PC with Event Darla recording interface and Midiman USB MIDI interface, running *Logic Audio Platinum* v4.0 and Square Circle *Wavesurgeon*, Akai S900 sampler, Watkins Copicat echo, ART DXR Elite delay, Zoom 1202 effects, Behringer Dualfex Pro enhancer, LA Audio Tubesonics TCX2 dual tube compressor, Samson Servo 170 amp and Tannoy M2 monitors, Beyerdynamic M69 ribbon microphone.

Michael Davies has sent in two CDs and was very keen for me to listen to the later one. Incidentally, readers, this happens quite often, so you may as well just send the most up-to-date, exciting new offerings from your studio.

The first track on the new CD is very mellow, with the focus firmly on the drum part, and most other instrumentation way below that in level. It certainly demonstrates clever use of the budget Zoom 1202, which has been "flicked" between three or four settings, treating the drum-track signal and enhancing the rhythm as a result. In-tempo delay is the main effect, but there's also what sounds like reverse gate and some coarse early-reflection reverb. The fact that Martin says he flicked the unit between programs implies that he handled it manually and treated it as a part of the performance. As a percussionist, he'd have the timing and dexterity to control such a procedure, but lesser mortals like myself would have to resort to another method — sampling the effect while manually changing it, recording it to the multitrack, or sending MIDI program-change messages from the sequencer to the Zoom. Users of *Logic Audio* can use the delay line on the Environment page to delay MIDI events, in combination with plug-ins, if needed.

Alas, a drum track alone does not an eight-minute mix make. The arrangement is poor, and apart from the vocal and echoed guitar sections there's little in the way of development. The level of the keyboards could certainly have been higher at some points in the mix, and this in itself would have added much-needed variety to an arrangement seemingly content to drift on and on. The sampled vocal line, "Learning to live with love", could have been toyed with, for example, using extreme EQ thinning and a touch of phase, multi-tap echo treatment, or even an occasional touch of reverb to give it a different 'voice' and different spaces in the mix. As it stands, it's a weak, unexceptional line that doesn't warrant the repetition.

Contrast that with the throaty and charismatic vocals of Hamed Kave on the second mix, and you may understand why Michael is excited about this particular project. It's interesting to note that the piece also has a long arrangement featuring subtle changes, such as the addition of guitar and slight shifts in the drumming pulse, but it doesn't get boring because the emotive vocal of Senegalese-born Hamed is constantly developing throughout the track.

The African percussion has also been rather nicely recorded, using a Beyer M69 Ribbon microphone, and well balanced against a programmed loop of low drum and hi-hat. Tasteful use of short reverb on the percussion and an expansive pre-delayed reverb on the voice finish off what is a very good mix. It's a vocal reverb similar to that found on albums by Youssou N'Dour (also a Senegalese musician), such as *The Lion*, and suits the emotive use of long, held notes that is a characteristic of this style. The closest I could get to it on an outboard unit (in this case a Lexicon LXP15) was a Bright Hall setting with a 2.9-second delay, full bandwidth (no HF cut) and a long pre-delay of about 90mS. Michael recorded this one in *Logic Audio*, and so may have used a plug-in. I tried *Goldverb* with a reverb time of 2.75S, pre-delay of 94mS and initial reverb delay of 94mS, no high cut, and an 87 percent bias in favour of reverb over early reflections. It wasn't as bright as I'd have liked, but an enhancer or a quality HF EQ could have brought that out. ■

Doctor's Advice: Avoiding & Reducing Sibilance

Some of the demos I've reviewed this month suffer from vocal sibilance. This is especially noticeable on words with the letter 'S' in them, and has the characteristic sound of a lisp as the signal is distorted.

If you notice sibilance on the source vocal signal, try changing the microphone for one with a narrower bandwidth. For example, if someone has a natural tendency to lisp slightly on the 'S' words, this will be accentuated by the better bandwidth of a condenser microphone, when a good quality dynamic microphone might just disguise the problem. Failing that, try altering the singer's position at the microphone; sometimes just moving them slightly off-mic can solve the problem. Finally, over-compression of the source signal can also be a cause of sibilance (see below).

In a mix, one cause of sibilance is over-equalisation in the critical 2-12kHz area, which can happen if any sort of HF boost is used. Over-compression is also a culprit, where the signal may break up when the attack is too fast, threshold low and ratio high. Any existing sibilance will also be accentuated by heavy compression. Finally, an extended HF response on a multi-effects unit used to treat the vocal will emphasise sounds like 'S', 'T' and 'F' which contain a lot of strength in the upper-mid and high-frequency area.

Solutions include restricting the bandwidth of reverb in particular, to about 12kHz on the vocals; using a dedicated de-esser to deal with the sibilance; or creating a de-esser, using an EQ boosted between 2-8kHz, connected to the sidechain of a compressor. This will cause the compressor to react more to sounds in the frequency range where sibilance is most noticeable.

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QUICKIES

White Lie

More attention to the drums would improve this demo CD enormously. To start with, they're mixed too high on some of the songs, the balance between programmed kit sounds is badly handled, and the dry drum mix doesn't suit the rock/pop production style. A remix is certainly in order, but there's no need to re-program the parts — just check the balance and add some short room reverb, especially to the snare. Try a decay time of 0.9-1.5S, dependent upon the tempo of the song, with an HF bandwidth of about 8kHz if you're after a more natural room sound. If you don't have an effects unit, look for

samples from the soundcard which already feature some room ambience. The vocals are also very dry, even though they appear to be treated to a low-bandwidth reverb on some songs. Although this works for some musical genres, it's not great in this musical context, so more attention to the vocal production is needed. And while we're on the subject, a bit more care on the vocal pitching wouldn't go amiss either! My favourite songs are the last two. The indie rock of 'Another Soul' features some neat guitar playing, and 'Special Day' demonstrates an ability to choose complementary guitar effects, such as delay and chorus, to create texture. ■

Byonik

The opening song has a pretty squashed acoustic guitar sound which can only have been achieved by heavy compression, although there's no compressor on the gear list — bizarre! It's also robbed the guitar of presence, and you should be aware that this is one of the things that compression can do, hence the inclusion of equalisation,

to compensate, on some units. On most of the songs, Spectrasonics' *Liquid Grooves* sample CD has provided the loop; the opener features a conga pattern that sits well with the acoustic guitar, bass and vocals. The hypnotic repetition of this one loop suits the relaxed narrative style of singer/songwriter David Withington, but occasionally could have been added to by tambourine or shaker. Manually played, this would have added some more dynamic light and shade to the arrangement. I'd say that this holds true for the entire album, and David could also have experimented with some of the fills on the CD too. One of the great strengths of this demo is that the songwriter is obviously really comfortable within this acoustic style. The lyrics have depth, the arrangements are strong, and the emphasis is on the singer's voice, nicely recorded with a Rode NT1, which entirely suits his relaxed delivery. ■

Skullshifter

The drum patterns used on this CD are from the rhythm banks of a Korg D8 digital multitracker, and the tracks have been built from them, so elements like fills have a tendency to be repeated and get a bit boring — more adventurous programming would improve the songs! Overall, the production sound is harsh, and I'd suggest that some of the sounds have been over-equalised, especially the vocals. No doubt this is to compensate for the lack of presence on the 25-year-old Unidyne III. Even if this mic has sentimental value, the time has come to upgrade. I also noticed that the last track has been mastered at a higher level than the others. Continuity of mastering level is something to be aware of if you're new to CD compilation. Favourite track is 'Rock 'n' Roll Trash', with its tight arrangement and fine, gutsy sax break. ■

Alan Burge

Alan's work was last reviewed in the January 2000 issue of SOS, and his recording technique has certainly improved. The third mix, 'Ice River Brew' has a full sound and a very good balance, with the exception of the bass end, which, he acknowledges, is a bit light for the entire CD. Yet his main fault lies in the choice of a short modulation as a vocal treatment, reducing clarity and also making him sound as though he's got a bit of a cold. This would be the result of phase cancellation, introducing a nasal quality. Sibilance is also a problem here and there (see the 'Doctor's Advice' box), and should have been nipped in the bud during the overdubbing process. Otherwise, these are cleverly arranged and well-performed songs with good lyrical content and some lovely atmospheric moments. I particularly like the descending chord sequence and choral vocal patch arrangement of 'Crash', sitting beautifully behind the piano and lead vocals — a real spine-tingling musical moment! Check it out on www.AlanBurge.com. ■

Cheapo Card Company

This month's most amusing letter and demo comes from Mr Cheapo Card Co, who should really be trying to get his humorous vignettes on the radio, or kids' TV. Technically all the mixes are bass-light and the vocal sound is a bit thin, but some EQ cut at 1kHz could sort it out on a remix. I liked the choice of metallic-sounding plate reverb for the voice — very 'Hammer House of Horror', and probably supplied by the Zoom 1201. The short arrangements are perfect for sending off to TV and radio companies, but the general tone of the letter could be less cynical and subversive if Mr Cheapo is serious about getting some airplay. It's also about time he got himself a web site. ■

Joe Gayon

Joe is a jazz-influenced trumpet player who has embraced MIDI as a compositional tool. Unusually, he uses Sibelius as his main MIDI software, presumably preferring its notation capabilities over those of its competitors. Mixing levels, especially when moving from one melody sound to another seem to be causing him a few problems. A perfect example of this can be found on a synthesized guitar, piano and strings piece, where the acoustic guitar patch taking the melody is much louder than the piano following on from it and then taking the lead itself. When mixing,

your ears are a better guide to the relative loudness of sounds than the meters, and short-attack, transient sounds can really jump out, even when recorded at the same level as other, slower-attack ones. In this instance, the automation afforded by Joe's digital workstation could have been used to get the right balance, but on such a simple arrangement well-timed gain riding of the relevant fader during the mix would have done the trick. ■

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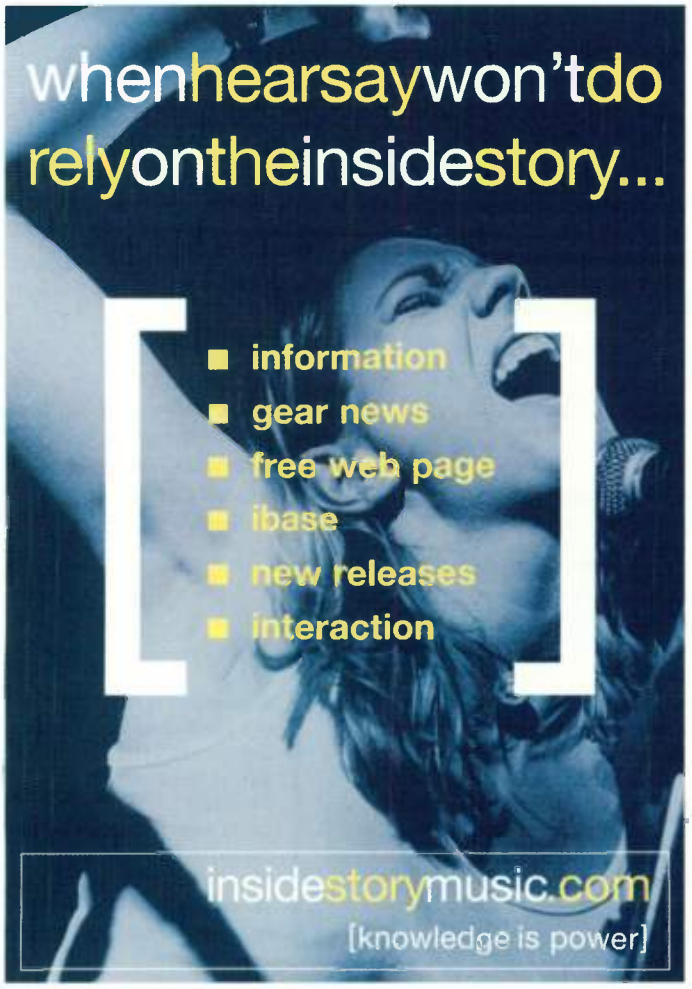

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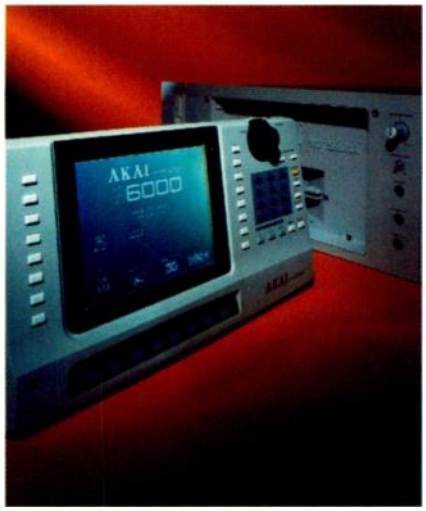
Vote Of Confidence

Akai S5/6000 "stable and reliable"

I totally agree with Steve Howell's response in the June 2001 Crosstalk about Hear'Say's disappointing comment on the Akai S6000 Sampler. I have an Akai S5000 Studio and when it was initially released it was bug-ridden. But Akai have fixed a lot of the problems through constant updates and the S5/6000 OS has been so far very stable and reliable. I've installed the new *ak.Sys* software and USB board, which makes transferring samples via USB super-fast. Who needs SCSI nowadays? Also, I am happy to say that I've just upgraded my copy of Propellerhead's *ReCycle* to Version 2 and tested its support for the Akai S5/6000. All I can say is that it works like a charm. *ReCycle* 2 is able to transfer and save the chopped-up loops in a specified folder on my hard drive, and *ak.Sys* takes care of the transfer from computer to sampler. This system is much faster and more reliable than SMDI SCSI transfer, in my opinion. I'm proud of my S5000, and I for one will back up Steve Howell on this issue.



Akai have continued updating their flagship samplers: they can now accept sample transfers via USB and integrate with *ReCycle* loop software.

Frank Escutin

Copy Rites

Partitions *can* be copied in Windows while the OS is running

In Martin Walker's PC notes (always much appreciated) in *SOS* July 2001, he mentions that there is no way to copy a Windows partition while it is running. Using Windows 98SE, I've been doing this for the past three years. It is a simple operation, which I've broken down into the following basic steps. Assume the new partition/disk has been created and formatted.

1. Via *Explorer*, create a Windows folder on the new partition/disk.
2. With *Explorer*, go into current Windows folder.
3. Mark swapfile (WIN386.SWP) with mouse.
4. On Edit toolbar, mark 'Invert selection'. This marks all files except the swapfile.
5. On Edit toolbar, mark 'Copy'.
6. Via *Explorer*, select Windows folder on new partition/disk.
7. On Edit toolbar, mark 'Paste'.
8. Windows now copies itself (minus swapfile) to the new partition/disk.
9. Via *Explorer*, go to current Windows disk at the top level.
10. Select all folders and files except Windows. (Use select Windows and invert selection as above).
11. On Edit toolbar, mark 'Copy'.
12. Via *Explorer*, select new partition/disk at top level.
13. On Edit toolbar, mark 'Paste'.
14. Windows has now copied itself, boot files and so on, plus any current applications, to the new partition/drive. If you need to boot from this partition/disk, you need to make the partition 'active', via FDISK. Windows automatically creates the swapfile, if it is not present.

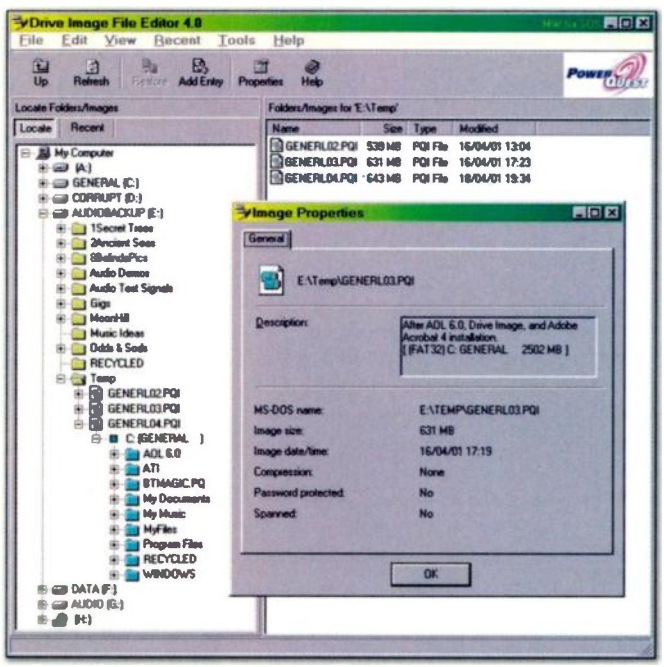
I've found this useful for doing a complete rebuild with two partitions on my C drive, one for music and one for 'the rest'. It can, of course, be done at any time you want to save a 'safe' system.

Dave Nash

Martin Walker replies: Thanks for the info — it just goes to show that we can't always believe what software developers tell us. For obvious reasons you can't simply delete a system file that's in use, or install a new version of a system file that's already running. You would need to use proper install routines to do this. Since *Drive Image* and its ilk run from DOS they can copy absolutely everything, including the swapfile, since Windows isn't running.

However, you've proved that your technique works when copying the currently running partition to another one, and this seems perfect for creating multiple versions of the same system without the expense of buying a dedicated utility. You will also have to make sure before you start that *Explorer* is displaying all hidden and system files, by ticking the 'Show all files' option in the View page of the Folder Options menu, otherwise these won't be included in the transfer.

However, judging by my own attempts to copy huge numbers of files using *Explorer*, *Drive Image* will still prove far quicker, as well as perhaps being more reliable — *Explorer* has occasionally locked up on me when transferring Gigabytes of data from one partition to another, and doesn't always seem to update the in-progress bar correctly during the process. *Drive Image* will, in addition, maintain the relative positions of every file during the transfer, since it produces a physical 'snapshot'. This may avoid possible problems with hidden software protection files that need to stay in a specific position. In addition, for backup purposes *Drive Image* offers compression, and spanning across multiple CD-Rs, so it's not completely redundant! SOS



Although you can copy your Windows partitions without the aid of additional software, *Drive Image* (see PC Notes July 2001) may well let you do the job faster, and it also offers other useful backup-related features.

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QY70 sequencer	RRP£449	£299
MU128	RRP £749	£MEGA
MDF3 data filter	RRP £329	£269
VL70 module	RRP £499	£MEGA

KORG

AMAZING DEALS

TRITON RACK

AT LAST - the rack version of the mighty Triton. Supreme performance modes and powerful sampling, plus room for 8 expansion cards make this a must for every studio.

RRP ~~£1699~~ **£1165** = 0% NO DEPOSIT

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 **KARMA**

Revolutionary technology & sounds with 16 track sequencer

£1599 **24 x £66.62** = 0% NO DEPOSIT

MS2000

Fantastic New 44 note analogue modelling keyboard with sequencer

RRP ~~£749~~ **£635** = 0% NO DEPOSIT

MS2000R

Fantastic New Rack analogue monster RRP ~~£649~~ **£525** = 0% NO DEPOSIT

TRITON

Probably the only keyboard you will ever need to but, integrating sampling, sequencing and killer performance. Features with optional expansion boards! Without doubt the best value product of 1999.

RRP ~~£1999~~ **£1645** AVAILABLE 0% FINANCE

TRITON PRO *76 note version.*

RRP ~~£2149~~ **£CALL** AVAILABLE 36 MONTHS 0% FINANCE

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RRP ~~£2999~~ **£CALL** AVAILABLE 36 MONTHS 0% FINANCE

KORG ELECTRIBE ES1 SAMPLER NEW

Slice and resample capabilities with great filters. Reads WAV and AIFF files.

RRP ~~£429~~ **£395 - 12x £32.91** = 0% NO DEPOSIT

ELECTRIBE

Desktop analogue synth & rythm machine. Incredible new sounds, the result of some stunning new analogue technology. .

RRP ~~£329~~ **£269** = 0% NO DEPOSIT

KAOSS

Realtime Dynamic effects controller. A must for all DJs incorporating the touch pad of the Z1, 60 programme FX & a five second sampler.

RRP ~~£369~~ **£219** CALL FOR MEGA DEAL

D1600 NEW

Affordable 16 track digital recorder. Mixing, Recording & CD mastering in one unit

From £1399 **24 x £58.29** 0% NO DEPOSIT

D12 NEW

New 12 track digital recording workstation

From £799 **24 x £33.29** 0% NO DEPOSIT

KAOSS MIXER

Combines Kaoss pads unique control with pro 2-channel mixer

NEW

RRP £499

24 x £20.79

SP100 Digital Piano NEW

Amazing digital piano RRP £849

GAK Price £499

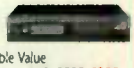
0% Finance available with NO DEPOSIT

SPECIAL OFFERS

SG Pro X £1149
Great Digital Piano

N1 ..... £CALL
Weighted Keys. N5 Synth Engine

N364 ..... £699
Great Workstation



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Unbeatable Value

XS D ..... RRP ~~£699~~ £399
Superb entry level keyboard

EXCLUSIVE DEAL

OASYS Version 2
RRP ~~£699~~ 24 x £24.95 = 0%
Ultimate sound card

TASCAM

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New 8 Track Digital Recorder
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424 MKIII

Portastudio. 6 inputs with mid sweep EQ

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PORTA 02 £99 **414** Portastudio RRP ~~£299~~ GAK Price £199

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DA78 24 bit 8 Track
RRP £1999 24 x £83.29 = 0% NO DEPOSIT

NEW **MX2424**

Digital 24 track recorder

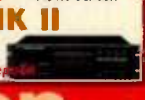
£3499 - 24 x £145.79

CDRW700

New Professional mastering CD recorder.

RRP £499 GAK Price £399 = 0% NO DEPOSIT

DA20 MK II



Industry Standard DAT machine.

£CALL = 0% No Deposit

Novation

SUPERNOVA

Voted best synth of '98. Now 20 note polyphonic, 8 part multitimbral. Amazing analogue modelling.

RRP ~~£899~~ GAK Price £919 = 0% NO DEPOSIT FINANCE

44 voice version now available at RRP ~~£1199~~ £1099 = 0%

IN STOCK NOW

Nova II & Supanova II Keyboards

Prices from £1149

0% NO DEPOSIT FINANCE

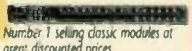
NOVA

Fantastic desktop synth.

RRP ~~£799~~ **£649**

0% NO DEPOSIT FINANCE

SUPERBASSTATION & DRUMSTATION



Number 1 selling classic modules at great discounted prices.

RRP ~~£449~~ NOW £299

nord

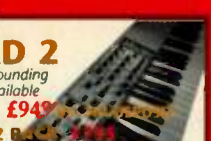
MODULAR

Incredible Keyboard

RRP ~~£1449~~

£1150 = 0% NO DEPOSIT

LEAD 2

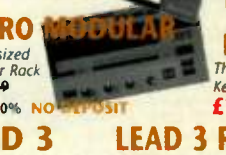


Fattest Sounding Synth Available

RRP ~~£999~~ £949

LEAD 2 RACK £749

MICRO MODULAR



Pocket-sized Modular Rack

RRP ~~£449~~

£349 0% NO DEPOSIT

MODULAR RACK

The Industry's Best Kept Secret RRP £1299

£1099 0% NO DEPOSIT

LEAD 3

£1895 24x £78.95 = 0% NO DEPOSIT

LEAD 3 RACK

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ELECTRO

£1195 = 0% NO DEPOSIT

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MASSIVE DRUM DEPARTMENT 25 KITS IN STOCK !!

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WE NOW HAVE 9 ROOMS CRAMMED FULL OF THE LATEST EQUIPMENT

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WE ARE ONE OF AKAI'S LARGEST UK DEALERS AND ALSO OPERATE AS AN AUTHORIZED REPAIR CENTRE. BUY FROM PRODUCT EXPERTS WITH TOTAL CONFIDENCE.

NEW **DPS16**
Marvellous new 16 track digital recorder with 4 FX busses, 250 virtual tracks and no data compression. Massive 20GB drive
OUT NOW RRP ~~£1499~~ £1099 available 0% NO DEPOSIT

S3000
FREE 32MB RAM RRP ~~£1099~~ £799 AVAILABLE ON INTEREST FREE CREDIT

MPC2000XL
FREE 32 MB RAM Incredible New Features PLUS at last Incorporates Time Stretch
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S6000
16 outputs, 128 note poly. Removable front pannel / remote controller EBX20 F/X standard NEW Operating Software INCLUDES FREE 64MB RAM
RRP ~~£3799~~ £1649 - AVAILABLE ON INTEREST FREE CREDIT

S5000
FREE 64MB RAM Expandable to 128 note poly with 15 filter types! NEW Operating Software INCLUDES 5 FREE CD-ROMS
RRP ~~£1799~~ £1099 - AVAILABLE ON INTEREST FREE CREDIT

DPS12i
12 Tracks of digital recording NOW with 10 GB drive + built in f/x card. Record on 8 simultaneous tracks with no compression!
RRP ~~£999~~ MEGA DEAL £799 = 0% NO DEPOSIT

E-MU

0% Finance on All Emu Products over 24 months

XTREME LEAD 1
64 voice techno synth rack
£549 - 24 X £22.87 = 0% NO DEPOSIT
XTREME LEAD TURBO
£699 = 0% NO DEPOSIT

MP-7
The power of Proteus AND Mo Phatt PLUS powerful multitrack sequencer
RRP ~~£1099~~ 24 X £45.79 = 0% Finance with NO DEPOSIT

B3
64 voice tone wheel organ
£549 - 24 X £22.87 = 0% NO DEPOSIT

VIRTUOSO
128 voice virtual orchestra
£799 - 24 X £33.29

MO PHATT
Urban Dance Module
£549 - 24 X £22.87 = 0% NO DEPOSIT
MO PHATT TURBO
£699 = 0% NO DEPOSIT

ESI2000 DEAL OF THE MONTH
Slightly cut down version of the ESI000 At an incredible price
RRP ~~£699~~ £499 Available on 0% Finance with NO DEPOSIT

E4XT ULTRA
128 note poly, 64 Meg Ram 8 outs. 32 channel + f/x + more
£1999 = 0% NO DEPOSIT

E5000 SAMPLER
Awesome,
£1149
24 X £47.87
0% Finance with NO DEPOSIT

E6400 ULTRA
£1499
12 X £124.91
Available 0% Finance with NO DEPOSIT with FREE RFX board

PROTEUS 2000
128 note poly + 3 additional ROM slots for 128 Mb of sounds.
£649 - 12 X £54.08 = 0% Finance with NO DEPOSIT

BEHRINGER

For over 10 years the Behringer name synonymous with budget, yet good quality and reliable studio effects, workhorses and mixers. With their new pricing structures, this incredible German company have driven it again, now they do it we do not know! All we can do is pass these amazing deals on to a grateful public. Read On

Very Special Offers of the Month - Save over 50%
Tube Compressor All valve compressor RRP £669 ..... £369
Tube Ultra-FX All valve enhancer RRP £669 ..... £369
Tube Ultra-EQ All valve EQ RRP £669 ..... £369

VIRTUALIZER PRO
20 bit dual engine FX with digital I/O £99 or... buy together with MODUALIZER PRO at £169

ULTRACURVE PRO
New version of this classical digital EQ £379

ULTRAMIZER
24 bit mastering processor. RRP ~~£319~~ £129

ULTRADYNE PRO
24 bit dual DSP mastering processor £389

CHECK OUT THESE DEALS

UltraPatchpatchbay	£49	Edison	£119	Multicom Pro	£129
Autocom Pro compressor	£99	Feedback Destroyer Pro	£119	Intelligate Pro	£169
Composer Pro compressor	£99	Powerplay Pro (Headphone system)	£119	UltraGain Pro	£149
Dualfex Pro enhancer	£74	Multigate Pro	£169	Ultra-Dl Pro	£169
Ultrafex Pro enhancer	£99			Super X crossover	£159

MX8000A EURODESK MIXERS
24 input 8 buss 8 aux sends & great pre-amps & mid sweep make this the best value desk ever made
GAK PRICE £999

MX2442A EURODESK
24 input 4 buss 6 aux sends.
RRP ~~£999~~ £699 - Price includes 3 x 8 way Looms

MX20.0.4 No. 1 Seller GAK Price £219

MX1642 £269

MX1604A 16 input 4 buss mixer ONLY £149

MX802A 8 inputs GREAT VALUE ONLY £99

MX602A 4 channel ONLY £75

Steinberg

Cubasis VST PC/Mac £239
Cubasis VST Score £365
Cubasis VST 32 ..... £495
Cubasis VST £85
Wavelab £299

Plug Ins
Pro 52 ..... £239
Model E £125
LM4 virtual drums £85

NEW **HOUSTON CONTROLLER**
RRP £999 24 x £41.62 = 0% NO DEPOSIT

NEW **MIDEX 8**
8 in - 8 out midi interface £265

NEW **HALION**
VST Sampler £245

NEW **USB2** £64

Producer Pack £575

emagic

LOGIC PLATINUM
PC/Mac 96 audio tracks + DSP FX RRP ~~£499~~ £429

LOGIC GOLD 48 audio tracks + DSP FX RRP ~~£399~~ £319

LOGIC SILVER 24 audio tracks RRP ~~£199~~ £159

EXS 24 Sampler £235
AMT 8 8 MIDI in/out £289
MT 4 4 MIDI in/out £129
UNITOR 8 Mk11 19" Rack MIDI interface - 8 in/out ..... RRP ~~£449~~ £399
WAVEBURNER £149

AUDIOWORK 8 PC Audio recording card ..... RRP ~~£399~~ £289
AUDIOWORK 2 16 track Audio Recording Card ..... RRP ~~£199~~ £169
SOUND DIVER Easy tp use Synth Editor ..... RRP ~~£249~~ £160

Propellerhead

REASON Synth Studio System. Thousands of sounds!! ..... RRP ~~£399~~ £275
RE-BIRTH 2 x 303's, 1 x TR800, 1 x RR909!! ..... RRP ~~£149~~ £119
RE-CYCLE Great Loop Tool for Samplers ..... RRP ~~£199~~ £165

MOTU

2408 MK11 ..... £899 - 24 x £37.45 = 0% NO DEPOSIT
1224 ..... £1175
NEW 828 Audio Interface £795
MTP-AV £569
DIGITAL PERFORMER £399
EXPRESS XT £339
MICRO EXPRESS £245

ECHO

MIA 24 ..... £215
GINA 24 ..... £365
LAYLA 24 ..... £775
DARLA 24 ..... £285

Ego-Sys

WAMI BOY £365
WAMI RACK 24 ..... £525
WAVE TERMINAL £299
MIDI TERMINAL £99
U2A USB £199

Hardware & Software

CAKEWALK SONAR Complete audio workstation £249
CREAMWARE POWERSAMPLER £395
CREAMWARE PULSAR II £889
DIGI 001 Computer Studio £799
FOSTEX VC-8 Convertor £189
EMU E-CARD £269
LEXICON CORE 2 + MP100 Daughterboard £299
NEMESYS GIGASAMPLER £69
NEMESYS GIGASTUDIO £269
SONIC FOUNDRY ACID PRO ..... £CALL
SONIC FOUNDRY ACID MUSIC £79
SONIC FOUNDRY SOUND FORGE 4.5 ..... £LOWEST
TERRATEC EWS88MT ..... £LOW
TERRATEC EWX24/96 ..... £LOW
YAMAHA VX256 ..... £179
YAMAHA DS2416 ..... £475

Midiman

THE COMPLETE Midiman RANGE IN STOCK
True RELIABILITY AT AFFORDABLE PRICES!!

Delta 1010 10 In / 10 out PCI Digital Recording system £529
Delta D10 PCI digital I/O card £205
Delta 44 PCI card £195
Delta 66 PCI digital recording interface £275
Audio Buddy £85
MIDISport £65
MIDISport 8 x 8 ..... £249
SuperSport £209
CO2 ..... £45
CO3 ..... £139
Midiman Thru 1x4 ..... £19
Midiman 3x8 ..... £65
Midiman Merge 2x2 ..... £45
Macman 1x3 ..... £45
BIPort 2x4 ..... £129
2x4 PC £79
4x4 Parrallel £179
PC/S PC serial £65
PC/P PC parrallel £49

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20 experienced staff!! Yes we are huge! Hi-Tech recording specialists

OPEN SUNDAY's 10.30 - 4.30

Outboard FX

dbx

NEW DBX386

New hybrid mic preamp.
RRP £499 24x £20.79
= 0% NO DEPOSIT

NEW QUANTUM

Fantastic new Finalizer RRP ~~£1449~~ £1399 0% NO DEPOSIT Finance
24 x £58.29 = 0%

1066 *Dual Compressor with expander/noise gate*
RRP ~~£479~~ GAK PRICE £CALL
0% Finance

266 *Classic Comp Limiter & Gate*
RRP ~~£329~~ GAK PRICE £129

286 *Mic Preamp/De-esser/ Channel strip*
Terrific Value
RRP ~~£299~~ GAK PRICE £159

Digitech

QUAD 4
4 independant studio FX simultaneously in one 19" rack
RRP ~~£395~~ £CALL

STUDIO 200 *Dual 20 bit FX processor* RRP ~~£299~~ GAK Price £199

TALKER *Vocoder, auto wah...*
RRP ~~£349~~ GAK Price £219

VOCALIST PERFORMER
Adds 2 harmonies to vocals with reverb RRP ~~£369~~ GAK Price £269

NEW VOCALIST

VR £359
VOCALIST ACCESS £CALL
VOCALIST EX £539
STUDIO 100 *Mega!!* £139

JoeMeek

VC1Q
Pro Channel compressor & Enhancer Preamp & 3band EQ
GAK PRICE £589

VC3Q

Bestselling pre-amp, compressor & exciter with balanced ins & outs
RRP ~~£399~~ GAK PRICE £CALL

VC6Q
Pro Channel Compressor & EQ
GAK PRICE £289

JOEMEEK C2

Optical Stereo Compressor
Great Value NOW £169

TL Audio

FAT 1 *Compressor* £249 0% Finance
FAT 2 *Compressor* £289 0% Finance

IVORY 5050
Mono Valve compressor/pre-amp £249 0% Finance

IVORY 5013
Dual 4 band parametric EQ

RRP ~~£469~~ £CALL 0% Finance

IVORY 5021
Dual valve mono compressor with expander/gate RRP ~~£469~~

£CALL 0% Finance

IVORY 5001
4 channel valve mic preamp RRP ~~£469~~ £CALL 0% Finance

Lexicon

Lexicon reverb/FX amazing new price RRP ~~£349~~ NOW £CALL

MPX500 FX *Incredible new 24 bit FX unit from the masters*
RRP ~~£449~~ £379 0% FINANCE

MPX100 *Get the amazing*

MPX1 *Top quality reverb & multi fx. Mega deal, Save over 40%*
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Hundreds of Headphones always in stock

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BEYER DT150 £119
BEYER DT100 £85
SENNHEISER HD25 £129
SENNHEISER HD570 £89
SENNHEISER EH1430 £19

MACKIE Mixers

MACKIE d8b

56 channels, 96 mon... faders. Numerous wo... No. 1 hits!! New Plug-ins now in stock RRP £8995 -
Call - Available 36 months inter...

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 - 24 x £166.24 = 0%

MACKIE 24/8

The classic 8 bus analogue desk, in stock and on demo
Price £UK LOW - 0% No Deposit Finance

MACKIE 32/8/2 £CALL

VLZ MIXERS

Complete range of Mackie VLZ mixers in stock
1604 VLZ Pro ..... £CALL
1642 VLZ Pro NEW £699
1402 VLZ Pro ..... £CALL
VLZ 1202 ..... £CALL
SR24 ..... £CALL

NEW **CFX LIVE MIXERS** *with onboard digital effects*
CFX 8 £499 CFX 12 £699 CFX 20 £899

Soundcraft Spirit Mixers

DIGITAL 328
£2490 - 0% NO DEPOSIT

FOLIO SX

12 mono & 2 stereo inputs 4 buss swept mids & loads more!.
RRP ~~£479~~ GAK PRICE £379

NEW SPIRIT M8 MIXERS
M4 ..... £499
M8 ..... £629
M12 ..... £759

FOLIO F1

16/2 ..... £299
14/2 ..... £249

FOLIO FX8 ..... £349
FOLIO FX16 ..... £699
Built in Lexicon multi FX unit! Swept mids, 4 aux sends.
FOLIO NOTEPAD
Small 10 input mixer with typical Soundcraft quality £109

SPIRIT STUDIO
8 bus mixers from an amazing £875

Studio Monitors

DYNAUDIO

Fantastic quality nearfield monitors
BM5's £349
BM6's £CALL BM15's £CALL

HHB CIRCLE 5'S
Owned by virtually every member of the shop staff!!
RRP £399 Now £315

HHB CIRCLE 5'S
Powered version £699

HHB CIRCLE 3'S
Slightly smaller, just as punchy £225

GENELEC 1030
Powered version £949 BEST UK DEAL!!

GENELEC 1029A
Industry standard bi-ampmonitors. Includes FREE Quicklock monitor stands worth £79 RRP ~~£749~~ NOW £479

MACKIE HR824 £1099

SOUNDCRAFT ABSOLUTE 0'S
Best performing monitor speakers under £200 RRP £229 £159

SOUNDCRAFT ABSOLUTE 2'S
Handling power of 100 watts RMS. Great studio workhorses
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YAMAHA NS10
Industry standard nearfield monitors
RRP £369 £299

EVENT MONITORS
Complete range in stockand on demo

TANNOY REVEALS
2 way nearfields with contoured framework. Our biggest selling monitors RRP £249 GAK Price £CALL

TANNOY REVEALS Active £399

JBL Control 1s £89

SAMSON SERVO POWER AMPS
Award winning power amps at unbelievable prices!!!
Servo 170, Servo 260, Servo 550
PRICES From £129

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Large diaphragm Cardoid true condenser from the masters RRP £729 GAK Price £485

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AKG C4000B
Simply the best value mic we have ever heard!. FREE AKG headphones & Mic stand in package RRP ~~£499~~ INCREDIBLE £289

AKG DRUM MIC SET £429

AKG C3000B *Industry standard, ideal for vocals and acoustic instruments. PRICE INCLUDES FREE mic stand* RRP ~~£399~~ £CALL

AKG 414 £549
AKG D880.770 EVERY LOW

AKG C1000S
Condenser with great frequency response £119

AKG C2000 £169

AKG D112 RRP ~~£199~~ £149

AUDIO TECHNICA 3525
Quality Studio Condenser mic. RRP ~~£269~~ £139

AUDIO TECHNICA 4033A

Probably our best value studio mic, including free shockmount & mic stand
RRP ~~£695~~ GAK PRICE £225

AUDIO TECHICA 4050
Condenser quality studio mic RRP ~~£995~~ £495

RØDE NT1

Particularly good studio vocal mic. Recommended! RRP £329 Now £139

RØDE NT2
Including cardoid & omni patters with free shockmount & mic stand/clip
RRP £499 Now £275 Superb Value

RØDE NT3 *Entry level Mic* £119

RØDE NTV *All Valve Mic* RRP ~~£749~~ £549 = 0%

SHURE SM57 £75
SHURE SM58 £75
BEHRINGER XM2000 £25
NEUMANN M147 £1089
NEUMANN U87 £CALL Nuff Said

ALESIS

ANDROMEDA

The most powerful real analogue synth ever made! RRP £2599
36 x £72.19 = 0%

ADAT LX20

Price includes FREE 8 way Loom & AKG headphones
RRP ~~£1399~~ £899 0% NO DEPOSIT

ADATXT20
~~£1999~~ £1579 0% NO DEPOSIT

3630 COMPRESSOR
Best value compressor
RRP £199 GAK Price £109

NEW **AirFX** £159 - In Stock

MASTERLINK

Revolutionary new stereo mastering unit
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0% Finance Available

SR16 *Highest selling drum machine anywhere Industry Standard* £159

MEGA DEALS

DM5 Drum Module	£269
Nano Compressor	£79
Midiverb IV	£174
Microverb IV	£139
Nanoverb	£89
MEQ230 Graphic	£179

CDR & DAT Players

NEW MARANTZ CDR770
Pro spec CD recorder
RRP ~~£649~~ £349 Available 0% No Deposit

NEW HHB BURN-IT
CD recorder
RRP ~~£499~~ £389 Available 0% No Deposit

TASCAM CDRW700

New Pro mastering CD recorder.
RRP ~~£499~~ £399 = 0% NO DEPOSIT

FOSTEX D5 *Pro DAT machine. XLR balanced ins & outs* £CALL

FOSTEX CR300
Pro-spec rewritable CDR recorder
RRP ~~£899~~ £599 = 0% No Deposit

HHB CDR850 *Pro CDR.* RRP ~~£806~~ £539 = 0%

MARANTZ CDR631
Pro Spec CD recorder £639 - 0% finance

PHILIPS CDR880
Bargain priced CDR with built in sample rate convertor RRP £499 GAK PRICE £329

PHILIPS CDR775
Dual deck CD recorder with double speed copier
RRP £469 GAK PRICE £349

PANASONIC SRV3800
Industry standard 20 bit mastering DAT machine
RRP £1099 £899 0% Finance

TASCAM DA20 DAT MACHINE
New version of quality machine. 10 FREE DAT tapes RRP £699 £CALL

TASCAM DA40 *New 16bit DAT recorder*
RRP £949 Deposit £94 24x£35.62 0%

TASCAM CD RW5000
Pro CD recorder. R/W.
RRP £899
Deposit £89 24x£33.75

FOSTEX

VF-16

Digital 16 track with built in effects and compressors
~~RRP £1199~~
MAJOR BREAKTHROUGH PRICE - £849

VF08 DIGITAL 8 TRACK NEW
RRP £549
Available on 0% Finance

VM04 Special Offer
Affordable digital mixer ~~RRP £249~~ £99

D108
Record 8 simultaneous tracks on this digital recorder which includes a hard drive & SCSI
~~RRP £1099~~ £845 Available on 0% Finance

VC8 *Adat/Analogue convertor.*
RRP £199 CALL FOR DEAL

D5
DAT recorder.
RRP £549 = 0% No Deposit

NEW D-2424 *Digital 24 track.* £2699 = 0% - No Deposit

FOSTEX OFFERS
D5 DAT £579, *D160 Recorder* £1649, *CDR300 CD Recorder* £700 LOW TO PRINT!
X14 4 track £99

TC Electronic

NEW **POWERCORE**
RRP ~~£999~~ 24 X £41.62
= 0% NO DEPOSIT

FINALIZER 96K
The ultimate mastering solution.
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doing the business

BIG GEORGE'S GUIDE TO COMMERCIAL SUCCESS

How do you spot a TV industry professional? They pay more attention to the end credits of a programme than they did to the show itself. How do you spot a successful player in the music industry? They know which record company department deals with delivery expenses.

Knowing who does what is an essential part of making your way in the entertainment industry, and helps you to work out who you should be working with/for/alongside. So here's a handy glossary detailing the key players, with their job descriptions. Of course, it's filled with sweeping generalisations, prejudice and personal bitterness, but if you feel that there are categories missing or a more detailed approach should have been adopted, you really ought to get out more. (I have dealt at length with many of the issues here in past editions of *SOS*. For access to most of my previous scribblings, check out the *SOS* web site, www.sound-on-sound.com, or www.biggeorge.co.uk/articles.)

TV Industry

• EXECUTIVE PRODUCER

The Executive Producer is the head honcho who answers only to the broadcast commissioner, a man (all broadcast commissioners are men) you will never meet. Executive Producers occasionally come into the place where the work is being done and demand changes to things (like your music) that have already been fully discussed by all the relevant people on the production. Perhaps the best way of describing the Executive Producer is the spanner in the works who either takes credit for a successful programme they didn't manage to mess up, or apportions blame for programmes that would have been fine but for their interference.

• PRODUCER

The Producer pulls everyone on the project together and does the hiring and firing. Producers all have completely different approaches; some second-guess everything that everyone suggests, while others are totally invisible throughout the production — until there's an award to collect. Mind you, it's the Producer's responsibility to bring a project in on time and within budget, which is not an easy gig.

• DIRECTOR

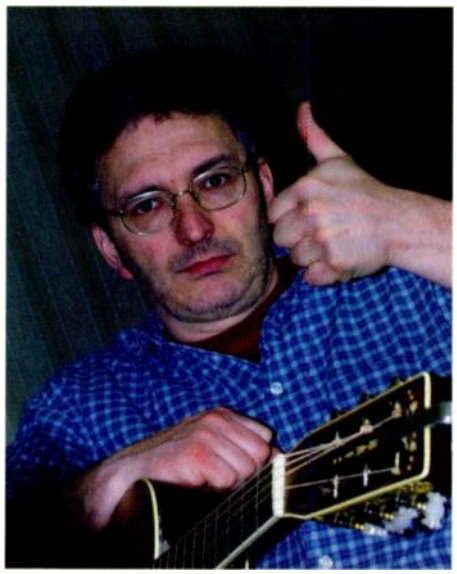
The Director is the person who discusses colours and angles, tells the camera where to point, decides where everybody should stand, screams blue murder, and says "one more take". They have a 'better' opinion than anyone else, so the trick is to make sure that all your great ideas sound as though they are the Director's great ideas. By the way, if the Producer is in the room when the Director is talking to you about something, the two will always start to politely disagree with each other about whatever it was you were agreeing about. When they do, keep your mouth shut.

• PRODUCTION MANAGER

The Production Manager is probably the only person who knows exactly what's happening on the production at all times — check everything with them. And be friendly: they make out the cheques.

• PRODUCTION ASSISTANT (PA)

The PA organises the Director's every move, times everything, logs rehearsals, and basically controls all of the statistics of the programme when it goes out on air. In my experience, PAs also know the best jokes and most salacious gossip.



• ASSOCIATE PRODUCERS

The Associate Producer does the groundwork for a programme, checking locations, booking guests, and dealing with bizarre requirements. Like the Sound Department, Camera Operators, Floor Managers, and so on, Associate Producers are your best mate, even if they do get a bit grumpy now and then. And like you, the aforementioned are all at the bottom of the food chain — at the moment!

• RUNNER

Like Associate Producers, today's Runners are tomorrow's Spielbergs and Scorseses. They are the youngsters who get in early, stay late, go to the shops, make coffee, get jerked around by tyrants and tossers, get sandwiches, then go back and get another sandwich with a different filling, as the Director changed his mind, wash up, hang about doing nothing, collect and deliver tapes... and so on. Their pay ranges between less than a supermarket checkout-assistant's wage and nothing at all.

Record Industry

• A&R (ARTIST & REPERTOIRE)

Traditionally, this title denoted someone whose job was to find the artist, choose the song, hire a producer/musical director, put a band together, hire an arranger, and book a studio to record it. In truth, their job hasn't changed an awful lot in the past 50 years. Of course, that shouldn't stop me (on behalf of everyone who has ever been slagged off by, ignored by, or condescended to by A&R personnel) having a serious poke. But let's get on.

Big George uses this month's column to present his very own media *Who's Who*.

Advertising Industry

Much of the infrastructure of the advertising industry is the same as in the TV and music industries. The following two, however, are exclusive to advertising.

• CREATIVE DIRECTOR

The job of the Creative Director is to hold meetings where they 'paint pictures' of their overall vision for an ad campaign and then watch the assembled team of experts struggle to measure up to their ill-defined expectations. They don't talk in practicalities; they are motivators (mainly in convincing the client that the campaign for which they are shelling out this extraordinary amount of money is worth every penny).

• COPY WRITER

The flow of the campaign and the direction of your musical contribution to it is dictated by the copy writer, whose job it is to 'sloganise' the brand. They come in two breeds. The first is the hacks who bang out ideas and treatments while watching the horse-racing on TV and spitting venom about every subject going. Their plus side is they don't go in for intellectual analysis of your contribution to their masterpiece, as they are too busy.

Then there are the 'artists', whose every act in the campaign is ripped from their very soul — and you have to go on their journey to reach the same plateau of perfection. These people are Creative Directors in the making.

Just Throw Money

This column is my chance to mouth off about the subjects you want explained and, occasionally, to deliver sad showbiz anecdotes. If there is a burning issue you want me to get my teeth into, the best way to get my attention is to send me a huge suitcase full of used, unmarked £10 notes. Even a copy of your music would do, plus your ideas on how to make the industry of music a safer place to inhabit. This is *our* industry, but if we're not careful the number-crunchers who control the means of commerce will dispense with us altogether. Contact me at: Big George and his Plastic Donkey, PO Box 7094, Kiln Farm, MK11 1LL. Email: big.george@sospubs.co.uk; web site www.biggeorge.co.uk.

• **LEGAL DEPARTMENT**

This department takes care of every contract, clause and litigious matter. You don't really have any personal contact with it, as legal people only want to talk to other legal people (your solicitor). And speaking of solicitors, it is recommended that you seek independent legal advice before signing anything. Getting out of a contract is possible, but can consume your life and destroy your every dream. So read it out loud to yourself before visiting a legal eagle. And here's a simple rule of thumb: the thickness of a contract is directly proportional to the size of the investment the company is making.

• **MARKETING**

Which demographic does your image appeal to, how can the public's desire to shell out their hard-earned on your product be maximised, exactly what photo and logo defines you? Marketing has become the new rock and roll. It used to be the music that was the most important element in the music industry; now it's how to promote the act.

• **PLUGGERS**

These are the people who go into radio stations and play new records to the staff in order to secure a spot on the A-list. They will also plead with TV types to have you on the show, as visually the way you stand motionless, staring at your feet, will keep the nation enthralled. Newspapers and magazines will know your favourite colour. For every minute the Plugger is in your service they sincerely believe every word they say, even if it is the same stuff they said about the last 100 records they worked on.

• **PUBLISHER**

Publishers take care of copyright issues and collect money from sales and performances. A publisher takes a percentage of your songwriting earnings (20–55 percent) and in return is committed to advancing you money, finding ways to exploit your work and, most importantly, believing in you. You can survive without a publisher, but ask yourself why everyone who makes music that sells has one.

• **DISTRIBUTION**

In simple terms, the distributor owns the vans that deliver records to the shops. Now, as anyone who has ever pressed up some records knows, selling them is not an easy matter. Of course, if you sign up to a £50 million deal with Sony Records you will never have to dirty your hands with distribution, but if you're putting out a record yourself and you want more people than your Mum to buy a copy, you'll need to know how to get it distributed.

Distribution companies are independent entities, and therefore open to offers. Their service varies from simply distributing a stack of your records to handling the entire process — pressing, international licensing, and so on. But my guesstimate is that less than two percent of their business comes from non-established record companies, and they take less than one percent of the self-released records they are offered. (NB. It *is* possible to make a quick couple of grand by selling your specialist material direct to the limited outlets who stock your sick brand of music, but you must know your market inside out.)

• **FIRST-CALL SESSION PLAYER**

The sort of player that makes you ill. They pick up their instrument and can play anything, not just brilliantly, but as if they've been playing the piece all their life. There are great players everywhere, but the cream is drawn to London, New York, LA and Nashville. They're well paid (£1000 per day isn't a rarity), but it takes iron balls to survive.

• **PRODUCER**

Producers differ enormously in how much influence they have on records — some decide what mic to use and the decay of the reverb, while others pop their head in every couple of days and change the second line of the chorus. Their job is to condense all the ideas and excitement within the project (that includes the band, the record company, and possibly the composer) into a saleable product.

• **ENGINEER**

Engineers route mics to channels, patch in compressors, and hit the record button without losing the greatest solo ever played. Here's a simple way of thinking of the difference between Producers and Engineers: a Producer puts his feet up on the mixer and says the snare needs reverb; the engineer says "how much?" and then makes it happen.

• **TAPE OP**

Tape Ops get in early, clean up the debris from last night's late session (which they themselves locked up after), make tea, go down the shop, produce tape copies, and, if they're clued up, turn into big record producers themselves. These days, the number of places for tape ops is dwindling, while the number of hopeful candidates is increasing. But for anyone wishing to get into the recording industry, that couple of years spent sticking labels on boxes and sweeping up far outweighs any amount of music technology education, if you keep your eyes and ears open and your mouth shut.

And Finally

If you're ever confused about anything (like who deals with delivery expenses), here's a tip: call the accounts department of the organisation in question, be very charming (they don't get many nice calls; most people ring accounts screaming "WHERE IS MY MONEY?"), and they'll point you in the right direction. SOS

sample shop

Our regular look at the hottest new sample CDs and CD-ROMs.

Chris Whitten's Monster Beats

(ZERO G AUDIO/WAV)

"One of the most ambitious drum loop CDs ever". Now that's a statement and a half to kick off a set of sleeve notes, but it's exactly how drummer and film composer Chris Whitten introduces *Monster Beats*, his new two-CD collection of drum loops for Zero G.

Described as a collection of "brutal, bangin', monstrous beats, loops and breaks", this collection offers over 75 minutes of audio. CD one comprises 90 tracks of loops, with a good range of tempos (mainly 60-155bpm, with one solitary loop coming in at a whopping 203bpm). CD two contains all the beats sampled, cut and looped in WAV format, with some extra loops and fills not included on the audio CD.

As for the beats themselves, each track features a played drum loop, in both dry and ambient versions, then the same loop processed with extra EQ or run through one of a number of the analogue modular synths, such as the ARP or Roland 100M, listed in the sleeve notes. The loops are tightly played and extremely well recorded, with just the right amount of grit and grime left to add some atmosphere — a nice touch that is sadly lacking in some other collections. Although the patterns included here lean heavily towards the rock/funk/alternative genres (perhaps unsurprisingly, as Chris has toured with both Paul McCartney and Dire Straits), with a little imagination and editing they could be used for just about any type of composition.

The processed beats work well enough, with plenty of filter and frequency manipulation going on, but never too much to obscure the groove and feel of the original loop. As for the "kind of edgy stuff guaranteed to make your ears bleed" that is promised by the CD's publicity, a few of the tracks on offer certainly hit the target. However, overall I felt the majority of the processing was a touch too polite and could have been more aggressive and unrestrained.

So is *Monster Beats* really one of the most ambitious drum-loop CDs ever? Well, this CD set does offer a solid collection of well-played drum loops featuring usable effects and processing. Producers and composers from all genres looking for something extra to spice up their drum tracks will find plenty to use here. But those out on the cutting edge or looking for truly extreme beats may find this monster just a little tame. *Oli Bell*

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Keith LeBlanc's Essential Trilogy

(AMG AUDIO-CD SET)

At £60 per disc, or all three discs for the price of two, you have to say that *Keith LeBlanc's Essential Trilogy* is top value for money. Almost four hours of superbly recorded, full-phat loops, beats, hits, scratches and soundscapes providing everything you need to get an authentic hip-hop and 'old skool' feel to your work — unless, that is, you're into hip-hop and old skool.

What do I mean by that? Well, hip-hop as an underground movement of music, rap and lifestyle has been around for over a quarter of a century. Only recently has it found its way into the mainstream. Five years ago you would never have heard a hip-hop beat on a TV ad or theme tune, whereas today you can detect the influence of Afrika Bambaataa on tea-bag commercials and the theme music of daytime chat-shows about marital problems in transsexual relationships. To get the truly authentic sound of hip-hop, you'd

probably be better off looking out a copy of DJ Swamps' *Never Ending Breaks* on vinyl, or spending your weekends at boot sales looking for copies of Don Covay or Sam and Dave records at 50p each. Then all you need to do is get yourself a decent turntable, learn how to scratch, re-evaluate your lifestyle and approach to music, and you'll be down with the Longbeach/Compton/Inglewood crew in no time.

Or do you just want access to the style and flavour of the modern world? If so, look no further than this sample CD set.

Before going into detail about *Essential Trilogy*, I will just point out to potential purchasers that AMG have a different system for licensing their samples than other producers. The common system is that the buyer is deemed to have purchased a licence to use the samples when they purchase the CD from the producer. The sleeve notes on AMG CDs direct the buyer to complete an enclosed licence agreement, if they want to use the samples commercially, and return it to AMG. Anyone who doesn't obtain this licence (which is free of charge) and uses samples from an AMG CD commercially, on a chart hit, for example, may find they are taken to court. According to the company, their approach is designed to reduce sample piracy. Now, back to the review...

Volume 1: *Hip Hop Hard Phat* and Volume 2: *Old Skool Beats, Class Of 2001* are armed with over 100 loops, broken down in various ways for a range of uses, dozens of cool scratches, drum hits and dubs, plus a few shouts. The majority of the beats are made up from a mixture of live drums and machines, processed in the lab and served up in slices of full mix, dry mix, FX mix, with/without hi-hat mix, and so on. Just loop 'em up and off you go. It's worth pointing out that the science of scratching records requires the same kind of adroitness as playing lead guitar, and these discs have the equivalent of Jimi Hendrix at the deck, scratching tones, beats and top lines. The results are all incredibly usable and authentic.

Volume 3: *Out There* contains an amazing array of soundscapes which, in truth, have more to do with Hollywood movie underscores than retro dance music, but are nonetheless superb. They range from ambient waterscapes to sitar backdrops, plus a few drumscapes from hell that could easily be part of an Arnie blockbuster soundtrack. The majority of these are between ▶

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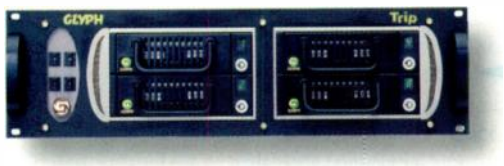

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90 seconds and three minutes long. There are a few drum breaks and percussion tracks, but after the onslaught of the first two volumes, they seem a little out of place surrounded by the vast soundscapes on this volume.

What this trilogy doesn't offer is the same old hip-hop beats that have been circulating the globe for the past couple of decades. What it does offer is a blueprint for the future of modern backbeat. *Big George*

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Nu Groove RnB

(E LAB AUDIO/WAV)

Sweden may not be the first place you think of when seeking a source for the R&B sound that has dominated the pop and urban charts over the last few years, but E Lab seem determined to challenge that perception. Adding to their growing library of 'street'-style sample CDs, the Swedish beatsters now present *Nu Groove RnB*, the sequel to their popular *Strictly RnB* collection. Spanning two CDs, *Nu Groove* is a collection of programmed drum loops for the busy urban producer.

All the audio is found on CD one — 73 minutes spanning 97 tracks. After the suitably smooth demo, the bulk of the CD (tracks 2-79) consists of 'Groove Kits', each containing a full loop plus variations and breakdowns. This is followed by the individual drum sounds that made up the original loop. Tempos in this section range from 50 to 111bpm.

Tracks 80-91 offer 108 one-shot beats labelled 'Loop Tools'. Each is cut to the same length in bars, and sorted into one of three speeds (70, 85 and 100bpm), making all the loops compatible and interchangeable. The audio CD is rounded off by six tracks of drum separates, called 'Sound Tools': assorted snares, rimshots and finger-clicks, plus kicks and hi-hats, for building your own loops.

CD two contains all the loops and samples featured on the audio CD as WAV files, plus over 500 samples and loops from other E Lab libraries, including the *X-static Goldmine* and *Vinylistic* series — a nice little bonus.

So what do the loops sound like? Well, the programming is tight and authentic, if not exactly ground-breaking. Patterns range from laid-back hip-hop loops to fractured, jiggy beats, and overall sound quality is excellent. The kicks boom, the snares snap, and the rimshots click as they should, although I'd dump the cheesy scratch sample that turns up occasionally. One small criticism is that the same synthetic drum sounds and very similar patterns begin to crop up after a while, which can make some of the loops sound a little 'samey'. I would also have liked more 'real' drum sounds and loops, to add a human flavour that the collection currently lacks.

Overall, *Nu Groove RnB* wears its influences proudly on its sleeve — track names like 'Missey', 'Usha' and 'Lilkim' should leave you with little doubt as to what to expect. Producers looking for unusual or off-the-wall hip-hop or funk breaks would be better off looking elsewhere. But if you produce modern R&B or streetsoul and are looking for an authentic, easy-to-use collection of chunky beats to slot easily into your tracks, *Nu Groove RnB* could well be for you. *Oli Bell*

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Pure Guitars

(YELLOW TOOLS S1000/ GIGA/EXS24 CD-ROM)

I played guitar (badly, since you ask) in my youth, but found keyboards a much easier proposition. Apart from the more logical note layout, a huge advantage of keyboards is that you can use a spare hand for a bit of surreptitious arse-scratching, a technique most guitarists can only dream of. However, there's nothing like the sound of a guitar for annoying the neighbours, and now, with the aid of the *Pure Guitars* CD-ROM, even pathetic string-fumblers like myself can produce a convincing guitar-like noise from our samplers.

Pure Guitars consists entirely of acoustic guitars: no licks, riffs or flamenco histrionics, just single notes plus harmonics, chords (straight major, minor and dominant 7th) and effects such as string squeaks and body knocks. The CD-ROM contains about 407Mb of unlooped samples, and for once the lack of loops is not a problem; the notes are allowed to die away without noticeable truncation, so the sound is entirely natural.

Eleven guitars were sampled, including two nylon-stringed and several steel-stringed ones, an Ovation piezo, a superb 12-string, and an acoustic bass. The steel-stringed guitars are played finger-style, and also with a pick. Most instruments offer generous five-way velocity switching, based on quiet, medium, loud, and 'exaggerated attack' notes. The fifth element is a tone slide up to the target note, which only kicks in at very high velocities.

The sound quality of *Pure Guitars* is clean and clear, the miking is beautifully done, and the samples have punch and presence. The library is all mono, but this in no way compromises the sound. Arpeggios and lead lines played on the 'Nylon Spanish' and 'Fingered Steel' sounded immaculate, and the occasional slide up adds the final touch of realism, even if you practically have to break a key to get the slide sample to sound. I found that quiet legato melodies were the hardest to emulate, but that is a restriction of samplers in general, rather than this library.

The chords (also performed at different dynamics) are presented with up-strokes and down-strokes in separate keyboard registers, which allows fabulously realistic two-fingered strumming. The tuning is excellent, and the 12-string's chords, though harmonically restricted, sound glorious. I can't see anyone outside of the Julie Felix fan club using the Ovation's dominant 7th chords, but if you yearn for an added 2nd or sus 4th, just dial up the single notes and play your own. String squeaks and body knocks I can live without, but the harmonics which accompany many volumes are most welcome.

I liked these sounds a lot, and found them very playable and musically satisfying — hence this four-star review. However, I have some criticisms. The samples in 'Nylon Vibrato' are identical to the ones in the 'Nylon Concert' volume, which wastes 32Mb of disc space. A far worse problem concerns 'dead air' on the front of samples: 'Nylon Spanish' contains many badly-trimmed samples, and is not the only volume affected. Such negligent programming can be easily (though laboriously) rectified by the user, but should never have occurred in the first place. The CD-ROM is still a good deal, though. *Dave Stewart*

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Mark Wherry investigates Beatnik, a powerful way of adding interactive music content to your web site.

The Beatnik web site's main page.

Despite increasing computer performance, Internet connections and multimedia possibilities, most music on the web today is fairly static, if it is present at all. Indeed, as web pages themselves become more visually impressive, dynamic and tailored to our needs, they are still, for the most part, like silent movies. Eighties pop master and music innovator Thomas Dolby Robertson has been interested in the possibilities of interactive music for many years, and this experience has culminated in the creation of Beatnik (www.beatnik.com), a platform for the delivery of interactive music on-line, and also the name of his company.

Introducing The BAE

At the very heart of Beatnik is the Beatnik Audio Engine (BAE) a music synthesizer, sample player, effects processor, sample-rate converter and stereo 64-voice mixer rolled into one. In addition to playing back linear audio formats such as MP3 and WAV, the engine provides a full software synth for playing back MIDI and RMF files, and you can even include your own samples.

The key advantage for the composer in using the BAE is that it provides a common platform on which to write and deliver music for the Internet. The problem with putting MIDI music onto the web has been that you never know how it will sound on the listener's computer. This uncertainty is eliminated by using Beatnik, because everyone is going to have access to the same sound set, and you can provide any extra samples that are required.

The Rich Music Format

Providing a common set of sounds is very useful, but perhaps the biggest strength of the BAE is its support for Rich Music Format (RMF) files, which are compact in size, play back almost instantly on demand, and can contain three different types of musical information.

Firstly, the RMF file can contain MIDI data, just like the MIDI files we are all familiar with, which is played back using the factory and user sounds available to the BAE. Secondly, the same file can contain linear audio stored in formats such as WAV, AIFF, AU (short for Audio, a standard audio file format for Sun and NeXT workstations) and, perhaps most significantly for Internet distribution, MP3. Lastly, the RMF file can also contain your own sampled instruments, that remain in the BAE while the RMF file containing them is in use.

The convenience of being able to supply this information in one file is obviously very valuable when you're sending it over the Internet, but the key to RMF is what you can do with it during playback (more later). After all, Beatnik is about interactivity, not just another way of playing static music.

If your RMF file is made up of custom instruments for sound effects, narration, or something similar, without any song data (such as a MIDI file), in Beatnik-speak it's referred to as an RMFX file. Despite this naming difference, an RMFX file is treated in exactly the same way as an RMF file and still has the .RMF file extension. For those worried about the security of their work, RMF files are automatically locked with 40-bit encryption, to protect copyright details and any custom instruments that you may create yourself.

Beatnik Player

To experience the world of Beatnik, simply download and install the *Beatnik Player* plug-in for your browser (visit www.beatnik.com/software/player.html). Although there have been various compatibility issues in the past, the latest version (2.2) supports *Internet Explorer* and Netscape *Communicator*, on both Windows and Mac platforms. (You can even get a copy of the *Beatnik Player* for Compaq's iPaq Pocket PC, a must for any musician who is also a hand-held computer anorak!)

The *Beatnik Player* plug-in is accessed by web developers through a JavaScript interface, and anyone already familiar with the JavaScript language should have no problem in getting to grips with the Beatnik Application Programming Interface (API). Full documentation is provided, in addition to tutorial material covering both basic and advanced topics, but if you're not familiar with JavaScript, you can use the 'EZ Sonifier' (www.beatnik.com/software/tutorials/sonic_wizards.html), a simple web-based wizard that generates code you can cut and paste into your web page.

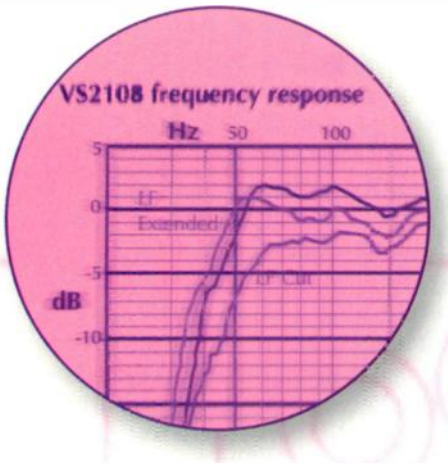
What Can You Do With It?

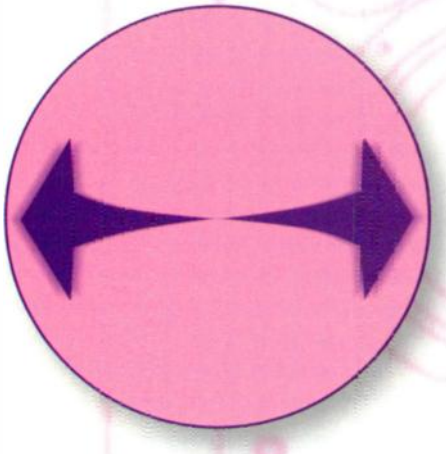
The simplest way of adding some interactive sound to your site with Beatnik is to 'sonify' the user interface; specifically, we're talking about links and elements users can click on. They will will hear a sound for rollovers and clicks, which can be a good way of giving your site something of a sonic identity. However, remember to bear in mind the number of times users will hear these sounds when navigating your site — you don't want to irritate them!

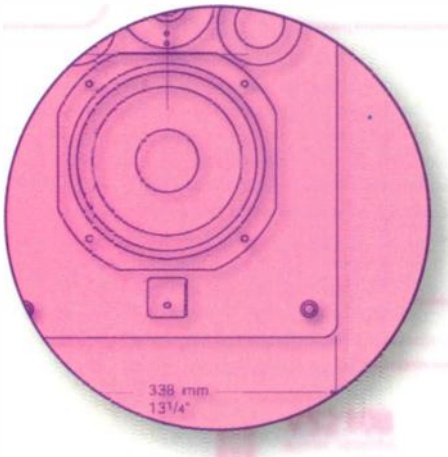
There are many possibilities during playback for MIDI data encapsulated within an RMF file; for example, you can alter tempo, or change level and pan positions. It's also possible to mute and unmute tracks, which means that you could select tracks to play randomly each time a page is visited, so that the user hears a slightly different arrangement on different visits.

You can also make use of QuickClips, short audio samples, usually between three and five seconds in length, that are optimised for immediate playback on a web page and are usually triggered by a rollover, or a mouse-click on an object such as a link or an image. Immediacy is the key reason for using a QuickClip instead of streaming Real Audio, for example, because the audio starts to play as soon as the user wants it, with no 'connecting to server' or buffer delays. QuickClips also need no external player window launched, to clutter up the display and usability of the web page.

The example Beatnik gives for the use of QuickClips is an on-line record store, where clicking or rolling over elements such as album covers or track names gives the user a brief preview of ▶







VS2108

Roger Quested's got a bit of a thing about speakers.

With over 30 years experience in monitor and acoustic design you may even call him obsessive. However, this single mindedness has produced many of the innovations we now take for granted in speaker design.

With Roger's range of smaller cabinets you can now bring Quested quality into your studio, whatever the size. The **VS2108** retains the superb stereo imaging and flat response which characterise the Quested range.

So next time you need serious monitoring, you won't have to think too hard. Chances are Roger Quested has done the thinking for you.

Quested users:

- Abbey Road
- Sarm West
- The Hit Factory
- Manor Mobile
- Sony Music Sudios
- Euphonix
- Zoo
- Jungle
- The Sound Company
- Square Centre
- Sasha
- Talvin Singh
- Blade
- Hans Zimmer
- Vince Clarke
- Joan Armatrading
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the relevant album or track. This example could be applied if you have your own home page to promote your music, giving your audience brief pre-download or pre-buy audio teasers. Take a look at Beatnik's QuickClips example page to see this in action, at www.beatnik.com/showcase/quickclips.html.

Adding QuickClips to your own page does involve some JavaScript programming ability, though sample code is available that you could adapt without too much difficulty, especially if you are already familiar with HTML. A QuickClips extension is provided to make life easier for programmers, and contains three ready-made instructions for talking directly to the Beatnik plug-in. The first is the Play command, which starts playback of a QuickClip and automatically makes sure that only one QuickClip is playing at a time. The second is the Stop command, which halts playback with a short fade-out, so that the audio doesn't end abruptly. It's worth noting that Beatnik only provides the fade-out for you if the clip's playback ends prematurely; you will still need to add your own short fade-out to the end of a QuickClip to account for when the whole length of it is played.

The third ready-made instruction provided by the QuickClips extension creates a clickable preview button to indicate when a QuickClip is ready to play (the extension transparently loads audio in the background while the web page is appearing). There's a full tutorial that takes you from the preparation of audio files right up to the process of putting a web page together at www.beatnik.com/software/tutorials/quickclips.html.

Mixman eMixes

Instead of becoming a platform for controversy, Beatnik is being positioned as a way of promoting artists and record sales within the music industry, and perhaps the best example of this is the eMix, a web application that allows you to remix music online.

The eMixes are custom-made by Beatnik, so there is currently no easy way for you to produce eMixes with your own material, but the number of eMixes online is increasing all the time and currently you can find tracks from Moby, Yes and David Bowie to remix, as well as a few others I'd rather not mention! The increasing number of partnerships being made with major record labels and individual artists will ensure that good content is always available for this purpose.

The eMix really does show off the potential of using Beatnik with JavaScript programming; your own remix actions can be recorded, stored and even emailed to a friend!

Taking the idea of on-line remixing a stage further, Beatnik have acquired Mixman, a company that specialises in software tools for DJ remixing. The highlight of their product range for most people will be *Mixman Studio DL*, a tool with which you can combine sounds to mix your own tracks; these can then be exported as MP3s, to the web or to CD. The 'DL' suffix refers to the fact that this version is downloadable. It costs just US$19.95, for either Mac or PC.

To Infinity And Beyond

As with most technology, the usual cliché about the possibilities being limited only by your imagination is true for Beatnik. This is because Beatnik makes the full API available to JavaScript programmers, making it possible to write any number of musical applications that can run in a web browser. For an inspiring example of Beatnik's potential, check out the GrooveTub at www.beatnik.com/showcase/groovetub/index.html.

One particularly interesting web page I found has some very useful aural training programs for music education, including melody dictation and interval training. These exercises are constructed entirely in HTML and JavaScript for browsers with the Beatnik plug-in, and demonstrate the diverse potential of music on the Internet. They can be found at http://stumac39.music.temple.edu/IWP/toolkit/default.html.

The Beatnik web site is a great starting point for further exploration, containing pages of examples and tutorials that will quickly get you up to speed on how to use Beatnik. The platform offers huge potential for changing how sound and music is brought to the Internet. If you have musical content on your web site, you need to look carefully at Beatnik. SOS

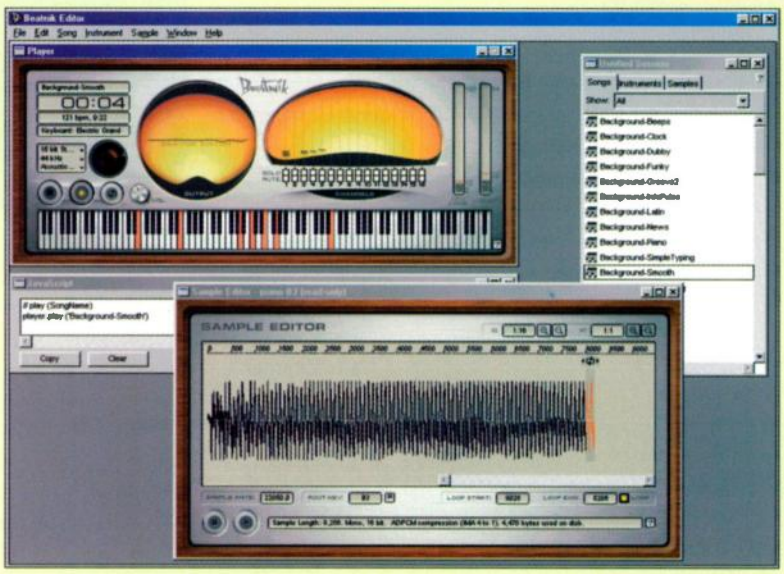
The Beatnik Authoring Tools

Beatnik offers two tools — the *Converter* and the *Editor* — for authoring RMF content. The *Converter* is a simple Windows-only tool for converting standard formats such as WAV and MIDI files into RMF files. A 'Pro' version (available for US$24.95) adds support for MP3 importing and exporting.

The Beatnik *Editor* is the ultimate environment for authoring your own RMF music. While you can do everything with it that you can do with the *Converter*, the *Editor* goes much further, offering the ability to create instruments to be played by the Beatnik Audio Engine. However, this power comes at a price: the *Editor* costs US$129.95, with only a limited demo version available for free download.

One feature that will interest users of powerful computers is the ability to link the *Editor* with your sequencer of choice, via OMS on the Mac, or MIDI Yoke on Windows (download from www.midiox.com). This method allows you to compose music with the sounds from the Beatnik Audio Engine, so you are able to hear exactly what your audience hears. Full step-by-step instructions for all major sequencers, on both platforms, are included in the new PDF documentation for the editor.

For more information about the authoring tools, downloads and online purchasing, have a look at www.beatnik.com/software. Users of *Mixman Studio* software will be interested to know that from version 4 they can export their work as an RMF file, ready for use in web 'sonification'.



The attractive Beatnik Editor allows users to author their own RMF (Rich Music Format) files, potentially in concert with their favoured sequencer package.

Get to grips with MIDI

Rather than struggling with a mouse or fiddly step-time entry, you would probably prefer to play notes using a music keyboard. In much the same way, dynamic control, such as mixing or sound-bending is better with hands-on hardware controls.

The ***C16*** has sixteen 60mm sliders. These sliders may be assigned to a variety of MIDI control functions, which are held as one hundred templates (*Targets*). As the ***C16*** is mainly a preset device you avoid the brain-ache of having to program it yourself, and you can quickly get stuck in to using it creatively. The large number of presets (ninety-eight) means that ***C16*** is ready, out of the box, to do most of the jobs that you are likely to want it to do.

It is easy to recall one of the *Target* presets. First, you look up its number. Then, holding down the TARGET SELECT pushbutton, you move sliders 4 and 5 until the two-digit LED display shows the correct number.

The ***C16*** has one MIDI IN and one MIDI OUT. It automatically merges the MIDI data it receives with the data it generates.

The ***C16*** has extensive support for *GM*, *GS* and *XG*. It can generate MIDI *Controllers*, *NRPNs*, *RPNs*, *Aftertouch*, *Pitch Bend*, *Notes* and the majority of *SysEx* parameter change messages.

If the MIDI messages you require are not available from a preset, two **programmable** *Target* locations (98 and 99) allow each slider to be individually set up. This feature has now been enhanced to support a wider range *SysEx* data formats. We provide an easy-to-use computer application to help you create your own templates – *Mac* and *Windows* versions are available for free download.

Full details of the built-in preset *Targets*, and a growing collection of ready-made User *Targets* (now including many *VST* plugins), are also available for free download from our website.

The ***C16*** is 210mm x 135mm x 55 mm and has a built-in mains power supply.

The ***C16*** has now been shipping in quantity for over a year. There have still been no units returned as faulty or damaged – there have been no service returns at all! The ***C16*** is consistently proving to be an outstandingly robust and reliable product.

***C16* MIDI Control Unit £148.75**

Control non-MIDI gear

Little MCV will let your MIDI system control your analogue synths. It can generate control voltages for the 1V/oct (log.) or the V/Hz (linear) systems. The gate can be set to five volts positive, ten volts positive or S-trig. It has *MIDI In*, *CV Out* and *Gate Out* ports.

Classic drum machines and sequencers, such as the *TB-303* and *TR-808* have Sync24 ("DIN Sync") inputs. When connected up via ***MDS***, they should start, play in time, and stop automatically by remote control from MIDI master equipment.

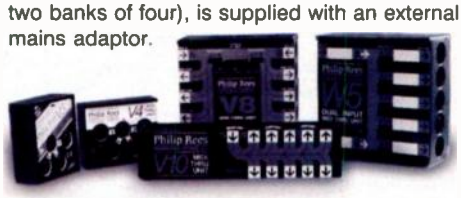
Both of these easy-to-use devices include integral mains power supplies.

***MDS* MIDI to Sync24 Converter.. £69.95**
***Little MCV* MIDI to CV Converter.. £75.95**

Low cost thru units

Some MIDI gear may lack thru sockets. Chains of more than three MIDI devices can suffer from data corruption. You can solve these problems easily and cheaply with our MIDI thru units.

The handy ***V3*** is a battery-powered one-into-three thru box. The ***V4*** has one input and four outputs, and is line-powered. The ***V8***, which has two inputs and eight outputs (arranged as two banks of four), is supplied with an external mains adaptor.

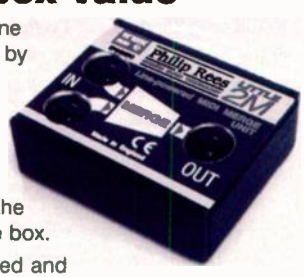


The ***V10*** is a mains-powered one-into-ten unit. The mains-powered ***W5*** has independent source selection for each of its five outputs.

***V3* MIDI Thru Unit £12.95**
***V4* MIDI Thru Unit £19.95**
***V8* MIDI Thru Unit £35.95**
***V10* MIDI Thru Unit £39.95**
***W5* Dual Input Thru Unit..... £48.75**

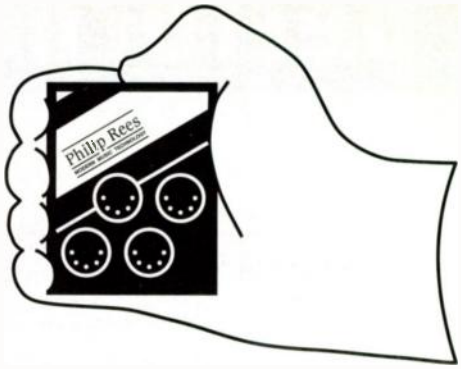
Merge box value

You can't combine MIDI signals just by joining the wires together. Merging MIDI data is a job for a microprocessor, like that in the ***Little 2M*** merge box.



This well-specified and compact unit is powered via one of its MIDI IN lines. Thus, it requires neither batteries and nor an external power adaptor.

***Little 2M* MIDI Merge Unit £39.95**



Functional simplicity

Versatile MIDI Channel Shifter & Filter

The useful ***CSF MIDI Channel Shifter and Filter*** is a compact MIDI processor unit with a built-in mains power supply. It can selectively pass or reject MIDI messages by channel, or alter their channel assignments. It can also mute a specific message type on a specific channel, or on all channels. MIDI *System* messages can also be selectively muted.

Two rotary switches combine to select the operating mode. A sixteen position switch generally selects a MIDI channel. A twelve position switch selects the function.

Eleven MIDI channel processing functions are available, as follows:

- **the selected channel retransmitted solo, the rest muted**
- **the selected channel muted, all others passed**
- **mute messages on channels above that selected**
- **mute messages on channels below or equal to selected**
- **the selected channel solo and shifted to channel one**
- **pass channel one solo shifted to selected channel**
- **shift all channels "round the clock" by selected offset**
- **mute control change messages on selected channel**
- **mute pitchbend messages on selected channel**
- **mute program change messages on selected channel**
- **mute all aftertouch messages on selected channel**

When the function switch is in the twelfth position (*System and Global*), the 16 position switch is available as a subfunction selector. The sixteen *System/Global* subfunctions are:

1: **bypass (pass all)**
2: **mute all system messages**
3: **mute System Exclusive messages**
4: **mute MIDI Time Code quarter frame messages**
5: **mute Song Select messages**
6: **mute Clocks, Start, Stop and Song Position Pointer**
7: **mute Active Sensing**
8: **mute all channel messages**
9: **mute all notes (on all channels)**
10: **set all note-on velocities to 100**
11: **mute all control change messages**
12: **mute all all-notes-off messages**
13: **mute all pitchbend messages**
14: **mute all program change messages**
15: **mute all aftertouch messages**
16: **retransmit all channel messages on channel one**

MIDI In, Out and Thru ports are provided.

***CSF* MIDI Processor £79.95**

Philip Rees

MODERN MUSIC TECHNOLOGY

Philip Rees 5 year guarantee

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performer notes

This month, *Digital Performer*'s useful but little-known Clipping window falls under the Performer Notes spotlight. Plus tips on where to find top VST freeware plug-ins for use with *DP*, and advice on setting up side-chain access to MOTU plug-ins.

The Clipping windows in *DP* rank among its least glamorous features, but they're potentially one of the most useful. At their most basic, they can behave as storage or 'archive' areas for data such as MIDI phrases, audio files and soundbites, or even entire sections of music consisting of a variety of data types. But they can also store or 'point to' data and files outside the *DP* environment, holding PDF-format manuals, or documents from other applications like audio editors and music scoring programs.

Clipping windows are really just 'views' of folders located on your hard drive. To get a better grasp of this idea, try opening a *DP* project which already has some MIDI or audio data in it. Under the Windows menu, select 'Clippings' and choose 'New Project Clipping Window' from the submenu that appears. A little Clipping window should appear, with its title bar highlighted ready to be renamed. Enter a name for it, and then double-click the title bar. A standard Mac OS window opens in the Finder with the same name as your Clipping window. If you look around in the Finder to see where this new window is located on your hard drive, you'll see that *DP* has automatically created a 'Clippings' folder inside your project's folder, and that the new Clipping window's folder is inside that. There is also a 'New Digital Performer Clipping Window' option, which creates a folder in a similar way, although this time inside a 'MOTU Clippings' folder located inside your Mac's Preferences folder. As you might guess, the difference between 'Project' and 'Digital Performer' Clipping windows is that data stored in a Project Clipping window is available only to the project in which it was created, but anything stored in a Digital Performer Clipping window is available to any project that you open.

Once you've created Clipping windows, you can copy MIDI or audio data to them from *DP*'s Tracks window with the 'Copy To Clipping Window' option under the Edit menu, selecting the precise Clipping window you want from the submenu. Once your window has data in it, you can pull copies back into the Tracks window at any time by simply dragging the Clipping icon from the window with the mouse, although obviously you can't pull MIDI Clippings into Audio tracks and *vice versa*.

The 'Copy to Clipping Window' option is one of the main ways of adding items to Clipping windows, and if you're clipping data from the Tracks or Graphic Editing windows it's the best option. Another method, often used for clipping external files or folders, is to drag Finder file icons directly into the Clipping window. If you drag a folder, or even your hard drive icon, into the Clipping window, *DP* simply creates an alias to it which works in exactly the same way as an alias in the Finder — double-clicking on the alias in the Clipping window will even open the folder or drive in the Finder.

To give you an idea of the versatility of Clipping windows, here's one containing a wide range of data relating to a recent recording of mine: effects settings for hardware processors dumped as SysEx, patch info, lyrics, audio drum fills, aliases pointing to my audio storage drive, pitch-bend settings... the list goes on.

Finally, you can also drag files into a Clipping folder's window via the Finder, whereupon they will then show up in Clipping windows in *DP* as normal. In general, though, it's better to let *DP* automatically create aliases for your files — that way you don't need to worry about accidentally erasing something important if you delete a clipping or its window.

So, what can you actually do with these windows once you've set them up and filled them with clippings? Users who find *Performer*'s metronome inflexible or clumsy often store MIDI click tracks they've created as clippings, as they can be easily dragged into and deleted from sequences when necessary, and, of course, very complex, irregular click tracks can be produced and stored if required. As I mentioned previously, Clipping windows can provide easy access to PDF instruction manuals, or linked word processing documents containing song lyrics or production ideas, settings information for outboard equipment, or perhaps diagrams of studio layouts or mic positions (see screen grab, above left). You can also drag web site addresses into clipping windows, most easily from *Internet Explorer*, by dragging entries in the Favorites window into the Finder, and then from the Finder to the Clipping window.

A different use for clippings is to store entire song sections, allowing you to completely restructure pieces with just a few drag-and-drop manoeuvres. You could even record System Exclusive dumps from your equipment into a sequence and then gather them all together into one Clipping window for later recall in other sequences — ideal for quickly creating easily accessible libraries of synth patches. Automation data, too, can be copied to Clipping windows and quickly replicated on other tracks. If you think about it, there's bound to be some way in which you could speed up the way you work by using clippings.

Using Plug-in Side-chains

A number of *DP*'s MAS effects plug-ins include side-chain inputs, allowing audio signals routed to them from elsewhere in *DP* to control or influence some

Quick *DP3* Tips

If you're creating lots of Clippings and putting them in the same Clipping window, you can speed things up by selecting 'Copy to Clipping Window' for the first clipping, and then simply using the keyboard shortcut Shift-Apple-C after that.

You can rename a clipping at any time by holding down the Alt key and clicking on the name of the clipping. This Alt-and-click renaming technique works on all sorts of titles within *DP*, including track names, marker names and soundbites.

If you need to bypass lots of MIDI or MAS effects quickly, hold down the Alt key and click on their names in the Mixing Board's insert slots. To quickly copy an effect from one channel to another, drag it from its insert slot whilst holding down the Alt and Apple keys.

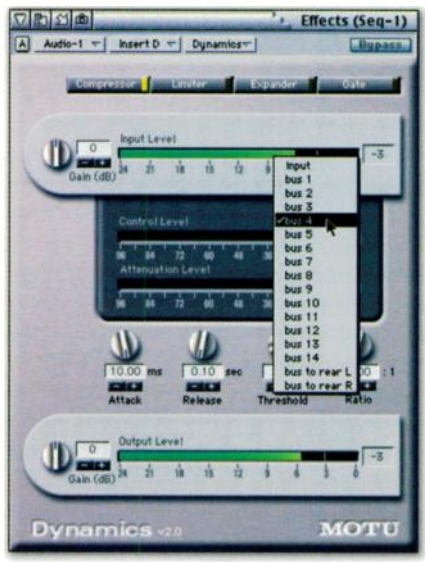
aspect of their operation. The most familiar application of this side-chain routing is 'ducking', often heard when radio DJs do voiceovers at the end of songs. Here, the DJ's mic signal is patched into the side-chain input of a compressor or limiter through which the song is being played, so that every time the DJ speaks, the compressor activates and the song audio 'ducks' to a lower level so that the DJ's voice is audible. The same effect can easily be set up in *DP*, but there are many more interesting possibilities too. MAS plug-ins offering side-chain routing include *Dynamics* (compressor, limiter, expander and gate), *Multimode Filter*, *Sonic Modulator* and *Ring Modulator*, and in all cases, audio must be routed to the side-chain inputs via one of *DP*'s busses (or a buss pair).

Setting up the side-chain input in the *Dynamics* plug-in is quite straightforward. Just above the control level meter there's a Control Signal pop-up menu which defaults to 'Input' when the plug-in is activated for the first time. This is perfectly logical, because normally, if you're compressing a lead vocal (for example), it's the level of the original vocal recording (the plug-in's input) that should be controlling the amount of compression which is applied. But the Control Signal pop-up can allow a 'side-chain' buss input to control the amount of compression applied to the audio passing through the plug-in. Note that this side-chain input is purely a control signal — it will remain inaudible unless routed to an output somewhere else in *DP*. So to get that DJ ducking effect in *DP*, you'd place a *Dynamics* (compressor) plug-in on the song's audio channel, and then set up an aux send on the DJ's mic channel. By setting the Control Signal pop-up on the *Dynamics* plug-in to the same aux send buss (see the screen grab below right), the mic signal will act as control signal for the compressor. Providing you've dialled appropriate settings into the plug-in, you should hear a drop in the song's volume every time there's a signal present on the mic channel.

Using the same kind of routing, you could try inserting compressor or gate plug-ins on channels carrying audio with a fairly constant level (like a synth pad, for example), and instantly give them some dynamic variation or even an aggressive 'chopped up' quality by routing percussion or other rhythmic parts to the plug-ins' 'Control Signal' inputs. There are numerous records that use this effect extensively — a recent example is the single version of David Gray's 'Babylon', the string part of which is gated with a rhythmic side-chain input opening and closing the gate [*although not within* DP — *Tracks Ed*].

Both the *Sonic Modulator* and *Multimode Filter* plug-ins have side-chain inputs, allowing their onboard envelope generators to be triggered remotely. So you could, for example, apply *Multimode Filter* to an electric guitar track, and use its side-chain input to trigger filter sweeps from a live vocal part for wah-type effects. As a final example, consider the *Ring Modulator* plug-in, which normally bases its sum-and-difference frequency calculations on the tones produced by its internal oscillator. But by choosing other options from the 'modulation source' pop-up, it's possible to select a buss input or even the carrier itself as the control signal.

With experimentation, it's possible to get some amazing effects using this kind of setup. *Robin Bigwood* SOS



Accessing the side-chain on the MOTU *Dynamics* plug-in.

Storing Plug-in Effects Settings

One of the best uses for Clipping windows is the storage and management of settings for *DP*'s MAS effects plug-ins. Although new or modified effects presets can be saved by selecting 'Save Settings...' from any MAS plug-in's mini-menu, these presets are normally only accessible from the project they were created in. But by holding down the Apple key and dragging plug-ins containing new presets from the Mixing Board's insert slots into a Digital Performer Clippings window, a library of user presets can easily be built up. You could create separate Clipping windows for each MAS effect, or perhaps have one window of favourite presets encompassing lots of different plug-ins.

Freeware VST Plug-ins

There are some truly great freeware VST plug-ins out there that will work with *DP* under *Pluggo* or *VST Wrapper*. Here are some that I turn to most often:

• SILVERSPIKE

RM844, which works under *Pluggo*, is an exceptional reverb plug-in that's good at creating believable small spaces and also more 'creative' reverbs. *Ruby Tube*, a valve amp and limiter simulator is also well worth having. For both, visit www.silverspike.com.

• ARBORETUM

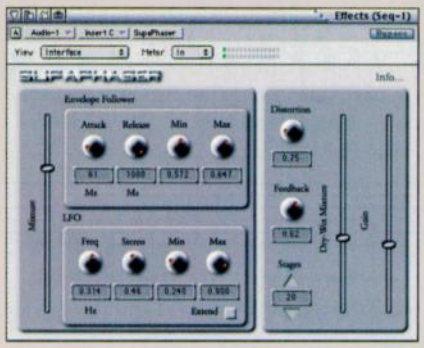
Whilst the *H-VST Low Pass* and *Ring Modulator* plug-ins available from www.arboretum.com seem fairly average at first glance, astonishing effects can be achieved by automating them under *Pluggo* in conjunction with their unique control surfaces. Exercise caution if you value your hearing...

• MAXIM DIGITAL AUDIO

There's a huge number of plug-ins to be had at www.mda-vst.com, but the best, which all run under *VST Wrapper*, are the handy *mda Piano*, the *JX10* synth, and *RoundPan*, a great psycho-acoustic panner.

• SMART ELECTRONIX

I've not come across many phasers as genuinely useful as *SupaPhaser* (pictured below) from www.smartelectronix.com. This is a superb, rich-sounding plug-in, with both LFO and envelope trigger modulation options.



Smart Electronix' *SupaPhaser*.

• PROSONIQ

North Pole, from www.prosoniq.com, is such a good 24dB-per-octave filter that when I first downloaded it, I suspected I'd unwittingly acquired a hacked version of a commercial product. But it's all above board (I checked), and works perfectly in *DP* under *Pluggo*.

• DREAMPOINT

Dreampoint's *FreeVerb* is a classic, and though it has relatively few parameters and no graphical user interface, it makes a nice noise. It's a touch heavy on the processor under *VST Wrapper*, but worth it. Surf to home.onet.co.uk/~jzracc/freeverb.htm to download a copy for yourself.

More wise words on using *Cubase*'s Score editor this month, as we explain how to create a musical score in which several voices share a single stave. There's also the usual assortment of handy editing tips...

Let's pretend we've recorded the right-hand section of a simple piano piece into *Cubase* and tidied it up using the methods described last month. Even when the instrument we're writing for is capable of playing more than one note at a time, such as the piano, overlapping notes can make a score extremely hard to read (see Figure 1, right). There are two ways to deal with this problem: a quick fix, and a more grammatically correct solution. The simplest approach is to turn on the No Overlap Interpretation Flag, as shown in Figure 2. If the overlap is caused by the way the part was played, as opposed to being deliberately written that way, the No Overlap quick fix is fine. However, when one part (in *Cubase*-speak) includes two different musical ideas (or voices) simultaneously, using No Overlap will create a grammatically incorrect score. For example, the part featured in the illustrations does indeed contain two musical ideas: a melody line (the upper note) and an accompaniment. Because we really do want that top note to sound over the chords for the whole bar, the correct way to present it would be as in the score shown in Figure 3, right.

Here we're using what are called 'polyphonic voices', a musical term and a feature implemented within *Cubase*. The idea is that it allows one stave to contain two independent voices, which are distinguished by the stems for the upper voice going up and the stems for the lower voice going down, to save us having to see a tangled mess of overlapping notes. *Cubase* lets you have up to four voices on a stave, though you will rarely need to go beyond two unless you're writing complex organ or guitar notation.

Setting Up

Setting up a stave for polyphonic voices is a fairly straightforward process. You begin by opening the Staff Settings dialogue (on the Score menu) for the stave you want to make polyphonic. In the top group, set Staff Mode from Single to Polyphonic, and click the Edit button in the same group to open the Polyphonic Settings dialogue. By default, the settings will give you two voices on two separate staves. This could be ideal for piano or SATB (soprano, alto, tenor, bass) choir arrangements, but useless for a single stave instrument, so for a single stave with two voices, disable the lower 5 and 6 voices by removing the ticks in the On column within Properties. The Show column in the Rests bracket allows you to show or hide rests globally for a particular voice on a stave. The note values stay the same, but the rests just get hidden.

If you're writing two voices on the stave all the way through the music, you should show the rests for both voices, so use the default settings. (Incidentally, when entering new notes, the voice the notes are inserted into is set by the Insert buttons to the far left of the toolbar in the score edit window. If you want to enter notes to appear on a second voice, make sure that the 2 button is selected instead of 1.)

The Up/Down column in the Stems bracket allows you to specify what stem direction the notes in a particular voice take. You can choose between Up, Down and Auto, which is the normal behaviour that notes take when we're not using polyphonic voices. As a general rule of thumb, if you're writing two parts on the stave for the whole piece, the first voice should be set to Up and the second to Down, which is the default configuration.

By default, all the notes will be be assigned to the first voice unless you specify otherwise. To assign a note or a group of notes to a different voice, first select the note or notes you want to assign to that voice. Now press Alt (Option on the Mac) and the number of the voice you want to move the notes to. For example, in a two-voice stave, pressing Alt + 2 will move the notes to the lower voice.

This method of selecting notes and then moving them manually is all well and good for short parts or the odd division, but if you want to move large quantities of notes to different voices it's soon going to get tedious. For this reason *Cubase* implements the useful (albeit overly dramatic-sounding!) Explode feature to do it for you. To use this, open the Explode dialogue, which is found under the Staff Functions submenu of the Score menu. Make sure it is ▶

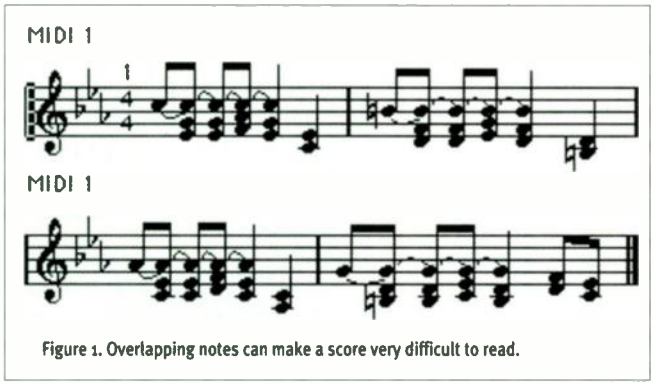


Figure 1. Overlapping notes can make a score very difficult to read.

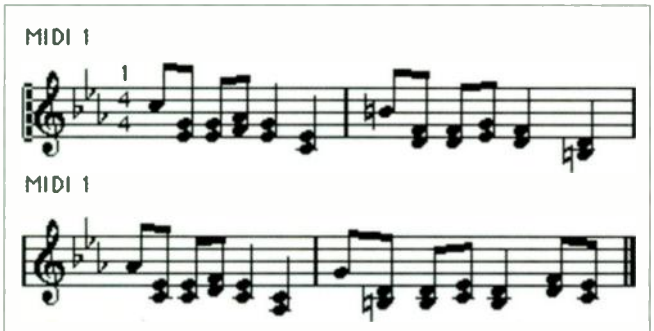


Figure 2. *Cubase*'s No Overlap Interpretation Flag gets rid of overlapping notes, but it can't tell the difference between intentional and unintentional overlaps.

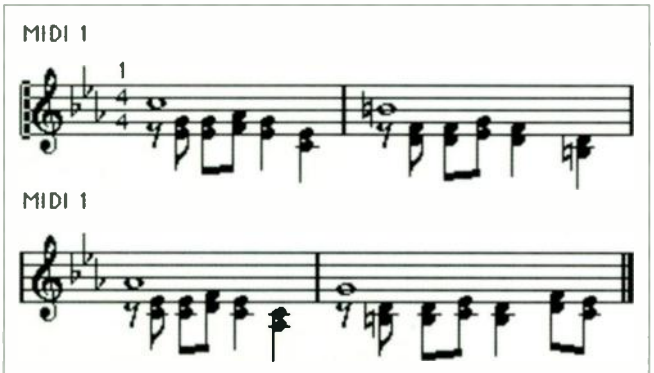


Figure 3. When you're dealing with two or more parts sharing a single stave, you'll need to use *Cubase*'s 'polyphonic voices' feature.

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▶ set as Notes to Polyphonic Voices, and then activate only the Bass to lowest Voice flag and click OK. The function of this setting should be self-explanatory!

Although it is very useful, there are some issues to bear in mind when using the Explode feature because, as with any automatic do-it-for-you feature, you always need to check through the score making sure it has done exactly what you wanted. If there's a break in one of the voices, the single line of notes that plays during the break is often incorrectly assigned to the wrong voice. Ambiguities of this type often trip up such automatic facilities: if only one voice is playing, *Cubase* won't necessarily know which voice to assign it to, so you need to check through carefully afterwards and make any necessary alterations.

Astute readers will notice that the Explode features are also available from the Polyphonic Settings dialogue when the Auto Move To Voices feature is enabled. However, I would generally recommend using the Explode feature after you've set up the polyphonic voices because in this case, if you want to undo the operation for some reason, the polyphonic settings won't get lost as well.

Only On Occasions

The procedures we've been looking at are great for a stave where the polyphony occurs all the way through, but what if only a small section of a stave needs to be written using polyphonic voices? *Cubase*'s Polyphonic Settings dialogue is clever enough to deal with this. When you are writing one voice with an occasional division, hide the rests on the second voice and activate the Center flag on the first voice. The Center flag ensures that the rests are displayed in the normal centre-of-the-stave position. Set the first voice's stem direction to Auto and leave the second voice set to Down. The stave will now behave normally, except that when notes are assigned to the second voice, the polyphonic voices feature will take effect as required.

One Track Or Two?

With most instruments or voices, it's fairly clear how best to set up the tracks and staves in *Cubase*. Most instruments and voices should be presented on one track with one stave and polyphonic voices used where necessary, either for splits or for naturally polyphonic instruments such as the guitar. By keeping the lower voices active (or by setting the staff mode to split instead of single or polyphonic), it's possible to have two staves displaying the music contained on one track. This is ideal for SATB choir music, which has four choir parts divided between two staves; the soprano and alto lines are written on the upper stave, with the tenor and bass parts occupying the lower stave. However, when it comes to writing for the piano or the harp, do you use the SATB approach or put the upper and lower staves on separate tracks? If it wasn't for one factor, my advice would be to use the SATB approach. However, if you need to use cross-stave beaming, it's only possible to achieve this if the upper and lower staves are on separate tracks. SOS

Mark Wherry is the author of the forthcoming Wizoo Pro Guide To *Cubase* Scoring.

Slurs And Note Symbols, The Easy Way

The slur is one of the most common symbols used to illustrate how phrases should be articulated on a score, and it's possible to add a slur as you would add any other symbol by going to the Dynamics Symbol Palette, clicking the slur symbol and drawing it onto your score. However, because you'll probably be adding many slurs to your score, this process can soon become tedious. Happily, there's a better way!

To add a slur to a group of notes, select the notes you want to add a slur to and choose Do / Insert Slur. If this wasn't easy enough, you can make this process even more efficient by adding a Key Command for the Insert Slur function: select Edit/Preferences/ Key Commands and click on the Score tab, and the Insert Slur command appears near to the bottom of the list.

If you're not entirely happy with the look of a slur that *Cubase* has added, it's very easy to adjust the shape to your liking: select the slur by clicking on either the start or end point. These control the start and end positions of the slur, while the middle point controls the shape of the slur. Keeping this roughly central will give the slur a balanced look.

The note articulation symbols are found in the Note Symbols Symbol Palette (Score/Symbol Palettes/ Note Symbols) and although they're added to notes individually, the *Cubase* programmers were aware how long this process could potentially take and how tedious it would be for the user.

- To add a single note symbol, select the note symbol you want in the Note Sym Symbol Palette. Then, with the pencil tool, click the note you want to add the symbol to.
- To add multiple note symbols, select the note symbol you want in the Note Sym Symbol Palette, and with the arrow tool, select all the notes to which you want to add the note symbol; then choose Do/Multi Insert.

The second procedure is a real time-saver; to make it even more efficient, it's probably worth adding a Key Command for the Multi Insert command.

One thing you'll notice is that notes have to be selected with the arrow tool, yet the pencil tool gets selected automatically when you select a note symbol from the palette. Fortunately, it's possible to tweak this behaviour: Open the Score Preferences dialogue from Edit / Preferences, and choose the Edit Behaviour tab. Then activate the item Double Click Symbol To Get Pencil Tool (it's the second item in the list) and click OK. You can probably guess what this feature does already. You now have to double-click a symbol to get the pencil tool, while a single click will now select the symbol without changing to the pencil tool — very useful for entering note symbols with Multi Insert. Note that if the pencil tool is already selected, even if Double Click Symbol to get Pencil Tool is activated, a single click will not change back to the arrow tool.

Mark Wherry

Cubase Tips

If you have Snap turned off in the Arrange page or track pane editor, it can be difficult to move parts between tracks without accidentally moving them forward or backward a little. Holding down the Shift key while you do so should keep a part's horizontal position locked. *Sam Inglis*

Got a friend coming in to work on your computer who's used to another sequencer and its keyboard shortcuts? The Additional Files folder on the *Cubase* CD-ROM contains keyboard setups for all the other major sequencers... *Mike Senior*

As every *Cubase* user must know, numbers 1 and 2 on the numeric keypad act as shortcuts to move the Song Position Pointer to the left and right locators respectively. If you haven't got any other marker points in the song, however, pressing 3 by default returns the pointer to the very start of the song, no matter where the locators are. *Sam Inglis*

When I'm editing, I quite often find myself wanting to cut up a part and move sections of it to another track. This can be fiddly to do in the Arrange window with its limited zoom resolution, but you can't open an empty track in the track pane editor. The track pane editor, moreover, won't always let you move audio unless you're dropping it onto an area of a track where there's already a part. However, you can use the pencil tool to create or extend a part in the Arrange page. If you have to do a lot of detailed cutting and moving between tracks, therefore, the easiest way is often to create a new part on an adjacent track, select this and the part you need to cut up, and double-click to open the track pane editor. You'll now be able to freely move sections of audio from your existing part to the other track. *Sam Inglis*

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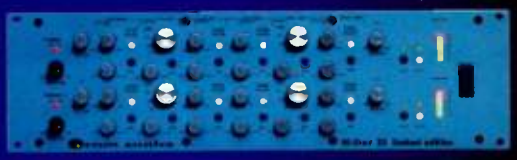

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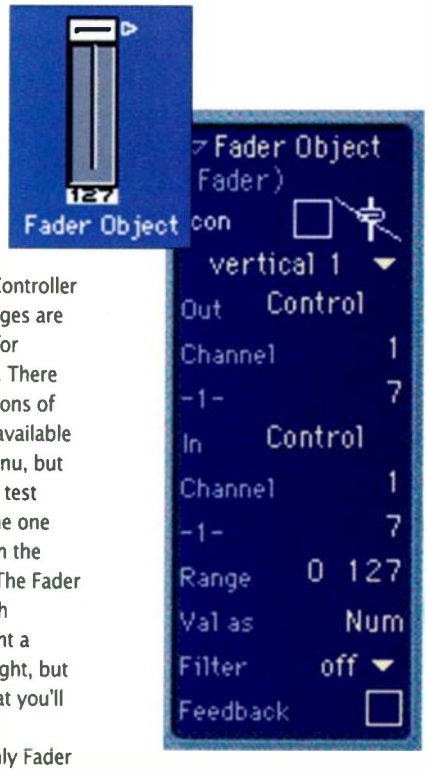
logic notes

Environment tricks and techniques to help diagnose and solve MIDI routing problems, plus tips on splitting stereo audio files and getting started with *Logic*'s powerful Hyper Draw function that allows you to graphically enter and manipulate control data.

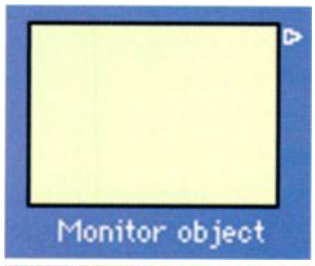


If you're going to get serious with servicing analogue audio systems, then you need a selection of tools at your disposal — a test signal generator, an oscilloscope, a spectrum analyser and various other audio meters. If an audio system is malfunctioning, you can use these tools to identify and correct the problems. The basic principle behind such troubleshooting is that you feed a carefully controlled test signal through the dodgy signal path, and that you then analyse the output of each processing block or circuit component looking for unexpected results.

This simple test principle also provides an extremely powerful way to deal with the MIDI problems which beset many *Logic* users within the sequencer's Environment window. Your MIDI analyser in this case is the Monitor object, while the Keyboard and Fader objects can be used as MIDI generators for test purposes. Let's have a look at each of these objects in turn.

A MIDI Test Set

The Monitor object is one of the most basic in *Logic*, and you can create as many of them as you like from the Environment's New menu. The object is shown as a



square window which displays all MIDI messages it receives in real time — if you need a larger viewing area, then highlight the object and drag the small square at the bottom right-hand corner to the required size. Clicking in the Monitor's display field empties it.

A Monitor object can be fed from any other object in the Environment simply by cabling to it from the source object. And, more importantly, it also passes all the MIDI messages it receives to its output unchanged, which allows you to cable the Monitor between other objects as well, without altering any of the MIDI information.

The first of the two MIDI generators at your disposal is the Keyboard object, which can output any flavour of note data you wish. Creating it requires another trip to the Environment window's New menu, and the resulting object can be resized much as the Monitor object can. The Parameters box is a little more complex, with options for setting the MIDI channel and velocity of output notes, and for setting the note number around which the keyboard display is centred. Clicking any note in the Keyboard object's display sends MIDI Note On and Note Off messages to its output. This can be easily verified by linking the Keyboard object up to a Monitor object.

The second useful MIDI generator available is the Fader object, which allows you to easily create MIDI Continuous Controller data — these MIDI messages are commonly used for control purposes. There are multiple versions of the Fader object available from the New menu, but I find the best for test purposes to be the one called Vertical 1 in the Fader submenu. The Fader object has enough features to warrant a whole article in its own right, but you'll be glad to know that you'll only need a fraction of its functionality here. The only Fader object Parameters that you need to tweak are the values in the upper Channel and '-1-' fields — the former sets the output MIDI channel and the latter the controller number. Once again, the Monitor object can be used to verify that the data is being sent correctly.

MIDI Troubleshooting Practice

Many *Logic* users, at one time or another, have a problem getting the MIDI messages from external MIDI controllers routed through *Logic* and back out to their external synth modules. There are a number of points in the process which can catch out the unwary, but your MIDI test gear can take the guess-work out of it.

If something goes awry in the MIDI chain — let's say you can't seem to access one of your multitimbral sound module's parts from your master keyboard through *Logic* — the first thing to ▶

Starting Out With Hyper Draw

The *Logic* Hyper Draw displays which are available from within the Arrange window and Matrix and Score editors are great for editing a range of MIDI data. Not only are they easy to use, but they also allow you to draw control changes onto audio regions — invaluable when automating your mix. To open a Hyper Draw display for any audio of MIDI object in the Arrange window, select it and then pull down the Arrange window's View menu. The Hyper Draw submenu allows you to view a range of displays, and the one for Volume (MIDI Continuous Controller 7) is a good one to start with.

You may initially notice no change to the Arrange window, and this is because the track has to be large enough vertically for the Hyper Draw display to be visible. Adjust this by dragging the bottom left-hand corner of the track bar until you can see the display — for the moment, increase the track size as far as it will go. If you now click within any track object you can set controller points for controlling the object's volume level. Notice that a line connects any individual points you put in, interpolating between them with a slew of similar messages.

A short click on any already created point will delete it, and double-clicking while holding the Mac's Alt and Shift keys (Ctrl and Shift keys on a PC) will delete the whole contour for that object. To adjust the values of individual points, hold down the Mac's Ctrl key (Alt key on a PC) after you've clicked on a point and it will only move vertically. *Mike Senior*

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01223 316091	023 8023 3444	0121 687 4777	0117 946 7700

do is to isolate the source of the problem. Cabling the relevant MIDI input port directly to a Monitor object in the Environment will quickly tell you if *Logic* is receiving what you expect it to. This can avoid the frustration of rooting around in *Logic* looking for a problem for hours, only to find later that your MIDI interface or master keyboard are wrongly set up or malfunctioning. Likewise, a Keyboard or Monitor object cabled to the relevant output port on your MIDI interface lets you check whether your sound modules are behaving properly.

Normally, however, musicians are more familiar with the operation of their keyboard and sound module than they are with *Logic*, so it's odds on there's some problem in the Environment setup. The exact action of each Environment object differs, and it's not necessarily immediately obvious how each affects MIDI passing through it, especially if you're just starting out as a *Logic* user. For example, while it might be obvious to the more experienced that an Instrument object forces the MIDI channel of messages passing through it to conform to that set in its Parameters box, this isn't necessarily obvious to the beginner and can lead to frustration when channel-changes on the MIDI master keyboard aren't therefore registered by the destination sound module.

The action of the Instrument object can be easily surmised, without recourse to the manual, using Keyboard and Monitor objects, as shown in Figure 1. The keyboard object has been set to output Note messages on MIDI channel four, as can be seen from the display of the first Monitor Object. The Instrument has been set to MIDI channel one, and the second Monitor object shows that this has changed the channel number of the notes which the Keyboard object generated.

In a similar way, the Fader and Monitor objects can be used to check that Transformer objects are behaving as you expect — Transformer objects are useful little things, but about as intuitive to set up as budget self-assembly furniture! Take a look at Figure 2 for example, where a test setup is in action. I have programmed the Transformer object to fix all incoming controller values to a value of 30, and the Monitor objects confirm that this is indeed happening.

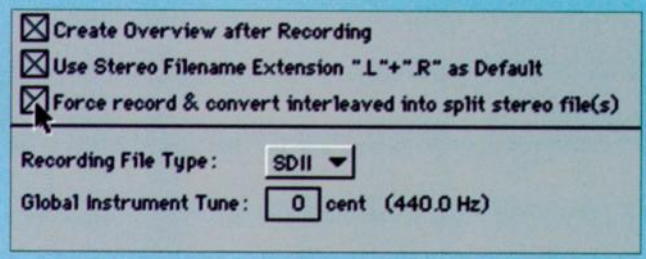
Splitting Stereo Files

I have a large number of multitrack recordings archived to CD-R, with guide tracks on the left channel and the track to be backed up on the right. Because *Logic*'s Audio window automatically imports stereo files in interleaved format, this causes difficulties when I want to import any of my backed-up files. However, there is a workaround...

Once you've copied the stereo file from the CD to your audio drive, open *Logic*'s Audio Preferences dialogue (available from the main Audio menu) and check the box marked Force Record & Convert Interleaved Into Split Stereo Files. Confirm the subsequent dialogue, and then select the Add Audio File option from the Audio window's Audio File menu, navigating to your stereo backup file.

A dialogue box will come up asking you what you want to do about the fact that you've chosen an interleaved file. Clicking on the Convert button will cause *Logic* to create two new files in the same folder as your backup file, corresponding to each of the stereo channels, and will add both these files to the Audio window's listing of the Song's audio files.

Because the converted files have '.L' and '.R' added to their names on the Mac (or have file extensions of '.WAL' and '.WAR' on the PC), they are therefore still interpreted by *Logic* as two halves of a stereo file. This means you can't edit them independently, so you should delete their entries from the Audio window's list. Now go and rename the two mono files meaningfully, leaving off the Mac suffixes or changing the file extender back to '.WAV' on the PC, and the files can now be imported into *Logic* separately. *Mike Senior*



Normally, *Logic* will import stereo files with their interleaving intact, but you can change this default with a quick trip to the Audio Preferences dialogue box.

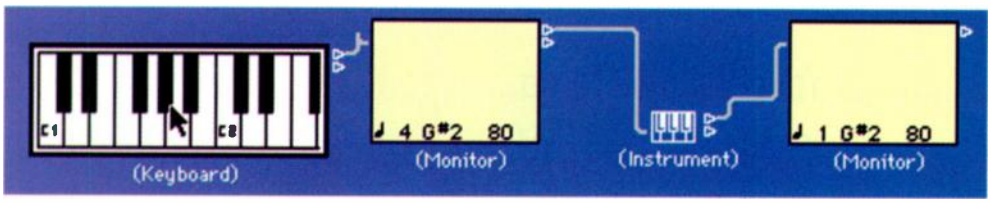


Figure 1. An Environment setup for testing the action of an Instrument object.

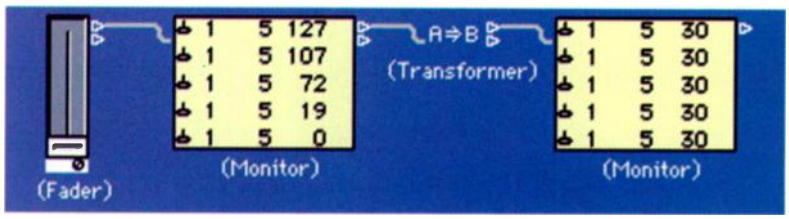


Figure 2. An Environment setup for testing the action of an Transformer object.

Living Without The Manual

Like it or not, *Logic* users rarely reach for the manual except in times of crisis. In such cases the manual has a knack of concealing what you want to know, probably out of spite over the lack of attention it normally gets. Fortunately, the MIDI tests we've looked at can solve most Environment problems in very little time at all, which means fewer trips to that binder sulking in the corner. *Mike Senior* SOS

Logic Tips

Zoom in quickly with the keyboard using your PC's Page Up and Page Down keys for horizontal control and holding the Ctrl key to make this vertical instead. On the Mac, just hold down the Ctrl key and press any of the cursor keys. *Sam Inglis*

If you're forever making small changes to the timing of audio and MIDI events, check out the Key Commands window for the Nudge commands. These are unassigned by default, but can make progressive and iterative timing changes much quicker. *Mike Senior*

By default *Logic* opens the Event List editor when you double-click on a MIDI part. If you want to change this default, take a trip to the Global Preferences, available from within the Settings submenu of the main Options menu. Here, select your favoured editor from the upper of the two drop-down menus at the bottom of the window. *Dave Lockwood*

Assign the same velocity value to multiple MIDI Notes by selecting them in the Event List editor and then holding the Mac's Shift and Alt keys (Shift and Ctrl keys on the PC) while changing the velocity of one of them as required. *Mike Senior*

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pro tools notes

Pro Tools users now have their own monthly column, focusing on tips, techniques, news and technical development coverage for the full range of *PT* systems, from the popular Digi 001 to top-flight professional studio hardware.

Software & Hardware Compatibility

- The new four-slot G4 Macs are now qualified for use with most Digi hardware, including MIX and 001. The exception is PTIII PCI hardware, although some users have been able to get it working with an update to the DigiSystem INIT extension (5.01cs8, available to download from the Digi website, www.digidesign.com/download). There is currently also an issue with Samplecell II cards in these Macs, which results in only one card being seen in multiple SCII card setups.
- Digidesign have approved the use of Titanium G4 Powerbooks with the Magma two-slot CardBus chassis (CB2S) for MIX and 001 systems. Serious pose-value if you get one of these!
- Digi 001 does not support Hewlett Packard Pavillion PCs, AMD K6, K6–2, or K6-III processors, or PCs with a VIA chipset motherboard.
- Apple's *iMovie 2* doesn't work through Digi hardware — you should use the Mac's built-in audio outputs.
- If you have a 1622 interface connected to your core TDM card, you should download DAE 5.1cs4 – see www.digidesign.com/download/daedsi.html. *Simon Price*

Welcome to the first instalment in a new *SOS* software 'Notes' column. As regular readers will know, we already run columns dedicated to leading audio sequencer packages *Cubase VST*, *Logic Audio* and *Digital Performer*, and we felt the time had come for *Pro Tools* to have a column of its own too. The releases of *Pro Tools LE*, the affordable host-based Digi 001 system, and the *Pro Tools Free* software have collectively been responsible for a large leap in the number of people using or trying *Pro Tools*. At the same time, progression of the MIDI side of the software, and a raft of new features, has seen a growing body of users who count *Pro Tools* as their main working environment, distinct from the traditional 'third-party application + Digidesign hardware' users. We aim to make this column a reliable repository of all things current in the *Pro Tools* community, with varied contributions covering tips and techniques, up-to-date technical and compatibility issues, new product information, short tutorials, explanations of key concepts, and news about projects that stretch the boundaries of *Pro Tools*.

One of the characteristics of the system is that different users develop varied approaches to achieving the same goals. As a *Pro Tools* specialist, whenever I've foolishly allowed myself the luxury of thinking I know the software inside out it's not long before I turn up at a new workplace and find myself saying, "Hey! Wait, do that again. I didn't know you could do that!" So if you're feeling community-spirited, email us your killer technique or shortcut. To reciprocate, we hope to respond to specific queries, whether they be technical or operational, to ensure that the column covers a wide range of interests, and not just ours. This month we've talked to Digidesign, to find out their priorities for the development of *Pro Tools* over the

Tightening Drum Recordings With Beat Detective

In *Logic* Notes for the June issue of *SOS*, Mike Senior detailed a time-saving technique for tightening up the timing of multitrack drum recordings. It caught my eye because almost the exact process he uses has been automated as part of the new Beat Detective tool in TDM *Pro Tools* 5.1.

In the early days of *Pro Tools*, one of the tasks it was most used for in music studios was transferring multitrack drum recordings and laboriously editing the sections with "a little more feel than perhaps desired" — as many bent-backed programmers and engineers will testify. Beat Detective can extract tempo and bar/beat grids from sections of audio for use in the session, but what we're concerned with here is conforming a drum track to an existing tempo map. Mike's *Logic* recipe uses the Strip Silence function to chop up the tracks — which is also an option in *Pro Tools* — but Beat Detective uses the method of detecting transients in the material and placing cuts in front of them. The resulting regions of audio are quantised with respect to the bars/beats grid, and then Beat Detective automatically fills any gaps by trimming back the start points of each region and crossfading — preserving the 'room tone'.

Here's the rough outline to get you started. This example assumes the recorded drums are roughly at the right tempo but need tightening — for all the subtleties, and how to extract a tempo map from the recording itself, see the Reference Manual.

- First, select the area of drums that needs help (use Grid mode to make the selection start on a bar of the Session's existing tempo map, for the best results) and pull up Beat Detective from the Windows menu. In the Region Separation page, click 'Capture Selection' to make sure it's looking at the right place.
- Next, click 'Analyse' and Beat Detective will search for transients in the waveform.
- Now adjust the Sensitivity slider and you'll start to see vertical lines drawn across the waveforms, indicating where cuts will be made. Notice that, if you've made a multi-track selection, the cuts from any single track are applied across all tracks. This is to preserve phase lock across multi-miked tracks. If you don't want this to happen, you need to go through the separation process on the tracks one at a time.
- Now switch to the Conform Region page, set the Strength slider to 100 percent and — making sure you still have the same selection length on screen — hit 'Conform'. With any luck, this should give you hard quantisation of all separated regions. Experimentation with the 'Strength' and 'Exclude Within' parameters will show you how to tighten things up while preserving some of the original feel.
- Finally, switch to Beat Detective's Edit Smoothing page, check the 'Fill and Crossfade' button, and hit 'Smooth'. *Simon Price*

This screen shows the point at which Beat Detective has located the relevant transients (how many it picks up will be affected by the setting of the Sensitivity slider) and has drawn in vertical lines at the places where cuts in the audio will be made. Each cut section (drum hit) will become a separate region.

next 12 months, but first here's a quick look at new and imminent products.

Product News

First off is the Pro Tools MIX3 ('Mix cubed'), which is more of a new *bundle* than a totally new product. MIX3 is an addition to the *Pro Tools* TDM core-system range, and is essentially a discount way of buying what would have been a MIX Plus with an extra farm card. This offer is presumably being made in response to the fact that projects making extensive use of *Pro Tools* 5.1's new surround mixing and multi-channel plug-in capabilities need more DSP resources. Don't despair if you've just bought a MIX Plus: Digi are operating their usual backdating policy, so recent purchasers can get their hands on another farm for around the same as the price difference between a MIX Plus and a MIX3.

The other recent release is the long-rumoured *Soft Samplecell*, a 64-voice, 24-bit software sample-playback and editing package. This is an enhanced, host-based version of the Samplecell II card. While I'd originally expected that Digidesign would build a sampler around TDM plug-in technology, the decision to develop a stand-alone software version means that it's open to all users. It also means that you've access to as much RAM as you have spare in the Mac, allowing you to load up to a Gigabyte of sample banks and instruments. Long-standing Samplecell fans will be pleased to note that *Soft Samplecell* features resonant filters, something the hardware version lacked. *PT* users can bring up the outputs of the sampler within their on-screen mixing environment via DirectConnect (Digi's equivalent to Steinberg's ReWire technology — OK, you knew that).

If all goes to plan, by the time this *SOS* reaches you *Pro Tools* version 5.1.1 will have been made available on the Digidesign web site. This will mainly be a maintenance release addressing a number of "unforeseen outcomes" and niggles, although it also features a handful of small but cool new operational features. These include well-thought-out enhancements to the zoom tool, some new features in the track show/hide list, and the ability to move crossfaded regions. I'll look at these changes in more detail next month, and point out any notable fixes when I've seen the release notes — although in all fairness 5.1 seems to have been quite reliable.

The people for whom the new version is especially significant will be those running *Pro Tools* on the Wintel platform. Version 5.1.1 will be the first Windows 2000 version of *Pro Tools*, providing an upgrade route for v5.0 TDM users on NT. Previously only the *LE* (001/Audiomedia III) releases of *Pro Tools* 5.1 were available on the PC, under Windows 98/ME.

The *Pro Tools* Future

I've been finding out about Digi's vision of the mid- to long-term future for *Pro Tools* music users. After v5.1.1, the next development will be *Pro Tools* Internet integration, allowing multiple users to work on the same session from remote locations. This development is being made in collaboration with Rocket Network, whose technology has already made its way into some other applications. The hub for these virtual sessions will be DigiProNet, already on-line at www.digipronet.com. The concept is going under the title of DigiStudio, and will be the chief new feature of *Pro Tools* 5.2, expected around August.

As for the more distant future, Digi are putting their engineering efforts into various lines of software development, so we won't see any hardware launches this year. They believe that the MIX platform still has plenty of life left in it, claiming that the combination of MIX3 and 5.1's ability to combine host-based and TDM plug-ins already represents a large increase in processing capacity. Software development is being split among improvements to music-based features (particularly MIDI), further enhancements for post-production users, and Mac OSX support. Could this be what we'll see with *Pro Tools* 6? Jed Allen, Manager of Digidesign UK, explains: "It's difficult to say when, and in which version we'll see these things, as they are being worked on in parallel." On the subject of OSX support, he says: "There's lots we could do with OSX, although there are still some questions about things like MIDI support. We use the PCI buss more than any other Apple developer, so it's a lot of work."

Next month, *Pro Tools* 5.1.1, and more on DigiProNet.

Simon Price SOS

Digidesign's new DigiProNet web site will form the centre of Rocket Network-powered collaboration between *Pro Tools* users.

Pro Tools LE Quick Tips

To quickly turn all automation on or off for a selected track, shift/Apple/click on the track. I discovered this by accident when I used the combination unintentionally and couldn't figure out where my automation had gone! An Apple/click turns off automation for just the currently selected parameter.

Don't forget the Spot dialogue when you want to move a region. As well as being a very exact method of moving regions about, it gives you the ability to make the end point of the region, rather than its start point, snap to the required location. This came in handy when I was lining up some audio files imported from another MIDI + Audio sequencer that I knew had uneven starts, but all finished together at the end. (You can also insert a Sync point at a place within a region that really needs to snap to a specific location, and the Spot dialogue can snap a Sync point to that location.)

To select all tracks in the Edit or Mix windows, option-click one track and all will be highlighted. If all are highlighted already, option-clicking un-highlights them. This is useful for many operations, but particularly if you've just created a bunch of new tracks at the start of a session: the newly-created tracks are already highlighted, and the easiest way to un-highlight them (so that you can start to choose individual tracks) is to use this command. *Derek Johnson*

Online Answerbase

On my last visit to the Digidesign web site, I noticed that the customer support department have published their 'Answerbase' on-line. This is a really useful information resource that has built up over a number of years, and was originally developed for use by the company's tech-support engineers. It's definitely worth checking out, if the tech-support lines are busy, as it covers just about all *Pro Tools* error messages, and has short descriptions of common concepts. *Simon Price*

pc notes

Most of us assume that only big businesses and financial institutions will fall victim to hackers, but the reality is that someone could be attempting to invade your personal computer right now. **Martin Walker** tries to make the world safer for PC users.

Last month I described how I've reconfigured my PC, firstly to make it more stable and robust, and also so that I could always return to a previous state if an application caused me serious problems. This month I thought I should follow up by investigating Internet Security.

Hack & Crash

We've all heard the stories about high-profile Internet hacking into government and company networks, but many people don't realise that the data on a personal computer can be just as much at risk during the time they're logged onto the Internet. Part of the problem is that Windows incorporates networking technology first introduced by IBM in 1985 — well before the Internet took off. Its file and print sharing facilities are designed so that data can be shared by all computers connected to a Local Area Network (LAN). These capabilities make the lives of many people much easier, but if you're on-line to the world they also mean that anyone in the world can (theoretically) access the data on your PC.

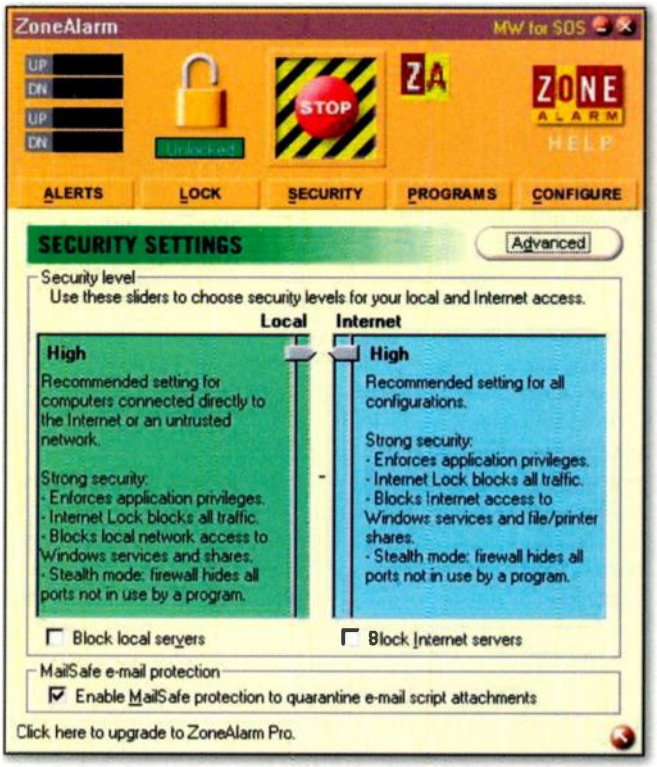
By the way, this type of hacking is completely different from a virus attack. In the case of the latter, a small piece of damaging code is embedded in a downloaded file and activated when you later run the application in question, or perhaps arrives via email. In contrast, hacking is possible if your PC isn't secure while logged onto the Internet, when it can be interrogated in real time, and your files tampered with, deleted, or even uploaded by someone else for subsequent worldwide distribution. Even if you password-protect your machine (and, like most musicians, I don't bother on my studio PC), password-cracking utilities are available.

Some Perspective

Admittedly, the risks are fairly low if you are only connected to the web for a short time, to collect and send email, browse a few forums, and download the odd driver. This is because your Internet Protocol (IP) address that uniquely identifies your computer will be different every time you log onto the net using a telephone line, so your PC can only be invaded during the time you're on-line.

However, if you have a permanent connection, such as a cable modem or DSL line, and your PC is left on-line for hours at a time, the risks are somewhat greater. In this situation your IP address is fixed, and once hackers have penetrated your defences they can return at any time to wreak more havoc. Freeware Internet 'scanner' utilities are available that can run 24 hours a day, searching for on-line machines and then collecting data about them. Some claim to be able to scan an entire country (albeit a small one) during a single night!

Fortunately, you can take precautions to stop malicious individuals gaining access to your PC, and it needn't be expensive. Firstly, if you don't need to share files across the Internet, it's possible to disable this function from within Windows (see the http://grc.com/su—fixit.htm page of the excellent Gibson Research Corporation site for details). These measures should make your PC data secure from most attacks, but will prevent you from using your PC with remote-access utilities such as *PC AnyWhere* or *Laplink*.



If you want your PC to be safe from prying eyes while logged onto the Internet, a personal firewall utility such as *Zone Alarm* is a must (see main text).

Personal Firewalls

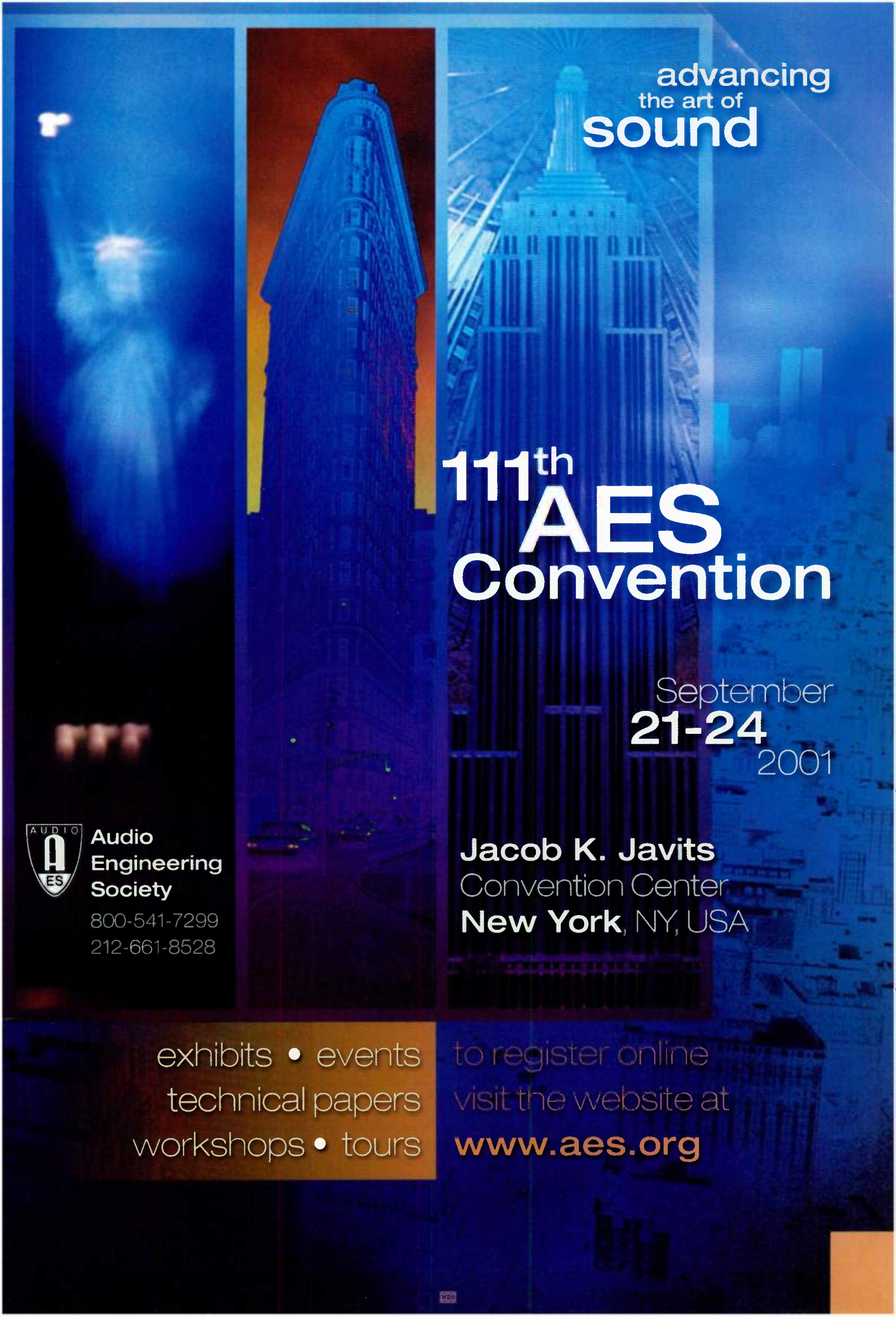
To provide more security and still leave you with the option of using the type of utilities mentioned above, you need a 'Personal Firewall' utility. As its name suggests, this software creates an impenetrable barrier that isolates your PC from the Internet, by inspecting each packet of data either arriving from the Internet (incoming), or being sent from your machine (outgoing).

Incoming data is examined before it reaches any other software in your PC, and can be blocked if deemed necessary. This action will prevent unauthorised access to your machine, other than the normal reading of web pages and the benign use of cookies. The latter are not only harmless but can be extremely useful — for instance, the one placed on your PC by the *SOS* forum remembers when you last logged off, so that you can subsequently choose to view only messages posted since your previous visit.

Outgoing data, obviously, is sent by your Internet software and browser, and these will need to be specifically authorised to do so — along, perhaps, with utilities such as *Download Accelerator Plus*, which I recommended back in the May 2000 PC Notes column. You might think that only checks on incoming data would be important, but, as many PC owners have already found, even Microsoft's Notepad can be doctored and made to sneak off and 'phone home' while you're innocently browsing the Net. Programs that do this kind of thing are known as 'Trojan Horse' programs.

Cause For *Alarm*

Having done my homework on Internet security, I began to realise that a Personal Firewall was essential to the long-term security of my data, and I started looking for a suitable utility for my PC. (For a well-researched review of Personal Firewall utilities, visit http://grc.com/lt/scoreboard.htm.) I fully expected and was quite prepared to pay £20 or so for a commercial product, but was surprised to find that one of the most respected ones, with a range of excellent ▶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reviews from various well-respected PC magazines, is a free download for personal and non-profit use, and costs only $19.95 to register for business users.

Zone Alarm, from Zone Labs, runs with Windows 9x, NT, 2000, or ME, and is a 2.8Mb download from www.zonelabs.com. It's easy to install and use, and although it defaults to being automatically loaded at startup, my preference is to run it 'on demand', just before I log onto the Net. Separate Security settings sliders are provided for the 'Local' zone (so that you can continue to share files and printers with other computers connected to a local network) and the 'Internet' zone, where the settings should usually be 'High', so that no other machine or web site can share files with your PC. Single-PC home users can just set both sliders to 'High'.

The first time you run *Zone Alarm*, you'll need to agree to let your default browser have access to the Internet, and whenever another one of your applications (perhaps an audio-streaming utility or program updater) subsequently tries to gain access, you have to specifically decide whether or not to allow this. If any unauthorised activity is detected, an alert pop-up window appears, to warn you, and all such activity is logged in a text file. *Zone Alarm* can also quarantine various email attachments to stop them from running, although it isn't a virus checker. You can also optionally Lock all inbound or outbound Internet activity, either on demand, or after a set period of inactivity (useful if you wander off while your PC is still on-line).

After installing *Zone Alarm*, I ran the tests on the Shields Up! web site (not connected in any way with Zone Labs), and this confirmed that my PC was now far less vulnerable to attack from outside or inside. I haven't noticed any reduction in Internet performance either, despite the fact that every packet of data is now being intercepted and checked on the way in or out.

I normally spend two or three hours a day on the Net, ferreting out information for my *SOS* features, often leaving my PC on-line for long periods as I write about what I've found while it's still fresh in my mind. In just its first 24 hours of use, *Zone Alarm* flashed up at least half a dozen warnings about attempted incoming requests to connect to my PC. Some happened as soon as I visited specific web sites, and others totally without warning. Although some were legitimate ones from my ISP, it was a sobering experience, and one that webmasters the world over have known about for years, but most individuals still don't realise what goes on under their noses. I feel a lot safer with *Zone Alarm* installed.

Incidentally, Zone Labs have a KnowledgeBase section on their web site, where you can click on the 'More' button if an Alert pops up on your PC, to link to their AlertAnalyzer page for more information about the attempted probe. You may even be able to ascertain the source of the probe.

Finally, there's a *Zone Alarm Pro* version of the software available for commercial users, at just $39.95, with support for Internet Connection Sharing, customisable security zones, and added protection from email attachments. Highly recommended.

Help At Hand

Following the catalogue of computer disasters that I detailed in the June 2001 *SOS*, several readers got in touch to offer helpful advice. Adrian Purkiss passed on details of a utility that claims to remove all trace of Microsoft's *Office 97* suite — you run it after the normal Windows uninstall procedure. As I explained last month, I've already taken the more drastic step of installing new versions of Windows on freshly formatted partitions, but if anyone else finds themselves in a similar situation the URL for the utility is http://download.microsoft.com/download/office97std/Utility/4.0/WIN98MeXP/EN-US/Eraser97.exe.

James Marchant offered me a review copy of the Farstone *Virtual Back* software that his company Counterpoint (www.counterpoint-mtc.co.uk) distribute to schools and colleges. It's perfect for such customers, since it runs in the background and monitors all hard-drive activity, making backups of any file that gets altered. If a student manages to crash the system, whether by accident or maliciously, those in charge can simply restore it, from a choice of up to 31 Restore Points taken at different dates.

Unfortunately, all this background activity does have a performance implication for the PC, so I doubt that many individual musicians will consider it. However, given the added protection, it's well worth considering in many scenarios. Visit www.farstone.com for more details. SOS

PC Snippets

• Those who read my PC Mastering feature in *SOS* June 2001 will no doubt be pleased to hear that, in partnership with BBE, Cakewalk have just released a DirectX plug-in version of the famous BBE Sonic Maximiser. Like most other enhancers, its aim is to produce more detail and focus at both low and high frequencies, as well as greater separation between instruments in the mix. However, BBE's process doesn't generate extra harmonics — instead it uses a rather different frequency-selective phase shifting approach. The plug-in sounds good (although it's easy to overdo the effect) and you can buy it direct from the Cakewalk web site for $129 ($99 for registered Cakewalk customers).

W www.cakewalk.com

• I hesitate to mention yet another *Cubase VST* update, as they've been coming so thick and fast over the last few months. However, along with the usual clutch of bug-fixes and enhancements (on this occasion for the Yamaha DSP Factory card, Tascam US428 interface/controller, CM Motormix, and Steinberg Houston, the version 5.0 revision 5 Public Beta 2 is notable for two reasons. Firstly, the program's equalisers have, for the first time, been optimised for AMD Athlon processors, as well as being further improved for the Pentium III range. Secondly, and becoming increasingly important, this is the first version to be verified for use with DirectX 8.0a. Steinberg are careful to point out that some existing soundcard drivers and older DirectX plug-ins may still not be compatible with DX8.0a (which certainly isn't Steinberg's fault), but this is still a step in the right direction.

Philippe Goutier, the author of *Wavelab*, has released a version 3.04c update for the program. This has new Pentium 4 optimisations, updated CD-R drivers, and a slew of minor bug fixes, along with support for the forthcoming *HALion* sampler and a readout of plug-in filenames during launch, to help track down badly-written ones that may halt the program.

W www.steinberg.net

For a new slant on plug-in enhancement, have a listen to the virtual *BBE Sonic Maximiser*, courtesy of Virsonix and Cakewalk.

• Following the successful launch of the *EXS24* software sampler for *Logic Audio*, the first UK shipment of Emagic's new *EVP88* 'vintage piano' plug-in has sold out immediately. With enthusiastic endorsements from the likes of Herbie Hancock and George Duke, both famous for their use of the Fender Rhodes, this is hardly surprising, but it does show that software synths have come of age, as long as you have enough computer processor power to cope with their requirements.

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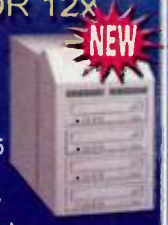

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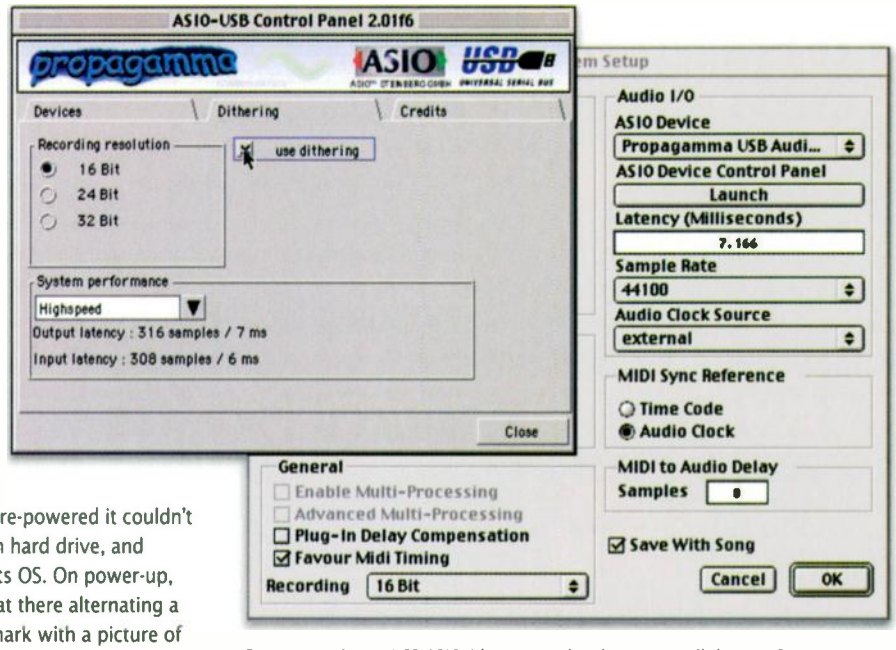
apple notes

USB latency is reduced by new Mac ASIO drivers, mLAN development activity steps up, and there's more news of MIDI and audio support in OS X. Meanwhile, **Paul Wiffen** is making a movie...



Propagamma's new USB ASIO drivers can reduce latency to as little as 7mS.

I've learned a couple of valuable lessons this month, in the course of travelling around various parts of Europe on a video shoot. In tandem with FireWire-equipped DV cameras, portable Macs (an iBook and a new Titanium Powerbook) have proved absolutely invaluable. However, when the iBook's battery got run down to zero one too many times, I discovered the wisdom of never allowing it to run out of power and shut itself down halfway through doing something — always put it to sleep yourself before this happens.

On this occasion, when the iBook was re-powered it couldn't see its own hard drive, and therefore its OS. On power-up, it simply sat there alternating a question mark with a picture of the system folder, despite strenuous efforts to make it find the OS on the hard drive. Take it from me, never travel without the OS CD-ROM for your model of computer (those for the G4 PowerBook, G4 desktop and G3 desktop which were available in the Czech Republic didn't work at all). On return to Zurich I had the problem fixed in 15 seconds, once the iBook had been fed the right OS CD.

Fortunately, the Titanium Powerbook offered the best possible back-up. Upgrading its version of QuickTime to Pro version 5 was the best move we could have made, as the video director soon found he could use this to preview four streams of video simultaneously in one window (as usual, my over-ambitious nature means that from my first-ever video shoot we were trying to make a four-camera-angle DVD).

And the usefulness of the Titanium didn't stop there. The director used *iMovie 2* to check rushes every night, as well as to write shooting scripts for the next day. Desktop DV is a very empowering technology, but it is nothing compared to mobile DV production. With so many bands tired of record company incompetence, indifference, or just plain dishonesty, and looking to the Internet to promote themselves directly, this technology will be crucial. Bands will have to start making their own video material and putting it on their web sites, and Apple users can rest easy knowing that their platform of choice is about five years ahead of the opposition. With a couple of DV cameras, a portable Mac and a Superdrive-equipped G4 733 back home to master your DVD on, the only limits are your imagination and your production budget.

Latent Power

Those poor misguided souls who follow my writing assiduously (you can get medical help, you know!) will remember that in my series on music on the new Macs last year, I singled out the USB ASIO drivers from German software house Propagamma as one of the lights at the end of the USB audio tunnel.

Update: Audio & MIDI In OSX

The future for FireWire on the Apple platform is looking very rosy indeed. Once again, I am indebted to Kendal Wrightson and Ian Steele for news on Apple Developer Conference presentations of mLAN in OSX, which we previewed in last month's column. They forwarded me a report from Glenn Gutierrez on the mac-powerbook@yahoogroups.com email list for Powerbook users, in which Glenn describes watching a QuickTime clip from the Conference. In the clip, Doug Wyatt and Chris Rogers of Apple discuss the support for MIDI and audio that's built into OSX. Glenn notes that Doug Wyatt, who wrote OMS (the Open Music System) while he worked at Opcode, demonstrated new MIDI APIs (Application Programming Interfaces) which programmers can use in their applications. He also mentions that "much of the new stuff appeared to be similar to using OMS", and comments that "the inherent timing problems associated with pre-emptive multitasking are overcome by buffering and time-stamping events, not unlike custom methods devised by Emagic, Steinberg and MOTU for their own USB MIDI hardware."

The theory was then put to the test with a demo on a Pismo PowerBook, of "live MIDI Thru to two instruments simultaneously, busy sequence playback, and a combination of both." Glenn says that the timing of the playback was good, with no stuck notes.

Chris Rogers' part of the demo covered OSX's audio architecture, which is described as "completely modular and extensible", with objects called AudioUnits that appear "similar to what you'd find in *MAX* or *Reaktor*." The AudioUnits can provide DSP processing, for such things as reverb, resonant filtering, ring modulation, mixing and MP3 codecs, and "can accept input from, or send output to, the external world, as well as multiple other objects." A higher-level AudioUnit called a MusicDevice works as a software synth. OSX even has an integral multitrack sequencing engine, with "high-resolution" event timing and a tempo-mapping facility. Editing can be done during playback, and tracks may loop independently. A new QuickTime file format, which also supports MIDI files, is on the offing, for saving sequences.

A sequencer application could be made using just these APIs, according to Chris Rogers, who then went on to demonstrate one he made earlier, playing sequenced drum hits, filter sweeps and level changes from "a two-page program he threw together. Its three tracks drove three individual AudioUnits (at least one was a MusicDevice) to play the sounds and modulate them."

Mention was also made of the DLS (DownLoadable Sounds) format, which replaces QTMA components (QuickTime Instruments) and "includes PCM samples in the package, along with a sequence... and data for envelopes, LFOs, and other typical sampler performance settings."

While the drivers delivered with the Roland and Tascam USB interfaces I looked at produced latency of more than 30mS, even under ASIO, those which Propagamma were selling for $30 on the Internet (and certain manufacturers, such as EgoSys, Media Assistance and Swissonic, were supplying free with their hardware under license) were able to get USB ASIO latency down to 14mS.

Another encounter with the Tascam US428 recently allowed me to verify that latency with that unit has improved to the same sort of level, and when I visited the Propagamma web site about six weeks ago I was pleased to discover that they were proudly claiming 7mS latency for their drivers — then horrified to notice that it was only on the PC. I immediately contacted Markus Medau of Propagamma, to find out what the story was. He explained that when Propagamma recreated the driver for USB ASIO on the PC they had made some refinements and tightened up the code, and that their very next mission was to rewrite their Mac driver with the same 7mS latency.

This was a relief to hear. While some people seem quite happy with a latency of 14mS, others cannot brook it for a moment, especially given the fact that latency can make it impossible to use plug-ins while recording. And, as Propagamma had promised, version two of their Mac USB ASIO driver went live on their website for download on 31st May; I was told that customised versions of the updated driver for licensed hardware products would be available through the relevant manufacturers shortly. He emailed me the drivers for the Swissonic USB Studio, and in 'Superfast' mode (which does need a pretty fast computer, like the Titanium Powerbook) they have indeed reduced latency to 7mS on the Mac as well.

New FireWire Chips On The Horizon

The recent AES (Audio Engineering Society) exhibition in Amsterdam brought more encouraging news of FireWire chip development. First, there was an opportunity to see the results of the Yamaha-Otari cooperation on the second generation of mLAN chips (which will remove, once and for all, the 8-channel limitation on audio I/O per device that is a 'feature' of currently shipping audio devices — although you can obviously have something in excess of 100 channels on the mLAN buss). NEC were also showing their long-distance solution for FireWire, opening it up for all sorts of installation and live-sound applications.

But my post-AES detective activities have uncovered other new chips being developed to really unlock the audio potential of FireWire. Sitting next to me at the IEEE 1394 Standards Committee meeting I attended recently was a man from a company called BridgeCo, talking very seriously about work on best practice implementation. On my return from the Czech Republic I found an invitation in my email to visit them and learn a bit more about what they're doing. It would be premature to give full details of what that is at this stage (not least because I haven't quite got my head around it yet) but they're talking about 128 channels of audio and a long-distance solution on a single chip with (most importantly, to my mind) full mLAN compatability, and they're working with Digital Harmony's DHIVA (Digital Harmony Interface for Video and Audio) standard — see www.digitalharmony.com for details. While they will not be selling direct to the public, but instead providing chips to manufacturers, if they get this product to market in a timely fashion it will have a serious effect on the capabilities of the typical FireWire audio device (not to mention its capability to handle the sort of bandwidth which video needs). More details when I have them — and permission to talk about them. SOS

QuickTime VR: A Well-Kept Secret

This month's featured web site, www.hradkarlstejn.cz/noflash_en/index.html, is not strictly music-related, but it is a very good example of what could be done with QuickTime VR if only people took the time. I have long thought that no-one has really explored the potential of QTVR, with its greater ability than straight video to 'explore' a space fully, so it was nice to finally discover a site which really makes full use of it. Someone from the Czech Republic whom I met at AES Amsterdam sent me the URL after I told him I was going there to film in castles. The site is for one of the grandest castles out there, Hrad Karlstejn. I don't suggest that you visit it just to bone up on Austro–Hungarian castle design, however, but to check out the virtual tours of some of the rooms. (Also see the Apple web site, www.apple.com, pictured right, for more on QuickTime VR.)

Apple's QuickTime VR audio/video-playback technology allows virtual tours of any location to be created, such as Paul White's home studio (below, left) on the *SOS* web site.

Ever since I first saw QuickTime VR demonstrated, using the famous footage of the Golden Gate Bridge more than 10 years ago, I have thought that it's one of the most under-used technologies out there, but these stunning 360-degree room tours make the point better than anything else I have ever seen done with QT VR. Why estate agents and other people who are selling/renting out property haven't jumped on this technology, I don't know... and think of the applications in our industry. Just imagine this technology used to let you wander virtually around a famous recording studio at your own pace, checking out the racks for interesting bits of signal processing gear or sound modules, or even the gold discs of previous clients on the wall. In fact, there's a QT VR tour of editor Paul White's home studio on the *SOS* site at www.sospubs.co.uk/sos/regular_htm/pwstudio.htm if you care to check it out.

atari notes

Derek Johnson rounds up the latest Atari news and software availability.

If there's one thing that algorithmic composition tools have in common (and lots are available for the Atari), it's that they each do their job slightly differently, and often have unique features. This is certainly the case with the freeware *MidiGen*, written by Petra Wolf and Joker Nies for their own use as a live, improvising tool (or, as Joker says, "I use it for abstract sound-sculptures, not as a sequencer source").

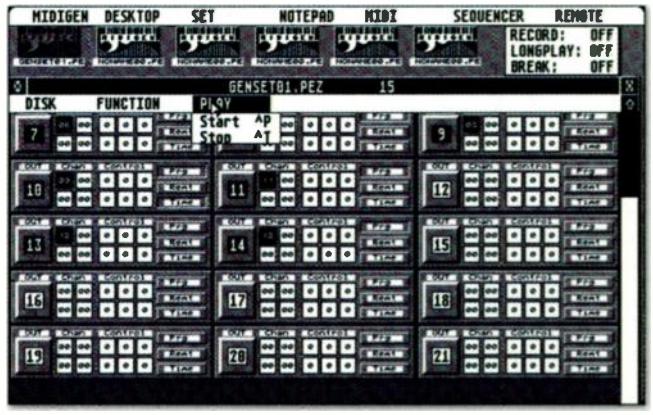
Here's The Gen

MidiGen is a complex program that started life as a MIDI-event generator, but grew until it became the comprehensive performance aid it is today. Essentially, *MidiGen* offers six Sets of 21 'Generators', each of which can send data on up to four MIDI channels; only one Set can be active at any one time. A multitude of user-tweakable parameters within each generator determines the program's output, in terms of note and controller data. This is, initially at least, a hit-and-miss affair, but if you're into this kind of software you'll be used to prodding parameters and dialogue boxes with your mouse to see what happens. There is no manual (though there are plans to produce one), but Joker provides a brief overview of *MidiGen*'s operation at http://sites.netscape.net/timconrardy/joker.htm. Also be aware that much of the busy but well-laid-out user interface is in German, though it doesn't take a modern languages degree to work out that 'Ausgabe Midikanal' is simply telling you where to set a MIDI Out channel. Most other terms are equally explicable; in any case, Joker's overview is in English and should get you over any initial humps.

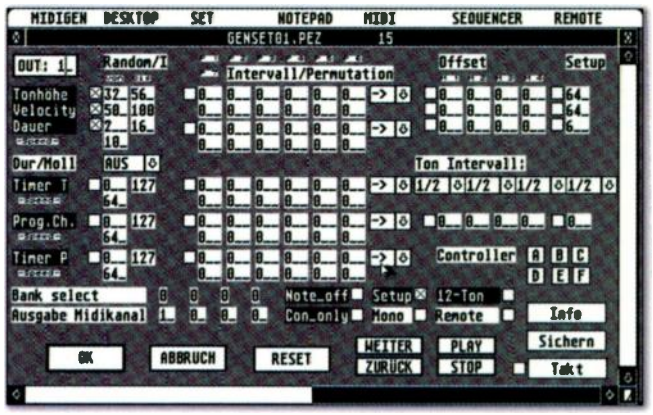
It seems that *MidiGen*'s algorithms generate both MIDI note and controller data in much the same way: randomly, and/or within a user-definable interval range, with ascending, descending, ascending/descending and permutational orders. In addition, note generation is influenced by a number of other functions. For example, it can be set to play with a 12-tone rule (no one note will be repeated until the other 11 have played first), and it's possible to generate sub-semitone intervals, in which case *MidiGen* uses pitch-bend data to generate quarter-, eighth- and 16th-tone intervals. That's a rare feature on any platform. There is user control over generated note lengths (though nothing is completely predictable in this program), as well as program changes. Though polyphony is five voices per MIDI channel, a 'mono' option is available for if you're driving monosynths from the program. There is a certain amount of MIDI File Format compatibility, so work done in *MidiGen* could be moved to other sequencers if desired. All in all, it's an intriguing program worthy of some exploration.

W http://groups.yahoo.com/group/atari-midi/files/jokermidi/

W www.klangbureau.de



The main page of *MidiGen*, showing a selection of the current Set's Generators.



A *MidiGen* Generator editor page, reached by double-clicking on any Generator in a Set.

On-line Action

Proof of the dynamic nature of on-line publishing doesn't come any clearer than this: I mentioned the latest editions of the *MyAtari* on-line Atari magazine in the last column, but at the time the May issue didn't contain anything specifically musical. It does now, in the form of an article by Neil Wakeling, author of *Pulsar*, the ST analogue-style sequencer simulation, describing his software. The software has been featured a couple of times in this column, and it's worth mentioning that a beta version of the forthcoming update (v1.53) to *Pulsar*, with new graphics and features, is downloadable from http://sites.netscape.net/timconrardy/pulsar.htm. If you'd like to play it safe, the last official update (v1.42) can be found at www.tuva.demon.co.uk/atari.htm#pulsar. And absolutely at the end of me putting together this column, the June issue of *MyAtari* has been placed on line.

W www.myatari.net

Anodyne Update

Hot on the heels of last month's quick run-down of developments at Anodyne Software, we hear that the *ExtenDOS Gold* CD ROM/CDR utility is now up to v3.3d. This update offers a range of bug fixes and interface enhancements, and is free from Anodyne's web site. An update is also imminent for the company's *CD Writer Suite*: support for MP3 files and backup for partitions larger than 650Mb is promised.

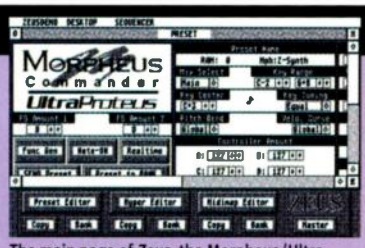
T Atari Workshop +44 (0)1344 890008.

W www.atari-workshop.co.uk

W www.cyberus.ca/~anodyne

Atari Ed/Lib!

Petra Wolf and Joker Nies, authors of the *MidiGen* software featured in the main body of this column, are also behind two freeware synth editors running on the Atari. First of all, there's *Zeus*, an editor/librarian for Emu's Morpheus and Ultra Proteus.



The main page of *Zeus*, the Morpheus/Ultra Proteus librarian for Atari.

Secondly, there's *Prophy*, a librarian for Korg's Prophecy physical modelling monosynth that can run as a stand-alone program or as a desk accessory. Both programs work on most flavours of Atari and should be compatible with multitasking operating systems.

W http://groups.yahoo.com/group/atari-midi/files/Jokermidi/

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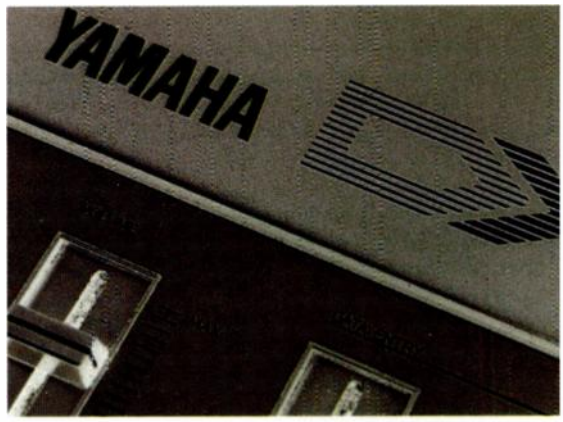


YAMAHA GS1 & DX1 PART 1: THE BIRTH, RISE AND FURTHER RISE OF FM SYNTHESIS

Although FM synthesis has its roots in the sixties, the instruments that popularised it were to dominate the synth scene of the eighties. **Gordon Reid** uncovers the origins of FM and charts its rise to fame, from its unlikely beginnings in academic research in the USA.

For once, one of my retros does not begin with the sentence, "I remember the first time I saw a..." That's because it starts at the Bell Telephone Laboratories in the 1950s, some considerable time before I was born. This was where a gentleman by the name of Max Matthews began experimenting with digital computers, to see whether they could become a viable means for generating audio signals. Matthews was far ahead of his time, if only because he realised that — unlike the primitive analogue signal generators of the time — computer-generated digital audio could be consistent and controllable. In 1957 he wrote a program called *MUSIC I*, programmed in assembly code for an IBM 704 mainframe computer. You may think this unremarkable, but you should realise that the 704 was a vacuum-tube (valve) computer utterly incapable of executing the program in real time.

Understandably, *MUSIC I* was only capable of generating very basic sounds (it had a single triangle-wave digital oscillator) but Matthews continued his developments and, in 1958, wrote *MUSIC II*. This had four triangle oscillators and was capable of much more interesting sounds. Inevitably, *MUSIC III* followed. Completed in 1960, Matthews wrote the program for a more advanced (transistor) mainframe called the IBM 7094. Then there was *MUSIC IV* (1962), *MUSIC IVF* (written in 1965 by a man named Arthur Roberts) and *MUSIC IV BF* (1966/67).

Enter John Chowning

At this point we must change scene, to Stanford University's computer department, and observe two researchers named John Chowning and Leland Smith, without whom the music industry would be a very different place today. They were working on a new version of the programs developed by Matthews and his associates, which they called *MUSIC V*. At the same time, Chowning was experimenting with huge amounts of vibrato (amounts that you could never obtain without the use of electronics), applying this to the audio-frequency signals generated by the digital oscillators within the program. Apocrypha has it that he accidentally programmed a vibrato that was larger than even he intended, discovering that the result was not vibrato, but a unique tone unlike anything he had heard before.

Chowning was apparently unaware that he had stumbled across a common technique used to broadcast radio transmissions: Frequency Modulation of a carrier signal (an 'operator') by a modulator (another 'operator'). This is understandable: FM radio signals exist at frequencies around 100Mhz, and even exceptional human hearing is limited to about 25kHz, so nobody had fully appreciated the audible effect that the modulator could have. By accidentally modulating a signal in the audio band, Chowning became the first person to hear what we now call FM synthesis, and he discovered that it was a powerful way to create new sounds. Consequently, in 1966, he was the first person to compose and perform a piece of music using FM as the sound generator. Called *Sabelithe*, it predated commercial digital synthesis by more than a decade.

Meanwhile, development of the various *MUSIC* programs continued apace, and in 1968 Princeton released a much faster version for the IBM 360 mainframe. Even MIT got in on the act and, in 1973, a compact version, called *MUSIC 11*, was developed for the PDP 11 minicomputer. *MUSIC 11* was a huge step forward. For one thing, the PDP 11 was much more compact than the huge IBM mainframes required by previous versions. Secondly, *MUSIC 11* was the first 'mini' digital synthesis program to use a QWERTY keyboard and VDU.

Throughout the latter half of the sixties, Chowning continued to develop FM synthesis, adding functions that allowed him to control the evolution of the sounds he created. Then, in 1971, Matthews suggested that he should create a range of

"By accidentally modulating a signal in the audio band, Chowning became the first person to hear what we now call FM synthesis, and he discovered that it was a powerful way to create new sounds."

recognisable sounds, such as organs or brass, to demonstrate that FM was musically useful and, therefore, a possible basis for a commercially viable product. Chowning did this and, with a view to licensing the technology, persuaded Stanford's Office of Technology Licensing to approach companies for him.

Yamaha Step In

Do you know the story of the A&R man at Decca who turned down The Beatles? Well, how do you think Hammond and Wurlitzer feel knowing that they turned down FM? As did all the other American manufacturers that the university approached. In desperation, Stanford contacted the Californian office of a well-known manufacturer of motorbikes, powerboat engines, and construction equipment. Yamaha duly despatched a young engineer named Ichimura who, after a brief evaluation, recommended that the company take out a licence on Chowning's system.

With understandable caution, Yamaha negotiated a one-year license that it believed would be sufficient to enable it to investigate FM and decide whether the technique *was* commercially viable. So it was that, in 1973, Yamaha's organ division (which, in 1974, would be responsible for the mighty GX1) began development of a prototype FM monosynth.

Despite the commercial development taking place elsewhere, Chowning was still an academic, and he continued working at Stanford on *MUSIC 10* (yet another version, this time for the PDP 10). Unfortunately for him, the university failed to see the value of his work so, after a somewhat acrimonious parting of the ways, he moved to Europe to continue his research. This later proved to be a significant embarrassment for Stanford because, when Yamaha approached it to negotiate an exclusive commercial license for FM, Chowning was no longer a member of the faculty. The best that can be said of the university is that it knew when to eat humble pie, reinstating Chowning as Research Associate of its Center for Computer Research and Musical Acoustics (CCRMA). Chowning then assigned the copyright of FM to Stanford, which duly assigned the license to Yamaha.

Chowning was, of course, no fool, and he later received a royalty on the sale of all Yamaha's FM synthesizers. And, while his personal deal with Stanford has remained highly confidential, the university is rumoured to have collected more than $20 million in license fees. Whatever the exact figures, it's no coincidence that CCRMA was later re-housed in its own purpose-built facility.

Anyway, with the legal technicalities sorted out, it was time to begin serious commercial development of an FM synthesizer. So, in 1975, Yamaha built a prototype polyphonic FM synth. But first...

The First FM Synths

Surprisingly, neither Yamaha's commercial work nor Chowning's academic efforts led directly to the world's first commercially produced digital synthesizer. Called the Synclavier, this was developed by NED (the New England Digital Corporation) and it was a polyphonic digital synth based upon 8-bit FM and additive synthesis.

Despite its famous name, it's highly unlikely that you have ever seen an original Synclavier. This is because they are incredibly rare. Released in 1978 or thereabouts, only 20 or so were made. The early Synclavier that some people recognise — the one with the incredibly sexy five-octave keyboard spangled with little red buttons — was, in fact, the second version. First appearing in 1980, NED called this, with remarkable logic, the Synclavier II. The instrument that *most* people recognise — the huge black, weighted keyboard — was the final version of the Synclavier. This soon became a mainstay of top professionals in the film and video industries, later spawning a powerful range of synth/sampling workstations, and nearly 20 years later it remains a favourite in post-production studios all over the world.

Yamaha, meanwhile, were in the synthesizer doldrums. Having scaled all the peaks with the GX1 and CS80, in 1975 and 1976 respectively, they had experienced a slow but inexorable slide from favour during the later years of the decade. The Prophet 5 and Oberheim OBX were cheaper and much lighter than the CS80, and the CS70M — designed to replace the CS80 and cure some of its perceived deficiencies — was a turkey of the first order. Similarly, the CS range of monosynths and the SK multi-keyboards failed to capture our hearts, souls, and wallets. Yamaha was floating into the backwaters of the professional keyboard world. Something had to be done.

It was not until 1981 that Yamaha unveiled their first commercial FM synthesizers, trailing NED by three years. Named the GS1 and the GS2, these abandoned recognisable synth facilities such as oscillators and filters, in favour of frightening new things such as multi-operator equation generators, ▶

Yamaha's first commercial FM synth, the GS1, looks a lot more like a lounge baby grand than a cutting-edge digital instrument!

Photos: Richard Ecclestone

YAMAHA FM SYNTHESIS

30kHz data rates, and digital-to-analogue converters. What's more, despite offering just two-operator algorithms, the operation of these monstrously expensive machines (the GS1 retailed for £12,000) was a complete mystery to all but the most mathematically orientated. Not that this mattered, as neither machine offered editing, each being (more or less) a preset instrument, capable of playing only the 500-odd voices supplied by Yamaha on little magnetic 'lollipop' sticks. Yet the GSs were, for a couple of years, reasonably successful. Toto, for example, layered nearly a dozen tracks of GS1 on million-selling hits such as 'Rosanna' and 'Africa', and used two of them in their live shows.

There was a good reason for this success. The sound quality and playability of the GS1 was exceptional (and the GS2 wasn't too shoddy either). But, in an otherwise pre-digital world, for most players these were hyper-expensive oddities. It's thus no surprise that Yamaha sold only around 100 or so GS1s and, in all likelihood, few more GS2s.

Then, in 1982, Yamaha demonstrated a keyboard with 'six-operator equation generators' that you could edit. It was never released in its original form, but this instrument was to be the progenitor of one of the most important synthesizers ever created. It would cost a fraction of the price of its predecessors. Moreover, it would weigh far less, would offer an unprecedented 16-note polyphony, and would incorporate velocity and pressure sensitivity. Furthermore, using a radical new technology called 'storage cartridges', it would be able to store and access thousands of new sounds. But before that, there were the CE20 and CE25 Combo Ensembles.

FM Giant: The GS1 In More Detail

Even today, the GS1 is a remarkable instrument, weighing 90kg (a hair under 200lbs) and designed like a miniature grand piano. It's clear that Yamaha intended it for studio use. But don't let the 19th century looks deceive you. Its beautifully weighted 88-note keyboard is both velocity and poly-pressure sensitive, and — with the exception of on-board editing — it is everything you would expect from a top-of-the-range synth dating back to 1981.

Setting one up is no mean feat. You have to tip the GS1 forward onto its front surface, so that you can bolt on the legs and the pedal unit. Then you have to get it upright again. I've managed to do this alone on two occasions, and my back still complains about it.

Once you've assembled the GS1, you can turn your attention to the sparse control panel situated immediately above and behind the keys themselves. At first this looks horribly limited. For example, there are only nine performance controls: vibrato and tremolo sections (each with speed and depth knobs), a 3-band EQ, a detune knob, and a master volume control. But these hide some superb performance capabilities. For example, the 'soft' pedal is actually a pressure-sensitive vibrato controller, while the centre 'sostenuto' pedal is a pressure-sensitive tremolo controller. (The damper, or 'sustain' pedal is exactly what it appears to be.) Likewise, the detune knob, far from being a simple detune, offers four settings: shallow and deep 'static' detune, and shallow and deep 'random' detune. It's remarkable how much life is injected into the sound by the random variations of the latter settings.

The only other control, aside from those that select and store voices, is the Ensemble On/Off switch. This introduces a real analogue delay line into the signal path, and makes the GS1 as swooshy and noisy as any analogue ensemble keyboard.

Finally, we come to the memories themselves. There are 16 of these, which you fill using Yamaha's preset voice library. To load a memory, you insert side 'A' of the small magnetic 'lollipop stick' in the card reader slot, then press one of the 16 location buttons to start the reading process. Once this is complete, you turn the magnetic stick over and load the information on side 'B'.

It's not obvious, but you've just loaded different voice data into two otherwise identical dual-operator/dual-carrier 16-voice synthesizers. This means that you can mix and match 'A' sides and 'B' sides from different patches, to create new, composite sounds in memory. Yamaha actually encouraged this, and the GS1 provides a 'Store' capability that allows you to record your new combinations onto single magnetic sticks.

You would probably be amazed at the expressive nature of the GS1. Even ignoring the polyphonic aftertouch control of both loudness and brightness, its sounds can be both digital — in terms of clarity and brightness — and very analogue in their warmth and depth. Indeed, had it weighed 80kg less, I would have been delighted to use one as my string ensemble of choice in the early 1980s. You won't hear me say that of any other FM synth! Nonetheless, the GS1 also pointed the way forward to the digital sounds of the '80s, with many of the FM pianos, harpsichords, and other plucked sounds that Yamaha would (almost) perfect in the DX7.

In 1984, Yamaha released a MIDI upgrade for the GS1. This fits inside the body of the instrument and has an interface/control panel that replaces one of the two radiator grilles on the underside. (Radiator grilles! I kid you not... The GS1 consumed 95W of power.) By modern standards, the MIDI specification added by the upgrade is incredibly primitive. The GS1 remains monotimbral, and communicates only on MIDI channel 1, 2 or 3. Furthermore, it only transmits and receives Note On/Off and Velocity messages. Oh yes, and it can't transmit and receive simultaneously. There is a switch to determine which it is doing at any given time!

Despite all the GS1's shortcomings, it was — and remains — a remarkable instrument, and a surprisingly satisfying one to play. Hmmm... maybe that's *not* so surprising, given that its 1981 price of £12,000 is equivalent to around £50,000 today.

Some of the original accessories that came with the GS1, including the 'lollipop' voice data sticks.

The few neat controls tucked away under the GS1's 'lid' give access to a small but potentially very expressive range of parameters.

The GS2 In Brief

The GS2 offers only one of the 2x2-operator synthesizers found in its bigger brother, and this limits you to simpler sounds comprising just side 'A' of a voice card. This may seem like a huge restriction, but given how radical FM synthesis was in 1981, and how bright and percussive FM voices seemed to a generation brought up on fat, splodgy analogue synths, it wasn't a problem.

Unfortunately, there are a couple of other deficiencies in the GS2's specification. On the electronic side, the GS2 loses the random modes of detune that add so much to some GS1 sounds. More significantly, it also loses the beautiful 88-note velocity and poly-pressure sensitive keyboard, which is replaced with an equally beautiful (but only velocity-sensitive) 73-note keyboard. This is the real difference. Whereas the GS1 is a wonderful instrument to play, the GS2 is *merely* streets ahead of anything else that was available back in 1981. Once you had played the GS1, nothing else would do.

Surprisingly, the GS2 is only 18kg lighter than its big brother, so you gain little benefit from its lesser specification. I suspect this is why — despite its much lower retail price — the GS2 sold little better than the GS1.

The First *Affordable* FM Synths

I remember seeing a second-hand CE20 for sale in the late '80s. It looked like one of those 'diddly-bop' four-octave home keyboards that Yamaha and Casio seemed to churn out with frightening frequency, and I duly ignored it. Had I known its significance, I'm sure I would have forked out the £60 or so that the seller wanted.

With 14 preset monophonic voices and six preset, eight-note polyphonic voices, this was undoubtedly the first affordable FM keyboard on the planet. Yet, like the heavyweight GS1, it offered vibrato, 'symphonic' (ensemble chorus), and programmable velocity and pressure sensitivity, at the time unknown on cheap polyphonic keyboards. That the aftertouch offered control over tone, volume and vibrato depth was just astounding. Another neat trick was offered by the portamento provided on the monophonic voices, which only created its glide effect when both the initial and the destination notes were depressed simultaneously.

Later copied by a handful of esoteric synths such as the Crumar Spirit, and more recently the Alesis Andromeda, this feature allowed you to use playing technique (rather than knobs or wheels) to create portamento and pitch-bend effects.

Despite its groundbreaking price/performance ratio, the CE20 was clearly aimed squarely at the home-organ market. Its solo voices comprised five woodwind, three brass, four strings, and two electric-bass imitations, while the polyphonic voices included such 'classics' as polyphonic brass, horn, organ, electric piano, harpsichord and strings. Of course, none of these — by today's standards — sounded much like the real thing, but when you consider the alternatives available in 1982, they were remarkable.

The CE25 was a somewhat different beast, with 20 polyphonic voices — five brass, three strings, two organs, two poly-leads, two poly-bass, and six percussive — so it lacked the CE20's monophonic portamento. By way of compensation, it offered a slider that controlled the depth of the ensemble effect. This allowed players to add just a hint of depth to voices that would have suffered had 100 percent of the effect been applied to them.

Whichever way you look at them, the CE20 and CE25 were revolutionary keyboards that should have created far more of a stir at the time, and should have carved a far deeper niche in synthesizer history than they have. The reason that they did not is, perhaps, that they were completely overshadowed by what was to come...

The World's Most Popular Synth

In retrospect, it seems clear that, just as the GX1 had been used to prototype technology for the CS50, CS60 and CS80, the GS1 and GS2 were test-beds for the DX series. Likewise, I suspect that the CE20 and CE25 were little more than market-testers for Yamaha, designed to ascertain whether the public was interested in the sound of FM. Yet, despite their decade-long gestation, finalising the first batch of DX7s proved to be a bit of a problem because, just as they entered production, Sequential Circuits launched the Prophet 600 — the world's first MIDI synth. The prototype DX7 had no MIDI, so Yamaha quickly upgraded the electronics to allow the instruments to transmit and receive on MIDI Channel 1. Unfortunately, the cases had already been manufactured, so you can recognise the earliest DX7s by the silk-screening of the word 'MIDI' on their control panels. The word was added later and, apparently, it's a slightly different colour from the other legends.

The DX7 turned synthesis on its head, offering digital operators and algorithms in place of the analogue trappings that keyboard players were so familiar with. It proved so daunting to musicians that it was largely treated as a preset machine, despite its full programmability.
Our thanks to London equipment hire company John Henry's for the loan of this DX7 for photography. Tel: +44 (0)207 609 9181.

Despite these teething troubles, the DX7 was an instant sensation. Its six-operator, 32-algorithm FM synthesis allowed programmers to create sounds of unprecedented complexity and/or subtlety. Its 16-voice polyphony made a mockery of the five-note Prophet 5 and the eight-note Oberheims and Jupiter 8. It offered 32 patch memories, and you could use ROM and RAM cartridges to expand the number of sounds available at any given moment. Furthermore, breath control augmented the velocity and aftertouch sensitivity. This was an unparalleled specification for the time.

Then there was the price... at under £1500, the DX7 was not only the most highly specified of professional synthesizers, it was by far the most affordable. It lacked the sonic depth of its analogue competitors, but it more than made up for this by providing a breathtaking new palette of sounds, many of which remain classics to this day. Of these, the now clichéd DX7 piano patch is probably the most (in)famous, and 18 years later it still shows no sign of disappearing. Indeed, so successful was this sound that it later became impossible to buy a synthesizer — analogue or digital — without an imitative patch named 'DX Piano', or something similar. Even sampled pianos and Roland's SAS (modelled) pianos offered DX imitations alongside their emulations of acoustic and electric pianos.

Breath control was an unusual expressive feature offered by the DX7. The breath controller input is found next to the phones socket on the left front edge of the synth.

It soon became clear that the DX7's forté was percussive instruments, and anything that sounded like two bits of metal being banged against each other. Furthermore, it excelled at orchestral imitations such as brass and woodwind. Taking the untreated sound from its single output and adding a little chorus and reverb proved highly successful, adding a realism that no analogue synth had ever approached. I even became a surprise beneficiary of this when, in 1984, Robert John Godfrey of the Enid (a band then famous for its huge rig of analogue synths) bought a DX7 and gave me his 'redundant' ARP Odyssey!

In stark contrast to its wide-ranging capabilities, the DX7 looked surprisingly conservative. At a time when many American instruments sported multi-coloured control panels, graphic affectations such as blue pin-stripes, and large blocks of wood on either end, Yamaha had given the DX7 a slim, sober, and professional appearance. This proved to be a master stroke. In 1983, the world was poised on the brink of the digital revolution. Large turntables with granite bases were out, and compact disc players were in; huge, mainframe computers were out, and tiny 'home' computers were in; large, knobby analogue synthesizers were out, and sleek digital synthesizers were very much in.

But just as the DX7 had great strengths, it had huge weaknesses. As we now know, it proved completely unable to create the warm pads that are meat and drink to any self-respecting analogue polysynth. It was also incapable of the characteristic filter sweeps that dominate so much of popular music in the 21st century. Likewise, its achievements in the field of lead synthesis are (to be polite) less than memorable.

It also had functional disabilities. It wasn't long before players started to notice the hiss generated by the 14-bit DACs used in the early models. In addition, it was a MIDI imbecile, and suffered from the most obnoxious operating system ever devised for a commercial keyboard. And, even ignoring the woefully inadequate screen and horribly abbreviated parameter names, FM synthesis was simply too much science for players brought up on VCOs, VCFs

"At under £1500, the DX7 was not only the most highly specified of professional synthesizers, it was by far the most affordable."

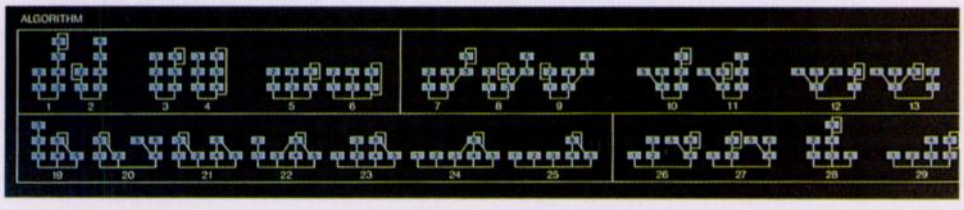
Sine Of The Times: A Bit About FM Synthesis

FM synthesizers create complex sounds by arranging and combining the outputs of digital sine-wave generators ('Operators') in different ways ('Algorithms').

The interactions of the Operators within the Algorithm determine the nature of the sound. Each Operator can act in two ways: as a Carrier, or as a Modulator. In simple terms, a Carrier is *acted upon*, whereas a Modulator *acts upon*. To be precise, a Modulator can also be 'acted upon' by another Modulator, but this is not the place to discuss FM in that much depth. Simply remember this: (i) the more Operators that can interact, the more complex the sound can be, and (ii) the more Algorithms there are, the more varied the range of sounds can be.

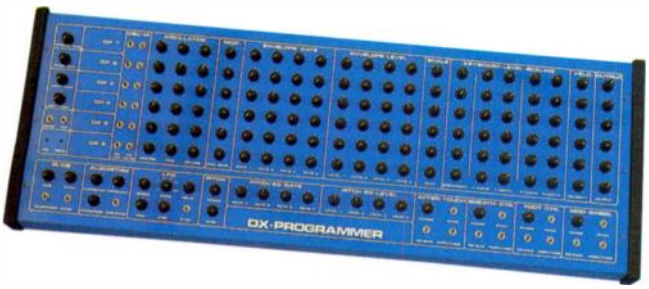
The GS1 has eight operators per voice (which is a lot) but these are arranged as four modulator/carrier pairs (which is extremely primitive). The GS2 is even worse: it sports just two modulator/carrier pairs per voice. In contrast, the DX7 has six operators per voice, but offers 32 algorithms that allow programmers to design sounds that take advantage of far more complex interactions between the operators. In this light, it's amazing that the two GS keyboards sounded as rich and engaging as they did.

For a full explanation of FM synthesis, take a look back at parts 12 and 13 of our epic synthesis series, Synth Secrets (see SOS *April 2000 and May 2000; also available on the* SOS *web site at www.sound-on-sound.com/search).*



The famous algorithm diagrams screened on to the DX7's front panel show its 32 configurations of operators.

and VCAs. Far from being, as Yamaha claimed, "an easier synthesiser to program than ever before", it precluded most players from all but the most serendipitous twiddling. Indeed, the vast majority of players never reached first base in programming the DX7, electing instead to use it as a preset instrument. Consequently, a whole industry was built on players' needs for more sounds on ROM, more RAM packs (both internal and external) and even computer-based patch editors for the brave.



The Jellinghaus DX7 programmer substituted knobs for the DX's flush-mounted membrane switches and menu-driven functions, aiming to make the synth much easier to program, but the result was a device almost as large as the DX itself.

Of the third-party products, perhaps the most important was the Grey Matter E! board, which increased the number of on-board memories from 32 to 320 (each with independent MIDI parameters) and added patch layering, plus limited EQ. Two French developers named Dan Armandy and Alain Seghir produced the less well-known but superior SuperMax. Like E!, this added more memories, layering, and enhanced MIDI controller capabilities, but also offered arpeggios, MIDI echo and delay, velocity cross-switching, and more.

But perhaps the strangest add-on (being about as large as the DX7 itself) was the Jellinghaus DX Programmer, a large blue control surface that offered dedicated knobs for all the important FM parameters. I only ever saw one of these, at Rogue Music in New York, and was sorely tempted to buy it. Unfortunately, I dithered an hour too long, and by the time I went back for it, it was gone.

If the DX7 took the world by storm (and it did), the same can not be said of its less-than-impressive little brother, the DX9. This lacked the DX7's velocity and pressure sensitivity and offered an emasculated eight-algorithm, four-operator-per-voice version of FM with just 20 patch memories. It was a strange sibling for the DX7. Whereas big brother almost single-handedly redefined the synthesizer world, little brother was — to be blunt — a complete turkey. Of course, Yamaha may be a lot sneakier than people realise. If ever there was an incentive to spend a bit more to get a DX7, the DX9 was it!

More successful was the TX7, a desktop MIDI module that contained the guts of a DX7, but offered no on-board editing. Then, in 1984, the monstrous TXn16 appeared. This was a 19-inch rackmount frame that housed up to eight TF1 modules, each of which was, in essence, a DX7. These came configured as the TX216 (with two TF1s) to the truly monstrous TX816 — a 128-note polyphonic, eight-part multitimbral device equivalent to no fewer than eight DX7s in a single cabinet.

But none of these modules captured the public's imagination as had the original DX7. That honour was left to another of Yamaha's monster synths with the number '1' in its name. It was time for the DX1. SOS

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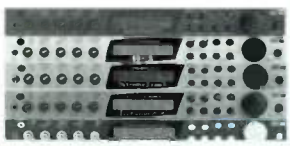

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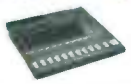

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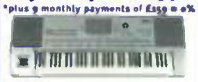

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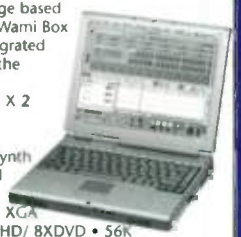

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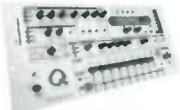

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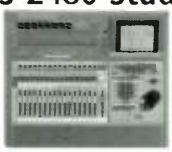

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These synthesizers feature both JV and XV wave forms making them the best sounding fully programmable synthesizers in their class. Features include over 600 sounds. 44 types of digital effects. 64 note polyphony. 6 assignable real time controllers. Advanced XV 88 arpeggiator. 88 semi weighted keys (RS9) 61 normal action keys (RS5)

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Microphone Data Book 2001

Chris Woolf

1006 Pages **Code B413**

£ 75.00

POSTAGE: Europe £9.10 — UK £7.25, World £15.25

The *Microphone Data Book 2001* is a unique compendium of every current microphone in professional use. This enormous work (over 1000 pages) details over 850 microphones from more than 50 manufacturers, and every microphone is documented on its own page (two in the case of multi-pattern mics) with a photograph and a complete set of technical specifications. A unified format allows, for the first time, direct comparison between microphones while thumbnail frequency graphs and polar diagrams have a fixed scaling which presents virtues and vices with remarkable candour. Comprehensive cross-indexing is included for intended use, price range, polar pattern and transducer type. Additionally, a series of short articles by many world-renowned names discuss the following: interpreting the data; microphone history; microphone design and use; stereo and surround applications; and how to reduce wind noise and vibration. *This is the ultimate essential reference book for anyone with a technical or professional interest in microphones.*

Roland Video Owner's Manuals

£ 24.99

POSTAGE: Europe £2.20 — UK £2.20, World £2.30

Learning how to use your new Roland equipment has never been easier with the introduction of these official Roland Video Owner's Manuals. Simple step-by-step instructions visually guide you through the functions of your new Roland equipment. Each VHS/PAL video (average 90 minutes duration) comes complete with an Index Card that lists all subjects mentioned on the video allowing you to shuttle the tape to the corresponding on-screen counter location. Presenter David Wills has been teaching musicians and studio owners how to use their recording equipment more effectively for over 15 years and now you can receive that same advice in the comfort of your own home. As a programmer/consultant with Michael Jackson, Whitney Houston and Phil Collins, David has been using Roland equipment since 1977.

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SP-808	Code V013	XV-5080	Code V017
JP-8000/8080	Code V014	JS-5	Code V018
VM-3100/3100PRO	Code V015	VM-7000	Code V019

Portastudio Video Tutorial (Code V020)
Portastudio Advanced Video Tutorial (Code V021)

VHS/PAL **Code V020** **Code V021**

£ 24.99

POSTAGE: Europe £2.20 — UK £2.20, World £2.80

TASCAM offers two Portastudio Video Tutorials created to help everyone from beginners to experienced recordists in the art of Portastudio recording. Both 2+hour productions are narrated by David Wills of Mind Media, a seasoned musician/engineer who breaks down each section of a Portastudio to make it easy to understand. Video One, titled *Portastudio Video Tutorial, Your Complete Guide to Personal Recording*, is based around the 424, 414 and Porta 02 series recorders. You'll learn what 4-track recording is all about. Mixing basics, connecting a system, signal routing, using effects, overdubbing, track bouncing and maintenance are explained in a straightforward, easy to understand method. The video walks you through the entire recording process from tracking to mixdown and is a must for anyone who is new to recording or who just purchased a Portastudio. Video Two, titled *Advanced Recording Techniques for Portastudios*, takes a tips and tricks approach to explaining professional studio techniques in a way to specifically optimise your Portastudio tracks. Production ideas, track management, advanced EQ, imaging, creative effect usage, how to add virtual MIDI tracks, pitch control tricks and other sound designing tips are demonstrated and explained. Both videos feature a time-code stamp on screen to help keep track of each section of these information packed tutorials.

MUSIC MANAGERS FORUM

398 Pages **Code B414**

£ 30.00

POSTAGE: Europe £4.40 — UK £3.85, World £7.25

Produced by the Music Managers Forum, this guide to artist management shows you how to lay the foundations from which to build lasting commercial success. The role of the manager is carefully discussed, as well as the roles of those people with whom he/she will have to deal, including producers, agents, publicists, and the executives of publishing and recording companies. Emphasis is given to the many legal issues involved, with pertinent and up-to-date illustrations. Appendices list UK and US music business societies, as well as all MMF manager members. Given the amount of information provided, this volume will be as useful to artists as to new managers.

FAST GUIDE TO CUBASE VST (3RD EDITION)

by Simon Millward

452 Pages **Code B374**

£ 22.95

POSTAGE: Europe £3.85 — UK £3.55, World £6.25

Any modern sequencer package can be daunting if approached without guidance, so during your first days with *Cubase VST*, this book will quickly become your best friend! Now updated to its 3rd edition which covers version 5, as well as previous versions, focuses on Steinberg's Mac/PC music recording package and encompasses all the latest developments, including coverage of many current VST Instruments and plug-ins, as well as some of the latest audio interfaces for both platforms. *The Fast Guide To Cubase VST* takes you from installation and setup through to sophisticated recording and mixing techniques, with an emphasis on hands-on examples. Highly recommended.

ELECTRONICA DANCE MUSIC PROGRAMMING SECRETS

by Roger Brown

370 Pages **Code B371**

£ 24.95

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The art of programming brilliant contemporary dance music, Drum 'n' Bass, Techno, Garage, and Ambient Hip-Hop etc, are all introduced within the context of *Cubase* commands and features. But you don't need to own *Cubase* to learn from this amazing book, as most of the tips here can be used with any sequencer. The accompanying CD (PC & Atari) is packed with MIDI Files, plus audio samples for Drum 'n' Bass, groove templates, and demos of leading music software. The book includes chapters on: Bassline and Rhythm programming styles, *Cubase*'s Logical Editor & IPS, *Cubase Audio*, and getting your creations distributed and sold. If you're into dance music sequencing, this book's unmissable!

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£ 5.00

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The essential ingredients of Paul White's individual bestselling books have been condensed down into this superb range of pocket books. Don't let the 'basic' title fool you, these little gems offer an enormous wealth of practical advice and tips for all levels of reader in each of the subjects he covers. Keep them by your mixer or take them with you on gigs, you never know when you might need them!

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by Ralf Kleinermanns

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This 194-page book helps you make the most of all those lovely effects plug-ins that come bundled with Emagic's *Logic Audio*. There are 500 professional plug & play presets designed to cover all applications, from signal processing and sound design to mixing and mastering. There's a brief description of each preset plus tips and tricks relating to each one and there are lots of audio examples on the included audio CD. If you would like to take virtual effects and processing that one stage further, this book is a must. For *Logic Audio* Silver, Gold and Platinum (Macintosh and Windows), Version 4 and higher. CD-ROM Mac/Win featuring 500 FX presets.

WIZOO GUIDE: VST PLUG-INS

by Ralf Kleinermanns

258 Pages **Code B383**

£ 17.95

POSTAGE: UK £2.80 Europe £2.95 World £4.75

Whether you're into mastering, creating sounds or arranging, work with Windows or Macintosh, or use a DirectX or VST interface, this book will show you which plug-ins will beef up your VST system best. The majority of the 258-page book is actually a guide to the grooviest plug-ins for a widely diverse range of applications. In addition to this comprehensive overview of software, the hippest plug-ins are covered in a dedicated section featuring an in-depth explanation written for musicians, with reliable ratings and practical tips that will help you come up with happening results. The CD-ROM (PC/Mac) features over 50 demo versions of plug-ins and over 100 freeware plug-ins.

WIZOO GUIDE: NORD MODULAR

by Peter Gorges

178 Pages **Code B249**

£ 17.95

POSTAGE: UK £2.20 Europe £2.25 World £3.55

Clavia's Nord Modular synth brought the concept of the freely interconnectable modular synthesizer right up to date, but despite its simple exterior, the inside is just as complex as the monstrous monophonic analogue synths of the '70s. To get any usable sounds out of the instrument without getting hopelessly lost requires expert guidance, which is where this guide comes in. This book offers a comprehensive overview of both the general theory of modular synthesis and its specific implementation in the PC-based front end of the Nord Modular. Logically arranged and chock-full of practical examples, this is a must-have for all Nord Modular owners.

WIZOO GUIDE: FX

by Thomas Adam

142 Pages **Code B403**

£ 17.95

POSTAGE: UK £2.20 Europe £2.25 World £3.60

Want the best effect settings for sound design and mixing? Make the most of your sounds and tracks with these 100 effects programs. Universally applicable, you can use these programs for effect devices, keyboards, mixers, plug-ins, and any other device or software featuring onboard effects. Every setting is described at length and demonstrated by an audio example. An effects primer is also included. If you've ever pondered questions such as, "What is the ideal compression for a snare?", "How can I fatten up a puny pad?" or "How can I generate complex grooves using delays?", wonder no more: the answers are right here. Including CD-ROM/Audio with audio examples, AIFF files and freeware utilities.

WIZOO GUIDE: ROLAND JV/XP SYNTHS

by Udo Weyers.

154 Pages **Code B385**

£ 17.95

POSTAGE: UK £2.10 Europe £2.15 World £2.45

This definitive introduction to the Roland JV/XP series of synths and expanders helps you to identify the right model and expansion cards for your needs. It helps you make the most of performances, patches and effects and includes a CD-ROM with audio demos, software demos and shareware. The contents include a survey of all related Models, Basic Terminology, Storing, Archiving, Dumping, Switching Patches and Performances via MIDI, Controlling Sound Parameters in real time, Creating Performances, Effects and Routing Programs, Programming Rhythm Sets, Editing and Optimising Patches, along with some useful tips on using the XP Sequencer.

WIZOO GUIDE: THE PERFECT MUSIC PC

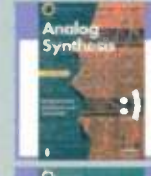
by Rainer Hain

298 Pages **Code B410**

£ 27.95

POSTAGE: UK £3.30 Europe £3.50 World £5.70

This book is for everyone who wants to make music on the PC, record it digitally, and burn it to CD. This indispensable guide will show you how a music PC works, how to avoid wasting money by clueing you in on which computer, audio and MIDI components are best for what you have in mind. How to install your computer, Windows and expansions to maximum effect and tune these components so that you can make your musical ideas reality. How to troubleshoot you PC on your own and gain more tracks, effects and performance using pro tricks. How to find the updates, drivers and information you need on the Internet. This book includes a CD-ROM with PC tools, software demos and music shareware.



WIZOO GUIDE: ANALOG SYNTHESIS

by Reinhard Schmitz

134 Pages **Code B384**

£ 17.95

POSTAGE: UK £2.00 Europe £2.00 World £3.10

This book is a complete guide to the workings of analogue (and virtual analogue) synthesizers. It breaks these seemingly complex instruments down into their basic building blocks of oscillators, filters and envelopes, each of which is fully explained. There are tips on how to analyse synthesizer sounds, modify them or create your own from scratch. Advanced techniques such as complex modulation, MIDI control of virtual analogue and the use of MIDI controllers is covered in depth alongside audio examples on CD that accompany the explanations. The CD includes examples from the Multimoog, OB-Xa, Nord Modular and other instruments.

WIZOO GUIDE: LOGIC AUDIO 4 MACINTOSH

by Dave Bellingham

204 Pages **Code B388**

£ 17.95

POSTAGE: UK £2.40 Europe £2.50 World £4.00

These up-to-date books for *Logic Audio* v4 Platinum, Gold and Silver show how to get the best from this amazing software. There are tips on how to select the best hardware/software for your *Logic* system and how to configure it. Learn how to record, arrange and process tracks in the Sample Editor; use the Digital Factory, effects and mixer automation creatively, plus a motherlode of top tips on how the pros EQ, mix and master CDs. Users of later versions of *Logic Audio* will still find a wealth of useful information and tips as most of the functions described carry over into subsequent versions. An included bonus CD-ROM features audio and song files, shareware, demos, utilities and FAQs.

WIZOO GUIDE: LOGIC AUDIO 4 WINDOWS

by Dave Bellingham

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WIZOO GUIDE: CUBASE VST MAC

by Ralf Kleinermanns

191 Pages **Code B382**

£ 17.95

POSTAGE: UK 2.40 Europe £2.50 World £3.95

Cubase "Virtual Studio Technology" turns your mild-mannered computer into a fully loaded digital multitrack studio with integrated mixer and effects rack. This Wizoo Guide, officially approved by Steinberg, will help you come up with the kind of results you always wanted. Find out all about the best hardware for the job, how to boost the program's performance and make the most of plug-ins, EQ and mixer automation; plus a motherlode of professional mixing, mastering and routing tips. The mixed-mode CD-ROM includes audio and data examples of the tricks described in the book, free plug-ins, and the best VST links on the Internet.

WIZOO PRO GUIDE TO METASYNTH 2.5

by Len Sasso

202 Pages **Code B387**

£ 17.95

POSTAGE: UK £2.65 Europe £2.75 World £4.40

The Wizoo Pro Guide to MetaSynth 2.5 will take you on a guided tour of Metasynth's unique composition and sound design features. A step by step guide and easy to follow tutorials show you how to compose and graphically design sounds in the magical Image Synth. Learn to use Metasynth's powerful Filter and Effects Palettes to edit your sound files. Design waveforms from scratch using the Wave Table Editor and the Procedural (FM) Synthesizer. Includes CD-ROM with 51 audio tracks, presets, samples, filters and more. These tutorials are easy to follow, fun to use and loaded with ideas for things to try on your own.

WIZOO GUIDE: KAWAI K5000

by Dave Bellingham, Peter Gorges

144 Pages **Code B386**

£ 17.95

POSTAGE: UK £2.05 Europe £2.05 World £3.15

Finally, the long-awaited programming guide for all K5000 users. This Wizoo Guide has been written primarily for those of you who are not new to synthesis in general, but are lost when it comes to additive synthesis. The book offers insider know-how in advanced additive synthesis. Contents include: patch analysis with clear, concise and easy-to-understand explanations; practical tips on all sound components, effects and real-time features; hard-core sound design with spectra, formant filter and harmonic envelopes, plus comprehensive FAQs , help, loads of tips and tricks. Includes disk with SoundDiver patch examples, Logic environment and samples.

CREATIVE RECORDING I: EFFECTS AND PROCESSORS

by Paul White

85 Pages — Code B201

The first edition of *Effects and Processors* was first published around a decade ago and was adopted by recording and music technology courses in colleges around the world Almost double the size of the original, this completely updated edition brings the subject right up to date by describing the operation and applications of analogue, digital and software plug-in effects and processors. In easy to understand English, the book describes how these devices work, how to connect them to your system and how to use them in a creative context to enhance your music. Chapters include The Mixing Console, Patching & Patchbays, Equalisers, Digital Delay Effects, plus many more.

£ 11.95

POSTAGE: UK £2.80
EUROPE £3.00 WORLD £4.85

CREATIVE RECORDING II: MICROPHONES, ACOUSTICS AND SOUND-PROOFING

by Paul White

231 Pages — Code B202

Originally available as two separate volumes (Creative Recording II and III), this updated work explains how the different types of microphones work and how to pick the right one for the task in hand. There's advice on miking just about anything from a solo vocalist to a full drum kit as well as a thoroughly practical section on soundproofing your studio and improving the acoustic performance of your mixing area. The subjects are explored with the minimum of jargon and inexpensive DIY solutions are provided to a number of studio problems. Subjects include: microphone types, instrument and vocal miking, practical soundproofing measures and basic acoustic treatment.

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DESKTOP DIGITAL STUDIO

by Paul White

240 Pages — Code B412

10 years ago, recording studios were usually racks of effects boxes, recording equipment and mixing desks that seemed to go on forever, all hooked up to a writhing mass of cables and connectors. Today, however, modern studios are more likely to be based around a single computer system, digitally performing all of the tasks that it used to take a whole studio full of equipment to perform. This is a step-by-step guide to setting up a digital recording environment capable of computer-based MIDI sequencing, audio recording and editing, sound synthesis and effects processing. With a full glossary of terms and diagrams, it offers the soundest advice money can buy, for beginners and intermediates alike.

£ 11.95

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RECORDING & PRODUCTION TECHNIQUES (2ND EDITION)

by Paul White

192 Pages — Code B200

This popular 2nd Edition takes a very practical approach to demystifying the various techniques used to record and produce contemporary music. The techniques described in this book are equally applicable to the home studio, and are described in plain English, clearly illustrated with diagrams. *Recording & Production Techniques* takes the reader through planning a recording session, getting the best performance from the artists, and producing the best possible mix while making creative use of effects and processors. It concludes with a valuable section on master tape formats and an overview of the various processes involved in duplicating CDs, cassettes and vinyl records.

£ 12.99

POSTAGE: UK £2.25
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LIVE SOUND FOR THE PERFORMING MUSICIAN

by Paul White

285 Pages — Code B376

No matter how talented a performer you are, if the sound out front isn't up to scratch, you won't win over your audience. Even relatively inexpensive equipment can produce exceptionally good results — if only you know how to use it... *Live Sound For The Performing Musician* is a practical guide to equipment and sound for small to medium-sized gigs. It covers everything from choosing PA equipment and backline amplification, to selecting the right type of microphone and finding your way around a typical live sound mixer. Also discussed are stage monitoring, effects and processors, tuning, DI techniques, radio mics, basic wiring information, amplifier and loudspeaker principles... and even performance tips.

£ 11.95

POSTAGE: UK £2.80
EUROPE £3.05 WORLD £4.95

HOME RECORDING MADE EASY

by Paul White

205 Pages — Code B352

Professional recording studios are crammed with stupendously expensive equipment that can be very complicated to operate. However, by choosing home recording equipment carefully, and by using it properly, you can create professional demos or even independent release quality recordings for very little outlay. Everything you need to know in order to make your own recordings is presented here in clear, non-technical terms, with diagrams and with the minimum of jargon. If you use the information in this book, you will be able to make your own professional sounding recordings, no matter how tight your budget. This is in no doubt one of our best sellers to date.

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MIDI FOR THE TECHNOPHOBE

by Paul White

184 Pages — Code B355

When Paul White first encountered MIDI, the main impediment to his progress were the very books claiming to explain it! Yet, the basic principles of using MIDI to make and record music have direct counterparts in everyday life which we take for granted, such as television and the telephone. In this book the absolute beginner is introduced to the concept of MIDI by way of analogy with familiar technology. In just a few hours, with no confusing jargon, you'll find out how MIDI works, what hardware is needed to build your own MIDI system and how to use that system to create, record and edit your own music.

£ 11.95

POSTAGE: UK £2.25
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MUSIC TECHNOLOGY — A SURVIVOR'S GUIDE

by Paul White

330 Pages — Code B365

Music Technology — A Survivor's Guide highlights common problems in recording and mixing music, addresses equipment dilemmas and offers troubleshooting advice. Most importantly it provides answers. Whether it's the debate on MIDI recording versus conventional multitracking, the basics of soundproofing, how to rescue an unsatisfactory mix, how to put together an accurate monitoring system or how to organise a recording session! this is the book for you. It also provides an overview of equipment types: for example, the pros and cons of hard disk recording compared to analogue, and the various types of studio outboard equipment. Ideal for any music technologist.

£ 14.95

POSTAGE: UK £3.20
EUROPE £3.40 WORLD £5.55

STUFF THE MUSIC BUSINESS

by Will Ashurst

183 Pages — Code B406

The music business is undergoing seismic changes. Record companies are buying each other out, dropping bands, firing staff and cutting costs. For the struggling band or manager, it has never been more difficult to attract record company interest. Using the opportunities opened up by the Internet, MP3 new music sites and direct sales; bands, managers and small labels can now bypass the major record companies and do it themselves. So don't wait for the business to sort itself out. Forget about the rejection letters and take control of your own career. Record, release, market and distribute your own albums and singles. *Stuff The Music Business* tells you how.

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LIVE SOUND MIXING

by Duncan R Fry

176 Pages — Code B256

This is a hands on, friendly introduction to all aspects of mixing live. It hails from Australia and is an SOS Bookshop bestseller. The author is an experienced live sound engineer and has packed his book with loads of superb information, diagrams and hints to take you from basic principles through to troubleshooting when things go wrong. Contains 15 chapters: Basic Principles, Mixing Consoles, Equalisers, Cables and Connectors, Microphones, Effects, Signal Processors, Amplifiers, Crossovers, Speakers, Monitors, Setting Up, Mixing, Problems, and of course the useful Appendix. Packed with diagrams and pictures of equipment, this book is essential reading for all live sound engineers.

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556 Pages | Code B192

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"The Bible of the music industry" — all the contacts you need in one handy volume. Thoroughly researched and totally updated, this is the book the professionals within the industry use to find studios, producers, manufacturers, record companies, publishers, management, promoters, venues, tour support services and so on. It covers the UK, plus sections of Europe, the Middle East, USA/Canada, Australia and South Africa. Accurate, comprehensive information in a well thought out and easy to use format. Essential for anyone who wants to be well connected in the world of music, who wants to know who manages who, or needs to know where to send those demo tapes!

MUSIC WEEK DIRECTORY 2001

396 Pages | Code B400

£47.00

Postage: UK £3.05 | Euro £3.10 | World £5.05

The *Music Week Directory 2001* is the official contact book for the UK music industry. Listing over 8,500 UK companies, the contents include Record Companies/Labels, Internet Designers/ Providers, Merchandise Companies, PR, Venues, Booking Agents, Producers, to name but a few. It delivers all the names, addresses, telephone numbers, email and website contact details for those listed. The book is also designed with a coloured index and divider system along the inside for ease of finding what area of the business you require. If you need instant access to the companies and people who make up the UK music business, you are definitely going to need this book at your fingertips.

PC MUSIC – THE EASY GUIDE

by Robin Vincent

116 Pages | Code B379

£9.95

Postage: UK £1.90 | Europe £1.90 | World £2.85

Easy to read and fully illustrated, this book shows you what you'll need to start creating your own music on your PC and will help you understand how a computer can be used as a creative music tool. It covers soundcards, recording music with sequencers, hard disk digital audio recording/editing, plug-ins, printing scores with notation software, using your PC as a synthesizer, getting music onto and off the Internet, using Windows 95/98 and it suggests sample PC music setups. It's rounded off with answers to some frequently asked questions (FAQs), a glossary, advice on the musical hardware and software you'll need, plus invaluable industry contacts.

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MODERN RECORDING TECHNIQUES (4TH EDITION)

by David M Huber & Robert E Runstein

495 Pages | Code B349

£23.95

Postage: UK £4.40 | Europe £5.10 | World £8.40

This is a weighty, up-to-date textbook that address all the areas of the project studio recording market — digital recording, MIDI, microphone placement, signal processing and so on, both from a practical and theoretical viewpoint. Every part of the recording and mixing process is covered in a thorough and accomplished manner while the business side of things is also covered. There's even a comprehensive glossary of terms. While approachable enough for the home recordist, more experienced recordists should find *Modern Recording Techniques* to be a helpful book as many of the technical aspects of recording are covered in considerably useful depth.

PRO-STUDIO TECHNIQUES (DVD / VIDEO)

VHS/PAL | Code V010

£28.99

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DVD | Code V010A

£34.99

Postage: UK £1.75 | Europe £1.75 | World £1.75

A comprehensive overview of aspects of professional recording in a commercial studio, using state-of-the-art technology. The essential guide for any musician, programmer or engineer, *Pro-Studio Techniques* is full of invaluable information. The video's team of experts provide insights into a pro recording studio and share tips along the way to help you achieve the best results. Main subjects covered include: Mixing Console • Equalisation • Compression • Microphones • Effects • Sequencing • Sampling • Multitrack formats • Drums, Guitars, Keyboards and more.

THE A-M OF ANALOGUE SYNTHS

by Peter Forrest

320 Pages | Code B294

£16.00

Postage: UK £2.45 | Europe £2.65 | World £4.25

Complete rundown of all the major analogue synths and keyboards ever made, spread across two exhaustive books. Each is a testament to the massive amount of research and effort put in by Peter Forrest, the author. Featuring pocket company histories and detailed data on the instruments they produced, each book provides a comprehensive overview of the qualities of various instruments; charts and tables assess secondhand values and maintenance levels necessary to keep a given instrument playable as well as such intangibles as sound quality, collectability and user interface. Includes colour photos of many classic and rare instruments. *(Please note: N-Z is out of print till further notice)*

THE BAND'S GUIDE TO GETTING A RECORD DEAL

by Will Ashurst

176 Pages | Code B405

£11.95

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Britain is once again the music business centre of the world, with more than 10,000 unsigned bands desperate for recognition from recording and publishing companies. All bands in this position, whether or not they have the requisite talent, are certainly missing one vital commodity: information. Without information you can waste 100s of pounds and enormous amounts of time by making the wrong moves. In a jargon-free, easy-to-understand, practical style, *The Band's Guide* steers readers through every aspect of getting a foothold in the music business. From finding a manager, playing live to cutting a demo, this book can give the answers and the edge that you need. Can you afford to be without it?

RUNNING A BAND AS A BUSINESS

by Ian Edwards, Bruce Dickinson and Phil Brookes

145 Pages | Code B404

£10.95

Postage: UK £2.25 | Europe £2.25 | World £3.60

Serious about making a living from music? Whether you are playing Wembley Stadium or the King's Head pub, this book gives you the inside information on how to run a money-making band. How to choose band members and band name, project direction, establishing a business structure, getting the right management. Learn how to create press interest. Touring is a must, so make sure you do it right. Find out about merchandising, and how to get the legalities right in contracts – how to use them, and how to avoid rip-offs. Complete with major name interviews with Kevin Nixon (Kula Shaker, Hit and Run) Gizz from Prodigy and Skunk Anansie's Ace and Rich, this is your how-to manual for band success!

MUSIC: THE BUSINESS (ESSENTIAL GUIDE TO THE LAW AND THE DEALS)

by Ann Harrison

292 Pages | Code B407

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Postage: UK £4.35 | Europe £5.05 | World £8.30

Answering all the questions, demystifying all the jargon, revealing the facts behind the headlines and the real figures underlying those multi-million pound deals. *Music: The Business* is the definitive guide to the UK's most happening industry. The only major book of its kind to comprehensively cover music law in the UK. This is the only non-legal jargon textbook that looks at all the leading cases (including Elton John, Robbie Williams and George Michael) and their impact. Written by leading lawyer Ann Harrison, who heads up the Music Group at one of the most highly respected entertainment law firms in Britain, *Music: The Business* is the ultimate guide to all the issues facing this exciting industry.

MP3 POWER WITH WINAMP

by Justin Frankel, Dave Greely, and Ben Sawyer

297 Pages | Code B408

£21.95

Postage: UK £3.30 | Europe £3.50 | World £5.70

MP3 has opened up new horizons for music fans, bands and the recording industry. CD quality music can now be downloaded, stored on computers, and streamed across the Internet. This book shows you how to harness MP3 for your own entertainment and use. Subjects include: play MP3 files, learn MP3 history, use Winamp skins & plug-ins, configure winamp, create MP3 files, musicians & MP3, advanced winamp usage, build internet radio stations and handheld portable players. There is also a CD-Rom included which contains Songs from they might be giants Frank Black, Skins & Plug-ins to enhance Winamp, MP3 Programming examples, Winamp shareware, and Shoutcase.

MUSIC ENGINEERING

by Richard Brice

357 Pages | Code B378

£ 19.99

POSTAGE: UK £3.25 | EUROPE £3.45 | WORLD £5.65

If you are an electronics engineer who needs specific information about music reproduction or if you are a sound recording engineer who needs to get to grips with the electronic technology, Music Engineering is for you. With an accompanying 40 track CD illustrating effects and instruments, this useful book will guide you through the world of recording techniques and audio effects. From Mics to Amps, Sequencers to MIDI and even video synchronisation, Newnes books are well known for their practical approach, looking under the covers at the technology behind a subject. Packed with illustrations, you'll wonder how you ever managed without it!

FONO DIRECTORY 2001

326 Pages | Code B401

£ 66.00

POSTAGE: EURO £2.60 | UK £2.40 | WORLD £4.20

The FONO Directory 2001 is Europe's premier music contact guide. This directory was put together as a working tool for everyone in that very business. It is the contacts book for the industry and you will find information here which you will not find anywhere else. The features included in this book are, 500-plus Music Control radio stations, Europe's leading retailers, the key TV shows and music channels, people behind the hits, plus crucial data on the European market. If you want help in making those vita contacts so that you can break a hit across Europe then this book is a must have for any studio, office or even home.

BEAT IT!

by Joe & Pauly Ortiz of Heavenly Music

110 Pages | Code B356

£ 11.95

POSTAGE: EUROPE £2.00 | UK £2.00 | WORLD £2.15

This book which comes from one of the top MIDI programming teams, is designed to help you play on an actual drum kit or, if you use midi setup, you will find subjects that help you to programme your own realistic drum and percussion patterns, with examples depicted in familiar 'grid' style. The patterns and the files on disk (which is found attached to the back of the book) are loosely grouped into styles like 50s and 60s, Pop, Soul and Dance, Rock and R&B, and Jazz and World Rhythms (which include patterns like Reggae, Soca, Calypso and Latin). You can also use the files to rehearse or jam along to, or to incorporate into your own demo songs or ideas.

6 STEPS TO SONGWRITING SUCCESS

by Jason Blume

Code B409

£ 12.95

POSTAGE: EUROPE £4.35 | UK £3.85 | WORLD £7.15

6 Steps to Songwriting Success is the only book to break down the writing and marketing of hit songs into six manageable steps: developing successful song structures; writing effective lyrics; composing memorable melodies; producing successful demos; taking care of business and developing persistence. In an easy-to-understand and lively format, the book includes 30 exercises for you to practice and hone your songwriting skills, as well as checklists to help you objectively assess your strengths and weaknesses. It is filled with quotes, anecdotes, and inspiring stories from songwriting professionals and also includes an appendix with a list of hundreds of resources for songwriters.

CUBASE VST TIPS AND TRICKS

by Ian Waugh

154 Pages | Code B197

£ 10.95

POSTAGE: EUROPE £2.20 | UK £2.15 | WORLD £3.45

There's not much you can't do with *Cubase VST*, but how many users really achieve full mastery over Steinberg's program? The manual explains how *VST* works but this book shows you how to *use* it! In this highly practical book you'll discover a wealth of tips and tricks to help you become more creative and more productive: optimising your computer system, improving your grooves, audio/MIDI quantisation, using dynamic events, arranging, recording, synchronisation, using the editors, mixing, fader automation, audio processing, using audio effects, EQ, troubleshooting, and lots more. An essential book for all *Cubase VST* users who want to get the most out of this powerful program.

CAN YOU SING A HIGH 'C' WITHOUT STRAINING?

by Thomas Appell

120 Pages | Code B319

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PHONIC 1002 mixer, compact, ten standard inputs, four stereo inputs, £50. ☎ 020 7735 2275 (London).

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RODE NT2 microphone with shock mount and hard case, unused and in mint condition, £175. ☎ Mark 077 7184 7774 or email markl@air-edel.co.uk (London).

ROLAND VS1680 V-expanded, Joe Meek VC3 compressor, Rode NT1, £1095. ☎ 01246 811234 (Chesterfield).

ROLAND VS1680 V-expanded, perfect condition, £850; Roland VS880 V-expanded, perfect condition, £400. ☎ Richard 01422 204089/077 8859 4886 (Halifax).

ROLAND VS1680, as new, expanded model, £1000 ono. ☎ 01803 866991 (Devon).

ROLAND VS1680 EX, 6Gb hard drive, PC software for cut and paste editing, dust cover, manuals, hardly used, immaculate, £850. ☎ Steve 01429 222517 (Hartlepool).

SENNHEISER E609, flat, Square profile for drums and guitar cabinets, boxed, mint and unused, £70; Sennheiser E855 vocal mic, boxed, mint condition, unused, £65. ☎ 079 5770 8262 (Essex).

SONY MDS520 full-size Minidisc recorder in 3U rack shelf, never gigged, hardly used, best in its class a few years back, £120. ☎ Chris 01656 865089 or email emulator@spacestation.co.uk(Mid Glamorgan, South Wales).

SOUNDCRAFT SPIRIT STUDIO 16 desk, pristine condition, £490; can deliver in South West. ☎ 01305 785016 (Dorset).

SPIRIT FOLIO LITE 12-channel mixer, four mic channels, 2 auxillaries, balanced jacks, EQ, power supply, home studio use, perfect condition, ideal for live, studio or PC use, £100. ☎ Doug 01709 518223 or email Doug@cliftonlane.free-online.co.uk (Rotherham, South Yorkshire).

STUDIO EQUIPMENT for sale including mixer, 16-track, remote/synchroniser and monitors, ideal for setting up a small commercial studio, call for details, £4700 ono. ☎ Andy 01633 613342 or email andy@rpmmusic.co.uk (Newport, South Wales).

TASCAM 32-2B quarter-inch mastering tape recorder with remote and DBX unit, nearest offer, £250; DTC 690 studio DAT recorder with remote very little use, custom SCMS modification by pro-digital, £175 ono. ☎ 0131 556 5334 or email silentsound@cheerful.com (Edinburgh).

TASCAM 38 half-inch eight-track reel-to-reel, £400; Seck 18:8:2 mixer, immaculate, home use only, £250 or both for £600. % 01297 552436 (Devon).

TASCAM 38 half-inch eight-track reel-to-reel, good working order, manual plus four reels, £350. ☎ Richard Rogers 0121 6280 0010/443 3664 (Birmingham).

TASCAM MX2424 with ADAT board, excellent condition, boxed, unit has been dark-roomed so the front panel has not been used, £2500. ☎ Marc 01428 681779 or email sosads@auxbuss.com (Guildford, Surrey).

TC ELECTRONIC FIREWORX v2.0, £1000; M2000, £500; Clavia Nord Rack 2, £500; PCMCIA, £70; Focusrite Compounder, £315; Phillips CDR760, £130; all as new, manuals and boxes. ☎ 079 70 748837 (Northants).

TRAXDATA 900 CD recorder boxed as new, Digi I/O, S/PDIF & optical, £120 ono. ☎ Lee 01274 864134 or email leesam@supanet.com (Cleckheaton, West Yorkshire).

UREI LA10 mono compressor, excellent condition, boxed with manual, £230; TEAC

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YAMAHA 01V digital mixer with ADAT board, as new, boxed with manual, £900. Samson Servo 170 amp, boxed as new, £75. HH8 Circle 5 passive monitors, as new, boxed, £250. ☎ 079 6859 1179 (London).

YAMAHA 01V digital mixer, hardly used, excellent condition, £1200 new but will sell for £800, fully boxed with manuals. ☎ 0131 478 1530 (Edinburgh).

ZOOM 9120 MIDI-controllable multi-effects unit, reverbs, delays, chorus, £100. ☎ 0131 556 5334 or email sienticsound@cheerful.com (Edinburgh).

sequencers

ALESIS MMT8 hardware sequencer, eight tracks, a doodle to use, excellent for live use, £90. ☎ 0115 938 4187 or email jezshearing@hotmail.com (Nottingham).

ROLAND MC8 microcomposer, very rare original digital-analogue sequencer, £400 ono. email chris@chriscarter.co.uk (Norfolk).

ROLAND MC303 Groovebox for sale, PSU, but no box, in full working order, I'm in Southampton/Winchester area, £150. ☎ Barry 077 7978 9099 or email roland@barnaby.org.uk (Swanmore, Hants).

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ROLAND TB303 old acid box for sale, Kenton retro-fit filter sockets fitted, £800 ono. ☎ 078 1039 2663 or email phirudic@ferndene22.fsworld.co.uk (Newcastle Upon Tyne).

ROLAND MC500 hardware sequencer with extra performance software and Mk2 software, others. ☎ 0131 556 5334 or email sienticsound@cheerful.com (Edinburgh).

YAMAHA QY70, you know the spec of this fantastic little portable sequencer, this one is brand new, boxed with manuals, leads, power supply, CD-ROM, unused bargain, £200. ☎ Doug 01709 518223 or email Doug@cliftonlane.free-online.co.uk (Rotherham, South Yorkshire).

samplers

AKAI MPC2000 sampler sequencer drum machine, all in one box with effects board and all discs and manuals, £400. ☎ Richard 01422 204059/077 8859 4886 (Halifax).

AKAI MPC2000, good condition, 32Mb RAM, boxed with manuals, Akai discs included, £350. ☎ Paul 079 5828 7231 or email paul@stoddartp.freeserve.co.uk (Birmingham).

AKAI MPC2000, 32Mb, flightcase, £800; Kenton Pro 4, £140; Korg Delta, £30; Technistar Drumsynth, £60; Sequential Drumtraks, £60; Yamaha RMX90 electronic drumkit, £150; Roland SH101, £225. ☎ Carl 0113 282 5283 (Wakefield).

AKAI S01 sampler, box, manuals, disks, £160; Korg 01/WFD Superdance card, £30; FM magazines issues one to 60, £150. ☎ Carl 020 8767 1298 (London).

AKAI S01, perfect first sampler for home studio, mint condition, expanded memory (32 seconds) and manual, £200. ☎ 077 7182 5091 or email simjw@aol.com (Sevenoaks, Kent).

AKAI S2000, SCSI, 16Mb, nearly new, boxed with manuals and PC, SCSI card and MESA software, £300. ☎ Tony 01243 576480/079 2340 7999 (Chichester).

AKAI S3000XL digital sampler, mint condition, boxed, can deliver, £650 ☎ Pete 078 6646 0344 or email pete.taylor2@btinternet.com (Northants).

AKAI S3000XL, excellent condition, 32Mb RAM, Zip drive, £600 ono. ☎ Francis 079 5765 2581 or email fmunn@hotmail.com (Leyton).

CASIO FZ1 with 2Mb upgrade, manual and disks, swap for synth rack modules; RM1X, Quasimidi Raw-O-Lution, Korg EA1 and ER1, DrumStation and BassStation, or sell for £350. ☎ Dan 01939 291192 (Shrewsbury, Shropshire).

EMU ESI4000 Turbo, extra outs and effects, £450; Roland s330 sampler, eight outs, loads of sounds, monitor, gritty sounds, £150. Atari 1040ST, monitor, mouse software, £100. ☎ 01689 606095/020 8249 7738 (Kent).

ENSONIQ ASR10 rack mount sampler and workstation, loads of sounds, flight case, video, manuals, excellent condition, £550. ☎ Paul 0191 528 0201 or email p_d_russell@hotmail.com (Sunderland).

ENSONIQ ASRX sampling workstation, fully upgraded, 34Mb, SCSI, 10 outputs, excellent sequencer, 24-bit effects, reads all formats, immaculate condition, custom hardcase, £655. ☎ Dino 079 4686 6428/020 8767 7558 (London).

ROLAND S760 sampler, Zip drive, £550; Roland W30 keyboard with sampler, £300; Waldorf Pulse Plus, £265; Behringer Ultrafex Pro Enhancer, £106; Alesis 3630 compressor/limiter, £75; 12U rack cabinet, £50; various racktab, £25 to £50. ☎ 079 2901 8120/0116 2761349 (Leicester).

YAMAHA A3000 v2 sampler, never used, cheap price including UK postage, £455. ☎ 078 8194 1613 or email hit_analogs@hotmail.com (Edinburgh).

drum machines

ALESIS S16 drum machine, £90. ☎ Lindsay 01865 242225 (Oxford).

ALESIS SR16 drum machine, boxed with manual, £95. ☎ Glyn (078 19 422433 or email Glynellan@hotmail.com (Sheffield).

ROLAND TR606 Drumatix drum machine, individual outputs fitted, excellent condition, original manual and power supply, £199 including overnight postage. ☎ 01273 324995 or email chris@organised-rhyme.com (Brighton).

ROLAND TR909, as new, mint condition, still in original box with manual, best offer secures. ☎ 078 8194 1613 or email hit_analogs@hotmail.com (Edinburgh).

YAMAHA RX21 and RX21L drum machine, manuals, £100 ono. ☎ Steve Fox 020 8530 7802 (London).

personnel

GUITARIST looking to form an experimental band in Sheffield area, influences include Sonic Youth, Trial Of Dead, MBV, Joy Division, Shellac. ☎ Mark 0114 255 0212 (Sheffield).

I HAVE SONGS suitable for a female vocal harmony group, happy, musical, feet tapping, hand clapping, come listen and choose what you like, arranged to suit. ☎ Fred 01935 873116 (Dorset).

SOUND ENGINEER with HND in professional sound and video technology, looking for entry-level position in post-production/format transfer house. ☎ Stephen Scott 078 33100 136 (Buckinghamshire).

USER OF YAMAHA QY700 and MU90R needs tuition on how to use these pieces of equipment, guitar lessons and cash in exchange. ☎ 020 8840 7165 (London).

computers

ANTARES AUTO-TUNE LE original software and manual for the MAC, still boxed as new, £50 ono. ☎ Andy 01633 613342 or email andy@rpmmusic.co.uk (Newport, South Wales).

APPLE MAC 7100, and Digidesign Audiomedia 2, CD-ROM, external Micropolis drive 17-inch monitor, loads of software, ideal mastering set-up, will swap, £200. ☎ 01626 854400 or email sunfish@btinternet.com (Newton Abbot, Devon).

APPLE POWERMAC 8200 complete working set-up, including Steinberg *Cubase 3.52*, MOTU MIDI Express XT, OMS, plenty email for full details, completely mint, hardly used, £700. ☎ Chris 079 7661 5497 or email chris.brown@moneyquest.co.uk (Glasgow).

APPLE POWERMAC G3/333MHz, 512Mb RAM, 6Mb vRAM, two ultra-wide 9Gb hard disks, 56K modem and 21-inch monitor, Emagic *Logic Platinum 4.5*, Steinberg *Cubase VST 4.0*, Steinberg *Recycle 1.7*, all new, boxed with manuals and dongles, MOTU eight in, eight out, MIDI in, £1500 for the lot. ☎ Phil 079 7473 6504 (Surrey).

ECHO DARLA 24/96 PCI audio card with two in, eight out quarter inch balanced jack breakout box, 24-bit 96KHz PC or MAC recording for only £195. ☎ Doug 01709 518223 or email Doug@cliftonlane.free-online.co.uk (Rotherham, South Yorkshire).

ENTIRE HOME STUDIO, PC running Emagic *Logic Gold 4*, Emagic Audiowerk8, ten software, Akai S3000, Spirit Folio SX mixer, Roland keyboard, Virtualiser Pro, Spirit Absolute Zero monitors, Alesis Nanosynth, all as new. ☎ Rose 078 1373 7678 (Yorkshire).

EMAGIC *LOGIC PLATINUM v4* for PC, £380; Emagic Audiowerk8 two in, eight out soundcard, £100; Winman 4x4 four in and four out, SMPTE, £50; will sell all together for £400. ☎ Richard 01422 204089/077 8859 4886 (Halifax).

IOMEGA JAZ DRIVE with 1Gb cartridge, excellent condition with power supply, one Jazz 1Gb cartridge, used as a backup unit only £135 ono. ☎ Michael 01458 832525 or email michael@touchwoodmusic.com (Wells, Somerset).

KORG 1212 audio card, two analogue, two S/PDIF and eight ADAT I/O, wordclock on one card, great sound and very stable, boxed with latest driver. £160 ono. ☎ Ali 020 7254 5298 or email ali.d99@virgin.net (London).

M AUDIO DELTA 66 soundcard, four in, four out, S/PDIF drivers for Mac and PC, excellent sound, very stable card, boxed with cable, drivers, manuals, as new, £200 ono. ☎ 0191 285 7596 or email steve@smidrop.net (Newcastle).

M AUDIO DELTA 66 soundcard for PC/Mac, excellent quality and condition, I have bought an all-in-one card otherwise I wouldn't part with it. ☎ 079 7125 5428 (Newcastle).

OPCODE MUSIC QUEST eight port/SE MIDI interface and patch bay, eight ins and eight outs giving 128 MIDI channels, highly accurate timing for spot-on sequencing, mint condition, can demonstrate, £175 ono. ☎ Mo 079 5658 2586 or email mosi@orintel.net.uk (Ashford, Middlesex).

ROLAND UA100 USB audio interface/sound module, boxed, £150. ☎ Dan 077 6522 7624 or email phd_uk@yahoo.co.uk (Reading).

SCSI SEAGATE U2W 18Gb hard drive, 5mS access time, 10,000rpm, designed for video and audio, cost £293, offers please. ☎ 079 6646 3429 (Doncaster).

STUDIOWORKS 575LE LG 15-inch TFT flat-screen monitor, excellent picture and condition, £270 no offers. ☎ 077 2052 9967 or email richard_gold@hotmail.com (Langley, Berks).

TURTLE BEACH TAHITI soundcard with Yamaha DB50XG, breakerboard, £100. ☎ 01297 552436 (Devon).

YAMAHA DS2416 soundcard 16-tracks, mixer, compression and EQ on each channel, comes with additional AX44 breakout box, no CPU overhead, £360. ☎ 020 8707 9828 or email kdcosta@barn4fun.com (Feltham, Middlesex).

YAMAHA SW1000XG sound card, over 1200 sounds, seven effects units, hundreds of dance drums, under two hour of use, unwanted gift, £270. ☎ Paul 020 8386 8501 (Herts).

YAMAHA SW1000XG soundcard with fantastic sounds and 32 MIDI channels, internal mixer with six stereo outs, £250. ☎ Jon 077 7941 6939 or email C714sad@hotmail.com (Brighton, East Sussex).

miscellaneous

AUDIO SOURCE RTA1 real-time spectrum analyser, gives you accurate control room readings for flat EQ on your monitors, new and boxed in leather case and with leads. Offers ☎ Vince 079 7330 6997 or email vincatesta@ntlworld.com (Bedford).

DIGITECH GSP2101 manual, as new, even has sticky Digitech labels, ideal if yours is lost or damaged, buyer pays postage, £10 ono. ☎ Michael 01458 832525 or email michael@touchwoodmusic.com (Wells, Somerset).

EPIPHONE SUPERNOVA, beautiful sky blue guitar with case, top condition, £250; Epiphone Viola bass also for sale, pictures on request, £350. ☎ Rich 01270 883779 or email rich@musiccontrol.co.uk (Stoke-On-Trent, Staffs).

FENDER JAZZMASTER 1962, clay dot, slab board, white, matching headstock, showroom condition, original, including case, £1000. ☎ Ben 0117 0974 2817 or email bs007a5908@blueyonder.co.uk (Bristol, Avon).

FENDER SQUIER JV-series electric jazz bass 1984, fantastic condition, sold with case, please make me an offer for this sought-after bass. ☎ 078 0830 0329 or email PaulBKeeves@Musician.org (Birmingham).

FENDER USA STANDARD Stratocaster, unused gift, never played, white with rosewood fingerboard, complete with Fender hard case, one year old only, £400; Line 6 POD v2 upgrade, F64 Floor controller, power supply, manuals, CD-ROM, unused, no offers please, £195. ☎ Doug 01709 518223 or email Doug@cliftonlane.free-online.co.uk (Rotherham, South Yorkshire).

FENDER VILLAGER vintage acoustic 12-string, £250; Yamaha FG140 acoustic guitar, £100; both in excellent condition; Steck Overstrung Piano, very full tone, records well, a real musician's instrument, £850. ☎ 01297 552436 (Devon).

GODIN SEMI-ACOUSTIC A6 beautiful four string semi-acoustic bass guitar, home use only, wicked Latin sound, £700. ☎ Antonio 079 6700 7391 or email antonio_montoya@yahoo.com (Lee).

GIBSON G3 bass guitar, 1978, black with original case, offers please. ☎ 078 0830 0329 or email PaulBKeeves@Musician.org (Birmingham).

GIBSON SG standard black, case, excellent condition, one year old, £575. ☎ 079 4110 8027 (Crawley, West Sussex).

HEIL HT1 TALKBOX, mint condition, still in box, amazing classic sound, as used by Bon Jovi and Peter Frampton, extra cost to post it, £120. ☎ Wayne 079 8081 7567 or email BonJoviMusician@aol.com (Oxfordshire).

HOHNER THE BLONDE unusual electric guitar, Telecaster-style pickups maple neck but full pearloid front, Les Paul shape, lovely neck, great action, super player, £150. ☎ Phil 01778 343598 or email phil@gguavstudio.co.uk (Peterborough, Cambs).

KORG FLIGHTCASE to suit Korg Wavestation-sized keyboard, good condition, hard black plastic with furry interior, £25. ☎ 01592 560350 or email ad.inlop@freestone.co.uk (Kirkcaldy, Fife).

MOOG FLIGHTCASE original Polymoog case, a couple of hinges damaged but otherwise a nice item with Moog logo on an aluminium case. Offers. ☎ 01592 560350 or email adunlop@freestone.co.uk (Kirkcaldy, Fife).

PETE CORNISH 8-way pro power distribution board, built like a tank, with long heavy duty lead and power safe/unsafe indicators, if you gig you need this, £15. ☎ Ric 01677 422041 or email ric_ward@lineone.net (Bedale, North Yorkshire).

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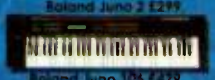

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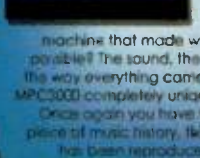

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As a means of personal therapy, **John Walden** explains what he learned from spending the New Year with Windows pains.

Love 'em or loathe 'em, computers are at the heart of many modern recording studios — indeed, in home or project studios the computer is often the key piece of equipment. This is certainly true of my own studio: my PC acts as MIDI sequencer, audio recorder, sampler, and occasional video-editing suite. In terms of pure hardware grunt, it is reasonably well specified to perform all these tasks. So why did I spend a full four working days last New Year, and a further two days during March, trying to get the damn thing to work reliably?

Towards the end of last year I upgraded from Windows 98 to 98 SE (using Microsoft's official upgrade CD) in order to get better support for both USB and FireWire. Over the next week or so, the computer that had previously been rock solid began to be a tiny bit temperamental, even occasionally crashing. I set about some routine troubleshooting to cure this minor irritation. Gradually, however, this troubleshooting developed into a full-blown system rebuild as I battled to get to the bottom of the problem (I've managed a number of computer networks, so I'm not a total novice when it comes to looking after PC systems). In the end, having re-installed the OS and all my software at least three times, on New Year's Day and with an *SOS* deadline looming, I just gave up, reinstalled Windows 98 First Edition, and hey presto, I had my stable PC back. I was extremely frustrated that Windows 98 SE had got the better of me.

During March, and without an *SOS* deadline approaching, my taste for self-abuse got the better of me and I decided to try again to get 98 SE installed. I encountered the same problem, only this time the crashes were much more frequent. The system was, essentially, unusable. Finally, after spending eight hours trawling the web sites of my motherboard manufacturer and graphics card manufacturer, as well as Microsoft's support site, I started to make some progress. I narrowed the problem down to an incompatibility between the particular combination of the BIOS on both my motherboard and graphics card when used with 98 SE. Armed with tech support and FAQ documents, and new BIOS versions, a few hours later I had a stable PC running Windows 98 SE. While I was pleased to have resolved the problem, I was traumatised by the experience, and very annoyed by the amount of time the whole process had taken.

So what are the lessons I've learned from this valuable character-building episode? Firstly, I've begun to realise just how 'professional' the PC in my studio is. It's certainly capable of making professional-quality audio recordings that can be commercially released, but with other studio equipment, professional means 99.9 percent reliable and a single manufacturer to turn to who will sort out the other 0.1 percent quickly and efficiently. To put it bluntly, consumer computers are not professional devices in a recording context. The only way to get close to achieving professional performance and support for a music computer is to buy a complete system (hardware and software) from a specialist retailer and let them maintain it for you. However, for most home and project studio owners, this also means some disadvantages, including higher costs. (By the way, while the wider range of component manufacturers for PCs probably means they are more likely to suffer this kind of problem, this is not just a PC or Windows issue. As demonstrated by Paul White's editorial in the February 2001 issue of *SOS*, the Mac OS can also show its temperamental side when it feels inclined.)

Second, computers need more regular attention than your average outboard unit, mixer or dedicated digital recorder. Following the accepted guides to good practice will definitely help to keep things running smoothly. The creative options a computer can provide are awesome but, at some stage, the musician in you will undoubtedly have to acquire some technical knowledge about the operating system, hardware and software you are running.

The bottom line? If you're considering putting a computer at the heart of your home or project studio, do it with your eyes wide open and expect to administer generous amounts of PC TLC on a regular basis. SOS

About The Author

Aside from writing occasional pieces for *Sound On Sound*, John Walden spends his time trying to reassure his neighbours that he is just trying to sing, and not in need of urgent medical attention.

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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