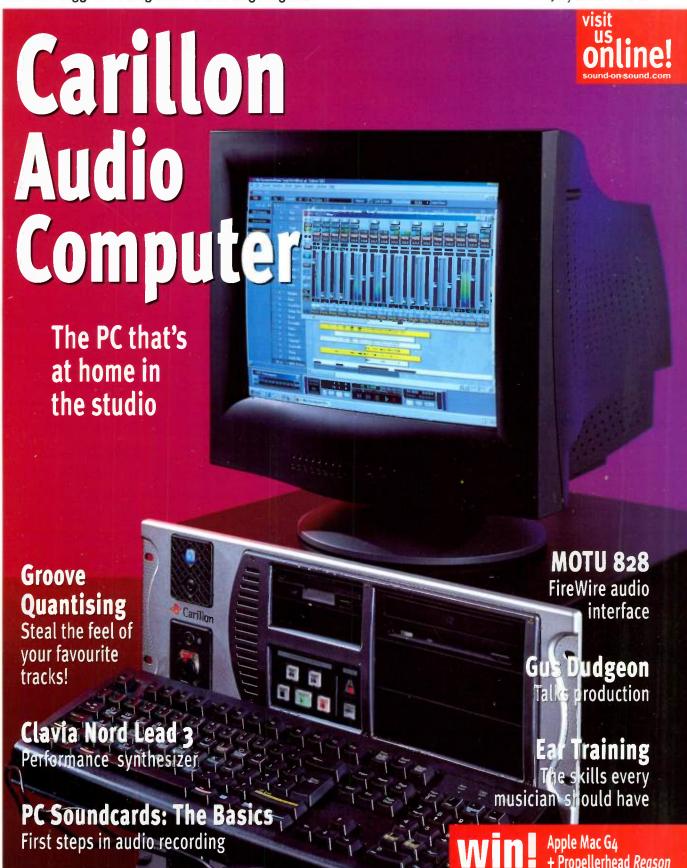
The UK's Biggest Selling Music Recording Magazine

July 2001 £4.25



Emagic EVP88 Electric piano for Logic ■ Equalisers Explained Tone-shaping tips ■ Yamaha DX200 Tabletop FM synth

■ Korg D12 Digital multitracker ■ TC Spark v2 Mac audio editor ■ Chris Tsangarides Rock producer ■ Rode NTK Tube mic Hoontech DSP24 Low-cost 24-bit soundcard ■ Bass recording Combining mic & DI signals ■ Studiomaster 162BP Mixer ■ Trident MTA Channel ■ Logic, Cubase & Performer Sequencer masterclasses ■ Internet, PC, Apple & Atari News

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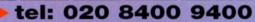


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# leader editor's comment

# survival of the fittest?

t's no secret that a high proportion of us rely on computer-based recording systems, not because they necessarily have the best user interface or reliability, but because they are comparatively inexpensive, integrate audio and MIDI, and can host virtual effects and instruments. Conversely, computers can be difficult to get working properly, clumsy to mix on, unless you use a hardware controller, and physically noisy, due to fans and hard drives. On top of that, we're at the mercy of those who design computer hardware and operating systems for a world in which multitrack music recording is only a very small part.

Then there's software piracy. It may seem like a victimless crime, but software developers are not all fat multinational corporations and most can't afford to work for nothing. One consequence is that several companies have decided not to develop VST versions of their more sophisticated products, so the legitimate user loses out by being denied choice.

Is there an answer to these problems?

I think there is, but it requires a lot of co-operation between competing hardware and software manufacturers to deliver the best of both computer and hardware worlds.

Everybody appreciates the flexibility of the computer, the big screen, and the 'mix and match' way in which various bits of software can be used to create a custom studio environment, but the reliability and structured user interface of a digital 'super Portastudio' equivalent, with a moving-fader mixer interface, also appeals.

One major hardware manufacturer I spoke to recently had identified the fact that most musicians are now choosing between the computer and the integrated digital

multitracker, with relatively few opting for separate mixers and recorders, other than at the pro studio end of the market.

His question to me was:

"What do we need to do to build hardware that people will want to buy?" I could only answer based on my own experience, and I'd be reluctant to choose a hardware solution, unless it provided everything my computer offers. And this doesn't just mean building in a 'dull but worthy' MIDI sequencer, because once you've invested time in learning your chosen sequencer, you won't want to change, especially if you've collected plug-ins and other add-ons that you can't use in the new system.

My dream solution is a silent-running hardware recorder/mixer into which I can plug a mouse, monitor and keyboard, and on which I can run my VST-compatible sequencer and plug-ins. This would allow me to record in a tape-style environment and edit in a sequencer environment. Naturally, mastering and CD/DVD burning would also be offered, along with full surround capabilities. Ideally, the operating system would be developed specifically for music (a version of BeOS, perhaps?), and the hardware architecture structured so that it could be expanded as new processors were developed. It also would have to support third-party MIDI interfaces and be updatable to future protocols, such as mLAN.

If things continue as they are, many users will buy their PC from a computer store and get their software free from the Internet, leaving the music industry to feed off the scraps. A widely supported hardware platform, on the other hand, could be designed with secure software copy protection, which should give the software manufacturers an incentive to create more sophisticated products while maintaining a sensible price. This hypothetical platform could also include expansion slots for DSP accelerators, effects boards and so on, to fend off obsolescence for longer.

Clearly this concept is a non-starter unless the four big sequencer manufacturers (Steinberg, Emagic, MOTU and Cakewalk Music Systems) get behind the idea, and the plug-in manufacturers follow. But without some serious co-operation we may face a future where we have to choose between a range of 'compromise' systems, none of which adequately satisfy our real needs, and whose manufacturers find it increasingly hard to make a living.

### SOUND ON SOUND

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

# **Definitely Distinctive**

Huge guitars, other-worldly synths and hard-edged sequencer tracks — that's the distinctive sound of Rammstein. The band relies on Emagic music production software to translate this sound from the studio to the stage. For a long time now, Rammstein have appreciated the creative possibilities, superb usability and razor-sharp timing of Logic Audio Platinum. But there's one distinctive feature that they consider to be of overall importance when using Logic Audio live on their current tour reliability. This is another reason why, wherever music is professionally produced, you'll increasingly find software and hardware from Emagic. Logic Audio — definitely the right choice.

Technology with Soul.

Logic Audio is available for Windows98/Me and MacOS.

For more information and a demo CD call Sound Technology on 01462 480000 or visit www.soundtech.co.uk sound Technology plc, Letchworth Point, Letchworth, Hestfordshire SGB 1ND.

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How do you follow 10 years in The Prodigy, one of the most successful bands of the last decade? By recording a solo album in an outhouse adjoining a disused windmill, naturally. SOS meets former Firestarter Leeroy Thornhill and his studio designer Joe Morena.

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Best known for his collaborations with Elton John, Gus Dudgeon is one of the most successful British record producers ever. He talks to us about his work.

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There are many sites on the web that aim to help you be a better songwriter, but there's also a lot of rubbish out there. We try to sort the good from the bad!

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If the Crumar Spirit is one of the best analogue monosynths the world has ever known, how come you've never heard of it? SOS explains...





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WDH

# seeing red

### Red Sound launch Elevata modelled synth and Cycloops instant-loop sampler

The latest instruments from UK-based Red Sound Systems are the Elevata analogue-modelling synth and the Cycloops looping sampler. The most instantly striking feature of Elevata is its package: not only can it be mounted in 3U of 19-inch rack space, but when used as a desktop instrument its front panel can be swivelled — elevated, if you like — to one of three preset positions. The DSP synth engine at the heart of the Elevata is based on that developed for Red Sound's DarkStar eight-voice synth, but apparently the modelling has been improved. Its main features include 16-voice polyphony, eight-part multitimbrality, six assignable outputs, two external inputs, fullyassignable joystick, and arpeggiator. Red Sound's new 'Sound Wizard' generates random parameter settings for designated synth sections — filter, LFO, and so on - to allow instant sound creation.

One of the attractive things about the DarkStar (Red Sound's other synth) is the fact that it can be turned into a completely different instrument by swapping its main EPROM. This facility has been carried over to the Elevata, but this time in the form of software plug-ins: up to three additional software applications can be loaded into the Elevata hardware and, once installed, each application can be accessed



at random from the front-panel controls, allowing the user to instantly switch between synthesis, vocoding and drum sounds. Software conversion kits will include a plug-in daughterboard and magnetic frontpanel overlay and will cost between £75 and £99 each. The Elevata should be available as you read this. and it will retail for £650 including VAT.

The Cycloops sampler is aimed at DJs, and uses a number of patented tricks to help create instant loops on the fly that cycle in sync with each other, and with the original audio that was sampled. DJs should be able to grab samples, sync them and build up a new track, spontaneously, during a live performance. A tempo display and headphone monitor are provided, and Cycloops comes with a three-option mounting kit. It retails for £275.







Neumann have moved into the digital domain with their new microphone system, the Solution-D. It's a digital mic offering a host of innovative features, including remote alteration of key sound parameters.

Solution-D offers integrated DSP processing, and its newly-designed A-D

# neumann go digital

### Neumann's first digital mic offers forward-looking features

converter aims to remove the need for an external preamp and converter, and allows gain adjustments to be made digitally inside the mic. Neumann point out that smaller productions can thus be recorded with just the Solution-D and a recording device.

Remote control of standard mic facilities such as the low-cut filter and polar response is possible, via a Remote Control Software program with a graphical user interface; the software even shows the signal level of the connected mics. Settings can be saved, and notes (possibly about the mic positions or session setup) may be added. The software also allows the configuration of one mic to be copied to others.

Solution-D has a number of features you normally wouldn't even expect to find in a microphone, including mute and phase reverse, as usually offered by mixing

consoles. It even offers a 'transient limiter', to allow limiting to be applied at signal source to counteract the occasional short duration, large amplitude transient - as Neumann point out, analogue mics need a lot of headroom in the following signal path to accommodate such signals without clipping. An integral noise gate and switchable test signals inside the mic are also projected.

As for the mic capsule itself, it features Neumann's new 30cm K01 doublediaphragm design. At the time of going to press, the price of the Solution-D has yet to be fixed (although it surely won't be a budget release!). More news as soon as we

Sennheiser UK +44 (0)1494 551551. +44 (0)1494 551550.



www.sennheiser.co.uk



# custom pc corner

### Digital Village DV Series

Hi-tech retail chain Digital Village are launching a range of Pentium III PCs specially configured for music use. There are two basic packages (which both include a large hard drive, keyboard, VGA monitor and CD-ROM drive): the DV Tower, which features front-mounted USB and audio ports for easy peripheral connection, and



the DV Rack, which is built for the road and demanding pro studio applications. Noise is always an issue with computers in the studio, and DV have specified Molex silent CPU fans and 'noise killer' PSUs for all their PCs. DV PC recording and sequencing systems start from £999.99; contact Digital Village for details of hardware and software options.

Digital Village are also exclusive UK distributors for Joemeek's MC1, which the two companies developed between them. The MC1, £139.99 (or £89 when fitted into your DV Tower or DV Rack), is essentially a Joemeek VC3Q voice channel packaged to fit in a PC's 5.25-inch bay, with a break-out plate at the back giving phantom-powered XLR inputs and a stereo output, so that it can be permanently connected to your PC's soundcard. See Digital Village's ad in this issue for details of your nearest branch.

W www.digitalvillage.co.uk

### Millennium MusicPCs

Nottingham-based Millennium Music Software have also unveiled their MusicPCs, a range of music-optimised PCs, available in



tower, desktop or ruggedised rackmounting packages.

Millennium's solution to the computer noise problem is to install quiet Coolermaster CPU fans in their PCs, and to offer the option of further soundproofing. In addition, they can offer Coolermaster's aluminium cases, which are reported to be good at conducting and dispersing excess heat. Each PC features an on-line Help system which provides instant access to dozens of frequently asked questions and how-to guides on getting started with your new PC. And if there's a problem you can't solve by yourself, perhaps Millennium's remote diagnosis system can help: a company engineer can diagnose, reconfigure or troubleshoot your PC via modem. Freebies include a selection of useful non-music PC utilities, plus free VST instruments and effects from the Internet, to save you having to download them yourself.

Millennium can also take your existing computer and rebuild it as a MusicPC, replacing components where necessary and making your choice of system enhancements from a range of options. The modified PC will then be configured and tested as if it were one of the company's newly-built PCs.

Millennium Music Software +44 (0)115 955 2200.

+44 (0)115 952 0876.

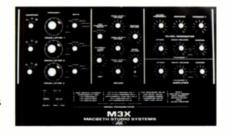
sales@millennlum-music.co.uk

# och aye the new!

### Scottish analogue synth to get Kenton MIDI spec

The latest news on the forthcoming analogue synths from Scotland's MacBeth Studio Systems concerns the 6U MX3 module. The M3X sends and receives 1V-per-octave control voltages (like many true analogue

synths), and is to feature an



extensive MIDI implementation, designed with Kenton Electronics. Kenton are also adding similar functionality to MacBeth's semi-modular M5 synth.

Other additions to the MX3's spec include a digital nine-waveform LFO and keyboard tracking routable to the resonant transistor ladder filter. There's plenty of sound-design potential, extensive cross-modulation of the three oscillators and frequency modulation of the filter is possible. The M3X is due in July, at a price of around £880 including VAT, but minus shipping, which depends on your location — contact MacBeth Systems for details.

macbeth2600@yahoo.co.uk
www.macbethstudiosystems.com

# lateral thinking

# Reliable guitar-to-MIDI conversion for US\$35?

UK-based Lateral Systems have developed software which apparently converts the audio from an electric guitar into MIDI data, with no modifications to the guitar required — the company claim that you simply plug the output of your guitar into your PC soundcard's mic input using an adaptor. *Guitar Synth* allows you to control the synth built into your PC soundcard or an external synth in real time. Chords and lead lines can both be accommodated, according to Lateral, as can vocal or audio input from CD. *Guitar Synth* requires Windows 95/98/ME, and costs US\$35 from the company's web site. An unregistered version is freely available, but the registered version can save data in MIDI File format, and displays notes on an on-screen guitar fretboard.

W www.lateralsol.com



# it's in the book!

### 1500 audio products in HHB's 2001 catalogue

HHB's 2001 equipment catalogue is out now, released simultaneously in a print version and a searchable version on the company's web site. The new catalogue contains information on around 1500 pro audio products that are available via HHB from more than 150 manufacturers — covering everything from studio monitors, mixing consoles, microphones and CD recorders to



computer hardware, headphones, samplers and sound modules. Each entry is accompanied by a brief description and specification, which makes the catalogue (by now an audio industry institution) a reference work in its own right. The 152page catalogue has already been mailed to existing customers and is also available free on request to "qualifying UK audio professionals" — contact the HHB sales department or apply via the web site.

HHB Communications +44 (0)20 8962 5000. sales@hhb.co.uk

W www.hhb.co.uk

### bullets

### Nova synth OS updated with new features

The latest software for Novation's Nova synth offers the synth no less than a "complete renovation", according to Novation. 0S4 boosts polyphony from 12 to 16 voices and introduces a Double Sawtooth waveform, which causes the oscillator to generate two saw waves with independent detuning. Set all three Nova oscillators to Double Saw, and a voice effectively has six oscillators, without compromising total polyphony. Other new features include a effects distortion algorithm (which overdrives the effects without increasing volume), an effects pan option, enhanced analogue modelling, the ability to receive SysEx dumps from Novation's Supernova II. and nine additional Dual/Split filter types. T +44 (0)1628 828888.



# six of the best

### Drawmer pack six channels of dynamics into new processor

Drawmer's new Six Pack is a 3U, six-channel multi-dynamics processor aimed at multi-channel surround processing applications. Each channel features a peak limiter, soft-knee compressor (with switchable auto or manual attack and release) and an expander/gate; comprehensive bar-graph metering is supplied for all channels. The Six Pack features an interesting approach to channel linking, in that it can be configured with any combination of channels linked to track each other's levels, to help prevent image shift. For example, front left/right and rear left/right channels can be configured as two stereo pairs, with individual control over both centre and sub-bass channels. Channel six has an optional switchable 120Hz low-pass filter, so that a subbass channel can be derived from a five-channel surround mix.

T Drawmer +44 (0)1923 378669.

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www.drawmer.com

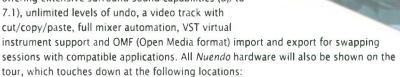
# campaign trail

### Steinberg's VST and Nuendo software go on UK tour

It seems to be tour season for Steinberg products. First of all, Cubase VST is being demonstrated all over the UK, in conjunction with the forthcoming Houston MIDI controller. The clinics will be given by Steinberg product specialists from Germany and the UK, and will consist of demonstrations, tips and tricks, and question-and-answer sessions, with the "chance to pick up a few freebies". The tour will carry on through the autumn, but the first confirmed dates are as follows:

- June 21, M Corporation, Bournemouth, 01202 395135;
- July 2, G.A.K, Brighton, 01273 671971;
- July 3, Digital Village, Croydon, 020 8407 844;
- July 4, Digital Village, Chadwell Heath 020 8597 3585;
- July 5, Serious Audio, London, 020 7637 9498;
- July 11, Digital Village, Acton, 020 8992 5592;
- July 12, Andertons, Guildford, 01483 456888;
- July 13, Rose-Morris, London, 020 7836 0127.

Steinberg's UK distributor, Arbiter, is also arranging a demo tour of the new Mac version of the Nuendo professional host-based audio workstation software, offering extensive surround sound capabilities (up to 7.1), unlimited levels of undo, a video track with cut/copy/paste, full mixer automation, VST virtual



- June 25, Digital Village, Acton, 020 8992 5592;
- June 26, Media Tools, Central London, 020 7692 6611;
- June 27, Serious Audio, Central London, 020 7637 9498;
- June 28, Millennium, Nottingham, 0115 955 2200.

T Arbiter Group plc +44 (0)20 8202 1199.

+44 (0)020 8202 7076.

www.arbitergroup.com

W www.steinberg.net



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anywhere - onto a blank

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Italy +39.0522.354111 email: mackieitalia@rcf.it

merrily along...

costing money.

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# Calling all sampleheadz...

### Bitheadz sampler upgrade adds new features and VST support

Good news for owners or prospective purchasers of Bitheadz's powerful Unity DS1 software sampler (reviewed SOS April 1999, with a v2 follow-up in August 2000); the latest version of DS1 (v2.1.2) supports the Steinberg VST protocol. The program will now be able to have its bank and program names accessed directly from within any VST-compatible sequencer, and its audio outputs will be able to go directly through the host sequencer's mixer, staying in the digital domain throughout. (DSI is already Rewire-compatible, so now

users have a choice.)

And that's not all: the new version also supports Digidesign's Real Time Audio Suite (RTAS), in addition to Direct Connect. So Pro Tools and Pro Tools LE users will also have direct access to Unity's bank and program names, for easy use of the program's samples. Up to 16 stereo Unity audio outputs will be available through RTAS.

The v2.1.2 update (which has other new features too) is available free to all registered Unity DS1 users; DS1 costs £299 including VAT.

Incidentally, recent upgrades to both Unity and Bitheadz's Retro ASI virtual analogue synth have added direct support for Roland's PC300 USB MIDI Keyboard, doing away with the need for additional software and hardware required for USB MIDI interfacing; the PC300 even takes its power from the host computer.

Unity Audio +44 (0)1440 785843.

+44 (0)1440 785845.

sales@unityaudio.co.uk

www.unityaudio.co.uk

W www.bltheadz.com

### bullets

### Dance sounds for Novation synths

Novation Nova and Supernova synth owners who like their sounds ready to go may be interested in Mig Music's new Dance Sounds Collection Volume 1 for those synths, comprising 256 sounds, including analogue synths, synth basses, leads and pads, strings, arpeggio synths, dance effects and more. The sounds are saved in MIDI File format on PC or Mac floppy, and can be loaded via a sequencer. A complete sound list can be viewed at the Mig Music web site, where a free demo set of 16 sounds can also be downloaded. The full collection costs £24.95 plus £2 p&p direct from Mig, or can be bought online and downloaded for \$39.

Mig Music +44 (0)20 8646 1197. W www.migmusic.com

### Speakers stand tall with **Ultimate Support**

Ultimate Support, distributed by Yamaha in the UK, have launched a pair of striking red speaker tripods. The TS80R (£99) and TS88R (£119) both use aluminium tubing and glass-reinforced polycarbonate fittings. Both are capable of handling loads of up to 150lbs; the difference between the two is that the TS88R is taller.

Yamaha Pro Music brochure line +44 (0)1908 369269.

### Tomorrow's World Show to feature hi-tech music area

One section of this year's Tomorrow's World Live Event, taking place at London's Earl's Court from June 27 to July 1st, is called Music World (sponsored by the Engineering Council!). This interactive area will enable visitors to make music themselves and discover how it's done by the professionals, through a live music stage showcasing the latest music and music-related technology. TWLE costs £10.50 in advance (or £11.50 on the door), with concessions and group discounts available

Ticket Hotline: 0870 122 0099.

www.twle.co.uk

## sheer XTC

### **New Pulsar XTC audio system** takes the load off your computer

Creamware's Pulsar XTC audio DSP system seeks to get around the problem of the large amounts of computer processing power needed to run effects and virtual instruments by providing its own power, via six 32-bit SHARC DSPs on its PCI card.

Pulsar XTC (£799) comes with an extensive software package containing effects and virtual instruments, but integrates fully with VST-compatible software under Windows and Mac OS. XTC plug-ins are used just like VST effects and plug-ins, but do not draw on the host

computer's processing power. The XTC's effects come from Creamware's high-end SCOPE/SP system, and, because processing is courtesy of the card's onboard DSP, can utilise more powerful 32-bit algorithms. Effects provided include dynamics, modulation effects and reverbs, all conforming to the VST 2.0 spec, and thus automatable inside VST-compatible

As well as effects, Pulsar XTC comes with a set of virtual instruments, including synths such as the analogue-style Miniscope and the vector synth Vectron Player. Also included is the VST-instrument Volkszämpler, which samples at up to 96kHz and 32-bit, and is compatible with Akai \$1000/\$3000, SoundFont 2, WAV and AIFF formats. As Pulsar XTC is based on SCOPE technology, users also have access to the many additional plug-ins which have been developed for the Pulsar/SCOPE platform.

The XTC PCI card can be expanded with an optional range of audio inputs and outputs, so that no additional soundcard is required; additional DSP cards may also be added to

expand the power of the system. An upgrade path to Pulsar II is available to Pulsar XTC users, offering extra features such as latency-free signal routing and live mixing functions".

SCV London +44 (0)20 7923 1892.

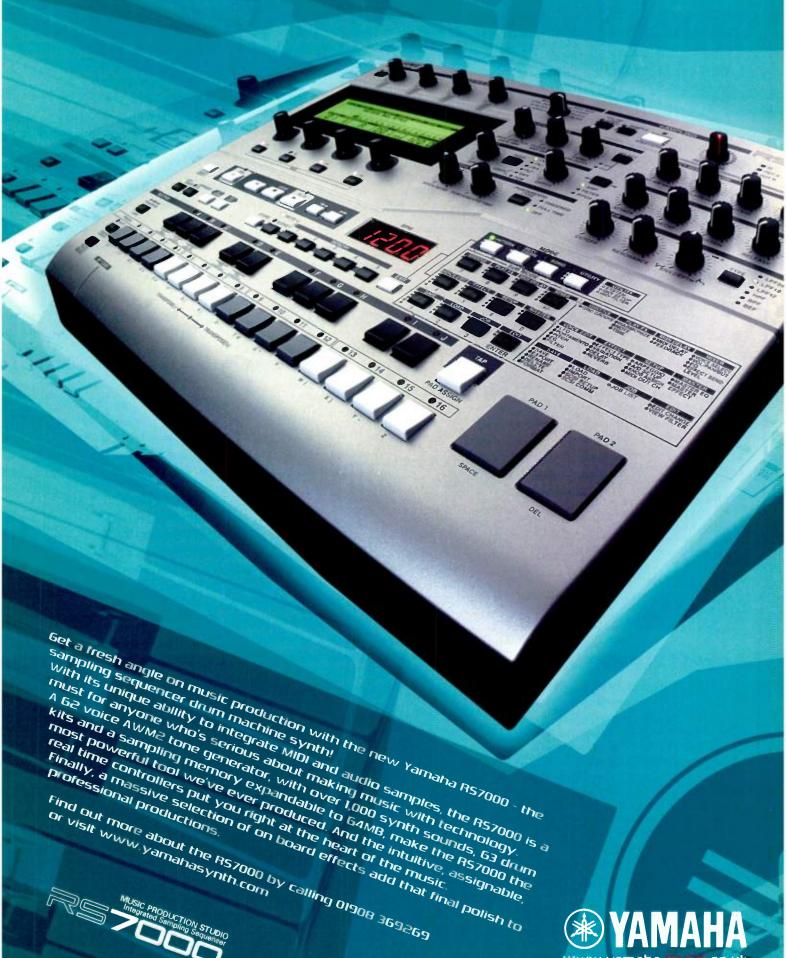
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# Together at last









# plug-in corner

### **Waldorf Percussion Synth**

Waldorf's Attack is a new percussion synth plug-in for both PC and Mac versions of Cubase VST. The software generates its sounds in real time, with direct control over all parameters. Each Attack kit provides 24 sounds, with a sound architecture based around two oscillators, each with nine waveforms. Traditional analogue waveforms are augmented by three samples (to create hi-hat or crash cymbal sounds), and ring and frequency modulation expand the sound palette further. There's even a dedicated 'Crack module' for reproducing analogue handclaps. The plug-in's filter section offers six filter types, resonance up to self-oscillation, and overdrive. Two envelopes can be assigned to controlling oscillator pitch and FM amount, filter cutoff and the output volume. Eight outputs - two stereo, four mono connect Attack to VST's mixer, and all parameters can be addressed over MIDI via the VST 2.0 system. In addition, 12 sounds in a drum set can be played melodically, allowing tom fills, conga patterns or other tuned percussion patterns to be quickly created; bass lines can also be played in this manner.

Arbiter Music Technology +44 (0)20 8970 1909. +44 (0)20 8202 7076. mtsales@arbitergroup.com

www.arbitergroup.com

www.waldorf-music.de

### **Prosoniq Resynthesizer**

Mentioned briefly in the recent SOS Messe show report, Magenta is the latest VST-format plug-in from Prosoniq. Behind the name is an intriguing pitch resynthesis technology which allows the user to apply real-time pitch-shifting and spectral effects under MIDI control. Any audio track or live audio input can be used by Magenta as a basic 'waveform' for resynthesis. At the heart of the plug-in is Prosonig's Multikernel Spectrum Resythesis Engine (MSRE), which, according to Prosoniq's claims, is capable of reproducing any sound by resynthesizing it from a set of basic waveforms, thus giving you flexible control over the timbre, pitch and harmonic development of a sound.

Prosoniq note that Magenta is capable of providing vocal-doubling effects, for fattening vocal lines or creating melodic choruses from single vocal parts. Formants can be preserved for natural-sounding pitch-shifting, and spectral filters, LFO and envelope control are also available for more

extreme processing effects. Magenta is due to be released for VST Mac only, but RTAS (for Digidesign Pro Tools LE) and PC versions are planned for later this summer.

Prosonig are also releasing a collection of their VST plug-ins as a bundle, dubbed, appropriately, The VST Plug-In Bundle.

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F www.turnkey.uk.com

www.prosoniq.com



### FXpansion Audio VST-DX Adapter

FXpansion Audio have released v3.0 of their VST-DX Adapter (shown above). As you might have guessed from the product's name, it allows plug-in effects and instruments developed for Steinberg's Cubase VST and compatible software on the PC platform to be used by applications which are compatible with DirectX technology. The new version's features include support for the DXi protocol used by Cakewalk's new Sonar sequencing system (reviewed last month). With the help of VST-DX Adapter, VST Instruments can be used within Sonar, and it's claimed that there's no added latency, nor loss of timing accuracy. In addition, VST plug-ins can be installed directly into an application's DirectX menu, with no intermediate control panel, and Microsoft's DX8.0 automation spec is fully supported, for improved, sample-accurate automation of all plug-in parameters in compatible host applications. Automation and control from an external MIDI hardware controller, such as Keyfax's PhatBoy and Kenton's Control Freak, is also supported. VST-DX Adapter v3.0 costs just US\$60.00/£40.00, and is available direct from FXpansion's web site.

W www.fxpansion.com



### Creamware Volkszämpler

Volkszämpler is a new sampling plug-in from Creamware that doesn't require the company's dedicated DSP hardware, being available for host-based VST-compatible software on both the Mac and PC. Volkszämpler (see above) supports mono and stereo samples, with up to 32-bit resolution and sample rates of up to 96kHz, and is compatible with sound libraries for the Akai S1000 and S3000, as well as with SoundFont 2. WAV and AIFF file formats. Samples can be loaded directly from the host computer's CD-ROM drive or hard disk. Sample manipulation facilities include velocity switching and velocity crossfading of keygroups, a graphical sample editor, a modulation matrix, two envelopes and LFOs, as well as a resonant filter.

SCV London +44 (0)20 7923 1892.

+44 (0)20 7241 3644.

www.scylondon.co.uk

W www.creamware.de

### Anwida Soft DirectX Reverb

Two new DirectX-format plug-ins are available from Anwida Soft: DX Reverb Light is a free taster, while DX Reverb, at US\$149, is the full package. As you can surmise from the name, both plug-ins are dedicated to reverb treatments, with DX Reverb offering true stereo performance and 64-bit internal



processing, and supporting 24-bit/96kHz operation. Eleven reverb algorithms are supplied, configured as one inverse reverb and two examples each of small room, medium room, large room/hall, plate and gated types. Minimum computer requirements are Windows 9x, ME, NT4, or 2000, a DirectX-compatible application, 133MHz Pentium processor, Microsoft's DirectX Media 5.2 and 16Mb of RAM.







# education corner

# The Institute of Music & Technology

Recently-acquired New Deal funding has allowed South East London's Institute of Music & Technology, based at Hurricane Studios, to extend their technology training programmes for unemployed people. The Institute has been offering free courses in music technology and sound engineering to unemployed people between the ages of 18 and 25, but free admission onto those same City & Guilds courses will now be open to unemployed people over that age.

Commercial courses are also available to employed persons.

IMT's studios have just been upgraded, to include Mac G4/Digidesign Pro Tools systems, PC and Apple workstations in every one of the six rooms, and a student project room for individual recording and sequencing time.

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F +44 (0)20 8691 5118.

E imthurricane@ukonline.co.uk

W www.imthurricane.org

### **University of Leeds**

Following its merger with Bretton Hall College, due to take place formally on 1st August, the University of Leeds is creating a major new specialist institute of performing arts and cultural industries. Degrees on offer will include popular and world music, music and electronic engineering, music theatre, performance and design, dance, acting, and creative writing. The University and the Funding Council will be investing more than £9 million in IT, accommodation, equipment and student services. The new courses will be available to students enrolling from 2001 onwards.

+44 (0)113 243 1751. f +44 (0)113 244 3923. W www.leeds.ac.uk

### **Birmingham Conservatoire**

An intensive development of music technology resources has begun at the Birmingham Conservatoire, with the aim of supporting a new range of activities and study areas for performers and composers. The new head of Music Technology, Lamberto Coccioli, gained extensive experience of new technologies applied to music during his years of work with pioneering electro-acoustic composer Luciano Berio. Composers can now

choose creative music technology as their first study area, and students on the course will be able to collaborate with other faculties, such as the Birmingam Institute of Art and Design, on animation, video, multimedia and installations.

Another addition to UCE courses is the new BSc (Hons) Music Technology degree offered by the Technology Innovation Centre, in partnership with the Conservatoire (subject to validation). The aim of this course is apparently to train "a new kind of sound producer/engineer, equally at ease in the concert hall and on the Internet, in a multimedia production and on location".

The Conservatoire is comprehensively equipped: facilities include a main recording studio built around a Yamaha 02R digital mixer and Pro Tools Mix24 TDM system, an AHB studio centred around an Allen & Heath mixer and a Mac G4 running *Pro Tools LE*, an editing suite, an iMac suite where the Music Technology courses are delivered, and a Research room.

+44 (0)121 331 6745/6738.

W www.conservatoire.uce.ac.uk

### **Leeds College Of Music**

Leeds College of Music is launching a new three-year BA (Hons) degree course in Music Production (validated by the University of Leeds), from September of this year. Students will work on a range of professional projects under the guidance of expert practitioners in



the fields of studio production, film, television and radio. The course will also enable students to gain hands-on experience in the latest DJ technology, undertake location recordings in a series of professional venues in Leeds, and write and produce an album of original tracks.

The College, following recent substantial investment, now boasts two 24-track digital recording studios and two 24-track digital mixing studios, employing both PC-based and ADAT recording systems (see pic below). In addition, there's a multimedia editing suite with 24 PC-based workstations and a state-of-the-art electro-acoustic music studio. The College's new multi-purpose venue, due for completion in 2002, will feature a variety of seating arrangements and a flexible sound and lighting installation, including surround sound. Students will also have access to the Pro Tools-based studios at the Leeds Media Centre. a professional music and multimedia environment supported by Leeds City Council.

T Admissions Team +44 (0)113 222 3420. F +44 (0)113 243 8798. W www.lcm.ac.uk

### Music For The Media

Music for the Media, the distance-learning film and TV composition course run by composer Guy Michelmore, is being launched in the USA, in partnership with the Film Music Institute in LA. The new US version of the course has taken two years to produce and includes dozens of new interviews with American composers, directors and producers. The course ships with a 300-page course text, five-CD set, a VHS video of timecoded video clips, and an optional CD-ROM set of QuickTime movies. Hollywood-based film and TV composer Mark Holdern has been recruited as

the first of the American tutors.

V2 of the course for the UK and Europe has also recently been unveiled, and includes a new unit on animation, additional assignments, and a completely updated and revised course text.

Music for the Media success stories include students who have scored the Jerry Springer game show *Greed* and a 36-part animation series, and one former student who now works as an assistant at Hans Zimmer's film music production company in California. The course costs £599 or US\$950 (but UK

course students aged 19 or over qualify for the government's £150 Individual Learning Account grant).

+44 (0)8700 118050.

info@musicforthemedia.co.uk

www.musicforthemedia.co.uk



# wall of sound?

# New range of absorptive panels makes soundproofing portable

It can only be presumed that those who toil in the American audio industry have no knowledge of such arcane topics as rubber-legged British comics of the 20th century. If they did, acoustic treatment specialists Auralex might not have dubbed their Modular Acoustical Environment range 'Max Wall'. Then again, perhaps they might have.

Whatever the source of its name, the Max Wall range consists of a family of portable, interlocking, flexible absorptive panels and mounting hardware that allows you to take your soundproofing with you. Max Wall is aimed at engineers who might

be renting a less-than-ideal recording space, or who might work in environments which need to be reconfigured due to different recording, and sound isolation, demands. No tools or adhesives are required.

The range is available from Auralex's UK distributor, Audio Agency. As a guide, the Max Wall 200 (which consists of two 20x48-inch panels) costs £297 including VAT, and the Max Wall 831 (eight 20x48-inch panels, three stands, and one 18x12-inch window panel) costs £1098.

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info@audioagency.co.uk

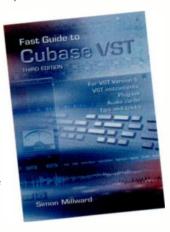
W www.auralex.com

## the fast show

# Expanded third edition for popular Fast Guide To Cubase VST

The Fast Guide To Cubase VST is now in its third edition, offering even more pages of explanation, tips and techniques for Steinberg's MIDI + Audio sequencer.

As well as providing a full range of general VST information and help, the new edition addresses the features introduced in version 5 of VST, covering changes to the Arrange window, the Marker Track, the Inspector for MIDI and audio tracks, the new EO section, and the 'True Tape' facility, amongst others. Installation and setting up of the program on Mac and PC are explained, as are audio and MIDI recording, and



Cubase's 'Virtual Studio Technology'. There's a section on third-party plug-ins, plus advice on getting the most from effects and processing techniques such as compression and limiting, and a range of PC soundcards and PC hardware configurations is covered too — although note that in the last area the book doesn't offer the same kind of depth for Mac VST users. Scattered throughout the book is a series of Projects which help instruct the reader on the use of VST for specific tasks, and time-saving shortcuts are also on offer.

The 464-page Fast Guide To Cubase VST costs £22.95 (plus p&p) and is available from SOS Mail Order (see the Mail Order section starting on page 274 of this issue).

SOS Mail Order +44 (0)1954 789888.

+44 (0)1954 789895.

mailorder@sospubs.co.uk

www.sound-on-sound.com/shop/shop.asp

# made in taiwan

Far East company assaults mic market with stage and studio range

PA specialists Proel International have secured UK distribution for a new range of microphones from Taiwanese company JTS, who have been designing and manufacturing microphones for 20 years. The NX range of mics is said to be suited to both live and studio use and includes the NX2 bass instrument mic, the NX8 dynamic instrument

mic, the NX7 dynamic multi-purpose mic, the NX8 dynamic vocal performance mic, the NX9 instrument/vocal condenser and NX8.8 vocal condenser, as well as a boxed set of either eight or five drum mics, the NX Set A or B.

All models in the NX series feature hardened steel grilles and are designed to be tough, yet inexpensive. As a guide, the NX8



vocal dynamic costs £79.99, the NX8.8 vocal condenser costs £84.18, the bass instrument mic is priced at £96.99, and the five-mic NX Set (including case) costs £449. Prices include VAT.

Proel International +44 (0)20 8761 9911.

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sales@proelint.co.uk

# news

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# • the drive of your life?

# Rorke Data stack Seagate drives for top capacity of 1.5 *Terabytes*!

As our Cutting Edge column reveals this month, Seagate have released the world's largest-capacity hard drive, a 180Gb model in their Barracuda range, with a spin speed of 7200 revolutions per minute, a formatted data transfer rate of up to 48Mb per second, and an Ultra 160 SCSI interface. Now Rorke Data have upgraded their RDD A/V Professional Series of storage peripherals to incorporate the new drive. (Interestingly, we hear that LaCie — www.lacie.com — have also launched a £699 180Gb external Ultra 160 SCSI drive).

Using Barracuda 180 drives, Rorke's single-, dual- and four-device storage systems are now capable of attaining capacities of a staggering 720Gb on the user's desktop; with their rackmount eight-device system, a storage capacity of 1.5 Terabytes is possible. Performance is not sacrificed to capacity, according to Rorke, who consider the devices ideal for professional audio-visual applications. The company say that "the RDD A/V Pro Series now offers the highest-capacity, lowest-cost storage currently available for data-intensive digital audio and video applications."

W www.rorke.com





### Audient mixers on line

New British analogue mixing desk manufacturer Audient have launched a web site. Log on for details of the Audient range of analogue consoles, graphic EQs and the ASP510 Surround Sound Controller, plus support documentation, including downloadable PDF copies of sales brochures and user manuals.

W www.audient.co.uk

### Steinway piano samples for Unity DS1 users

Patchman Music have released their second native CD for Bitheadz' Unity DS1 software sampler for Mac and PC. The Studio Series-MegaPiano disk features stereo Steinway samples with no loops. All samples decay naturally to silence. Six banks are supplied, ranging in size from 13Mb to 235Mb, and featuring up to three velocity levels. The disk is available from the Patchman Music web site for US\$195, plus \$5 US or \$15 non-US shipping.

W members.aol.com/patchman1/bitheadzunityds1MegaPiano.html

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new Loopstation, for example, has been widely acclaimed as the world's premier resource for the sampling musician (see the flyer in this month's magazine).

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For only £699.99 you can own a D24, including one MY8 ADAT, AES/EBU or TDIF digital interface board of your choice (worth £199 alone!), factory installed and ready to go (other boards available at extra cost). The D24 records onto Magneto Optical disks (MO) - a very secure format with no physical contact to the disk surface, unlike hard drives. These disks are removable just like Adat tapes, so you can simply record your audio and press eject. No lengthy backup to DVD-RAM or tape drives, no need for hard drive caddies or burning dozens of CDRs, just pop the disk out it's that easy! They're cheap too, and much quicker and easier than buying and swapping hard drives in caddies. You can fit two or three typical songs on each disk. Now, if you're thinking: "It's only got 8 tracks! I want 24 tracks like the big machines have got" - no problem (in fact, you get 64 tracks to pick and choose from since each has 8 virtual tracks as well) - just buy three machines at £699.99 each and you've got 24 track non-linear 24 bit multitracking, with 12 tracks in 96kHz mode, for under £2100, including the digital I/O boards! And with onboard time-stretching, varispeed, jog/shuttle wheel and non-linear editing, you are getting top notch features as standard (more about these on the right).

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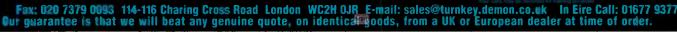
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# CES

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

C B



# DEDICATED AUDIO PCs

New British company Carillon Audio Systems have developed the first ever "au 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-ribration 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 speci. 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

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the system manuals.) Carillon AC-1 includes thousands of samples onboard and an exclusive version of the Loopstation search engine for access to our new royalty-free sample library, available free online. Below are a selection of available Carillon systems, but please call for a free 32 page full colour catalogue for the full details of the computers themselves and the complete specifications of the systems Call us today to transform your experience of computer music making!



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REASON

### E'S LOW

# CAKEWALK SO-NAR

### 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

5 PLUG-INS FOR UNDER

Nothing

could have been better"

LOGIC PLATINUM - Up to 128 audio tracks, 31 included real-time DSP effects, support of multiple high-end hardware. RRP 4549 OUR PRICE 4429.991 EMAGLOSPL MAPC LOGIC GOLD - Up to 96 audio tracks, real-time DSP effects, supports Audiowerk B and Korg 1212 RRP 4399 OUR PRICE £299.99! EMAGLOGGOL MAPC

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!!!

J.S. (Oxford)

emagic

# 5(I)NAR

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# GUARAN

# 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.

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

DELTA 44/66 PCI AUDIO INTERFACE

Both cards

support 24 bit

96kHz rates

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.

FROM

MMAN-DELTA44



oduction of the Apple range of iMac and Thi 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 Window drivers too.

1 X 1 ALSO AVAILABLE only 4X4 ALSO AVAILABLE only £119.99 8X8 ALSO AVAILABLE only £249.99

### **DELTA 1010** PCI AUDIO INTERFACE



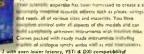
MIDI SPORT 2x2 MIDI INTERFACE w

any PC. The converters are in the outboard IU rack and handle 24 bit 96kHz rates. Operating levels are +4dBu or -10dBV, and can achieve = 0GdB THD+N.



MNI-1/O ALSO AVAILABLE only £189.99 - expansion box for Delta 44/66 featuring 4 balanced imputs (2 with phantom powered mic preamps) 4 stereo ins, aux send + return + dual monitor outs

### TASSMAN ACOUSTIC MODELLING V2



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VIRTUAL STUDIO V1.5

### MIDI QUEST UNIVERSAL EDITOR PLUG-IN

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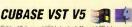


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165

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SONIC FOUNDRY SOUND FORGE 4.5

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1202VLZ PRO

MACKIE

1604VLZ

**MACKIE D8B** 

SOUNDCRAFT **GHOST 24LE** 

YAMAHA

03D

PRO



# 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.



### 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



### FOLIO F1 14 & 16 INPUT STEREO MIXERS

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





### SPIRIT FOLIO SX 16:4 PORTABLE MIXER

A great 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

> Please ask your sales assistant for details





### MACKIE CFX16

### MACKIE 1402VLZ PRO

### MACKIE 1642VLZ PRO

MACKIE 32:8 BUS

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### BR8 PORTABLE 8 TRACK STUDIO

**DPS16 STUDIO** DIGITAL PERSONAL STUDIO

Another excluser Tombuy offer!
Akar's all-commend non10GB hard disk recorder and mixer
with a "ip-up licreen, which can
record 16 tracks at unicompressed
rates of up to 24 bit 96kHz. It has a
further 250 initial tracks a funding and
further 250 initial tracks as all, and
to fixep all your out-takes as all, and
on store 100 locate points pur
song. The main 162 di sall miser
section has 3 band sweepable EQ
with parametric middrains and
saniphore miseries, see the substitution



DIGITAL 20:8:2 MIXER

with piraneutic midrating and samples acting permitting a tigner of automatics via MIDI. The included EBHM FX board provides 44 effect types onboard which can be routed minimily from the from the 4 aux sends. Seatup a saw year level wa SCSI to a hard drive or CDRW burner for which the DPIS has arrives ordivare so you won't even need to hook up your computer. The main stereo digital informatic is SPDIF coasial. The Large screen males all move margination and setup a breaze so you can master the whole operation. Don't miss out on this incredible one off ideal - this price is a STEAL!



D8 DIGITAL WORKSTATION







AKAI DPS12

### FOSTEX VF08

# 389

**MACKIE HDR24/96** 

### D1600 HARD DISK RECORDER

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### *CD-RW700* COMPACT DISC RECORDER

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## HHB CDR 850

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£899

TCD-D8

SONY MZR-90

### ICES JARAN

EZ CD!

### CDR770 PRO CDRW RECORDER



The CDR770 is the most affordable CD Recorder ever from Marantz and features their new Advanced Power Calibration (APC) rearrang and restures their new Advanced Power Cambration (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

### CDR631 PRO CDRW RECORDER

despite their higher voltage and different data subcodes. Includes infrared remote control.



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.



### 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



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 nossible CDR500 TWIN DECK CD RECORDER

SAIVE £11500!

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

24 BIT DIGITAL 8 TRACK

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



### VS-1880GX HARD DISK MULTITRACKER

RP £2199 1399

### 788 HD PORTASTUDIO



### AW4416 HARD DISC RECORDER

CDR1000

PRO CD RECORDER



YAMAHA

YAMAHA

01 V DIGITAL MIXER

02R DIGITAL MIXER

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

### PANASONIC SV3800



799

SONY MZR-700

### TASCAM DA20 MKII



TASCAM DA40

TASCAM DA45HR ווויבונו

TASCAM 202 MKIII

TASCAM MX-2424

TASCAM 424 MKIII

KORG D12

TASCAM DA302





TASCAM DAP1





TASCAM MD301 Mk2



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16 track hard drak re-with 8 virtual tracks. 16 track simultaneous recording via ADAT of 16 channel digital mi-with 3 band EQ. 2 au and 2 invarnel FX but

TASCAM PORTA 02 Mk2





TASCAM 414 MKII



YAMAHA MD8S

YAMAHA MT400

YAMAHA MD4S

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# OPE'S |



yet again, offers the versatility of a Swiss army knife, but with the precision of a surgeon's scalpel - when it comes to finding its "niche market" in the D.I.Y. mastering field.

A stereo-linked analogue processor with balanced ins and outs on TRS jacks and XLRs, and a range of features usually only found on more expensive digital multi-processors.



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

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

### VOICEMASTER CHANNEL STRIP



ISA-430 PRODUCER PACK

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AIR FX
REALTIME STEREO EFFECTS

FILTER & RING MODULATOR

MOOGER FOOGER

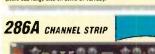
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ANALOGUE DELAY EFFECTS UNIT

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Studio quad 4

MULTIEFFECTS

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

PCP330 PROCODER

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REALTIME EFFECTS

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### PRICES GUARAN



### MPX100 DIGITAL REVERB / EFFECTS



reverb for that Lexicon feeling.

One of the first budget digital ffects to include SIPDIF coaxial digital output as standard, to

RRP £249 LEXI-MPX10

### 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

nultieffects presets. Like the MPX100 you get coaxial S/PDIF, complete MIDI parameter control and 24 bit converters

### RRP LEXI-MPX200

RRP £499

### MPX500 DIGITAL REVERB / EFFECTS



MPX1 TRUE MULTIEFFECTS PROCESSOR

16 parameters in realtime. 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.

Lexicon's newest multieffects unit has a whole host of top quality studio effects and offers remote MIDI control of up to

LEXI-MPX50

### With one dedicated Lexicon DSP chip for reverb and another separate one for the multieffects, the MPX-I

rings you powerful simultaneous signal processing for an incredibly low price, w up to 6 concurrent effects

blocks in some algorithms. These include even morphing from one effect to another, as pioneered in the Lexicor The latest operating system includes on-line help and database for sorting presets - achieving quality results is as quickly and easily as possible

LEXI-MPX1

YAMAHA

RRP Coop

viscount

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

FINALIZER EXPRESS

24 BIT 3 BAND COMPRESSOR

M2000 24 BIT

DIGITAL MULTIEFFECTS UNIT

# PRO R3 DIGITAL REVERB

### **EFX-10** STUDIO MULTI-EFFECTS

599

### RFX-1000 MULTIEFFECTS RACK

RFX-2000

MULTIEFFECTS

### FAT-1 Assello

VALVE COMPRESSOR RRP £349 269

### IVORY 5021 HYBRID VALVE COMPRESSOR TL Audio

### RFX-300



### ALESIS 3630

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Digital harmonics with FX Generates 4 extra harmony parts - Corrects your out of ..... £LOW

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TLA IVORY 5050

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### TLA CLC1 CLASSIC

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# LEXICON PCM81 FX PROCESSOR

### SPL VITALIZER STEREO JACK

TLA IVORY 5013

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Other offers may not be available when price beating. We must be able to substantiate the quote and the goods must be available and in stock.

### THE FUTURE OF MUSIC TECHNOLOGY

As technological progress continues to make digital storage devices bigger, RAM cheaper, and processing faster, hitherto outlandish ideas come closer to being realistic possibilities.

This month, Dave Shapton thinks about teaching his computer to Name That Tune...

hard disk landed on my desk a couple of days ago. It had been sent by Seagate for our business to evaluate. Nothing unusual in that: as we supply non-linear video editing systems, we get through mountains of disk drives. This one looked just like all the others, if a bit bigger and heavier. I was just about to pass it on to our engineering department when I realised that this beast had a capacity of 180Gb

### **Big Ideas**

For those of you who have better things to do with your life than keep track of incremental increases in hard disk capacity. the current generation of disks maxes out at about 75Gb - so this new Seagate is significantly more than twice that. What's more, put six of them on a SCSI chain and you've got over a Terabyte of capacity. Storage is getting cheaper at a faster rate than ever before. Ten years is a long time in the history of computing, and hard disk capacity has grown a thousand-fold in that time: a factor of 10 every three years. I don't know what we're going to do with all this storage but, at the very least, in three years time you won't have so much need to compress your audio files into MP3 format!

Of course, storage is not the only factor driving computer technology forward, although it's an important one. Processing, RAM, and bandwidth

are all significant too, and they have got faster, cheaper and bigger (respectively) at least a hundred times over the last ten years. Add all these factors together and you've got a revolution. Multiply them together and you've got a hyper-revolution. That's the only term I can use to describe our state at the moment.

It's difficult to comprehend change when it's as drastic as what we're seeing now, as the Internet pervades our everyday life and two-year-olds draw their first pictures on a computer, not on paper. I don't have an exact formula, but I do believe that as the individual elements that make up a computer grow in their own capabilies, the scope of what we can do with the technology grows even faster than these components. Here's what I mean.

As disk capacities grow, we can store more and more stuff. And as processing speeds go up we can do more with the stuff we can store. So having more room to store things is progress in itself, but add to this an ever-growing ability to process the material in the store, and what you actually get is something far greater than if you just 'add' storage and processing together. So let's imagine we've got a massive store of music on our computer. So much, in fact, that's it's getting difficult to find anything. What better way to find your song than singing it to the computer? You'd simply say

"find me the song that goes 'dum di dum di dum'" and, in no time, your computer would find the very song for you. To do that, it would have to analyse your feeble attempts at singing the song in question, extract the sequence of notes, and then compare this sequence with an index of melodies it has extracted from the recorded songs, using complex DSP.

This is an extremely processor-intensive task, but at some point in the very near future, I wouldn't be surprised if such a facility were to turn up as standard, in (say) Windows 2003. (I work with a guy, a digital image analysis specialist,

using 56K modems!) and I can't even begin to predict what we'll be doing with computers then.

### **Napster Nipped**

The storm over Napster rumbles on. There are some new developments, widely reported in the popular press, which suggest that the Peer-to-Peer saga is entering its end game.

Under unbearable pressure from the actions of the music industry lawyers, Napster has agreed to 'filter' its content to prevent swapping of copyright works. Using lists of copyright protected songs supplied by record and publishing companies, Napster can now



Seagate's new 180Gb Barracuda drive is a giant amongst hard disks — for the moment...

who - in his spare time develops algorithms for extracting note information from polyphonic audio tracks. He is confident that he is close to being able to do this.)

If that's two or three years ahead, what about 10 years ahead? Storage will probably be a thousand times cheaper than it is today. Processors will be between a hundred and a thousand times faster. Bandwidth will be virtually unlimited and effectively free (although, if BT has anything to do with it, we'll probably still be tell whether a request for a song should be processed. In practice, this means that if you search for works by, say, George Michael, you will be told that "no files were found". If you can't find them, you can't download them. If you search for works that haven't been published by a major organisation, the chances are that you will still be able to find

On 9th May 2001, ZDNET (a leading computer news source) reported a "precipitous drop" in the number of song trades





The Secure Digital Music Initiative seeks to develop technologies for preventing copying of digital music, and thus safeguarding copyright. However, its four proposed watermarking methods were compromised by a team of Princeton researchers.

▶ through the free song-swap service. It now seems that the loyalty of Napster's customers may be proportional to the number of copyright works it has listed on its servers (remember that Napster doesn't itself store the works — it only points users to the other user's computer where the required file can actually be downloaded).

Napster is, for now, defeated. But it changed the world. And it really did get the attention of the music business.

Since we're talking about copyright, I thought I'd bring up the subject of watermarks. A watermark is a digital 'signal' that is embedded in the audio stream and designed to be immune to processes such as MP3 compression and web streaming. The idea is that if you try to record a watermarked file to a device that recognises watermarks, the device will block the recording. The jury is still out as to whether

watermarking actually degrades the sound. In theory it must. In practice — although I disagree with the whole idea of watermarking — it's very unlikely you would be able to distinguish a watermarked work from the original, clean version.

The Secure Digital Music Initiative, an organisation whose aim is to devise methods of maintaining a semblance of copyright protection in the digital age, endorses the use of watermarks as a way of identifying the copyright status of musical works. In an attempt to verify the robustness of their watermark technology, the SDMI decided to demonstrate it in the most public way. They issued a challenge: defeat the watermark and win a prize! It only took a few days for a Princeton Professor, Edward Felton, and his team to crack all four of the watermark methods in the challenge.

As has been widely reported in the computer press and on the Internet, rather than take his prize, Felton announced that, in the interests of research, he would publish details of the techniques used.

Some time later, shortly prior to a conference where he was to reveal his research, he received a letter from the SDMI suggesting that legal action would be taken if he published

details of their watermarking techniques. Disturbingly, the SDMI hinted that they would consider invoking the provisions of the Digital Copyright Millennium Act, a — shall we say — 'surprising' piece of American legislation that appears to make any action that could lead to violation of copyright an offence.

This is where we can begin to prove that there is something completely wrong and unsustainable in the music industry's fight against the new paradigm wherein computers, as well as gramophones, can play music. You see, the first sign that an argument is invalid is when you can show that if you push it far enough it leads to contradictions.

And that's just what's happened here. I'm no expert on American law, but my understanding is that one of the most fundamental rules of American society (possibly almost as important as the right to carry the means to kill your fellow Americans) is the right to free speech. That's the right which is being violated by the SDMI's proposed invocation of the DCMA. It's also what is preventing me from telling you where you can find all these details on the Internet. Just as well there are search engines... EOS

### Beware The Bear: File-Swapping Dangers

The Napster idea is actually a very simple one. It's one of those things that seems obvious once it's been done. And to prove this, there are new Napster clones springing up every day. I've written before about Napster clones. Some of them don't use a central database, but set up a distributed architecture in which searches are made between end-users' computers. And it works, if not as well as Napster. (Not surprising, when you consider that the only sense in which the *ad-hoc* network is organised is that it uses a specially devised protocol. Gnutella is not a 'thing' in itself.)

But if you are tempted to use services like Gnutella (whose friendliest version is in the form of the Windows-based *BearShare*), there are some things you need to know.

First, the Internet is a nasty place. You will find that MP3 files are not the only things you can swap. If you load the 'monitor' window in the BearShare application, you will see that requests for pornographic material run a close second to music requests. If you are easily shocked, don't



select the monitor option.

Second, er, the Internet is a nasty place. When you install the current version of *BearShare* software, you also install software that gets into your computer, monitors your online activity, and sends you "appropriate" advertising. To do this, it probably sends data about you to... well, who knows? And it does this whether or not you are running *BearShare*. If you find irritating mini-web pages popping up unexpectedly, you probably have this software (known generically as 'Spyware') on your system. Worst of all, it's difficult to get off your computer because there's no uninstall option.

I now think that the only safe way to experiment with the Internet is to have a separate, dedicated computer. Not only should it be isolated from all other computers you may have, but you must be prepared to format it and re-install the OS occasionally. And, of course, you should have personal firewall software installed. Since I installed BearShare, my Internet connection has slowed down and has become flaky. I won't make this mistake again. Meanwhile, any software supplier that proposes to put Spyware on your computer must make it quite clear that it is doing so and give you the option of not installing it. A message along the lines of "do you want to install software that will kill the performance of your computer, send such information about you and your computer as it deems fit to anyone it chooses, and make your computer so unreliable that you will have to re-install your operating system?" would do nicely.



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# Your technical questions and queries answered

# Can you help me studio work experience?

So far, I have contacted a local studio that is allowing me to come in for a try-out during a session, to assist the engineer, hook cables. recording but a professional studio environment is new to me. Any advice so that I don't embarrass myself and even maybe impress them a bit? Also, any advice on getting into this as a career?

### Bill Ricchini

Assistant Editor Mike Senior replies: So

I've been trying to purchase a idea where I can get one? I've tried the net, but no luck so far. Gary

Your first stop A should be the SOS Reader Ads, both in the magazine and on-line at www.sound-on-

sound.com. I had a quick look and found a OY20 in the April 2001 issue for £120. You could also place a wanted ad in SOS. Then try ad papers like Loot (and their web site),

and even local free ads papers. If you can't hang around for one to turn up. call some of the retail shops and

> often deal in second-hand gear as well as new. Look especially at the For Sale ads in the Classified section, for used-gear specialists, I called Brixton

Exchange Mart to see if finding a QY20 would be easy and they had one in stock, but you'll probably pay a fair bit more if you buy from a shop. The up-side is that you may get some kind of warranty. Debbie Poyser

module, and Millennium didn't configure the 1000XG's sounds in Logic. Consequently, I'm stuck with the 128 bog-standard GM sounds. I did ring them to ask, and they tried to help but said specific knowlege of the XG card in conjunction with Logic was needed. They gave me the Yamaha and Emagic support line numbers (which were fairly useless).

For more hints, tips and problem-solving visit the SOS Discussion Forum

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

to do. If you make the tea well, they might

think you're made of the right stuff and get

One down-to-earth piece of advice, as well.

Keep some paper and a pencil in your pocket,

beverage orders and preferences at first, or a

shopping list for the local general store. (Don't

be writing right under anyone's nose, or they'll

off the little effort it requires; it certainly did so

probably take the piss.) This activity will pay

for me on countless occasions. One of the

they feel that you're reliable, and writing things down means that you don't have to rely

on your memory when trying to remember

how all the different members of the string

As for general careers advice, David

Engineer' series ought to give you a lot of

If you need more info, try the web site's

search engine.

b.engineer.htm

engineer.htm

engineers3.htm

engineer.htm

SW1000XG?

Mellor's four-part 'How To Become A Recording

useful pointers. It ran in 1999, so it's now free

to view on our web site - here are the URLs.

www.sospubs.co.uk/sos/apr99/articles/

www.sospubs.co.uk/sos/may99/articles/

www.sospubs.co.uk/sos/jun99/articles/

www.sospubs.co.uk/sos/sep99/articles/

the sounds in my

I bought a PC from Millennium to write music

on (933MHz, 256Mb RAM) with Emagic's Logic

and the ES1 and EXS24 plug-in instruments. It

Yamaha SW1000XG soundcard with it as well,

works well, apart from the fact that I had a

so that I wouldn't need an external sound

How can I access all

section take their coffee at 3am...

things which will impress a studio most is if

you doing more interesting things.

and write down anything you need to

remember - this is likely simply to be

Could you explain how I can access all the sounds available on the soundcard (and even use the XGEdit software?) so that it was worth me spending £400 on the SW1000XG rather than £200 on a more basic card? Stephen Wright

Peter Peck, Yamaha-Kemble's Marketing Manager, Music Production, replies: To help you get the most from the SW1000XG, we have created a dedicated web site at www.xafactory.com. Here you will find the latest drivers, along with lots of

hints, tips and FAQs.

There are also step-by-step details covering how to set up the SW1000XG within various applications. Probably the most useful area to you will be the downloads section, where you will find the Advanced User Guide. This should help you through your situation. I'll briefly point you in the right direction, but please take a look at the site for more specific detail.

Basically, the best way to access the extra sounds and voices on the SW1000XG from within Logic is the XGEdit software and the latest multi-client SW1000XG driver. This will allow you to not only play back and record using the additional sounds, but also to access

# make the most of my

I want to get into record producing as a career. and so on. I'm a bit nervous, as I've done home

far you seem to be doing just the right things to achieve your aim. In the studio, just make sure you don't get in the way, and stay alert to learn what you can. Don't expect to impress anyone when you first get into the studio, because it's more likely to backfire and cause someone to get annoyed. Much better to simply avoid being a nuisance. Some may disagree with my judgement, saying that it is important to show enthusiasm and energy by offering help. It is true that being enthusiastic is important, but you need to show this without the risk of seeming pushy and without niggling anyone. I'd say that the best way to show enthusiasm is by being conscientious in the tasks that the studio staff give you of their own

> volition, rather than by pestering them for things

> > QY20 to replace a stolen one. Any Duckworth

chains that advertise in SOS, as they

\*\*\*\*\*\*\*\*

Can I control a Fostex D80 digital eight-track recorder from my Atari running Cubase v2? For example, when I rewind the D80, will the sequencer follow it, and vice versa? Dave Stix

The D80 is capable of transmitting MIDI Clock and MIDI Time Code, and supports MIDI Machine Code, so it should be easy enough to sync your Atari to it, provided Cubase v2 supports these features. It's always better to have the sequencer follow the audio recorder rather than the other way around. Sam Inglis

After your answer to my previous

Question, my Native Instruments

B4 plug-in now works well, but there

before the sound triggers. I'm using a

Fatar 880 keyboard and Emagic AMT8

The usual solution to latency (the

A name for this delay) is to go into

the Audio and Drivers menu in Logic

and reduce the I/O buffer size to 0.5.

This is the setup I use, and I get pretty

with a setting of 1, but it could trip up a

much negligible delay. You can get by

fast player. Paul White

is a slight delay when I hit the keys

MIDI interface with Logic 4.7. Jo



# Q&A

all the effects processors and synth editing parameters. I hope that this information helps you get the most from your SW1000XG — and thank you for your interest in Yamaha Music Production equipment.

# Why won't my VST instruments run in Logic?

I am fairly new to computer music, and something is really vexing me. How do you

run VST instruments in Logic? I'm currently using version 4.5 on a PC (though I will soon be upgrading to 4.7). I can get the virtual instruments I have installed working fine in Cubase, but not so in Logic. I read in some text included with the Native Instruments 84 demo that it was as easy as creating a VST instruments folder within the Logic program folder itself and then opening it as you would the Emagic ES1 plug-in synth?. This has so far vielded no results and I am on



the brink of tearing my remaining hair out, as I am assured by people that this should work. Are these people mad? Am I mad? I refuse to believe that I'm the only one with this problem!

**Robb Bluett** 

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

### **Assistant Editor Mike Senior replies:**

Getting a VST instrument that you have installed to work with Logic requires that you place it in the VstPlugIns folder that resides in the main Logic program folder — this is the same whether you're using a Mac or a PC. If you don't have one of these folders, you can make one (call it 'VstPlugIns', with no spaces). Once this is done, you need to boot up Logic and create an Audio object within the Environment. Select this Audio object within the Environment window and then select Instrument I from the drop-down menu in the 'Cha' field. Now select your VST instrument from the drop-down menu at the top of the object (see screen grab, left).

# How do sequencers work?

I would like to know how sequencers actually work. I am considering buying one, but am not sure which to go for. Initially I was thinking of buying the Yamaha QY70 (my budget is a bit restricted and I also don't have much space). After trying it out in a shop, I was happy that it offered the functionality but was not too impressed with the sounds. I do, however, like the sounds Roland synths have to offer (they sound warmer and more realistic).

My question is: can the QY70 be used as a sequencer for an external sound module (or a synth keyboard such as the Roland RS5)? If so, does that mean that the sounds coming from the module are recorded/sampled by the sequencer, or does the sequencer simply trigger them from the sound module? My concern is that if the sequencer samples the sounds, they may lose sound quality.

### **George Tsikos**

### **Assistant Editor Tom Flint replies:**

A sequencer in its most basic form is a memory bank which stores note information as MIDI data. It's a bit like a multitrack recorder, in that it is usually used to record music as separate tracks, except that a multitrack recorder will record audio rather than MIDI data.

Older hardware sequencers like the Roland MC50, which I still use to this day, have no internal sound module or preset rhythm patterns. They simply remember the note information sent to them from a connected keyboard or MIDI control device. This MIDI information will usually be note pitch, length, velocity, and any other controller information delivered from a modulation wheel or real-time controller knob. When the sequence is replayed, the sequencer sends the recorded note data back out to the keyboard or sound module and will, in effect, play back the performance. The beauty of MIDI is that you can always change the sounds, shift the note data, and perform all manner of edits to your music in a way that is not possible with recorded audio.

The QY70 certainly functions as a sequencer that can control other devices, but it also has its own internal sound-generating module and rhythm generator. You should be able to plug any other sound module, regardless of make, into the QY70 and control that device's sounds over MIDI. The audio of that device will still come from its own audio outputs, because only note information is stored in the QY, so you will need to route the sound module's audio outs to your amp and mixer before you can hear the result. This is how you would use the Roland module.

Concerning the QY's own sound set, it's worth making the point that XG sounds are extremely editable and can be controlled and modulated in a great number of ways using MIDI control data. Bearing this in mind, you might find that the sound generator on the QY offers you much more than its preset sounds first suggest.

Although storing MIDI information requires only a fraction of the memory that would be needed to record audio, sooner or later you'll fill up the memory of the QY70. To relieve this problem, Yamaha have provided Mac/PC

### quick fixes

I have just been given a Mac Classic II. I've found a MIDI sequencer that will run on it (Midigraphy) and I need to get MIDI Information in and out. Midigraphy lets you select either 'Printer' or 'Modem' port for MIDI receive/send. Where can I get a MIDI Interface that will do the job ? I have tried Midiman but their interfaces use serial ports. Caleb

A On most Macs, the Modem and Printer ports are serial ports, so a serial-port interface such as those made by Midiman and others should work in either socket — you would then

use the selection in *Midigraphy* to tell it which port your interface was plugged into. You'll also need to install OMS (the Opcode Open Music System), which is how *Midigraphy* communicates with a MIDI interface. You can download this from <a href="https://www.opcode.com">www.opcode.com</a>. However, some modern interfaces may not work with such an old Mac even though they use the right port, so make sure the shop will allow you to take it back if it doesn't work! *Sam Inglis* 

I'm a reader from Hong Kong.
I read an article in SOS some time back about location recording a

School Choir; the mic stand used was said to be an Ambient Jumbo Pole. I think I need one of these for upcoming projects over here.

Do you know who the UK distributor is? (I'm sure there's not an HK one!) Dr Eric James

Ambient Gmbh are a German company selling a wide variety of sound equipment, including a range of Quickpole mic stands that features the one you're after. Their web site is at <a href="https://www.ambient.de">www.ambient.de</a>, and in the UK their products are sold by First Sense (+44 (0)1225 480994).



I couldn't find any details of other overseas distribution at the web site, but they welcome emailed enquiries, which you can send from the site. Debbie Poyser



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mix down to stereo on location, doing a

number of takes and compiling the best bits

from these after recording. However, I'm not sure how effective this approach will be with

your current gear line-up. My main concern is

that the crossfades used in the Roland VS880

material. From my own experience of the VS.

you ought to be able still to do limited editing, and you'll get the best results using the 2mS

crossfade time - I find the longer times tend to

fade, and this will probably be too instrusive in

classical material, but try them all out and see.

Two ways of spacing mics

for stereo recording.

you ought to make sure you're in MAS

most about sound quality.

(uncompressed 16-bit) recording mode -

doing anything much in the way of close

tempted to use the Rode mics as my main

stereo pair, and then use the Tandys as

miking, if you're after a Radio 3 sound. I'd be

ambience mics, to be mixed in if required. The

Beyerdynamic dynamic mics are probably best

left out of this session, as they'll not really be

open-sounding enough for the purpose of

classical musicians are likely to be pickier than

As for miking up, I'd personally suggest not

Also, it's worth making the general point that

dip the overall level at the mid-point of the

your options when editing stereo classical

aren't particularly tweakable, and this will limit



storage utility software so you can move QY MIDI data to a computer's hard drive. For hooking up to a computer, the QY has a 'To Host' output connector, which should connect to the computer's modem or printer port. If you don't have a computer in your studio to do this, you might find the QY a little restrictive, and it might, in that case, be worth looking for a sequencer with a floppy drive or other removable storage medium.

Yamaha have a manual library on their web site, where you should be able to access the PDF manual for the QY70: www2.yamaha.co.jp/manual/english/ index.html

### What's the best way to mic a classical chamber trio?

I have recorded a demo CD of my acoustic folk duo. This project has been successful, so much so that a chamber trio I know want me to record them. My own CD was close-mic'd and overdubbed. This will not be possible with classical chamber music. My question is how to get a 'Radio 3' rather than a 'Classic FM' sound with the equipment I have, or with as little investment as possible. My recorder is a Roland VS880 EX and my mic collection comprises two Rode NT1s, four Tandy/Realistic PZMs, three Beyerdynamic TGX 58s, and one TEAC MC210 back-electret stereo mic. The room is live, with a wooden floor and big windows. The trio consists of flute, oboe and piano. The piano is an upright, very good sounding and well tuned, and I think this will be the biggest problem.

John Reed

Assistant Editor Mike Senior replies: Most classical sessions tend to

quick fixes

Do you know of the existence of any company producing decent MIDI file drum patterns? I use Cubase. have a neanderthal knowledge of programming believable patterns and fills, and am not particularly

stimulated by hours spent inputting drum parts. Harry Robertson

Commercial MIDI file drum A patterns, such as those from Heavenly Music and from Keyfax's Twiddly Bits series, certainly do exist, but one slightly different product you could check out is Steinberg/Wizoo's VST Drum Sessions (£79.95 each.

reviewed January 2001). Each contains 20 live multitrack drum performances



recorded as audio and then chopped

into REX files, allowing you to edit them

within Cubase, change tempo. quantise, and so forth, in the same way as with MIDI files. (You also get MIDI files derived from the performances.) If you're looking for realistic drum parts 'ready made', this is probably the best solution I know of. Contact Arbiter on +44 (0)20 8202

1199. Sam Inglis

I bought a Valley 610 compressor second-hand and would like to get hold of a handbook. The company are/were based in Nashville TN, USA. I don't seem to be having any luck. Got any ideas? Tom Rusty

classical recording.

Take time getting the sound as right as you can before you record any proper takes - you won't really want to be using the VS's processing or effects afterwards, if you can help it. If the sound is too dry, move the main pair of mics away from the musicians a little, or try fading in the ambience mics a little. If there are problems with the room in general being too live, you could try drawing the curtains over some of the windows. If the balance isn't right between the instruments, try changing the positioning of the players or the mics, and experiment with opening the lid of the piano. If the balance of the players isn't right in certain sections of the music, your only real remedy is to discuss this with the musicians and get them to retake that section. Once you've started doing takes, be careful not to change the miking setup, as you want to be able to edit different bits together and you'll therefore need them to match in tone as exactly as possible.

Stereo miking isn't really my forté, so I can't really recommend which of the available stereo miking techniques would be best (but see Hugh Robjohns' comments, next).

### Technical Editor Hugh Robjohns adds:

Where Mike mentions not altering the mic setup during recording, I would also add the same about the balance of the mics - any changes make it impossible to edit different takes together.

Regarding which stereo mic technique to choose, you could use the NT1s as either a spaced pair (try angling them outwards about 100 degrees to each other and spaced about 18cm apart), or as a coincident pair (90 degrees mutual angle with the capsules mounted one above the other for vertical coincidence). The latter should give better imaging, but the former often sounds more pleasing and natural to many musicians' ears.

> After some research, we haven't A been able to confirm whether Valley (or Valley People, as they were called) still exist, but London's Funky Junk vintage equipment company can help you out on the manual front. Funky Junk have what may be the world's largest collection of studio equipment manuals, and the collection includes one for the 610. They'll be happy to sell you a copy if you contact them on +44 (0)20 7609 5479, or email them at sales@funky-junk.co.uk. Their web site is at www.funky-junk.co.uk. (Thanks to Funky Junk's Roddy

Matthews for his help.) Debbie Poyser

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# Q&A

I'd stick with the NTIs as the main pair and experiment with altering the positions of the mics relative to the musicians (or vice versa), as well as trying the musicians in different places in the room, and relative to each other. It takes time to do, but pays dividends in the final results. If the best position for the woodwind results in the piano losing some definition, you could try using the tiniest hint of the Tandy mics on the piano to bring back a little definition and focus.

You obviously have a room arranged already, but for others interested in doing the same kind of jobs, I find the key is locating a venue with a suitable acoustic, both in terms of reverb and in terms of quietness. A country church is often ideal, if you can sweet-talk the vicar and offer a donation for the new roof fund!

# Why won't my editor/librarian talk to my sequencer?

I have just read your review of Emagic's Sound Diver editor/librarian software in this month's edition of Sound On Sound - twice, mainly because it makes far more sense than the manual that comes with the program. I have set up said program with all instruments loaded and libraries saved for them, but I cannot get Logic (Platinum) to talk to it. Do you need to have multi-instruments in the Environment already for each instrument? If so, why? I thought Sound Diver was meant to do all of this. I have tried adding multis, then loading up Sound Diver, which brings up several "Sound Diver Nord Lead, etc" icons, but why are there now two - one for the standard Environment

quick fixes Multi and one for the



Sound Diver register? I can't be the only one pulling my hair out!

**Peter Lawford** 

Editor Paul White replies: Before I started to use Sound Diver, I'd already set up my Environment with multi-instruments, as I'd been working without Sound Diver for years. Then, when Sound Diver is unleashed, it is able to suck the actual patch names out of the modules; these names may be different to the ones typed into your multi-instruments - if you typed any in. If starting from scratch, I'd be inclined to create all the necessary multiinstruments first in Logic, but not bother about patch names. Just tell Logic what ports and channels your instruments are on. Then set up Sound Diver, use it to get your patches, and do an 'update patch names using Sound Diver' operation to update your Environment object. When you've done this, save as a default song.

# Now can I timestamp audio files?

In Simon Price's recent series [*Pro Tools Explained*, SOS *February-April 2001*], he mentioned that in order to transfer projects from Emagic's *Logic* sequencer to *Pro Tools*, you need to timestamp the file before transferring it. What are the exact steps you need to take in *Logic* to timestamp the audio files?

Sean

Simon Price replies: In addition to raw audio data, SDII-format audio files (the format you'll need in this situation) can contain basic edit information; namely the 'in and out' points of regions used within the file, and their start locations within an arrangement. All audio files already have

an 'original timestamp', which holds the start position where the file was recorded. In most cases, though, you edit and move audio around, so the original timestamp won't help if you want to spot audio into Pro Tools at the same position as it appeared in the Logic arrangement. To update an audio file with information about a contained region and its location (User Timestamp), select the region in Logic's Audio Window, and choose Export SDII Regions from the Audio File menu. The region can now be imported into a Pro Tools session, and spotted to the User Timestamp location. This method of transfer can be time-consuming and laborious for moving entire songs to Pro Tools, so it's more common to create continuous audio files for each track in Logic, and just use these. There will be much more detail regarding inter-application transfers in an article I'm writing for a future issue of SOS. SOS

I'm a long-time user of Emagic's Logic, but I can't figure out why the screenshots in June 2001's 'Logic Notes' have a dark-blue backing. The default on my G3 is mid-grey. Is this a bizarre effect of the printing process, or is there a way of editing the default interface colours? I've checked through all the preferences I can find.

I'm not just interested in aesthetics; I think that the screenshots in your feature are more readable because of the increased contrast. Paul Crowley

A Those screenshots have different colours because I use a reduced colour resolution on my Mac here at the SOS office, and for precisely the readability reasons that you give.

To change the colours of Logic to the blue—tinted ones, reduce the resolution in the Mac's Monitors & Sound control panel to '256', rather than using the normal 'thousands' or 'millions' options. Mike Senior

I am studying A-Level Music Technology and currently looking for work experience. I'm having real trouble finding studios in the London area that will take students on this basis. Do you know of any? Adam Fish

We don't keep any lists of studios that take people for work experience. I think your best bet is to contact the MPG (Music Producers Guild) by calling +44 (0)20 7371 8888, or look for information on their web site at <a href="https://www.mpg.org.uk">www.mpg.org.uk</a>. You could even try contacting the BBC. When I visited one of their studios last year they had

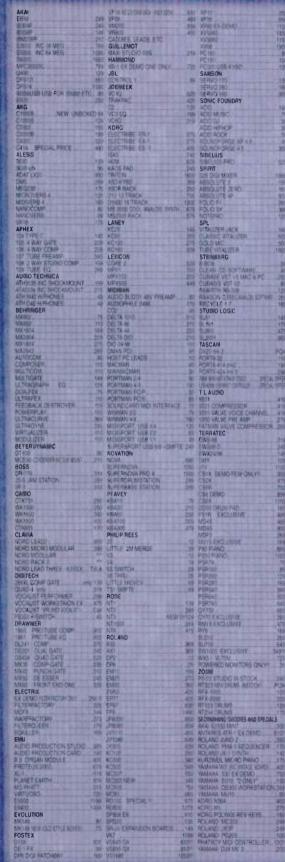
someone there who was doing work experience. *Tom Flint* 

Q I have just read about a web site that features vocals that anyone can download and remix. Do you have any idea what the web address is?

Chris Robertson

The website you're looking for is called The Vocal Factory, and it was mentioned in the Readerzone feature on Glenn Brooks in the February 2001 issue of Sound On Sound. The web address you need is <a href="https://www.thevocalfactory.com">www.thevocalfactory.com</a>. Tom Flint





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**EMAGIC EVP88** 

# electric

# EMAGIC *EVP88* ELECTRIC PIANO VIRTUAL INSTRUMENT PLUG-IN FOR *LOGIC AUDIO*

More and more vintage hardware instruments are now being modelled as virtual instrument plug-ins. With EVP88, Emagic have turned their attention to electric pianos, producing a Logic-only plug-in which models several different piano types. Paul White discovers that the tines they are a-changin'...

magic's EVP88 is an electric piano virtual instrument plug-in for use with all versions of Emagic Logic Audio from v4.7, on both Mac and PC platforms. It uses modelling to emulate the various piano types it offers, and thereby claims to produce a more accurate response to playing dynamics than sample-based instruments, while still allowing the user access to key parameters of the sound. Models of the Fender Rhodes Suitcase Mk I, the Fender Stage Mk I and II, the Wurlitzer 200A and the Hohner Electra are included, grouped into the following preset titles: 'Suitcase Mk I', 'Stage Piano Mk I', 'Stage Piano Mk II', 'Bright Stage Mk II', 'Hard Stage Mk II', 'Mk IV', 'Wurlitzer 200A', 'Soft Wurlitzer', 'Funk Piano', 'Electra Piano' and 'Metal Piano'. A cut-down version of EVP88, called EVP73, is also in preparation. This offers only one model (the Fender Rhodes), but at least the plug-in will be a VST instrument, allowing its use with sequencers other than just Logic.

#### **EVP88** Controls & Effects

The control panel is the same for each *EVP88* piano, offering a virtual dial with which the user may scroll through the 10 available piano models. The usual menus are present for saving and

# avenue



loading user patches, and in addition to the basic piano, there's also a supremely nice Phaser, Tremolo and Chorus section. A couple of smaller dials at the top of the window set the maximum number of voices (up to 88) and permit finetuning, and as the name of the plug-in suggests, it responds to MIDI notes over the full 88-note range.

Most electric pianos work by striking metal tines with hammers, so EVP88's models provide parameters directly related to this kind or mechanism. For example, there are separate Decay and Release controls, with individual level controls for the Bell and Damper components of the sound. Bell affects the metallic attack at the start of the sound, while the Damper mimics the sound of the mechanical dampers used in real electric pianos. As a concession to modern times, the stereo image has a width control, and to satisfy the real purists. there's adjustable stretch tuning for both the upper and lower parts of the keyboard. There's also a Warmth control in the tuning section that affects the general timbre of the piano sound, and that's in addition to the usual bass and treble controls, based around those in Emagic's Fat EQ plug-in algorithm.

Those who have an affection for electric piano sounds will know that the end result is often a

# Remarkably faithful to the original instruments, especially in its dynamics. Easy to use. Excellent built-in phaser, tremolo and chorus. CONS No full VST version yet, though the forthcoming EVP73 aims to offer the most popular Rhodes model in VST instrument format.

**EMAGIC EVP88 £169** 

SOUND ON SOUND

EVP88 does for the electric piano

the tonewheel organ. It really is

astonishingly good.

what Native Instruments' B4 did for

combination of amplifier/speaker overdrive and added effects, such as chorus, phaser or even wah-wah. On *EVP88*, the amp side of the equation is looked after by the Drive section, which features adjustable gain and a Bright/Dark tone control. At higher gain settings, the sound gets pretty dirty, but in a convincing way. It's more than simple distortion, as there's none of that fizzy roughness you get by adding overdrive without speaker simulation.

Phasers are often looked upon as pretty tame effects, but the one provided here is an absolute classic, with Rate, Colour and 'Stereophase' controls. It's as simple to use as a pedal, but it gives exactly the right swirling quality to the sound. Anyone who remembers Hugh McKenna playing electric piano in the Sensational Alex Harvey Band will know just how expressive this combination can be, and Emagic's emulation comes so close that the result is pure nostalgia.

Tremolo is also a 'must-have' effect to add life to electric pianos, and, like the phaser, this one has a so-called 'Stereophase' control as well as the expected Rate and Intensity. Again the result is spot-on. Finally, there's a Chorus effect with a single Intensity control. I don't know which chorus device this is designed to emulate, but it has a nice analogue pedal quality to it and works well with the piano.

#### **Rhode Test**

As most regular SOS readers will know, I am to piano playing what Saddam Hussein is to lacemaking, so I enlisted a piano-playing colleague to help out as well as an engineer friend who has worked on many sessions using the original Fender and Wurlitzer pianos. To hear EVP88 played properly was a revelation. The dynamics associated with those classic pianos was all there, along with the pronounced and progressive tonal changes that accompany playing dynamics. In fact, the only comments were that the keyboard didn't

feel the same as those on the original instruments (this was fair, as I was triggering *EVP88* from an unweighted keyboard) and that it didn't seem quite right having all the notes properly in tune! It was almost like playing an unnaturally well-serviced electric piano.

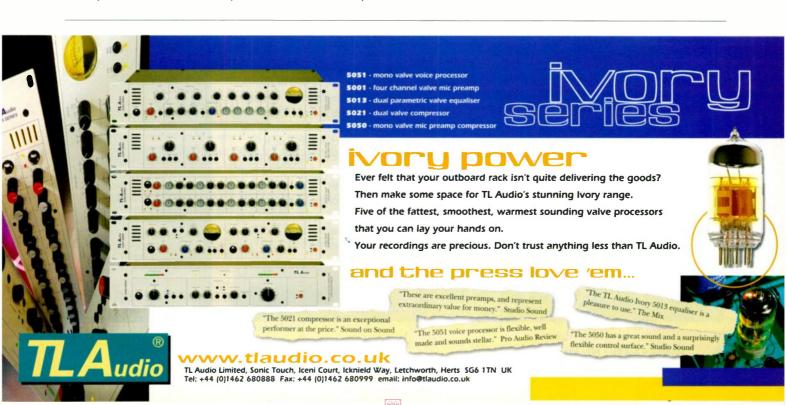
Though the degree of tonal control offered by the front-panel knobs might seem limited, EVP88 actually provides all the adjustment needed to produce natural-sounding variations on the basic piano sounds, and being able to tweak the tine attack makes a lot of difference to the feel. Naturally you can automate any tweaks in real-time via MIDI, and automating the effects could be particularly useful. My favourite preset overall had to be 'Suitcase Mk I', though the Wurlitzer's classic warmth and greater mellowness also came across with uncanny realism. The bell-like tones of the 'Electra' piano were redolent of FM synth electric piano sounds, while the Funk and Metal variants were my least favourite, though still eminently playable in the right context.

#### **Conclusions**

In EVP88, Emagic have captured the spirit of the mechanical electric piano with the same care and attention to detail that Native Instruments lavished on their B4 tonewheel organ plug-in. Indeed, because the electric piano is a dynamic instrument (organs normally have no velocity component), the result is all the more impressive; the difference between EVP88 and a Rhodes sample is instantly evident. To get the best out of this plug-in, you need to be a good piano player; hearing jazz played on it is quite astonishing. Driving it from the MIDI guitar is less impressive, though the dynamism and excitement of the instrument still manages to shine through. If you're a Logic user and you play piano, this is a plug-in that you can't afford not to own. And if you're not a Logic user, you still don't have an excuse, as the forthcoming VST-compatible EVP73 isn't far off release!

"In EVP88, Emagic have captured the spirit of the mechanical electric piano with the same care and attention to detail that Native Instruments lavished on their B4 tonewheel organ plug-in."





#### SHERMAN FILTERBANK 2

signal to trigger the onboard envelopes and lurching into mild distortion, but analogue overdrive is the very essence of the Sherman sound, and I for one liked it a lot.

The third switch transposes the filter range, either up an octave or up a fifth. This latter mode has what Sherman describe as a 'dirty character', which works very successfully on monophonic signals with a little filter-frequency modulation — suffice to say I've experienced more 'dirty characters' since the Filterbank 2 arrived than a News Of The World hack at a swingers' convention!

Another switch, probably the most important addition of all, activates the two tracking modes, both of which tune the second filter to the pitch of the incoming signal. (Filter 1 can also be slaved to it using the Harmonics control.) For normal use, Track mode will be most suitable, but for the most speaker-wobbling basses the Track Low setting will be more appropriate. A new white LED is positioned next to this switch to indicate when the tracking system is locked on. Like many pitch followers, the results when working with either of the tracking modes depend hugely on the quality of the input and the range over which you try to use it. Playing cleanly articulated notes on a synth gave fairly (though never fully) controlled results, and added a sizzling presence or an ominous rumble depending on the filter settings.

The last of the new switches offers a new sawtooth LFO waveform and a means to retrigger the LFO via the AR generator. I smiled at the manual addendum sheet, which suggested "pumping grooves were an unavoidable result" of this retrigger function, but it certainly is capable of some interesting effects, especially on drum sounds when you've got the LFO running at a low speed.

#### **Bank Balance**

The original Filterbank was far more than just a couple of filters in a box, and its successor features several useful improvements, such as the pedal input and the pitch follower. The Filterbank 2 shines as an analogue distortion unit or exciter, and if you consider the number of features included, the interfacing possibilities, the MIDI control and its general organic quality, you can see this unit finding a home in many studios — as its predecessor did before it.

The only problem I can see is that you do need to spend some time with one of these to fall in love with it — with its numerous controls, flexible patching and MIDI functionality, there's a lot to digest. This isn't helped by the fact that the front panel appears at first glance to be a little disorganised and non-intuitive and, even with familiarity, I can't say I actually like it. For example, the input level knob is far too close to the FM amount, resulting in unwanted adjustments, and the ADSR knobs are confusingly not in a straight line.

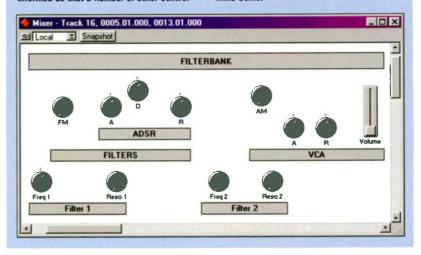
And the learning curve isn't eased by the same ill-named "Abusers' manual" that Chris Carter disliked so much four years ago. Rather than

#### MIDI Mixer Maps

Sherman's website already provides both a Steinberg *Cubase* mixer map and a *Cakewalk* studioware panel for external control of the Filterbank 2. However, Sherman have informed us that a number of other control

templates will be available soon, including an Emagic Logic Environment setup and patches for the Kenton Control Freak and Doepfer Pocket Control hardware controllers.

Mike Senior



describe each function, it is structured as a series of exercises to familiarise you with Filterbank operation. These exercises take time — time you might not have under normal 'shop demo' conditions. I diligently plodded through them all, and I probably understand the unit better because

of it, but I am acutely aware that many would-be customers won't have the time to do this. What's more, the tutorials haven't been updated to reflect the new model — unless all the new switches are set to their centre positions, the exercises won't necessarily work as intended.

However, despite these small complaints, even an old fogey like myself wasn't immune to the Filterbank 2's rough charms. In the first few seconds after plugging it in for the first time, I gave my monitors more exercise than they've had in years, as cat-worrying highs and heart-stopping bass erupted from them. The tracking modes in particular could justify buying one of these boxes, if you find that you have trouble making your solos cut through.

When I read the review of the original Filterbank I put off checking it out, reasoning that I could spend the cash on yet more synths instead. Now I see I missed a chance to make what I already had sound a little different, to breathe life into some of my virtual analogues, to dirty up some of my bland drum grooves — there's serious cutting, tearing mayhem to be had for anyone even remotely resembling a Prodigy wannabe! Find a shop with a Filterbank 2, try it out for as long as you can, and you just might find that it will be the energy bolt you've been looking for in this increasingly tame world.



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# direct dilemma

Craig Anderton shows you how to get the best results when combining miked and Dl'ed feeds from a bass guitar.

here are two main methods for recording bass guitar: miking an amp, which picks up the amp/speaker combination's character, and recording direct, which avoids the amp by feeding the instrument directly into your mixer or multitrack recorder, via a Direct Injection (DI) box or other interface, for a cleaner sound.

To get the best of both worlds, some engineers seek to use both of these approaches simultaneously. The problem is that the miked signal always ends up being delayed slightly in relation to the Dl'ed signal, because of the time sound takes to travel through the air from the speaker cab to the microphone — approximately one millisecond per foot travelled. This delay causes the two similar signals to be out of phase with each other, so that mixing them together results in comb filtering, a pattern of peaks and troughs in the frequency response which will usually weaken the combined sound.

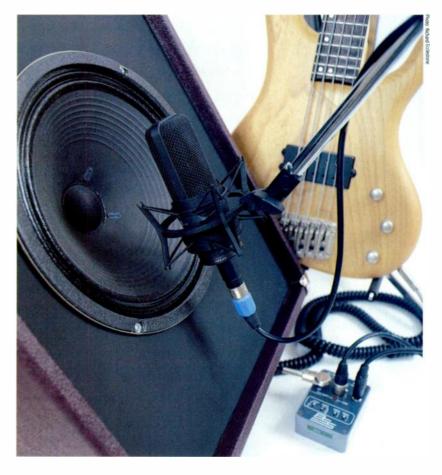
The good news, though, is that you can compensate for this delay in order to retain a strong sound. Moreover, there are ways to do this both before and after the recording has taken place.

#### **Phase Matching While Tracking**

If you want to match the phase of the mic and DI signals while recording, the simplest solution is to artificially delay the DI signal as well, in order to match its phase with that of the already-delayed mic signal. An outboard delay line is one option for doing this, but you won't be able just to use any old unit. For a start, you're likely to need to have a fine delay-time resolution available to you, which rules out most analogue delays as these can't usually resolve delays of less than a millisecond or so. Furthermore, digital delays will typically need at least half a millisecond of processing time, even when set to their minimum delay time, so they'll work only if the mic is placed six inches or more away from the speaker - sometimes, the amp's mic sits only about an inch away from the speaker cone.

However, a number of digital mixers include a short high-resolution delay line on every channel, which is ideal for time-alignment purposes. For example, both the Panasonic DA7 and the Yamaha O-series mixers allow you to set individual channel delays with single-sample accuracy. Other digital

#### **MATCHING THE PHASE OF MIC & DI SIGNALS**



mixers include built-in insert effects processors which offer a high enough timing resolution.

If you have access to a delay line which cuts the mustard, then the first step towards getting the mic and DI signals lined up is to patch them both into separate mixer channels. Pan the channels to centre, as this makes it easier to detect comb-filtering problems. If you're using an outboard delay line, patch it into the direct path's insert point or between the DI box and the mixer. Alternatively a similar routing could be implemented within a digital mixer using built-in effects processing, though it would be worth placing delay processors into both channels (with the mic channel's delay time set to zero) in order to remove the processing delay of the insert from the equation.

Once you've done this, get the bassist to play continuously on one string, at a consistent level. To simplify the level-setting process, or just to avoid the bassist getting too bored, you could temporarily unplug the instrument and feed in a bass-range synthesizer tone, modulated by an LFO of around

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5Hz — you may need to tape down a key and tweak the amplitude and filter envelopes in order to prevent the sound from decaying over time.

Once you've got audio coming into the two channels, solo each in turn and set them for the same approximate level. Then temporarily flip the DI audio out of phase using that mixer channel's phase invert switch. Now it's time to experiment with the DI channel's delay-time setting. Starting from the minimum delay available, slowly increase the delay using the smallest increments possible. At some point, the overall level of the combined mic and DI signal will start to drop, and you should try to find the delay setting that causes the greatest drop.

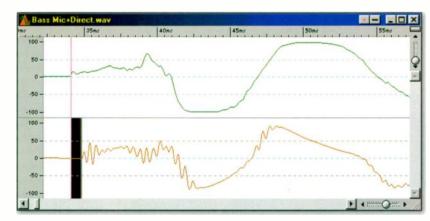
If you get no volume drop, then either the delay line can't achieve a short enough delay, or the resolution isn't sufficiently fine. In which case you'd be best advised to record the mic and DI signals onto separate tracks and then to attempt to fix any comb-filtering problems in the mix. There is also a possibility that the lack of volume drop could be due to an out-of-phase wiring problem, but that's a whole separate topic...

Having found the minimum volume point, try for an even lower volume by moving the mic in very small increments closer to or further from the speaker cone — working in quarters of an inch is a fairly safe bet. If you have no-one to watch the meters for you while you move the mic, then it can be handy to write down meter levels between moves to keep a track of things.

If you've followed these instructions, you ought now to have almost completely compensated for the delay in the miked signal, so it'll be time to undo the phase change on the DI channel. The two signals should now be well in phase, and ought to be stronger together than they were before. All that remains is to balance the channels appropriately.

#### Fixing It In The Mix

If you don't have a suitable delay to hand while tracking, then you should record the mic and DI signals to separate tracks so that you have the option of aligning them later while mixing. If you're



recording to analogue tape, or to a digital multitrack tape machine, then such fixing might have to be done with a delay line in a similar way as when tracking. Some digital tape machines, notably the popular Alesis ADATs, provide facilities for delaying their individual tracks, which can simplify the correction process considerably as no external delay processor is required.

With hard disk recorders and other random-access digital recorders, their waveform displays and non-destructive editing functions can be used instead of delay processing in order to line up the audio. All you have to do is zoom in the waveform display view far enough so that you can clearly see the initial attack of both tracks — you'll see that the audio recorded from the mic starts slightly later than that recorded from the DI. Simply use your particular program's editing facilities to line up the mic track with the DI track.

#### Phasing, Shmasing...

Eliminating comb filtering might take a little time to do satisfactorily, but it can greatly improve your bass guitar sounds. So set aside a few minutes to try out some of the techniques described above — you might well be surprised at how much better your recordings sound in the end.

Thanks to Jay Graydon for his assistance with this article.

If you have access to hard disk recording and editing software, then phase-matching can be achieved quickly and easily by aligning the waveform displays, as shown above.

"A number of digital mixers include a short high-resolution delay line on every channel, which is ideal for time-alignment purposes."

#### Compensating For The Processing Delay Of Modelling Preamps

Users of physical modelling processors, such as the Bass Pod from Line 6 or Johnson Amplification's J Station guitar processor (which actually has some very good bass amp simulations on it), have an additional factor to take into account. Both the digital conversion and the physical modelling process take finite amounts of time - a few milliseconds, in fact - which means that the signal emerging from the outputs could be even later, compared to the DI signal. than the signal from a miked cabinet would have been. Line 6 have cleverly dealt with this issue on the Bass Pod by incorporating a dedicated DI output on the unit itself. This simply offers a buffered clean throughput of the input signal which is delayed to time-align it with the physically modelled signal. The difference between

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The Line 6 Bass Pod has sockets for both a throughput DI signal and the modelled miked signal, to avoid phase problems.

using this output and a traditional DI box split is dramatic, as the Pod's 9mS or so latency places it firmly in comb-filtering territory. Using the timealigned DI, you can freely balance the clean and amp-simulated signals against one another

amp-simulated signals against one another without producing any notching or tonal coloration — the two signals simply add.

The J-Station has a lower processing latency, so the audible effect is slightly less pronounced, but it is still there and you certainly wouldn't want to record a bass instrument with that degree of comb-filtering. In the absence of an onboard solution, you will need to use an external delay processor on your DI signal to compensate, as suggested in the main text. I'd recommend starting out in the region of 4mS and fine-tuning from there by ear.

Dave Lockwood

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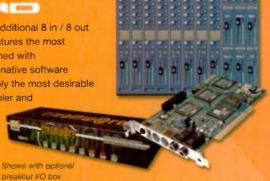
- Six SHARC processors me in XTC effects place no fould on the host CPU (a single SHARC DSP could be compared to a hypothetical 480 MHz Mac G4I)
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parameters within other ASIO-compatible

fire

**Paul White** tests MOTU's new FireWire-based multi-channel audio interface for Mac or PC.

48V phantom power,



A Mac multitrack audio recording application called *AudioDesk* is bundled with the interface.

In a nutshell, the 828 unit is a mains-powered, 1U rackmounting audio interface for MacOS or Windows that can handle up to 18 simultaneous inputs and outputs at either 16- or 24-bit resolution. These are configured as eight analogue connections, two optical digital connections that can be used as either ADAT or TOSLink ports, and a pair of phonos dedicated to S/PDIF in and out. Connection to the computer is via a single FireWire cable and, like all FireWire devices, the 828 can be hot-plugged. No PCI card is needed.

All the analogue line out connections and six of the inputs use balanced TRS jacks operating at +4dBu and these are all serviced by 24-bit converters. The remaining two inputs are on Neutrik combo XLR/jacks, enabling them to accept line-level or mic-level inputs. Both XLR inputs have



The 828 connects to the host computer via FireWire, and offers ADAT 9-pin Sync, co-axial S/PDIF and optical digital interfacing as well as its analogue I/O.

with a maximum gain of 40dB. This is less than the mic amp gain of a typical mixing console, but adequate for normal vocal recording or instrument close miking. The other analogue inputs have level controls that operate as pairs 3/4, 5/6, and 7/8. The analogue inputs use very nice-sounding 24-bit, 64x oversampling converters, while the outputs use 128x oversampling. Sample rates of up to 48kHz are supported but 96kHz has been

switchable as a pair, and both have gain controls

omitted to keep the cost down and also,
presumably, not to place too much of a bandwidth
burden on the FireWire link.
Included in the design is a through monitoring
system called Cuemix Plus for polatency.

system called Cuemix Plus for no-latency monitoring of input signals when recording or overdubbing, though with modern computers. latency will often be so low as to be insignificant. Outputs 1 and 2 are also fed to a further pair of balanced jack outputs for monitoring, and if Cuemix Plus is being used, the selected input (or input pair) is summed with the main outs. A front-panel Main level control adjusts the level of the main outputs, and there's a separate control to adjust the Monitor signal level. Two rows of eight LEDs monitor the audio input and output activity for the first eight channels, but there's no metering as such - that is generally taken care of by the host software. Additional LEDs monitor the S/PDIF input and output status, the optical in and out status and the clock rate.

Also fitted are an ADAT 9-pin Sync connector

#### **MOTU 828 £795**

#### pros

- Comprehensive audio interfacing options, including mic amps and through monitoring.
- 9-pin ADAT Sync supported with ASIO 2-compliant host software.
- Doesn't need a PCI slot.
- Works with G4 Cubes, iMacs and FireWire-equipped laptops.
- Hot-pluggable.

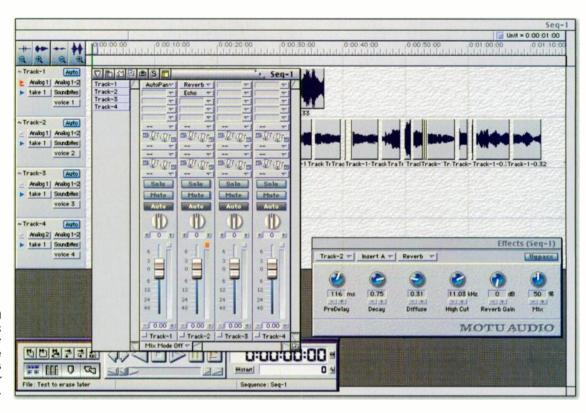
#### cons

• Mic amp gain a bit on the low side.

#### summary

The MOTU 828 is a high-quality audio interface offering analogue, S/PDIF and ADAT connectivity combined with the convenience of FireWire. It also includes a pair of mic amps and an integral monitoring system making it a true one-box solution.

SOUND ON SOUND



The bundled AudioDesk multitrack recording software for Mac is based on the audio part of MOTU's Digital Performer sequencer.

(see box) and a footswitch jack, which can be configured to two different sets of keyboard commands, one for opening and one for closing. This is included primarily to provide hands-free punching in and out, but can be reconfigured to control anything that is accessible via a keyboard key command. There's also a headphone jack for monitoring.

#### Installation

The 828 comes with an ASIO 2 driver plus support for MacOS Sound Manager, for the benefit of those who want to use it with iTunes or listen to audio CDs via the interface. The Mac AudioDesk software that comes with the 828 is based on the audio side of Digital Performer, and is actually a very nice stand-alone multitrack recording application. I suspect that most people will want to use the 828 with their own choice of software, but AudioDesk is a very useful extra to have thrown in. Installation is from CD-ROM and during installation, you're asked where the ASIO driver should be placed. My tests were done using my own Mac G4 system and installation was both simple and uneventful once I'd got hold of the

prompted by the installation software).

To make use of the 828 on a Mac, the

correct version of the FireWire enabler (as

To make use of the 828 on a Mac, the computer should be a 300MHz or faster G3 or G4, with at least one FireWire port and FireWire Enabler 2.4 or later. You can use MacOS 8, but OS 9 is recommended. PC users need a 300MHz or faster Pentium-based machine with at least one FireWire port, and a PIII running Windows 2000 or Windows ME is recommended.

Once installed, the 828 options are accessed by means of a small Control Panel window where you can set the optical ports to ADAT, TOSLink or Off and set the sync status to internal, S/PDIF or ADAT 9-pin. It's here that you also set the key combinations to be triggered by the footswitch, the 'samples per buffer' size and the sample rate. The 'samples per buffer' size determines the latency, with smaller values equating to lower latencies. A buffer setting of 512 equates to 23 milliseconds, which is just high enough to affect the feel of a performance, but I had no problem with a setting of 256 or even 128, which brings the latency down to the point where the vast majority of people can't perceive it. Where your system latency is too high for comfort, 'through monitoring' is an option when recording audio tracks (although you won't be able to hear the effect of any plug-ins as you record), but it obviously doesn't work for virtual instruments.

The pedal input and Sound Manager support are both enabled via tick boxes, and a further window allows a monitor input source to be selected for use with Cuemix Plus. When the optical input or output is set to TOSLink, the S/PDIF phono connector will not be available for selection, as only one S/PDIF port can be active at

#### **ADAT Sync**

In addition to its audio I/O, the 828 features an 9-pin ADAT Sync connector, but be aware that this only works if the host application fully supports the ASIO 2 protocol. Most of my tests were done with Emagic's Logic Audio, which doesn't, so the only way to lock up an ADAT in this case is via MTC or SMPTE, which requires an Alesis BRC, a JL Cooper SyncLink or a MOTU MIDI

Timepiece. You can transfer data to and from an ADAT using Logic and an 828 with no problem — it's just the sample-accurate location that doesn't work. When I used the included AudioDesk software, however, I got it to lock to the 9-pin sync and follow the tape counter position with no problem, and Digital Performer and Cubase VST should do the same.

#### **MOTU 828**

a time. Note that you can only make changes in the Control Panel window when the host application is not running — I tried this with Logic Audio, and once Logic grabs the ASIO driver, you can't make any further changes to the I/O configuration or sample rate until you quit Logic.

Unlike MOTU's 2408, which also doubles as an audio routing system, the 828 is very

#### **Conclusions**

This has turned out to be a relatively short review because the 828 is one of those 'does what it says on the tin' products that just gets on with the job without fuss. The bundled *AudioDesk* software (which also includes some good-quality plug-ins) is easily powerful enough for Mac users who need



straightforward: it simply gives you 18 inputs and outputs, the eight analogue channels numbered 1 to 8, the S/PDIF 9 and 10, and the ADAT channels 11 to 18. These are accessible from within the host application and any routing is done there in the same way as with any other audio interface. Once the 828's ASIO driver is selected in the host application, its inputs and outputs appear in the list of available selections in that software. On those pieces of software that are fully ASIO 2 compliant, ADAT 9-pin Sync appears as one of the sync options.

#### In Use

Once I'd installed the drivers and configured the Control Panel, the 828's I/O options appeared as choices within Logic Audio, after which the program ran normally. I made some test audio recordings and listened carefully to the playback to make sure there were no glitches — which there weren't - and found the overall audio quality was extremely good. I then went on to try the S/PDIF input with a 16-bit feed from the back of my DAT machine. This meant setting the Control panel to S/PDIF sync, after first quitting Logic to allow access to the Control Panel, and I also found I needed to set the sample rate value in both the 828 Control Panel and in Logic. This may be an issue with other software too, so don't just assume that once the driver is configured correctly, everything else is. Again the S/PDIF inputs were piped in smoothly with no glitching problems.

As an ADAT user, I checked the system's ability to transfer eight ADAT tracks at a time at 48kHz, which it did with absolutely no problem. In *Logic*, the audio moved across fine, but without the benefit of 9-pin sync time location, as was expected. Doing the same test in *AudioDesk* showed that the time cursor followed the ADAT tape location whenever 9-pin was selected as the sync reference.

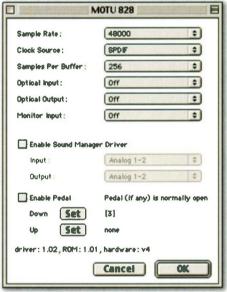
Recording vocals and wooden flute via the mic amps again demonstrated that serious design attention has been paid to sound quality, though I felt a little more mic amp gain might have been useful for the benefit of anyone working without a sensitive capacitor microphone or when recording quieter sounds.

multitrack audio recording without MIDI, but my guess is that most users will buy the 828 to run with software they already own. The fact that not all audio software fully supports the ASIO 2 protocol may mean that you can't use the ADAT 9-pin Sync for sample accurate location and synchronisation, which is regrettable, but that's hardly a problem of MOTU's

It is fairly obvious that MOTU are targeting the Digi 001 market as the 828 offers similar I/O facilities (although there's no MIDI port), is similarly priced and it comes with bundled multitrack audio software. However, the addition of ADAT 9-pin Sync and FireWire connection extends the flexibility of the interface considerably, and widens the market to include 'slotless' Mac owners. The inclusion of monitoring and mic amps (which the Digi 001 also offers) also provides a means for the serious user to run an 'all-soft' system without needing a mixer or separate mic preamp.

The audio quality of the unit is commendable, and though it doesn't support 96kHz, it's my contention that there aren't more than a dozen or so studios in the world that can exploit the full benefits of 96kHz recording. and I think I'd be safe in saving they'll probably choose something much more expensive than the 828 anyway! Instead, it provides a real-world solution to a real-world need, and in addition to providing a means for all those G4 Cubes and fast iMacs to function as serious desktop studios, it can also be used with more conventional Macs and PCs to free up another valuable PCI slot. In another context, the combination of an 828 and a G4 PowerBook could form a killer portable recording system. This is a very welcome new product which does its job without fuss, and the extent to which it is already back-ordered shows just how desperately it was needed! 503

All eight of the 828's analogue outputs, and six of its inputs, are on quarter-inch jacks. The other two inputs are on Neutrik combination XLR/jack sockets, and connect to high-quality mic preamps.



The Samples Per Buffer setting allows you to adjust the latency when recording with the 828. There's also a 'zero-latency' through monitoring option.

in	formation
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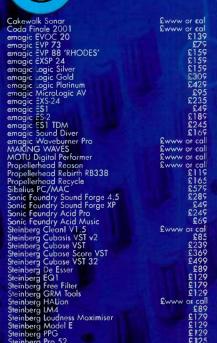
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AMTECH AGE PRO

# age concern



he Age Pro from Swedish manufacturer
Amtech is a specialised mono echo unit
designed to emulate the vintage tape-loop
and magnetic disk guitar echo machines of
yesteryear. The unit's all-analogue circuitry uses
old-fashioned charge-coupled devices to simulate
the sound of up to five tape replay heads — except.
of course, without the excessive background noise,
head fouling or snapping tapes!

#### **Virtual Tape Heads**

The Age Pro's input is designed to match a guitar output (though it also works with synths and other line level sources of up to 400mV in level) and an Input Gain control allows different sensitivities of guitar pickups to be accommodated. A line input is also provided alongside a duplicate instrument input on the rear panel, and a 12-segment LED bargraph meter monitors the input level. The Input Level control adjusts the amount of signal being fed to the delay circuit. Output is via two quarter-inch jack outputs, one providing an effect-only feed, while the other provides a mix of direct and effect sound set by the front-panel Echo Level knob.

The timing relationships between the five 'virtual' heads are, necessarily, fixed, but the overall echo speed can be controlled from the front-panel Speed knob to produce proportionally longer or shorter delay times, and a Repeat knob effectively sets the delay line's feedback level — at the maximum Repeat setting the unit stops just short of going into self-oscillation. The Tone control tweaks the frequency content of the delays, and settings somewhere under halfway get the most authentic results. Emulation of the wow and flutter of older tape echo units is present in the form of a Flutter knob, which introduces small pitch modulations which are a vital part of the vintage sound.

The tape-head switching is done by means of the Mode knob. This has eight positions where settings one to six offer preset configurations of delay patterns. In position seven, five LED-equipped buttons (marked T1 to T5) can be used to turn individual virtual heads on or off to create rhythmic repeating patterns, while position eight enables the user to set up a custom echo effect using five delay level trimmer pots on the rear panel.

There are also two pedals included with the unit

Paul White tests a specialised analogue delay unit, designed to emulate the unique warm sound and complex echo patterns of its vintage, tape-driven ancestors.

— a footswitch and a variable pedal. The footswitch plugs into the variable pedal, and that then connects to the Age Pro's rear-panel footswitch socket.

A front-panel control called Pedal Low sets the level of echo that is allowed through the system when the footswitch is in its off position. When the footswitch

#### AMTECH AGE PRO Guitar echo unit



is on, the variable pedal may be used to adjust the delay level between the Pedal Low setting and maximum.

#### Conclusion

The Age Pro is obviously aimed primarily at the guitar market, especially the sector that hankers after creating authentic Shadows, Ventures and surf sounds. To confirm this, an included sheet lists echo and Strat pickup settings for 22 popular Shadows hits! There's even mention of a publication called *The Ultimate Echo Book*, which provides even more comprehensive echo settings...

Even if you're not particularly a Shadows fan, the Amtech Age Pro still has a lot to recommend it. For a start, it's a lot quieter than its predecessors, with a healthy residual noise figure of -70dBA. But in spite of this more modern spec, it does manage to capture the essential sound of those old tape units pretty accurately, providing an especially nice rounded tone. I'm not sure that the actual delay sounds are any more authentic than the modelled tape delays in the Line 6 Delay Modeller, which is rather cheaper in the UK, however, that particular unit doesn't have five delay taps, so the Age Pro still ought to find a market — especially amongst the true Shadows fans and those keen to maintain an all-analogue guitar signal path.

#### **AMTECH AGE PRO £795**

#### pros

- Authentic multi-head tape echo
- · Easy to use.
- Foot controls included.

#### cons

- Relatively expensive.
- Delay times not programmable.

#### summary

A niche product that does what it sets out to do very well indeed. Not the most cost-effective general purpose delay box, but great for that vintage guitar sound.

SOUND ON SOUND

#### information

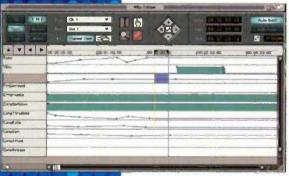
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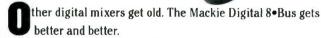
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#### YAMAHA DX200

It looks like a groovebox, but inside it's a powerful FM synth, fully editable via bundled software.

#### Derek Johnson & Debbie Poyser

modulate those frequencies...



# classic

### YAMAHA DX200 FM SEQUENCING WORKSTATION

fm?

ven when you thought FM synthesis had gone away, it hadn't. There were several years during the '80s when you couldn't turn on the radio without hearing the distinctive clangy bells, upfront basses and unrealistic yet somehow appealing brass sounds that digital Frequency Modulation is so good at. But eventually sample-based synthesis overtook FM in the mainstream, and analogue began its return to pre-eminence via the dancefloor. FM synths, like the analogue 'dinosaurs' of a few years before, littered the free ads, becoming the cheap instruments of synthdom.

And we all know what happens then. When synths become old and cheap, impoverished musicians pick them up and turn them to their own ends, and eventually they're rehabilitated as a source of trendy 'new' sounds. It happened with analogue, and to a lesser extent (perhaps because of FM's legendary resistance to programming), it happened with FM too. FM basses, in particular, became a staple of certain dance music styles. Yamaha's investment in Frequency Modulation technology continued to look safe.

It's still looking safe, with the launch of the first stand-alone FM synth in almost 10 years, the DX200. (We disregard 1998's FS1R, which was marketed as an eight-operator formant synth.) Not that you'd immediately identify the 200 as FM, despite the

small 'FM Synthesis' screened next to the name of this knob-laden groovebox. The sound-generating powers of FM (in this case derived from the engine on one of Yamaha's PLG150FM plug-in boards, which lies at the heart of the DX200) have been married to a tricksy four-track analogue-style sequencer, simple effects and sample-based rhythm sounds, to produce a very cool-looking box in Yamaha's 'Loop Factory' series. It's partnered in the same range by the SU200 groove sampler (reviewed November 2000) and the similar AN200 physical modelling sequencer workstation, reviewed in last month's SOS. The DX, though, can be used simply as a fully editable polyphonic sound module, or in groovebox mode with three rhythm parts and a monophonic synth part.

What FM synths lacked in the '80s were real-time editing knobs, and these the DX200 has aplenty. They're the key to how the DX200 makes FM approachable, allowing fundamental parameters to be edited with simple knob tweaks. Sonically, too, this is FM with a difference, because Yamaha have added a modelled emulation of a voltage-controlled filter (VCF) that lets you shape an FM sound as though it was an analogue one. And the more ambitious can still access the full depths of FM sound creation, because inside the DX200 is a six-operator FM engine, editable via the bundled Mac/PC editing software. In DX-style FM synthesis, operators are the equivalents of oscillators, are either designated Carriers or Modulators, and are arranged in an Algorithm — for more on all this, see the 'Bluffer's Guide To FM' box at the end of this

#### Overview

Yamaha manage to cram a lot into the DX200's foolscap-sized front panel, yet the impression isn't of

#### YAMAHA DX200 £450

#### pros

- FM made easy, with lots of editing knobs.
- A great sound character that's different to other current instruments
- Resonant filter.
- Good value for the facilities.
- Superb free editor unlocks the synth's full power.
- It can load DX7 patches (many are available on the Internet).

#### cons

- Limited effects.
- Playback tricks can't be recorded spontaneously (unless you have a recorder running...)
- EQ only accessible via software

#### summan

A self-contained little groovebox packing a big sound and a big feature set. Expect to hear a lot more of FM's unique aural signature when the DX200 hits the shops.

SOUND ON SOUND

a cramped control layout. The main display is a fourcharacter LED, with a matrix of nine labels, such as Song, Pattern and Beat, to its right. The currently lit label indicates what the display relates to at any one time. Below the LED panel is a group of related buttons, plus a data knob that edits the values in the display. The panel's main section (Voice) hosts all sound editing knobs and buttons, including an LFO section, a set of envelope generator (EG) controls (routable to either the filter or the separate amplitude EG), a VCF section, an Effects section, and a set of FM-specific editing knobs. Below all this is the Keyboard section, 16 numbered keys which can be played like black and white notes on a real keyboard. These keys also allow sequencer steps to be entered, as well as acting as shifted Song. Pattern, MIDI and Utility controls. Finally, there's the Control section at the bottom left, which hosts sequencer controls, including transport buttons.

The simple back panel features MIDI I/O (no separate Thru), a headphone jack, stereo jack audio output, external PSU input and a power switch.

#### The Synth

As already mentioned, when used with its built-in sequencer facilities the DX200 is a monophonic synth with three additional monophonic rhythm parts, although when accessed via MIDI, it's capable of generating 16 simultaneous notes of synth voices, plus up to 32 simultaneous rhythm sounds.

Synth voices are saved with sequence data as Patterns, and the DX200 comes with 256 of these preset (see 'Bring The Noise' box opposite for comments on these), plus 128 user slots. To create an original voice, you select a user Pattern, then commence building the sound, first choosing an FM algorithm on which to base it (once again, refer to the 'Bluffer's Guide' box if you're lost). Different algorithms create sounds with different characters, and some are better for making certain sounds than others. Just like the venerable DX7, the 200 offers 32 algorithms to choose from, but making the choice is down to experience; noticing which algorithms are used by the Yamaha presets you like (or are closest to the sound you want to make) is a good start.

The following facilities can then be set up for your sound:

#### LOW FREQUENCY OSCILLATOR

There's a choice of six LFO waveforms (triangle, up/down sawtooth, square, sine, sample & hold) and a routing parameter to assign the LFO to modulate pitch, amplitude and/or filter. Speed control is via a dedicated knob.

#### **ENVELOPE GENERATORS**

There are two of these, of the standard ADSR (Attack, Decay, Sustain, Release) type, to determine how the sound's amplitude and filter contours change over time. Each stage has a dedicated knob, but there is only one set of ADSR controls for both envelopes. The Filter and Amplitude EGs can be selected simultaneously, for quick tweaking if the sound doesn't need separate filter and amplitude contours.

#### VCF

The filter is a resonant device with cutoff frequency and resonance knobs, plus a Filter EG depth control with both positive and negative movement, so that inverse envelopes can be applied to the filter (these make the filter close over time instead of opening). Six filter characteristics are available: 24, 18 and 12dB low-pass, band-pass, high-pass or band-eliminate — typical of an analogue synth, but unusual and most welcome on an FM instrument!

#### **PORTAMENTO**

For creating glide effects. This is editable via a dedicated knob.

#### KEY ASSIGN

This mode selector button allows you to determine whether you play the DX200 monophonically or polyphonically. This might seem odd on an instrument that's essentially monophonic when used with the built-in step sequencer, but polyphonic voices behave differently to monophonic ones (the decay of one note will still sustain when another is played, if required), and of course the mono/poly options are valid when playing the DX200 over MIDI; in this situation the mono option lets you play bass and lead sounds as if they were being generated by an old monosynth. A Unison option for both modes stacks up and detunes four voices of polyphony for a fatter sound, albeit with only four-voice polyphony in Poly Unison mode.

#### **FM MODULATOR CONTROLS**

So far, we've come across little, other than the presence of 'algorithms', to indicate that this is an FM synth, but the FM Modulator knobs change all that, accessing a range of FM-specific parameters (of course, since these are still accessed by knobs, there's no need to tangle with FM theory if you don't want to - you can just tweak until the desired result is obtained). Basically, when used from its front panel, the DX200 offers the user less control over the Carriers and Modulators in the FM algorithm than in classic old-style FM: there's some choice of Modulators, but then the influence those Modulators have over the Carriers is governed by just three knobs, labelled Harmonic, FM Depth and FM Decay. Decay is a simple envelope, controlling how quickly or slowly the modulator's level (and its effect) fades out. Harmonic controls the frequency of the preset selection of modulators, and FM Depth their level. In concert, the three knobs determine how subtle or obvious the frequency modulation effect is. If it's more obvious, the sound will be clangorous and metallic, but in general, careful use of these controls helps add movement and depth.

#### NOISE OSCILLATOR

This adds one of 16 types of noise to a sound. Yamaha suggest that this is good for 'dirtying up' a waveform, but it's a fairly basic facility that can't be used as a modulation source. It can, however, add a noise attack to a sound, as in wind instrument or percussion simulations.

#### EFFECTS

A simple, single processor is on offer, featuring a handful of delays, flangers, phasers, overdrive/amp effects, plus a chorus and a reverb. There's little



Tweaking the cutoff parameter of the DX200's resonant filter.

#### Bring The Noise: Preset Patterns

Over 250 preset Patterns is a lot. and playing with them could keep some people amused for ages. transposing them in real time. tweaking knobs, reversing on the fly, switching between them, and so on. The immediate impression. though, is that Yamaha's programmers were trying hard to achieve street cred; there are a lot of aggressive and hard, or strange and impressionistic sounds and sequences. That said, you can dig further, and discover Patterns with bloopy and filtery textures, and even an impression of warmth and fuzziness that almost makes you forget that the DX200 isn't an analogue (or analogue modelled) instrument.

One thing that impresses across the board is the feeling of bass given to the presets: there is a pleasingly dubby feel to the DX200's bottom end. The rhythm kit features a dizzying selection of sounds, 121 in total: three flavours of bass synth sound, 15 bass drums, 14 snares, several toms, hi-hats and rim shots, plus tablas, Latin percussion and scratches. The variety should be applicable to many musical and dance styles. Non-percussion, non-bass sounds include various stabs and hits, synth waves, zaps and so on.

#### YAMAHA DX200

editability — just a send control to the effect, and one additional parameter, such as delay time for the delays. The effects sound OK, but you find yourself wishing for more.

In addition to the main effects, there's a switchable Distortion effect, available solely to the synth voice; the only control over this is how much is applied, from a fairly subtle dirty edge to a singing, compressed, guitar-like sustaining grunge.

Your edited sounds, as mentioned above, have to be saved with their respective Pattern. Avoid the Scene knob if you've not yet saved your voice, as an inadvertent tweak can completely blitz your edits. This knob, along with its two associated buttons, hides a neat facility: to store two versions of a sound and either switch between them with the buttons, or morph between them by turning the knob. The Scene facility was also offered by Yamaha's recent CS-series synths, but the morphing ability is new, and great fun to use. It also expands the user memory, in effect, as two versions of all 128 user sounds can be stored if you use it.

#### The Sequencer

The DX200's step sequencer offers four tracks of eight, 12 or 16 steps each, with each step able to generate either three or four events: the ones that can be applied to the Synth voice are Pitch (MIDI note number), Gate Time (note length) and Velocity. The three Rhythm voices have a additional option: Instrument Select, for assigning one of 121 drum, percussion, bass and sound effect samples to a step. Since each step in a Rhythm voice can still be assigned a Pitch, you can use Rhythm voices to create melodic material — bass lines, for example — alongside the Synth voice and whatever Rhythm parts you've created, expanding the DX200's versatility. Each Pattern track can also have its own Level and Pan value, set in friendly fashion by knobs.

Accessing these many parameters involves a certain amount of mode switching, so various controls have multiple functions. For example, the eight knobs immediately above the keyboard tweak synth parameters during synth editing, but during sequence creation they become step parameter value knobs. Because there are only eight, they're switched in two banks, so that the user can alter parameters for all 16 steps, and further switching allows the knobs to alter the three or four parameters available to each step. You soon get the hang of it. A handy shortcut makes it possible to quickly change one parameter on multiple steps, useful for moving a parameter's value into the right ballpark, or setting all steps in a Rhythm Track to the same Instrument.

A real-time Pattern-record option is also available, complete with metronome, count-in and looping overdub (plus the option to shift the DX's keyboard over the full MIDI range). The only real frustration with this option is the 16-step limit. Sequence or voice data can be copied from one Pattern to another, but not, sadly, between individual tracks.

#### Going Soft: The Cross-Platform Editor

The supplied DX200 Editor is well designed and easy to use. It features three main screens (Voice, Free EG and Step Sequencer editors), subsidiary windows offering librarian functions, and a bonus DX7 edit screen for creating and auditioning voices with a graphic representation of that venerable synth (and loading DX7 patches). A large collection of sounds from Yamaha's PLG150DX board, from which the

DX200 is derived, is also included. All front-panel parameters can be edited, plus many more. Here's a rundown of what's available only in software:

#### VOICE EDITOR

The biggest addition here is the complete set of FM parameters, as featured on the DX7, with all six operators fully configurable. Frequency, tracking mode, the four-stage envelope generator (with level and rate for each stage), level scaling and rate scaling are all editable. A pitch

EG is also editable in software, and all EGs (including the filter EGs) can be edited graphically. Another window shows the current FM algorithm, with feedback control. There are more portamento and key mode controls (the Detune parameter in unison mode is particularly useful), and a random pitch parameter allows you to introduce a little, or a lot, of pitch variation, in unstable analogue synth fashion. In the editor, the VCF benefits from an input gain control and cutoff scaling (the filter EG also offers velocity sensitivity), and the Distortion effect becomes completely configurable, with a choice of 'amp' types, drive,

low-pass filter frequency and output level. The LFO gains delay, mode and sync parameters. Completely missing from the DX200's hardware controls is a two-band EQ that can be edited by software: this offers low (32Hz-2kHz) and mid (100Hz-10kHz) bands, with +/-12dB gain, and a Q control for the mid band. Patterns can also be named for librarian purposes,

though this name isn't visible on the DX200 itself, due to display limitations.

#### • FREE EG EDITOR

No major additions here, just a helpfully large graphic representation of the parameter moves on an X-Y axis, plus the option to draw them manually and easily assign an EG plot to a DX200 parameter (see below). The four EGs are



colour-coded, so it's easy to keep track of their plots. The editor also allows Free EG length to be set in seconds as well as bars.

#### • STEP SEQUENCER EDITOR

The main benefit of this editor is that all steps and parameters for each track are visible in one window. It's in this window, also, that the track mix parameters are edited, as well as the effects. As Chris Carter noted in his AN200 review in last month's SOS, the effects are no more editable with software than they are from the DX200 itself, which is a shame.



The main Voice Editor window, showing the many parameters that can be edited in depth, particularly the FM algorithm operator parameters on the bottom third of the screen.

#### Play It Again

Some great playback facilities can be applied to Patterns once they've been recorded. At the press of a button, a Pattern can be reversed, which is most enjoyable. You can also double or halve a Pattern's tempo, apply a variable Swing for a triplet feel, give an entire Pattern a +/- 24-semitone pitch offset (this affects the Synth track and the Rhythm track bass sounds), mute/unmute Pattern tracks, and shorten or lengthen all notes on all tracks in a Pattern with a gate-time offset. Retrigger and roll effects, made

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#### YAMAHA DX200

popular by some dance idioms, are also available: the former continuously restarts the Pattern, and the latter creates a guarter-, eighth- or 16th-note roll on the synth voice while the Rhythm parts carry on playing. Patterns can also be rotated forward or backward, so that they start on a different note; this can't be done during playback, however.

The 'Beat' facility allows you to designate a new number of steps for a Pattern after it's been recorded. For instance, chopping four or eight steps off a 16-step Pattern causes the remaining steps to stretch to fit the same time scale — so a 12-step Pattern plays four beats of eighth-note triplets, and an eight-step Pattern plays a bar's worth of eighth notes rather than 16ths. This facility won't suit every Pattern, but it can create a good effect.

Finally, Patterns can be assigned to 12 of the individual keyboard buttons and triggered live in any order. Shifting the keyboard over a three-octave range allows up to 36 Patterns to be triggered.

These Pattern manipulation options are essentially meant for live performance, but in Song mode some of the same effects can be programmed by selecting the desired events to occur on any of a Song's Pattern steps. A Song is a chain of up to 256 steps, with each step able to contain a Pattern and various playback settings: these comprise pitch offset, reverse, beat mode, swing, gate time, track mute, and a tempo value. The last facility means songs can jump from very slow to hyper-fast (the tempo range is 20-300bpm). There's memory space for 10 Songs.

And there's more: it's possible to record the movements of up to four synth voice parameters into a Pattern, using the DX200's 'Free EG' (great feature, odd name!). Once a synth track has been recorded, you can go into Free EG mode, select a length (up to eight repetitions of the current Pattern), choose a Parameter and then record knob-driven changes to that parameter. Free EG playback length can be changed after recording, so tweaks recorded over a bar could be stretched to the full eight bars.

The DX200's MIDI spec is quite advanced, and most of its knobs and buttons transmit MIDI data which can be recorded into an external sequencer these knob movements are transmitted whether you use the DX200 as a groovebox or a sound module (also, all the 'knobbed' parameters, and the many hidden parameters normally accessible only via the editor, can be altered over MIDI, from a MIDI mixer map or hardware controller). The DX200 lacks a Local Off mode, though, so be careful how you set up the target sequencer, to avoid recording the wrong data or tweaking the wrong tracks. Also be aware that there are two modes for transmitting and receiving MIDI data, one of which bizarrely disables a number of knobs. Of course, the DX200 can be a MIDI sync master or slave.

MIDI data that's not transmitted, sadly, includes the real-time Pattern-manipulation options discussed above. Incidentally, the DX200 can dump its memory contents over MIDI, so if you don't have a PC or Mac you can save to a MIDI data filer, or use a generic SysEx librarian if you work

#### A Bluffer's Guide To Frequency Modulation

FM synthesis as practised by Yamaha is not as hard to explain as you might imagine (and the DX200 manual has a chapter on the theory). A set of six sine-wave generators (known as Operators) is organised into Algorithms, which determine how the sine waves interact. Operators are classed either as Carriers or Modulators, where a Carrier produces a sound and a Modulator interacts with a Carrier to change its pitch or timbral output. One Modulator in each Algorithm also has a feedback option, allowing it to modulate itself for more complex timbral change. All Operators have a range of parameters, including pitch, a multi-stage envelope generator and keyboard

level scaling. The interplay of Carriers and Modulators creates the potential for a type of complex, dynamic sound not possible with the majority of subtractive synths.

FM's sonic signature, once heard, is unmistakable: mention its electric piano, hollow bass, and tuneful, clangy bell simulations, and you'll pass muster in synth circles. FM can be precise, digital, and bright, with a tendency to harshness and over-brightness. Though warmth is not a term that would often turn up when describing FM - at least before Yamaha whacked a filter on the DX200 - the system can be tamed sufficiently to manage subtle and delicate sounds.

on another computer platform.

#### **Conclusions**

We wouldn't feel the need to change that much about the DX200, though it would be great if Pattern playback features could be recorded into the onboard sequencer on the fly, or if they transmitted MIDI data for recording into an external sequencer. An arpeggiator would also be good, as would more Pattern steps (though the sequencer wouldn't then be a classic 16-step device), and the effects feel rather undeveloped.

As a sequencing workstation, the DX is fun and very hands-on. Yamaha have implemented some nice operational tricks to help make the most of multi-function controls and limited display; for example, you can easily check the current value of a knob, or its original value before editing, and obtain fine control over parameters by switching from dedicated knobs to the stepped data-entry knob. Honourable mention should also go to the manual, which isn't perfect but adopts an accessible and largely useful 'Tip' format.

Yamaha have done a fine job of making FM tweakable in friendly analogue fashion, yet the DX200 retains the distinctive FM sound character that sets it apart from other new synths on the market. The addition of a resonant filter just makes it more versatile, allowing the creation of a wider range of timbres. The DX200's sonic precision suits it very well to highly rhythmic music, and although some of its preset sounds are quite aggressive and/or strange, they certainly have a place in today's market, particularly among harder-edged styles. However, because the synth's sound engine is so programmable, especially with the help of the excellent bundled editing software, this instrument won't be restricted to just those styles. It's good value for money, too.

Overall, the DX200 is a great instrument which will certainly appeal to a wide range of people, from relative novices (who will love the tactile ease of the workstation) to more experienced synthesists (who will be able to explore its sonic corners in greater detail with the bundled editing software). Many musicians — us included — would be very happy to own one. 202

"Yamaha have made FM tweakable in friendly analogue fashion, yet the DX200 retains the distinctive FM sound character that sets it apart."



Pattern tracks can be muted/unmuted during playback for instant creation of arrangements on the fly.

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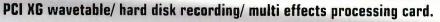
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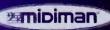
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#### RODE NTK



ustralian mic manufacturers Rode were one of the first companies to push down the cost of owning a serious capacitor microphone, and their range includes a number of rather nice tube models, including the Classic and the NTV. Their most recent addition to this series is the new Rode NTK, a cardioid valve microphone with a one-inch diameter capsule. A Sovtek 6922 dual-triode tube operating in Class A, working in conjunction with some discrete solid-state components, provides the impedance matching and pre-amp gain for the capsule using a modern valve like this means that replacements ought to be cheap and easy to find. The standard of mechanical and electrical engineering is impressively high, and the components, while not being esoteric, are of high quality and are mounted on a robust glass fibre circuit board. The tube itself is held in place in its porcelain socket by means of a plastic spring clip assembly that locates over the 'pip' at its top.

#### Special K

The all-metal housing is meticulously machined and finished, with easy access to the tube

# light Classic

Rode have brought down the cost of their celebrated large-diaphragm valve microphone technology still further with their new NTK model. **Paul White** warms it up.

compartment via a screw-off body sleeve. The dual-layer grille, which seems very tough, is made from heat-treated steel and the capsule itself sits on a shockmount. Though the mic bears more than a passing resemblance to other classic studio mics, it doesn't seek to directly emulate any specific model and there is no frivolous 47 or 87 in the title. A satin nickel finish augments the classic appearance, with a gold-plated stud indicating the 'hot' side of the capsule.

A simple mic stand adaptor comes with the mic and this locates securely to the base of the microphone via a threaded locking ring assembly. Rode's SM2 shockmount fits the NTK and is available as a cost option. A seven-pin XLR cable connects the microphone to its power supply, and the audio is then fed out via a regular three-pin balanced XLR. The PSU includes a power switch with status LED, ground lift switch, but no pad or filter. The seven-pin XLR and power cables are supplied along with a vinyl carry pouch, but there's no fancy flight case.

Though the paper spec can't tell you much about the sound of a mic, the sensitivity figure of -38dB (ref. 1V/Pa) and an equivalent noise figure of just 12dBSPL (82dB signal-to-noise ratio) shows that this model more than holds its own in those departments. The dynamic range is better than 147dBA and the maximum output can be as high as +29dBu, which explains why no pad switch is needed — you could record battles with this mic! In fact, the maximum SPL is a staggering 158dB, which is some way beyond the point that most people's eardrums would meet in the middle of their head...

Looking at the frequency response curve shows a couple of presence bumps, a small one at around 5kHz and a higher, broader one at around 12kHz. Overall the response is from 20Hz to 20kHz ±6dB.

#### **RODE NTK £700**

#### pros

- · Warm, detailed, expensive sound.
- Sensibly priced.
- Nicely engineered and styled.
- Uses a readily available, sensibly priced modern tube.

#### cons

- No low-frequency cut switch.
- No hard carry case.

#### summary

The Rode NTK is a very serious tube microphone at a middle-market UK price. It is especially suited to vocals and seems to reinforce the character of each singer rather than imposing its own.

SOUND ON SOUND

#### information

- £ NTK, £699.99; SM2 shockmount, £69.95.
- Prices include VAT.

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#### In Use

The Rode NTK lives up to all my expectations in sounding both warm and flattering, yet open and detailed. Every subtle vocal articulation is captured, and though the tube circuitry does seem to make for a slightly larger-than-life sound, its effect is nicely understated insomuch as the end result sounds perfectly natural. The lack of a bass roll-off switch means that you'll need to rely on your mixer or voice channel



Even though neither the NTK nor its power supply offer a pad switch, the NTK can still handle a massive 158dBSPL maximum pressure level.

if you need to engage any low-frequency filtering - you'll certainly need to use a shockmount if you don't have this facility anywhere in the signal chain.

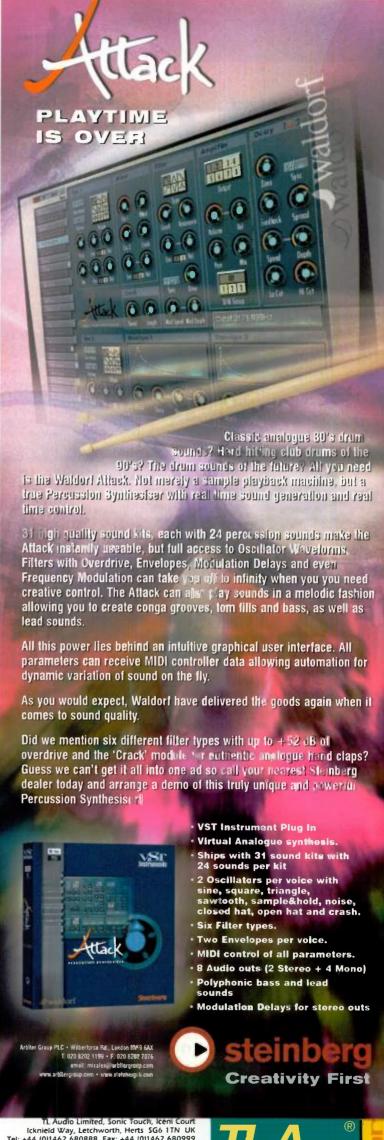
Working with vocals fairly close to the mic allows you to exploit the proximity effect to make the sound even bigger and warmer. The grille seems more than reasonably effective in reducing pops, but for any serious studio work you really should use the mic in conjunction with a pop filter, even if it's only a piece of stocking over a wire hoop. I also tried the mic with wooden flutes and acoustic guitars and found it tackled both with equal capability. Again, it flatters, but in a way that doesn't lead to it being 'found out'. I like it very much! 593

## **Second Opinion**

I had high hopes for the NTK, mainly because I tried and loved Rode's Classic when it was released some years ago. That tube giant, though, cost around £1200 at the time, and this was way more than I could justify on one microphone. Obviously, then, I was hoping that some of the Classic's magic might have rubbed off on the rather more affordable NTK.

I wasn't disappointed. From the outset, the NTK is a lovely mic to handle and is obviously beautifully and robustly engineered. And as for the sound - it's one of those mics that you only have to speak Into to know that it's going to be good. Smoothness, purity and immediacy are three words that instantly spring to mind. Though it has what seems to be a natural quality, there's

some subtle enhancement going on. With my voice I found there was an edge to the sound that I could really work with, emphasising and de-emphasising it by slightly changing the way I was singing — probably something like the way guitarists feel when they've achieved a satisfying 'singing' tone from their instrument. I found the mic helped me with articulation, too, though the flip side of that was a very slight tendency to sibilance. The NTK is not tacking in warmth, but it's far from being muddy or fat-sounding, and the vocal I recorded with it sat beautifully in the mix and really made its mark. Needless to say, I made sure to get a good take done before the mic had to go off to Paul for the main review! Debbie Poyser





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feature

ear training

#### Emagic HearMaster (Mac/PC)

This is a relatively unfussy but effective and comprehensive way to teach yourself to recognise intervals. tunes, chords, scales and rhythm patterns. It has a deceptively simple interface which hides a lot of different features. You can load in pre-programmed lessons, or set it up exactly as you want - so if you're having trouble telling the difference between major and minor thirds, you can concentrate on those until you get them right reliably. While testing it. I found my abilities at the basics improved rapidly, although it wasn't so good at the more advanced areas. It will play tunes instead of just

intervals for you to recognise, and it can teach you some fairly obscure jazz-type scales.

The downside with HearMaster is that it's a little old (last updated in 1997), a little flaky, and will sometimes do strange things like lose all its chord tables, or start speaking to you in German. That aside, it's good value for what you get, and probably the most effective way to run through simpler ear-training lessons.

Emagic's HearMaster is simple and affordable; generally it's one of the better packages you can buy.



- particularly as some of them don't have established names. Being able to recognise them. though, is a very useful skill.

Beyond scales, all music has repeated patterns. These are called either idioms or clichés, depending on how generous you're feeling. Learning them can make your life a lot easier, because you can recognise whole riffs in one go. This is one of the simplest and most useful kinds of ear training you can attempt. If you go through any style of music you like, learn to recognise some of the most common patterns, and then learn to play or sequence them, you'll have gone a long way to mastering that musical style.

A related skill is chord recognition, Being able to tell major from minor is a good start, but ideally it should be just as easy to recognise diminished, augmented, and other more colourful chord patterns. While this may sound daunting, people often find this part of the process is relatively easy. A key point here is that you don't need to spend time learning chords you never use. If you play fairly simple rock or dance arrangements, then major and minor chords, with a few sevenths, will

do just fine. If your interests are more jazzy, you may find yourself heading off into rarely explored harmonic hinterlands that include chromatically altered ninths and elevenths, and other musical esoterica. How far you take this is up to you. While you could spend the rest of your life learning obscure chords, all you really need to do here is learn the chords you're already familiar with in the music vou make intuitively.

As with tunes and riffs, chord sequences also tend to be clichéd. Most people are familiar with the three-chord tricks that are used in a lot of pop and rock. (D, G, and A on quitar, because it's easy to play. Or the 'Phil Collins sequence'; E minor, D, C, D). A bit more listening will show that a few other more obscure sequences and changes are also popular, such as going from minor to major during the chorus of a song. Again, you can make huge improvements in your ability to pick things up by ear just by learning to recognise, and perhaps play, these sequences. It's impossible to stress this enough - ear training is at least as much about learning to recognise common musical patterns that you already know as it is about learning to hear the

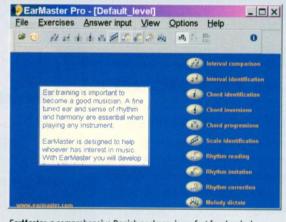
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#### MidiTec EarMaster Pro (PC Only)



EarMaster, a comprehensive Danish package, is perfect for classical students and those who are serious about developing their listening skills.

It's almost a rule of thumb that any software that has 'pro' in its title is anything but. But Earmaster Pro is a very competent package, covering everything from intervals to complex chord sequences, all arranged as graded lessons from the very simplest to the almost impossibly obscure. In terms of content. this is perhaps the most comprehensive package around, as it covers just about everything you might need to know. But the slant is definitely classical rather than rock/pop (never mind dance) and that makes it more appealing for anyone studying for grades or university entry, and not quite so useful for songwriters, or anyone who just wants to bash away on their Strat or Nord Lead.

The main downside is the lack of scope

for customisation. The lessons are pretty much as given, and if they're not what you need, there's nothing you can do. This only really matters with the absolute basics once you get past that stage, the approach seems to work just fine. The other disadvantage is that the software is quite results-driven, and it's easy to feel like you're taking an exam instead of just learning because you want to. On this note, you might find it useful to know that there is actually a slightly more expensive education-oriented version, EarMaster School, which adds better statistics, custom lesson design and network support.

Overall, if you don't mind a fairly disciplined approach, it's an effective teaching aid, and good value too.

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relationships between individual notes in isolation.

You could say that music is like a building; stacking bricks on top of each other is important and stops the whole thing falling down, but it's the overall shape of the thing that matters most. If you can learn to recognise different outlines, working out where the individual notes go gets a lot easier. There's a story told about how the young Mozart was able to listen to a performance and then write down every single note played. Remembering thousands of notes would be impossible, even for a genius; but remembering the overall structure of a piece and using that as a memory aid to work out the rest is just about feasible, especially if you already know enough about the different structures that composers use to be able to pick the one that was used when writing the music. After all, even classical music has accepted structures, and even clichés. Learn those, and suddenly it becomes altogether more approachable.

Finally in the relative pitch camp, there's the ability to deconstruct an arrangement into its component parts, such as bass, vocals, chords, and lead, and identify each part separately. Complex as it may sound, this is really just an extension of the skills I've already mentioned. If you can hear the structure, you can usually fill out the individual lines just by listening to them, even in the densest of

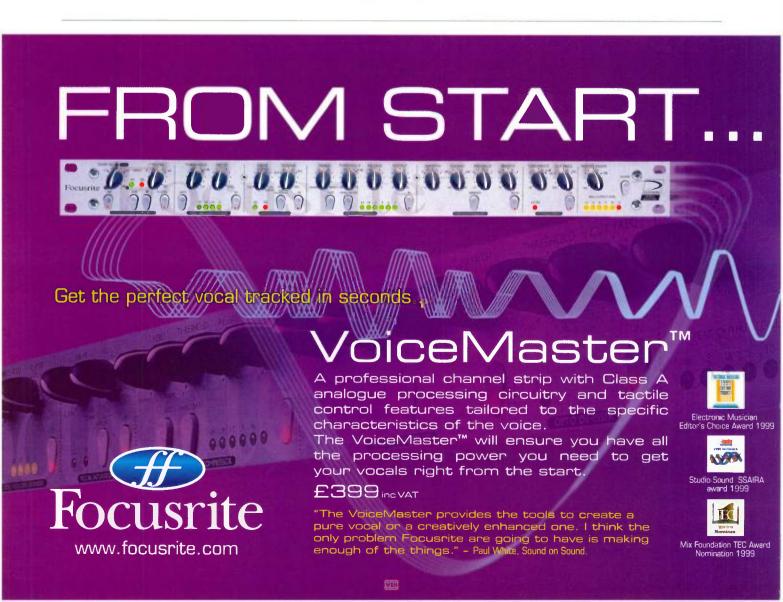
arrangements, where a little guesswork may be necessary.

You may be boggling at this point and thinking this seems like a lot to take in. Isn't it easier just to fire up your home studio and start playing stuff intuitively? Indeed it is, and there's no reason at all to stop doing this. But being able to understand melodic lines and structures opens up completely new kinds of music-making. It also makes it easier to be creative. If you can't hear the big picture (as it were), your songwriting can be a hit-and-miss affair. You've probably heard or recorded demo tracks that sound nearly-but-not-quite impressive, and yet you can't quite put your finger on why. Once you start to understand how successful songs are put together, you're that much closer to making music that people want to listen to. It's true that learning the tricks and the formulas is no substitute for true inspiration, but there's no harm in being able to give your music an edge it wouldn't otherwise have.

#### **Perfect Pitch**

The above skills are all derived from an ability to recognise relative pitch. But there's a different, unrelated ability which can also be extremely useful. Perfect pitch is the ability to hear a note and name it, without reference to anything else. If someone plays an 'A', you can tell that that's what it

"Ear training is at least as much about learning to recognise common musical patterns that you already know as it is about learning to hear the relationships between individual notes in isolation."





is, and not any other note. If you have *advanced* perfect pitch, you can also determine whether that A is correctly in tune, or slightly sharp or flat — again, just by listening to it, without any other kind of pitch reference. It's like having a built-in biological guitar tuner, or set of tuning forks.

The advantage of perfect pitch is advanced musical literacy. The disadvantage can be musical hell. Imagine being unable to listen to music without hearing tiny deviations from perfection all the time. Worse still, imagine having the notes you're playing clash with what you *expected* to hear, such as when playing an incorrectly tuned piano (and pianos are often deliberately tuned a semitone or two flat, partly because they stay in tune longer that way, and partly because old cheap models will very occasionally implode because the frame can't cope with the string tension for correct tuning — not something you want happening in your living room).

Once again, 'conventional wisdom' has it that you either have perfect pitch or you don't, and that it can't ever be acquired. In fact, most people seem to have a rudimentary sense of perfect pitch. Try playing a MIDI-based arrangement in your favourite sequencer, then transpose it to a different key and play it again at the same tempo. Doesn't it sound strangely, inexplicably different? In theory, all the tempo and relative pitch relationships are exactly

the same, so there should be no difference. In practice, just about anyone can tell that something important has changed, not just in the notes, but in the 'feel'. And that's where perfect pitch seems to live for those lucky enough to have it - not in the notes themselves, but in the 'quality', 'vibe', 'feel', or 'colour' of each one (all common examples of the frustratingly vague terms people resort to when trying to express musical ability in words). Some people try to teach themselves perfect pitch by listening to a tuning fork over and over until they remember the tone, and then referring anything they hear to that internal reference. But that's not really perfect pitch; it's more like relative pitch keyed to an absolute frequency. The experience of true perfect pitch seems to be very different.

You can get a hint of it just by playing two different notes on your favourite instrument (if you have a synth, use your favourite patch). Swap between them, and really listen. You may start to hear that not only does the pitch change, but that each note has an indefinable quality about it — it may honk, squeak, squawk, blart, or be smooth and mellow. If you practice recognising those differences, you'll eventually be able to open up that aspect of your hearing, and ultimately recognise individual notes.

That's the good news. The bad news is that



when starting out, perfect pitch is a lot easier to hear on only one instrument - the one you're most used to playing. It seems to take a while for it to develop on other instruments too. The rest of the bad news is that starting to hear this way with any kind of confidence can take you anywhere between six months and two years, depending on how much you practice. Is it worth it? Surprisingly, even just getting a few hints of the experience suggest it can be. Instead of hearing chords, you suddenly start hearing music as relationships between different notes, each of which has its own emotional quality. This can make listening a lot more intense, and a lot more enjoyable. But is it an essential skill? Probably not. Most people, including plenty of professional musicians, both classically trained and otherwise, seem to get by without it. In ear-training terms, it's the icing on the cake, as opposed to the bread-and-butter usefulness of relative pitch.

#### The Dangers Of Thinking Too Much

I started off this article by commenting that most people have some degree of musical ability, even if they don't think they have, and that this ability can almost always be improved by training. If you're of the opinion that you're either born with a good ear or not, you might counter this by commenting that there are plenty of people who like music, but can't sing in tune to save their lives. Surely, the argument goes, these people are simply tone-deaf? Furthermore, there are many obviously gifted musicians around who nevertheless find the process of ear training difficult. Doesn't this strengthen the argument that you're either gifted with inate musical ability or not, and that time spent trying to develop it is time wasted? I'd like to conclude by attempting to explain why I think these arguments are not valid.

Dealing with the second point first — singers and violinists tend to be more aware of pitch than guitarists and keyboard players. A little thought should suggest why. If you're singing, you need to be sensititive enough to hit those notes exactly. Similarly with string playing — no frets on the fingerboard board means no room for error. Guitars are fretted so you can take pitch for granted, at least until you start bending strings. Real pianos, of course, aren't even slightly capable of pitch-bend, so again you can just assume your fingers will play in tune. Synth players who practice their pitchbending technique tend to open their ears while they do it, but most keyboard players just set their keyboard's pitch-bend range as wide as possible and hope for the best.

So, put simply, the ears of some musicians don't have any incentive to open, depending on the instruments they play. But that's not at all the same thing as being tone deaf. Tone deafness is practically a medical condition, and is extremely rare. Most people have some sense of pitch and pitch relationships, although usually their ability is rudimentary and doesn't start working properly until it gets some practice. And as for singing —

## EarTraining.com Relative/Perfect Pitch Supercourses (CD/Cassette-based Course)

We cynical Brits may be unimpressed by the bad photography, cheesy intros, dodgy voiceovers and general commercial shininess of these two American CD courses. But if you can get past the camp and the glitz, they offer an interesting alternative to software-based instruction.

Coming on a sizeable pile of CDs, both include the kind of information you'd normally only get from a teacher. Where software checks how well you're listening, tuition tells you what to listen for. This can make all the difference between stumbling around and

stumbling around and making real progress.

Both courses follow the same format. There are two lessons per CD, each of which starts with an entirely skippable and pointless introduction. before getting into the meaty stuff, which is mostly teacher David Burge telling you things you need to know, followed by some exercises. For US\$139, the Perfect Pitch course takes you from the basics of listening to being able to hear the subtle differences that can help you recognise absolute pitches. The more advanced levels help you with fine-tuning and intonation, so you

can recognise not only absolute note values, but also whether they're precisely in tune or not — a useful skill for anyone who makes music, and damn-near-essential for anyone who sings, or tries to.

The main issue with the course isn't the money involved — \$139 isn't all that expensive, considering what you get — but how much time you have to put in. It only takes a few minutes a day, but realistically, no one is going to finish this course in less than six months, and you could still be learning a couple of years down the line. Also, there's no guarantee that you'll have

perfect pitch at the end — although I'd be very surprised if anyone finished the course without much improving their ability to recognise all sorts of musical details.

The Relative Pitch course (which for some reason isn't advertised on the company's web site) follows a similar format, but takes you through just about every chord shape and interval used in music today. This is far more comprehensive than any of the software courses. It's useful for anyone, but possibly



EarTraining.com's CD/cassette-based training courses are more camp than a field at Glastonbury — but there is a course to help you develop perfect pitch as well as relative pitch.

more so for jazz/funk/obscure players than people heading in a classical direction.

Is it worth it? 349 dollars (the cost of the Relative Pitch course) is a hefty price tag, and looked at objectively, you'll get better value from one of the software packages. But if you can spend this kind of money without wincing, then yes, it's worth it, as you get the next best thing to personal tuition.

If you don't like either course, there's a 40-day money-back guarantee. There are no electronic commerce facilities on the web site, so you have to phone or fax the US to order, or use unsecured email.

teaching people to relax and lose their self-consciousness sorts out a surprising number of pitching problems.

Something similar applies to ear training. Pitch recognition works best when it isn't filtered through the conscious mind. Most people's musical instincts are sound, but they get swamped by a counter-productive tendency to analyse and understand what they're hearing — which is actually the opposite of what ear training is supposed to be about. Getting your analytical mind to shut up is hard work, but when you do, you'll likely be amazed at how much more you can hear, and how different everything sounds.

#### information

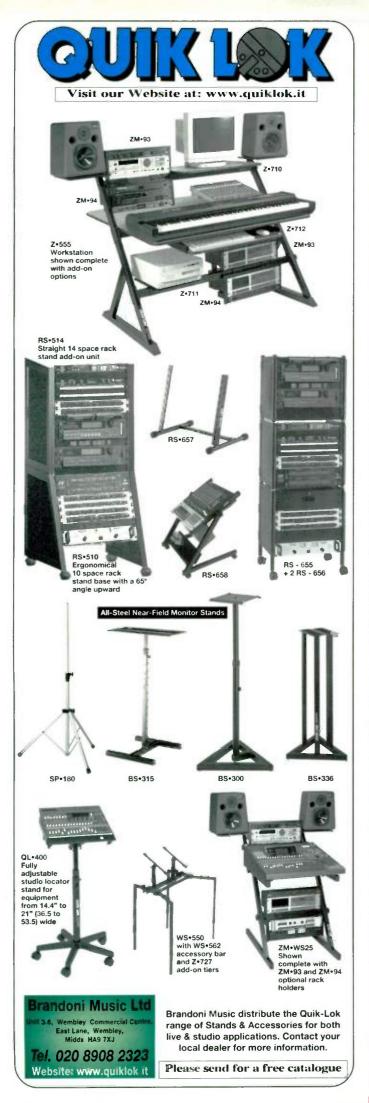
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If you need bely there's an extensive trouble shooting section with an off-

line database of frequently asked questions. And because all Carillon Total System manuals are written as web pages this off line help links seamlessly to an up to the minute on line version for your specific system. This is updated with hints tips, and fixes as they come to light and is particularly useful when software updates are issued. Our System Beta Testers focus on how a you can rest easy when you boot up the latest version of Cubase for the first time





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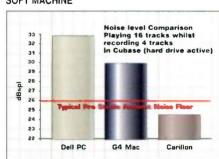
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#### TC WORKS SPARK XL V2

Version 2 of TC Works' Spark XL stereo audio editing software offers several unique new features and a very fast new Virtual File Engine that should speed up the operation of the program with large files. Paul White fires it up...

## TC WORKS *Spark XI* V2 MAC AUDIO EDITOR

C's 'new and improved' Spark XL v2.0 is a stereo editing package for Macintosh computers, intended for sound design, track editing, album editing, MP3 file encoding, multi-effects processing, mastering and audio CD production (in conjunction with Adaptec's Toast or Jam CD-burning software). Spark can import and convert AIFF-, SDII- (interleaved or split) and WAV-format files, and will run at 24-bit, 96kHz if required, with built-in noise-shaped dithering facilities for bit reduction when, for example, producing 16-bit CD masters from 24-bit audio files. Spark can also deal with 192kHz, 32-bit floating-point AIFF and WAV files.

Perhaps the most unusual feature of the original program was its effects matrix, a four-by-five network of virtual slots which could be filled with VST plug-ins connected in different ways to form powerful processing combinations. In Spark XL v2.0, this matrix can be increased to any size that the computer can support — because VST plug-ins use native processing power, to get the best out of the program you'll need a fast G3, and ideally a G4. Spark XL itself differs from the standard version of Spark only in that it provides additional TDM support and comes with an additional five TDM Plug-In slots in the effects matrix, but it does come with more bundled goodies. The new version of Spark adds to its original complement of plug-ins the new metering plug-ins, Sonograph and Metergraph, which offer spectrum analysis and time/frequency histograms respectively, Touch Wah, which can produce MIDI controller information, and the Spark Modular synth (reviewed in SOS September 2000). The excellent de-noising and de-clicking of the original Spark XL, however, have been joined by new goodies such as an Audio-to-MIDI modulation device for controlling other plug-ins and the complete TC Native Bundle, containing TC's premium reverb, dynamics and EQ. My own view is that Spark XL's de-noising alone is worth the extra cost over the standard version, so the entire bundle could be considered a bargain.

The original version of Spark was full of good



Spark XL's main edit screen, showing the transport bar, playlist and waveform edit window

ideas, but was let down by a slow file engine that insisted on recalculating the overview for the entire audio file after every tiny edit, making it quite impractical to work with files any longer than a single song. This has been remedied with a brand new and very fast Virtual File Engine, where no changes are destructive until you save them. All temporary audio files are kept in a 32-bit floating-point format and there's now unlimited context-sensitive undo (you set the number of undos you'd like in the user preferences), with the Matrix, Play List, Editor and file Database each having independent undo histories. These undo histories are not visible as lists but you can, for example, track back through your last Play List edits and undo them without upsetting anything you've done in the other sections.

#### Installation

Installation is from CD-ROM, after which the program will run for up to 21 days before you need to authorise your hard drive using the now familiar challenge-and-response routine. If you need to use Spark on different computers, you'll need to install

## TC WORKS SPARK XL

## £499

- · Stylish, uncluttered user interface.
- · Fast virtual file engine.
- Unlimited undos
- FX Machine for combining multiple VST and Spark plug-ins.
- FX Machine may be used as MAS or VST plug-in within other VST applications.

 I still find the cursor/navigation facilities a little unwieldy.

A vast improvement over the original Spark and Spark XL. The file engine is now impressively fast and the FX Machine means the program can be used for just about any type of stereo (or mono) audio file editing, even where sophisticated processing is

SOUND ON SOUND

and authorise it to run on a removable hard drive of some kind. The included VST plug-ins can only be used in other VST applications if an authorised version of *Spark* is present. The de-noising and de-clicking plug-ins are dedicated *Spark* plug-ins and so can't be directly used in other applications, but one of *Spark*'s ace tricks is its ability to create what is essentially an effects macro in the FX Machine matrix, which may then be used inside other VST or MAS applications. That means that if you want to use the de-noiser (or any combination of *Spark* and VST plug-ins) inside another VST or MAS program, all you need to do is 'wrap up' the chosen effects combination in the matrix first.





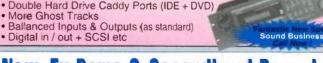
Sonograph and Metergraph are plug-ins that are new to version 2.0 of Spark and provide time/frequency histogram and spectrum analysis displays.

The software supports Apple Sound Manager (for playback only unless ASIO Sound Manager is selected) but it is fully compatible with ASIO and Direct I/O audio interfaces. I used a Pro Tools 888/24 interface running under Direct I/O for testing and experienced no problems. For CD burning, *Toast* or *Jam* is required, and *Jam* is needed for producing Red Book-ready CD masters. The *Spark* playlist is designed so that it exports into *Toast/Jam* prior to CD burning. MacOS 8.6 or later is required to run *Spark* v2; I tested the program using OS 9.0 and OS 9.1 running on a 450MHz G4.

#### **User Interface**

Spark's designers were keen to get away from the messy multi-window approach adopted by some audio software, which is why the program is still based around just two main windows with other sub-windows appearing only when





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#### TC WORKS SPARK XL V2

needed. The main view shows the waveform edit window and the overview, along with resizable audio file and playlist browser sections, while Master View deals almost exclusively with the FX Machine effects matrix.

Audio recorded or imported into a session is shown in the file management window, and audio files may be dragged directly from the desktop. A new innovation is that complete folders may be dragged into the file window, whereupon only compatible audio files will be recognised. Tracks from conventional audio CDs can be imported via Apple's QuickTime or via programs such as Toast Audio Extractor, and any audio format supported by Quicktime can be used. TC Works have also included the ability to import waveforms directly from Akai-format CD-ROMs via a SCSI CD-ROM drive. Spark already provided sampler support via both MIDI and SCSI (where applicable) enabling samples to be transferred to and from Akai \$1000/1100. 2000 and 3000-series machines as well as Emu ESI and E4-series machines. Kurzweil K2000/25000/ 2600s, Roland \$760s and Yamaha A3000s, Loops are transferred along with sample dumps, but there's no facility for keygrouping.

When files are imported, an overview is automatically created after closing the recording dialogue window, whereas the overview data seems to be calculated in the background when recording audio directly into *Spark*. Creating an overview for an imported six-minute song took less than 10 seconds on my G4. Real-time or non-real-time (for better quality) sample-rate conversion is available, and the work flow follows the familiar pattern of defining regions in the waveform editor before assembling them in a playlist. Regions may be whole songs or sections of songs: a new grouping facility enables groups of consecutive sections to be locked together, which is welcome in situations where songs comprise two or more regions.

Markers may be created automatically for each section of audio recorded, or they may be added manually, either on-the-fly or when the transport is stopped. Once created, a marker may be dragged to adjust its position if necessary. Double-clicking between consecutive markers highlights the area between them, and pressing Apple-R creates a region, which is then added to the region list, after which it can be named. This is probably the most accurate and reliable way of creating regions, although you can simply a highlight a section of audio using the cursor and convert that directly to a region if you need to.

Markers can also be dragged in the overview waveforms display — which, as I pointed out when I first reviewed *Spark*, makes it too easy to move them by accident. I feel more attention needs to be given to locking region edits. You can lock them and also give them names, but in a future version, I'd like to see automatic locking without having to go through the dialogue box routine, and also some visual indication that a marker is locked. Apparently you can deliberately prevent the movement of a marker, region start or region end by holding the

Shift or Alt modifier keys as you navigate, but frankly this is a little clumsy.

#### Navigating Spark

Navigating through a *Spark* file is possible by a number of methods, although the cursor handling is still rather cumbersome (see box). Lassosing a section in the overview waveform causes the main waveform display to zoom into the selected area; there are also a number of zoom scale presets and, of course, you can skip back and forth through the file using markers. The main waveform window can either be set to locate to the cursor position, set in the overview waveform, or to remain static until you select a new section in the overview.

In addition to the two main windows, there's a floating transport window which incorporates a dial for scrubbing, varispeed or for auditioning proposed time-stretching changes (before processing time-stretches off-line for optimum results). The static setting of this wheel can now be rendered into the file, so the varispeed or time-stretch setting can be destructively processed. During recording, the transport window displays high-definition bar-graph level meters.

There's been some improvement in sound quality during scrubbing, and TC Works have also added the ability to use the Alt+Cursor Left/Right keys to change playback direction without changing the playback rate. I miss the Sound Designer II feature that lets you scrub from Stop rather than having to select Play or Pause mode first, but Spark's scrubbing is far more controllable than SDII's. I also liked Sound Designer II's ability to be able to play back audio by clicking and holding the mouse anywhere in the overview waveform, and Spark gets close to this idea except you also have to hold down the Apple key. I find this invaluable for fast location of edit points.

#### **Audio Editing**

Both destructive and non-destructive editing is possible in *Spark*, although even apparently destructive editing remains non-destructive until the

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## De-noising & De-clicking In Spark XL

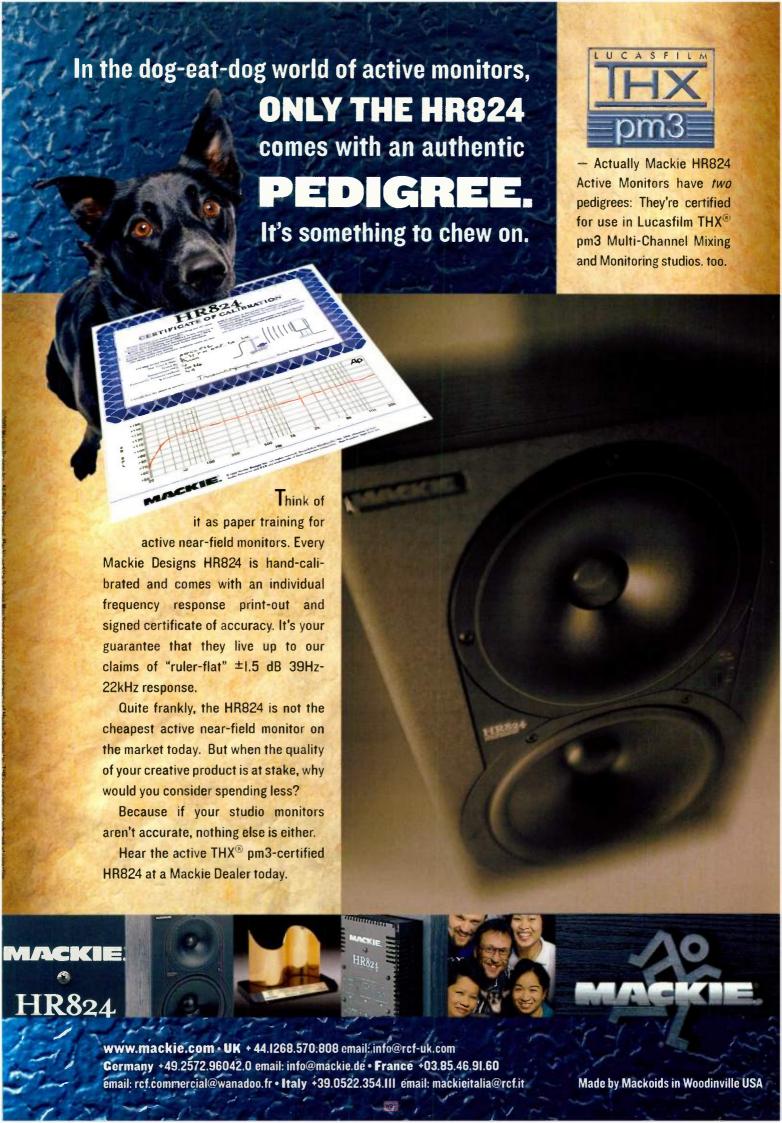
Spark XL's noise-reduction and de-clicking plug-ins are truly excellent, and rival anything I've heard short of real high-end, DSP-assisted systems. Digidesign's DNR (pronounced 'dinner'), by comparison, sounds rather like a two-day-old packed lunch! As with most such systems, Spark XL's noise reduction relies on 'learning' a small section of noise from before or after a track, whereupon multi-band processing is used to remove low-level noise in each frequency band. The characteristic 'ringing' side effects typical of such systems are markedly reduced, and moderately noisy material can be cleaned up very effectively without sounding processed.

Though the click-removal software is designed primarily for single clicks and glitches, and deals very well with vinyl clicks and scratches, it also works reasonably effectively

in reducing crackle, and using a combination of the de-noise and de-click, old vinyl records can be cleaned up to a surprising degree.



Spark XL's noise-reduction and de-clicking plug-ins are among the best available.



#### TC WORKS SPARK XL V2

work is saved. Creating regions is non-destructive, as is the action of creating crossfades between playlist regions (done in a separate Cut sub-window, which appears when summoned) but hard waveform changes can be made by cutting, pasting, moving, redrawing and time-stretching (although, again, these are only made permanent when you save). These can all be undone, but they will ultimately change the audio file you're working on. Most of the edit facilities are perfectly standard, and my only small concern is that the drawing tool still doesn't include a waveform smoothing option to ensure that you don't introduce audible clicks when modifying waveforms. Without one, such a tool is of very limited use, because no matter how smooth your newly drawn waveform looks, the chances are that you will hear the edit unless it's obscured by something like a drum beat.

Other familiar destructive editing features include normalising, gain change, fade-in/out (with a new graphic fade dialogue) and silence. There's also the option to phase-invert selected sections of audio and to remove DC offset. Sample-rate conversion is also a destructive process, because it ultimately leads to the creation of a new file at the new sample rate. The quality of sample-rate conversion is extremely good, with none of the high-frequency aliasing artifacts that afflict simpler systems.

Quite a number of major additions have been made to the edit facilities other than the very welcome increase in speed. For example, split stereo files may now be loaded and edited as stereo files, markers can now have names as well as numbers, and marker positions can be locked. Markers, Regions and Loops are saved and loaded with projects and files, depending on the file format: WAV and *SDII* files save Markers, Regions and Loops, while AIFF saves Markers and Loops. Pressing T during recording creates new, separate audio files on the fly and the already comprehensive graphic Fade dialogue box offers more options than before. On top of that there are new keyboard shortcuts for power users.

#### **Cut Editor**

Spark provides a first-rate Cut editor with waveform displays where the user can both view, audition and adjust the transitions between playlist regions. Two region boundaries appear in the window at any one time, which is essential for auditioning edits that span three regions, as would be necessary when the middle region is very short (say a single drum beat or similar). Region lengths may then be changed on the fly while auditioning the transitions by using user-definable 'coarse and fine' nudge buttons.

Various types of crossfades, butt edits and even



The Cut Editor provides detailed control over region joins.

pauses can be applied to the transition regions, crossfade curves are seen overlaid on the waveforms and any user-customised fades may be saved as presets. There are two modes of nudging, one of which preserves the region length, and one of which extends the regions into the crossfade area. The latter is clearly more suitable for musical use where timing needs to be preserved, while the first option is useful in dialogue editing.

Nudge values can be changed by typing in a new value, and an Auto function is available that endeavours to locate the best edit point inside the range defined by the nudge value. *Spark* can either loop around the edit points as you make adjustments, or you can have it play only when you ask it to. A compare function is available to see if you have improved the edit or made it worse! *Spark*'s crossfades are calculated in real time rather than being written to disk or stored in RAM, which means long crossfades are not a problem. Another nice ergonomic feature is that once a transition has

## **Cursor Handling**

Spark's cursor-handling system is rather different to other programs I've used (other than Wavelab) and I must admit to finding it a little frustrating. There are actually two cursors, a red playback cursor and a green edit cursor — the idea being that you can play a different section from the one you select for editing. When playback is stopped, the playback cursor returns to the edit cursor position, which is usually the point at which playback starts. This means that if you want to find a particular point in the file on the fly, you have to create a marker, whereas in just about every other program I've used, the playback cursor always remains at the current

time location when you hit stop. To play back audio outside the currently selected region, you need to Apple-click and hold down the mouse button, or go to the File menu and select the whole file rather than a specific region. Alternatively, triple-clicking in the wave edit window also selects everything, and playback may also be started at any location by clicking in the lower half of the time ruler. When it comes to auditioning region transitions from Spark's playlist, a draggable progress bar in the transport window lets you play from anywhere in the playlist so you're not limited to a fixed pre-roll time as you are in some programs.



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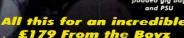
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been optimised in the Cut editor, it's possible to step directly to the next transition without leaving the Cut window. The Cut window also allows the insertion of CD track start IDs at the start, centre or end of a crossfade.

#### **Master View**

The Master window includes level faders, high-resolution level meters, a phase-correlation meter and the FX Machine matrix. The default layout is the same four-wide, five-long matrix found in the original *Spark*, but the user can now specify more cells as required. VST or *Spark* plug-ins may be loaded into these cells, which use an intelligent system to handle interconnections. Phase inversion has been added to the FX Machine repertoire and the standard Apple+I key combination can be used to show information relating to selected plug-in slots. A separate window now shows processor loading plus hard disk and memory info.

If plug-ins are added from left to right, the signal runs through them in series, whereas if several plug-ins are placed above one another in a column following a single plug-in, its output will be split to provide parallel feeds for all the plug-ins in the second column. A straight piece of virtual wire can be placed in a cell if needed for routing purposes. The boundary of each active matrix cell includes a tiny level meter, and each plug-in has input, output and mix settings. Effects setups created in the matrix can be saved for future use.

Spark's original effects included limiters, compressors and EQ as well as reverb, delay, chorus and lo-fi treatments. All these are retained, but but if you need a multi-band compressor, you'll still have to build your own in the FX Machine using multiple filters and compressors. TC are clearly not about to throw in a Finalizer just yet! As I intimated earlier, the Spark XL de-clicking and de-noising plug-ins are exceptionally good (see box).

The effects matrix is at the output end of the Spark signal chain, but if there's a need to process while recording, up to two VST or Spark plug-ins, or FX Machine macros, may be used in the audio record path. Finished audio projects can be dithered down to a lower bit resolution. Spark has always had a batch processing facility, which is ideal for those situations where you have a load of audio files you need to convert to MP3, sample-rate convert or otherwise process without having to sit through the entire session. The program can convert between AIFF, SDII, WAV and MP3 formats, via the FX Machine if necessary, and an Add Tail feature has been added so that you don't lose the end of a file that's being treated with reverb or some other delay-based effect. Spark is also able to run a QuickTime movie in its own window at the same time as the program is running.

#### **Conclusions**

The *Spark* ethos has always been to offer as much flexibility as possible, which is good insomuch as it makes the program suitable for a number of different applications, from stereo editing and



mastering to sound design. The other side of the coin, of course, is that so much flexibility tends to make the program less focused than a dedicated stereo editor. Nevertheless, TC Works have done a good job in keeping the program manageable, given its capabilities, and it seems very stable.

For me, the region locking system could do with tightening up and simplifying and I still don't find *Spark* as quick as it might be when it comes to locating and creating regions, probably due to the number of keyboard combinations that have to be learned to use all the functions. Whereas earlier versions were hamstrung by a slow file engine. however, v2.0 motors along nicely, even if you're working with album-length audio files, and the ability to add different audio file formats to a project is very useful under certain circumstances. I was also impressed by the quality of MP3 conversion, which is about as good as I've heard.

The FX Machine constitutes an impressive chunk of the program, and its ability to 'wrap' VST and Spark plug-ins to enable them to be used in a MAS or VST environment cannot be praised too highly. The learning curve is gentle enough to climb without actually getting off and pushing, but it pays to keep a chart of key commands close to hand. If the original Spark was a Swiss Army knife, this is one of the deluxe models with a fold-out saw, a magnifying glass and a thingie for getting stones out of drummers' hooves. Indeed, Spark XL v2.0 is seriously good news and must now be a strong contender for best Macintosh stereo editor, as well as providing the only open real-time processing environment for use in other VST/MAS applications. 🖾



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# synth secrets

ast month, I used the Moog Minimoog to create a patch designed to represent — as far as possible — the acoustic principles of brass instruments, as discussed in Synth Secrets 24 and 25. The result was a range of sounds that, despite several compromises, exuded the essence of brassiness, if not the exact timbre.

Unfortunately, not many people are fortunate enough to own a Minimoog. Only 12,000 or so were ever made and, on those rare occasions that one appears for sale, the price tag is often in the region of £1,000... which puts it beyond the reach of most players. Cheaper, less endowed synths are far more common, so you're much more likely to own, for example, a small Roland than any Moog. But does this mean that brass sounds are the preserve of the fortunate few? Not a bit of it! This month, I'm going to take what is perhaps the most popular analogue monosynth of our time — the Roland SH101 — and apply the same principles as last month.

## Comparing The Roland SH101 & Minimoog

Figure 1 (below) shows the top panel of an SH101 with all its controls set to zero. It doesn't look much like the Minimoog from last month, does it? That's not surprising... much of its architecture is unlike that of the Moog. On the other hand, there's a surprising amount that's similar, and some that is identical. So, before going any further, let's compare the two synths, and get to grips with the problems you might

encounter as you try to translate a patch from one to the other.

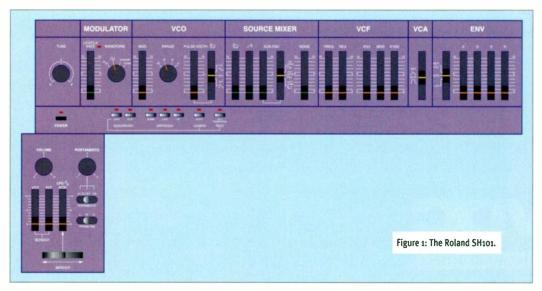
Starting on the left, and ignoring trivia such as tuning knobs and On/Off switches, both synths offer a Modulation section. However, whereas the Minimoog limits you to using Osc3 and/or the noise generator as a modulator, the SH101 offers a dedicated LFO. This offers just four modulation waveforms (compared to the six on the Minimoog's oscillator) and is strictly low

## PART 27: ROLAND SH101/ARP AXXE BRASS SYNTHESIS

**Gordon Reid** concludes his attempts to adapt an idealised analogue brass patch so that it can be programmed on real synths. This month, he looks at the Roland SH101 and ARP Axxe.

frequency... you cannot use it for two-operator FM synthesis as you can Osc3 on the Minimoog. Furthermore, noise is an LFO waveform, so you can't mix this with the cyclic waveforms as you can on the Moog. But on a positive note, the SH101 has a modulation option called 'Random', which is a Sample & Hold generator clocked at the LFO rate. This makes possible a number of effects that you cannot obtain from the Minimoog.

Moving to the right, you come to the synths' Oscillator sections. The major difference here is obvious: whereas the Minimoog has three audio frequency oscillators, the SH101 has just one. However, Roland has minimised the shortcomings of this by allowing you to modulate the pulse width of the square waveform using the LFO or the envelope generator. This means that the SH101 can produce a range of rich, chorused sounds that you can't obtain from the Minimoog. Furthermore, whereas the Minimoog has just a toggle to control the amount of Oscillator Modulation (vibrato), the SH101 has a dedicated control that allows you to



apply as much or as little as you require.

Because the SH101 has just a single oscillator, you might think that it needs no Mixer. However, the oscillator in the Roland produces three waveforms simultaneously — a sawtooth, a pulse wave, and a square sub-oscillator — and the Mixer is where you recombine them. With a separate noise generator as well, the SH101's architecture may not be as flexible as the Minimoog's, but it's not shoddy either.

Next come the synths' 24dB-per-octave low-pass filters. Like the Minimoog, the SH101 offers control over the cutoff frequency, the resonance ('Emphasis'), and the amount of contour, but it also has variable controls for modulation and keyboard tracking. Unfortunately, whereas the Moog's filter has a dedicated ADSD contour generator, the Roland's has to share its single ADSR with the audio VCA.

This brings us neatly to the VCA and its associated contour generator. On the Moog, the amplifier's contour generator is another ADSD gated by the keyboard. In contrast, the Roland has a true four-stage ADSR that can be triggered by the keyboard (Gate or Gate+Trigger) or by the LFO. Furthermore, you can disconnect the ADSR from the VCA by placing the switch into the 'Gate' position, thus leaving the contour generator free for purely VCF duties.

The last set of controls lies in the performance panel found to the left of the keyboard on both synths. The Minimoog has Pitch and Mod wheels, but the Roland is somewhat more flexible. You can

set the maximum amount of pitch-bend and filter modulation produced by moving its bender controller in a left/right direction, and set the maximum amount of LFO modulation produced when you push it away from you. You have more control over portamento, too. Whereas the Moog offers a Glide rate control and an On/Off switch, the Roland adds an 'Auto' function, which applies portamento only when you hold two keys simultaneously.

The SH101 has one more trick up its sleeve. When you set the VCA mode to 'Gate', the synth responds to its keyboard in the same way as the Minimoog does. It is low-note priority and when you play, it only retriggers its contour generator after you have released all previous keys. But when you set it to 'Gate+Trig' it becomes last-note priority, and generates a trigger every time you press a note, or when you release a

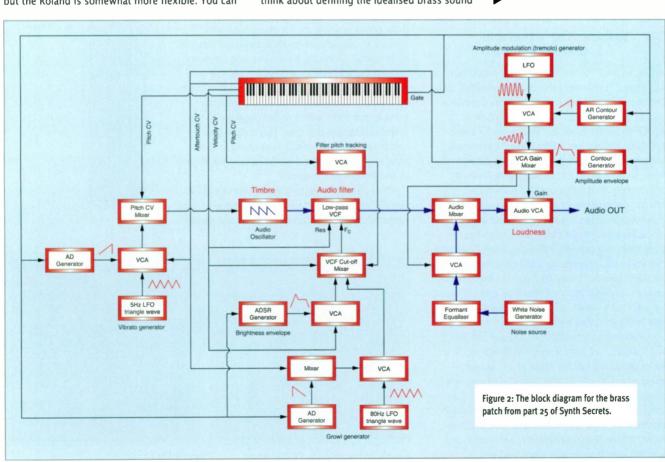
note to allow an older one to sound again. This type of response is of huge benefit for certain types of playing. Unfortunately, it is not available on the Minimoog.

## The Brass Patch On The SH101

Now that you appreciate many of the differences

between the two synths, you're in a position to think about defining the idealised brass sound





using the more limited (single-oscillator, single-contour-generator) architecture offered by the SH101. Let's start by referring back to the block diagram for a brass patch, first shown in part 25 of Synth Secrets (see Figure 2, below).

Clearly, the SH101 has far too few component modules to recreate this in full, so I'll have to restrict myself to the most important elements of the sound. This means that the delayed vibrato to the left of Figure 2 will have to go. Similarly, the shaped noise is a goner. As for the tremolo and some of the complexities of the growl generator... sorry chaps, but there's no place for you, either. So what can I do?

Fortunately, the idealised brass patch requires only one oscillator, so the SH101's limitation in this area doesn't affect the sound. I can select the 4' range in the VCO section, and raise the sawtooth volume fader in the Mixer to allow this waveform to enter the signal path. At the same time. I must make sure that the pulse, sub-oscillator and noise faders are at zero, or these waves will change the fundamental nature of the sound, making it unsuitable for brassy timbres (see Figure 3, above right). I'll also set the Mod control in the VCO section to zero; like last month's sound, this patch will have no LFO-driven vibrato.

Since I'm using only the sawtooth patch wave, I can ignore the Pulse Width controls in the VCO section (they affect only the pulse wave) and the sub-oscillator waveform selector in the Mixer.

#### Shaping The Waveform — Loudness & Tone

Again, it's time to filter and shape the sawtooth waveform. You'll remember that last month I used the contour generator in the Loudness Contour section to generate an envelope with a short Attack and instantaneous Release. At the same time, the contour generator in the Filter section generated a more 'shaped' contour to determine how the tone changed over time (see Figure 4, above right) Well... this can't be done on an SH101, because it only has one contour generator.

However... I've already mentioned that you can disconnect the SH101's VCA from its contour generator, and connect it directly to the Gate from the keyboard. This means that I can create the loudness contour shown in Figure 5, which is close enough to the Minimoog contour to give the result I want. I have shown the control panel setting for this in Figure 6 (see right).

Returning now to the filter contour, the SH101 has a distinct advantage over the Minimoog... it has a dedicated Release stage in its contour generator. You might think that there's no point in setting the release slider to anything other than zero for this patch, since the gain of the VCA will return to zero the moment you release the key, However, the SH101 envelope is very rapid, and you can hear it snap shut when the Release is set

to zero (many novices complain that the contour generators on their synths generate 'clicks' when the Attack and/or Release controls are set to low values, not realising that this is a compliment to the electronics, not a fault). Setting the Release fader to '2' gives a nice, smooth tail to each note.



Figure 3: The SH101 oscillator and mixer settings.

This brings me to some thoughts about how brass players move between notes. If they are

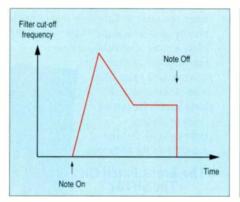


Figure 4: The desired filter contour for the SH101 brass patch.

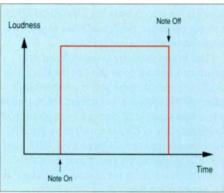


Figure 5: The loudness envelope generated by connecting the Gate to the VCA

tonguing notes, there will be a short break between each, and you must play the keyboard in a slightly staccato style to emulate this. However, if the player is using a valve instrument, and presses a valve to change pitch, the transition will be smoother. (Actually, it could be very uneven because the player's lip tension is no longer appropriate to the length of tube... but that's not a discussion for today.) Anyway, the important point is that there will be no re-triggering of the notes' contours in this case. This means that I must set the filter contour to respond to Gate only, and not Trig. The Env settings are therefore as shown in Figure 7 below.

Of course, all these settings will be useless if the VCF itself is not set up correctly. It needs to be almost closed at the start of the note, and should



Figure 6: Using the Gate to determine the VCA envelope.

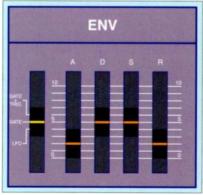


Figure 7: The Env settings for the filter contour.

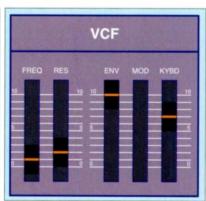


Figure 8: The VCF settings.



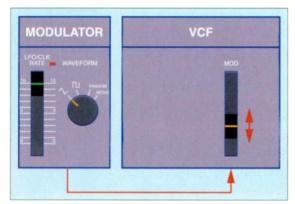


Figure 9: Applying rapid modulation to obtain growl at the start of the note.

• open a great deal during the Attack phase of the envelope. This means that the Freq slider in the VCF section must be close to zero, and the Env fader must be at or near its maximum. Furthermore, as you should know from the theory explained two months ago, there must be just a touch of resonance to create the correct harmonic profile, and the cutoff frequency must track the keyboard at a little less than 100 percent. If I ignore the Mod fader, this allows me to define the VCF section as shown back in Figure 8.

Now for some bad news. Like the Minimoog, the SH101 has only one source of modulation. This means that I must make a choice. Do I want to use the Modulator to add gentle vibrato to the patch, or the more dramatic 'growl' that is so effective in

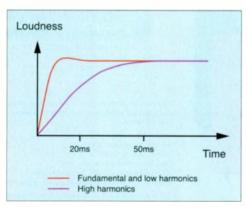


Figure 10(a): The ideal rise times for lower and upper harmonics.

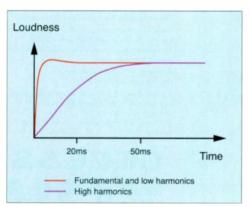


Figure 10(b): The SH101 response for lower and upper harmonics.

brass patches? Clearly, by the way I've worded that sentence, it's the latter. But, since the SH101 lacks the EGs and VCAs needed to control the growl, I will have to do this manually, using the Mod fader in the VCF, adding modulation at the start of the note and removing it as the note approaches its steady state. I find that an initial setting of about 60 percent works well, reducing this to 0 percent by the time the filter contour reaches the Sustain Level (see Figure 9, left).

Of course, I also need to set the Modulator appropriately. Because the SH101 Modulator is purely an LFO, I do this by setting it at its highest rate. As for the

waveform... I use the triangle wave, as I did on the Minimoog.

Last month, I showed that the Attack of the Loudness contour, coupled with the slower Attack of the Filter contour, allowed the harmonics to enter the sound at close to the appropriate rates, as defined by the analysis of real brass instruments (see Figure 10(a) below). This month, I don't have the luxury of the VCA contour so, as shown in Figure 10(b), the lower harmonics enter rather too quickly (this is the consequence of the square loudness contour shown in Figure 5.)

The audible consequence of this is that the start of the note is rather less authentic than it was on the Minimoog. But... (and it's a big 'but') two things save the day. Firstly, no VCA responds instantaneously, so there is still a slight lag in the rise time of the loudness contour. Secondly, any residual deficiency can be masked using the growl effect described above.

Moving on, it would be nice to be able to add the shaped noise described in part 25 of Synth Secrets. Unfortunately (and in common with the Minimoog's noise generator), the SH101's noise generator lacks the formant shaping of the turbulent noise in a real instrument, and sounds very unnatural. As on the Minimoog, it is best omitted

It would also be beneficial to add delayed pitch modulation (vibrato) to the patch. And, yet again, I have run out of facilities... the SH101 has only one modulation source, so it isn't capable of this. At a pinch, I could try the same trick as last month, and use the pitch bender to add vibrato manually. If I set the VCO Bender fader to a small value, I can then move the Bender itself from side to side to create the desired effect (see Figure 11, right).

Unfortunately, this will be at the expense of the growl, because you can't play the note, manipulate the bender, and manipulate the Mod fader simultaneously. So the best you can do is play the notes and add *either* growl or vibrato, depending upon the requirements of the music.

Putting everything together into a single patch, Figure 12, on the next page, combines everything I've described. It looks very different from the Minimoog patch shown towards the end of last month's instalment of Synth Secrets, but the "Whether you're programming a '70s Minimoog, an '80s Roland SH101, a '90s Nord Lead or a 21st-century Access Virus Indigo, the principles for a given sound remain identical."

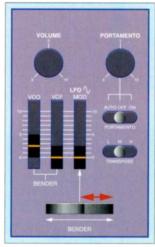
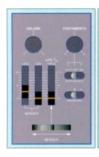


Figure 11: Adding a little manual vibrato.





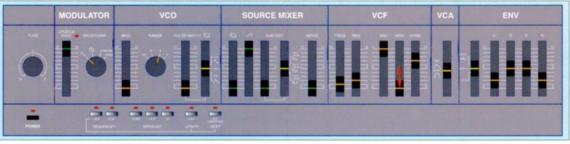


Figure 12: The SH101 brass patch. Note: the performance panel control has been placed at the right end of the diagrams on this page for clarity.



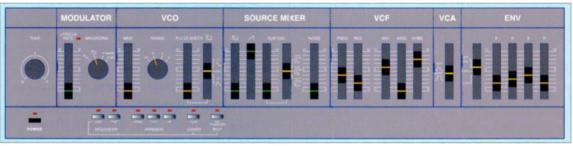
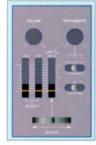


Figure 13: Roland's Trumpet patch for the SH101.



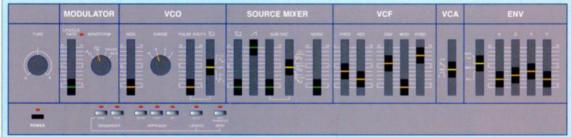


Figure 14: Roland's Tuba patch for the SH101.

audible result is nevertheless as similar as it is possible for two such different synths to be. Moreover, although the SH101 is unable to recreate much of the patch in Figure 2, set up carefully and played sympathetically it can still sound remarkably brassy.

#### Other SH101 Patches

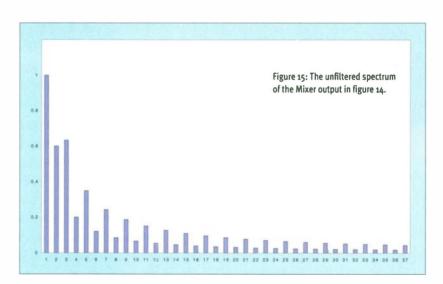
Before leaving the SH101 behind, I thought that it would again be instructive to analyse a couple of the factory patches; one good, one bad. Let's start with Figure 13 above; Roland's Trumpet patch in the original SH101 manual.

This is a very disappointing sound. The Attack/Decay stages of the Env are too short, the amount of Env control in the filter is too low, and the higher initial cutoff frequency allows too many harmonics through when you first press a key. Furthermore, there's no modulation, so there's no movement in any portion of the note. Yurgh!

The Tuba patch from the SH101 manual fares much better, and introduces another concept: that of adding different waveforms to achieve a particular timbre. Take a peek at the Mixer section in Figure 14 above. You'll see that the sawtooth is present at 60 percent of its maximum, but that there's also a square wave sub-oscillator present, one octave down and at 100 percent of its full loudness. The result is the harmonic spectrum shown in Figure 15 (right), and the waveform

shown in Figure 16 on the next page.

As you can see, while remaining sawtooth-like, both the spectrum and the waveform are more complex than those of a simple sawtooth and, of course, the timbre changes appropriately. If you have access to an SH101, listen to the patch with the sawtooth alone (it lacks body) and then to the square wave sub-oscillator alone (it sounds hollow, and not at all brassy). In this patch, the combination of the waveforms defines the sound, almost as much as the filter and amplitude



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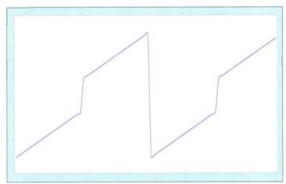


Figure 16: The waveform described by the spectrum in Figure 15.

> settings. This is something that will come up again in later parts of this series.

#### The Brass Patch On The ARP Axxe

Figure 17 shows the control panel of the ARP Axxe, another low-cost, single oscillator monosynth. At first sight, this appears to be very different from the SH101, but look more closely. There's just one voltage-controlled oscillator, which produces both sawtooth and pulse waveforms simultaneously. There's also a noise generator, variable pulse width on the pulse (square) waveform, and pulse-width modulation courtesy of the LFO and the ADSR. The LFO produces sine, square and S&H waveforms. You can modulate the 24dB-per-octave, resonant low-pass filter using the LFO and/or the contour generator, and it will track the keyboard in any amount from 0 percent to 100 percent. There's just a single contour generator, and it's a fourstage ADSR... The list goes on and on. Sure, there are differences between the Axxe and SH101 too. For example, the Axxe has no sub-oscillator, and like the Minimoog, it possesses an external signal input, not included on the SH101. Nevertheless, the important elements of the SH101 and the Axxe are the same.

So why do they look so different? The reason is simply one of presentation. The controls and panel graphics for the Axxe are based on ARP (ie. American) designs that first appeared on the ARP 2600 in 1970. In contrast, the SH101's panel is a development of the Japanese Roland Juno 6, which first hit the streets in 1981. Same facilities, different countries, different eras; hence the different appearance.

Now, ignoring these superficial differences, turn your mind back to brass patches. Logic tells you that, if the two synths' facilities are the same, I should be able to set up a brass patch on the Axxe, simply by remembering how I did so on the SH101.

Locating the Audio Mixer section on the Axxe, I find the sawtooth waveform produced by the VCO, and raise this to its maximum. At the same time (and for the same reasons as before) I must ensure that the square waveform and noise faders are at zero.

Next, I locate the five faders that control the Voltage Controlled Filter, and raise the VCF Freq

(initial cutoff frequency) and the Resonance faders slightly. Then, I set the ADSR tracking fader to a high value, and the Kybd CV tracking to a moderate value. The sine wave LFO modulation fader can be left at zero.

Moving to the right, I raise the initial VCA Gain in the Voltage Controlled Amplifier. However, I leave the ADSR fader at zero. This disconnects the VCA from the ADSR, just as on the SH101.

Finally, at the far right of the panel, I set the ADSR Envelope Generator to something approximating the SH101's 20 percent, 50

percent, 50 percent, and 20 percent values.

Figure 18 opposite shows the patch thus defined. If I now stop and play the Axxe, I'll find that I have something that sounds *similar* to the SH101 and Minimoog brass patches but, in a number of ways, isn't quite right. And, for some reason, there's some sound leaking through all the time... Arghh! The note never dies!

#### **Final Tweaks**

Let's deal with the big problem first. There are apocryphal stories of ARP 2600 owners who, in the early days, contacted ARP to say, "Wow! It's amazing... but how do you make it *stop?*" The reason lies in the combination of the VCA Gain and VCF Freq sliders. If the first of these is greater than zero, the VCA is always amplifying (ie. passing) any audio signal received at its input. This means that the only way to silence the sound is to remove *all* its harmonics using the filter. Therefore, I must reduce the cutoff frequency to zero between notes if silence is to reign, and I can do this by moving the VCF Freq slider to zero.

Unfortunately, this contravenes one of the principles of the idealised brass sound... that the fundamental should pass as soon as you play a note. So maybe a better compromise would be to reduce the VCA Gain to zero, and use the ADSR to open and close the amplifier. Now, the amplifier is controlled by the ADSR and, again, silence will reign between notes (see Figure 19, right).

Playing the Axxe patch again, it still isn't quite right. To understand this, you must remember that all synths are not created equal. The circuits within different models will respond to the controls in slightly different ways. So I must tweak the settings to obtain the right results on the ARP. In this case, I find it pleasing to increase the Decay time, reduce the Sustain Level, and reduce the ADSR CV in the VCF... all of which emphasise the initial parp of the brass sound.

One thing I can't do, however, is produce the filter rasp that was so successful on both the Minimoog and the SH101. This is because the LFO has a maximum frequency of just 20Hz, which is not fast enough to create the desired effect. However, the last thing I want is a static, boring sound, so I'll use the LFO to introduce a gentle vibrato — something that also sounds good on brass instruments.

"...if the two synths' facilities are the same, I should be able to set up a brass patch on the Axxe, simply by remembering how I did so on the SH101."

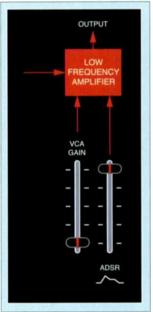


Figure 10: Silencing the ARP Axxe.

I could do this by setting the LFO rate to around 5Hz, and by raising the LFO sine wave CV fader in the VCO (it's the second fader from the left). However, there's a better solution. This 'Mark 2' Axxe has Proportional Pitch Controls (PPCs) shown on the far left of the panel. When you press down on the middle one of these pressure-sensitive pads, it adds modulation, just like an aftertouch-sensitive keyboard. The PPC therefore allows you to add vibrato in a realistic fashion... it's far better than the fixed amount of low-frequency modulation that would have been introduced using the LFO slider.

The final Axxe brass patch appears in Figure 20 below, and you won't be surprised to learn that it sounds very similar to the both the Minimoog and SH101 patches. OK, so each of these synths has an individual character, and there are many analogue

aficionados who could distinguish between them. But that's not the point. The important thing here is that I've succeeded in programming the same sound on all three instruments. Indeed, you may not realise it, but you've learned an important lesson over the past couple of months. It's this:

Once you've learned how to create a brass patch on one synth, you can recreate it on any synth capable of doing so.

So, whether you're programming a 1970s Minimoog, a 1980s Roland SH101, a 1990s Nord Lead or a 21st-century Access Virus Indigo, the principles for a given sound remain identical. Once you understand what it is that defines 'brassiness', you can program the equivalent patch on any subtractive synth. Neat, huh?

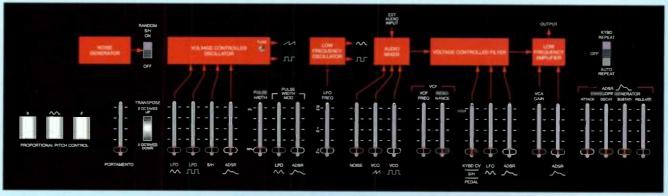


Figure 17: The ARP Axxe.

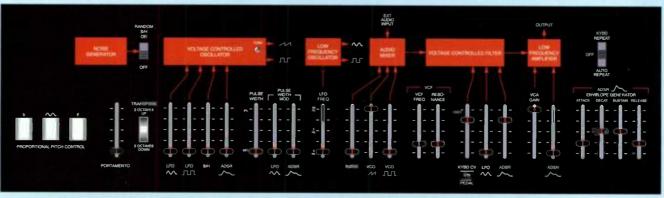


Figure 18: The idealised trumpet sound recreated on the ARP Axxe.

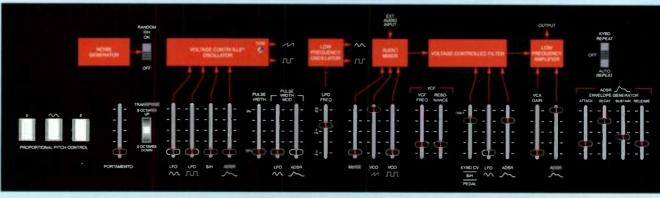


Figure 20: The final ARP Axxe brass patch.

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n almost any other band, Leeroy Thornhill would have stood out by virtue of his two-metre frame alone, but as the dancer in The Prodigy, he had some pretty stiff competition for the limelight. Hell, even fellow band member Maxim Reality, with his outlandish clothing, psychotic coloured contact lenses and wild rapping style, never stood a chance of winning media-attention contests with Liam Howlett, whose public persona, a mixture of hard-asnails Essex bovva boy and eerily obsessive studio boffin, proved surprisingly beguiling to the press. And nobody, but nobody, could outgun Keith Flint, who - perhaps not wholly unsurprisingly - was never denied tabloid headline coverage with his penchant for eccentric body piercing, rolling into concerts in vast translucent inflatable balls and styling his hair to look as if it had been ripped, still growing, from the heads of 17 different people and stitched into place by Keith himself.

With such bandmates, it was never going to be easy for Leeroy Thornhill to shine. And so, a few months into the 21st century, he did the sensible thing and left the band.

#### The Tall Guy

A year later, Leeroy is positively beaming at me from across the farmhouse table in his sizeable kitchen. And well he might — not only has he just completed his first solo album (*Beyond All Reasonable Doubt*, released under the name Flightcrank), but he produced, recorded, mixed, and sang on most of it himself, in a former garage adjoining the converted windmill where he lives. It's an admirable result by anyone's standards, but for the man who self-effacingly refers to himself as "that tall geezer out of The Prodigy," it's absolutely stellar.

"Cameron McVey [producer of All Saints, Neneh Cherry, and Massive Attack] produced 'Amazing', the single, and Luke Gifford of The Strongroom engineered one track and helped me produce the vocals on another," explains Leeroy. "But the rest was all done here by myself. I'm quite pleased, because two tracks were done on Neve desks at Mayfair Studios, but they don't really sound that much better, if you see what I mean.

"I love the fact that the album's DIY. This was my first album, and I wanted to do as much as I could — I wanted it to be *honest*. I produced 11 of the 14 tracks, mixed them and mastered a lot of them myself, with my TC Finalizer."

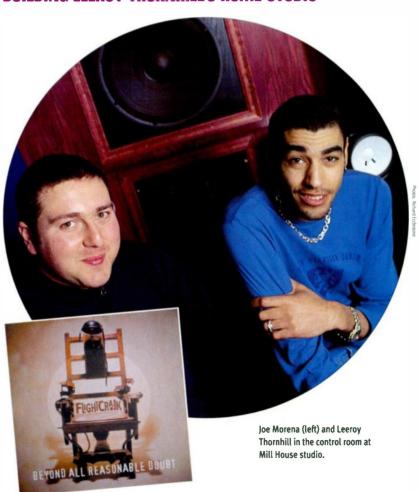
Surprising as these latest developments may be to casual followers of The Prodigy's success, Leeroy's seemingly new-found career in songwriting and production goes back a long way — back, in fact, to the dawn of The Prodigy itself. Mere weeks after the band's formation in 1990, their founder, Liam Howlett, was forced to buy a second Roland W30 sampling workstation to play at live gigs with. Almost immediately, Leeroy began taking the spare home, got Liam to show him a few basics, and, as he inimitably puts it, "started to write some well dodgy music with it!"

Over the following years, Leeroy nurtured his bedroom studio, adding the first of what would

How do you follow 10 years in The Prodigy, one of the most successful bands of the last decade? By recording a solo album in an outhouse adjoining a disused windmill, naturally. **Matt Bell** meets former Firestarter Leeroy Thornhill and his studio designer Joe Morena to discuss the making of a recording facility in a former double garage.

# garage remix

FLIGHTCRANK • JOE MORENA BUILDING LEEROY THORNHILL'S HOME STUDIO



eventually become three linked Mackie 1604 mixers, several affordable but highly capable effects units such as the Boss SE70 (a favourite of Liam Howlett), and a few synth modules. "Eventually, me and Liam switched over from the W30 to Macs and Cubase VST after Music For The Jilted Generation, [The Prodigy's second album, from 1994] and Liam did The Fat Of The Land [1997] on Cubase on his Mac. That was wicked, 'cause we all got computers at the same time, and were helping each other out. But sometimes, Liam would get a bit of new equipment, like an MC303 or something, and say 'This thing's wicked,' so I'd get one. Then I'd come to him hoping he'd know how to work it, and try to prompt him, saying something like 'That MC303's great - I can't wait to get my head round it.' But more often than not, he'd just say 'Well, once you know how to use it, let me know!'

"I always wanted to do my own stuff, but it was hard the dance scenes were always changing. Also, I was doing stuff based around samples, and they were always out of date so quickly. It wasn't until

'96 or '97 that I started to work out what I was really into. I started doing some remix work in the studio in my last house, but it wasn't until the band stopped touring and I moved here a couple of years ago that I really got it together musically.

"I really wanted to put a proper studio together when I moved. It always sounds like a lot of money, but when you consider what you can pay out for a studio or rehearsal rooms, as well as the time driving there and setting up — you save on all that. And you can rent it out if you build it properly. So when I started talking to Joe, I made it clear that I wanted a studio here that I could hire out and produce for other people in, as well as me."

#### Do The Hustle

Leeroy made a fine choice of collaborator on his studio project in Joe Morena, a part-time computer engineer with a reasonably successful second career in remixing (Eternal, Simply Red, Dave Stewart), and a sideline in studio construction. Joe had set up some gear for Liam and built him some custom studio racks, but it was his attention to detail in getting Maxim Reality's studio fit for him to finish his solo album in that made Joe the first port of call for



other Prodigy members who wanted their home studios upgrading. Leeroy: "It was like a hustle for a bit. Everyone wanted Joe to work on their studios. And everyone wanted what he was installing for the others, as well!"

Joe: "I've always been interested in the technical side of studio construction — I built my own studio and have worked in quite a lot of the big studios in London, like Whitfield Street and The Strongroom. That's interesting, because a lot of them look lovely on the surface, but when you start poking about and opening up cupboard doors, all the wires start to fall out in great tangles, and you think 'I could do it better than this myself!"

Leeroy had decided that the studio at his new house, the converted windmill, would be spared no expense. The room he planned to use was in a high ceilinged outhouse connected to the house, but separately accessible via its own door to the outside. "It was a double garage that the people before had started to make into a room. It was a concrete shell when I moved in, really," explains Leeroy.

#### **Planning & Preparation**

Much discussion and planning with Joe ensued as to

The control room at Mill House is built in a horseshoe shape around the chair in front of the the Mackie D8b, and at the optimum position for the Yamaha NS10 and Genelec monitors. To the left is the digital patchbay, to the right the monitor for the Mackie D8b and the Mac G4 monitor and keyboard. In the centre under the D8b, on slide-out trays, are the master keyboards. Pride of place is occupied by the Roland W3o (top tray, only just visible in this shot), a Clavia Nord Lead can just be seen poking out on the second tray, and the virtually unused Novation BassStation can be seen at the bottom. The window on the extreme right of the picture gives a view of the neighbouring vocal booth/drum room.

be the best way to convert the space into a studio, with Joe keen to establish exactly how Leeroy intended to use the studio and what quality of recordings he hoped to be able to make with it. He considers this part of the planning stage very important in studio construction. "Everything I do for people is custombuilt. Some studio design companies insist that things have got to be done in a certain way on every project. But everyone works differently, and so I think studios should be built around the individual. The individual should not be forced to work around the studio."

Joe drew up a plan for a predominently digital studio centred around Leeroy's existing Cubase VST/Mac setup, but upgrading to a G4 Mac and adding top-quality monitors, a digital desk and a digital patchbay. Space was set aside for a vocal booth and tie-lines were planned in around the control room so extra gear could be patched in quickly. Joe: "I designed the layout, too. Leeroy sits the middle and can get to everything - he doesn't have to go behind racks to access anything. That's why I made the digital loom and digital patchbay. If you get an idea, you want to try it out quickly, not spend ages trying to connect gear up first. I don't care what anyone says about not needing a patchbay in their studio. You can't run everything into the desk live, unless you don't have more than about two bits of gear - and you're not going to get very serious results with two bits of gear."

"Liam did!" interjects Leeroy, grinning again. Ignoring him, Joe continues. "Any engineer can come here and just plug straight in because of the tie-lines and patchbay. You can cross-patch *everything* in that room. It took me about a week to figure it all out and plan it!" Serious for a moment, Leeroy agrees: "Joe's done it totally properly. We took time to do it right; I believe in only doing things once."

Leeroy's outhouse is situated only 25 metres from his most immediate neighbours' house, so careful planning was necessary to ensure the studio was well soundproofed. Furthermore, he and Joe realised that the room would need to be properly acoustically treated in order to enable Leeroy to do professional, release-quality mixes there, so they sought some quotes from specialist studio design companies though Leeroy won't name names! "I got a few companies down to look at the space, and some of the quotes I got were just ridiculous. Seventy-five grand — that was with carpets, desks and some chairs, but no equipment. It makes you laugh. Some of them walked in and started talking in technical jargon and trying to pull the wool over my eyes, but I wasn't having it. I used to be an electrician anyway, and I'm not stupid. I already had an American book on studio construction, and it isn't the black science it used to be, thanks to articles in magazines like yours! So... I let a couple of companies draw up some designs to see where the bass traps should go, and then decided to build it myself!"

Joe adds, "I looked at the plans with the chippy Leeroy was using to restore the rest of the windmill, and we thought, 'It can't be that hard to do...' It's not like it was special wood or anything — it was stuff you can buy at the builders' merchant."



#### **Designing & Building**

Joe and Leeroy drew up plans for a classic room-within-a-room construction, with a double-skin wall supported on vibration-deadening neoprene rubber, which Leeroy's carpenter then built. "The first inner wall was isolated from the concrete wall of the outhouse by a two-inch air gap, and rested on neoprene pads underneath and neoprene supports all around. The studio floor was isolated from the inner wall by more neoprene as well. The first inner wall was two layers of plasterboard, a joist, another layer of plasterboard, and then a two-inch air gap filled with rockwool. Then there was a second inner wall built the same way. We lost four feet all around the room just by putting in the walls, and about a metre off the ceiling, because of all the airconditioning ducts and electrics. Luckily, it was a high room to start with, so it just seemed like a normal-sized room at the end of it all.

"The windows are triple-glazed, about nine or 10 inches deep, and we put in a dual air-conditioning system, completely silent, with acoustic baffles for each unit. I think the baffles were about 1500 quid! At least it doubles as a heater in the winter..."

Both Joe and Leeroy profess themselves delighted with the results of the soundproofing. "When we were testing the new monitors later, a friend went outside and said he couldn't hear anything, but he could *feel* it on his chest — just a sensation. But the important thing was that he couldn't hear it from near the neighbours' house."

#### **Getting Into Gear**

After all the planning and building work, upgrading Leeroy's studio equipment was viewed as the fun part. Much was brought over from Leeroy's old studio, including the old synths, effects, compressors, and NS10 monitors, but far-reaching changes were made to bring the studio as fully into the digital domain as far as possible. A digital desk was to sit at the centre of the studio, connected digitally to the G4 running *Cubase VST* via three MOTU 1224 audio interfaces, giving 24 channels of simultaneous I/O. New, high-quality monitors were needed, and Joe also specified a TC Electronic

Leeroy's MOTU MIDI (left) and audio (right) interfaces nestle under the Mackie D8b monitor in one of Joe's custom racks. The left rack also houses his three Akai samplers, while the right rack contains a host of effects and synth modules from his old studio. Classic Prodigy gear can be seen here, such as the three Boss SE70 effects units (favourites of Liam Howlett), the Roland E660 digital parametric EQ, the Ensoniq DP Pro multi-effects, and the Emu Vintage Keys and Roland JD990 synths.

## G4 Or G3?

The one snag in the gear upgrade process was the move to the Apple G4 Mac. Leeroy: "When we got that, we had MIDI trouble for months... and it was down to one driver that wasn't working properly."

Joe takes up the explanation.
"It was because the G4 we bought
was an early one, a hybrid with a
G3 motherboard. We didn't know
it, but we actually needed a
special OMS driver for that
machine that hardly anyone knew
about. Eventually, a bloke came
down from [UK MOTU distributors]
Musictrack, put the new driver in,
and in a couple of hours it was
working."

"It was so frustrating," moans Leeroy, "I was thinking, 'I've got enough power in this computer to run a small country... and I can't even record a tambourine!"







▶ Finalizer mastering processor and a distribution amplifier so that simultaneous copies of the same stereo mix could be made from the Finalizer to up to 10 mastering recorders in a variety of formats, including CD-R, cassette, and DAT.

The choice of new desk was between the Yamaha O2R and Mackie D8b. Joe: "I didn't think the Yamaha had as friendly a user interface at all — there was too much page-flicking. The Mackie is laid out logically and you can use it quickly, whereas the Yamaha was a case of hitting this button 10 times and then that gave you six pages and they gave you more pages... all on that tiny screen."

Unsurprisingly, the Mackie won the day. "The only criticism that you could have against Mackie, really," comments Joe, "is that they've been slow with their upgrades, but then they don't seem to put out software that doesn't work and then have to keep revising it."

When it came to choosing monitors, Leeroy and Joe plumped for a large pair of active mid-field Genelecs, partly because the built-in amps helped them to save space, but mainly as a result of being impressed by the service from UK Genelec distributors SCV, who gave them a demonstration of several models and then lent them a pair of their favourites to try out. When their pair arrived, Joe designed some custom rockwool-filled wooden soffits in which to mount them. "When we put them in the soffits, it totally changed the way they sounded."

#### **Done & Dusted**

The studio was completed by some curved, brightly coloured oak-veneered wooden racks, also designed by Joe. Leeroy is delighted with them. "I love the colours; it's a bit of stimulation. And I like the curves, too. Why have straight edges? The vibe in the studio is so important. If it's static, like an office, you'll never get anywhere."

Vibemaster Morena agrees. "The furniture side of my design business seems to be taking off now — people don't want those cheap black chipboard racks any more. Basically, if you come up with an idea, I can build it, provided you've got the money! Doing racks like this is a bit more expensive, but you're getting a one-off, and you know it's been properly designed to fit in your space."

Leeroy reckons that however you look it at, using Joe to design his studio saved him a great deal of money. "It cost me about 25 grand in the end. That doesn't include people's wages for building it, but it does include the materials. And five grand of that was for the soundproofed air-conditioning units."

But was it worth it? Would Leeroy not have got a better acoustic environment by paying professionals to do it? Joe is dismissive: "The only things the





original companies said was that we'd have problems above the door and by the window. So we put irregular bits of foam above the door..."

"...and I thought 'Well, we'll have some curtains by the window!" adds Leeroy.

"We also borrowed an idea from looking at the walls in the Strongroom," adds Joe. "The walls are covered with stretch fabric, hessian, stapled and with white foam underneath. That's quite absorptive. I admit we were mucking about a bit, trying different things, but you soon get used to how the room sounds anyway, your ear compensates. And I think Leeroy's got used to the sound of it now." Certainly the soundproofing and acoustics were good enough for a real drum kit to be set up and recorded in the studio's vocal booth for one of the tracks on the Flightcrank album.

#### The Logical Choice

Joe's good working relationship with Leeroy shows no signs of coming to an end with the completion of the studio. His current ongoing project is to serve as Leeroy's live technician when he takes Flightcrank on the road in the Autumn. "Leeroy throws challenges at me. He nicknamed me 'The Sorter'," laughs Joe. "It doesn't matter what you need, Joe can get it or put you in touch with someone who can," agrees Leeroy. One recent challenge for Joe was to obtain Leeroy a copy of Emagic's Logic and teach him how to use it - another example of Leeroy wishing to stay ahead of the game. "I was thinking that if I was in a situation where I was producing someone and they turned up with Logic, I wouldn't want to have to leave them sitting around for 10 hours while I got their song into Cubase," explains Leeroy, "and it was something else new to learn."

"We got the album out of the way, and then we spent some time sitting down and learning it," remarks Joe. He pauses, then reflects on his employer and friend, "Leeroy's really good at picking things up; you only have to tell him something once."

Not bad for the tall geezer out of The Prodigy, eh? 🖾

Left: Leeroy's mastering rack. Joe has wired a stereo feed from the D8b's AES-EBU stereo digital outputs to the TC Electronic Finalizer mastering processor here, and then on to the DVA 10HP distribution amp at the top of the rack. From there, simultaneous copies of the same Finalized stereo mix can be made on up to 10 destination recorders, including the HHB CDR800 CD writer, the Tascam DA302 dual DAT and the Tascam DA30 MkII DAT seen in this rack.

Above Right: Enough compression for you, Mr Thornhill? From top to bottom: Dbx 262 Project 1 dual-channel compressor/limiter, Dbx 160A compressor/limiter (x3), LA Audio 4x4 four-channel filter/gate/compressor, Dbx 1066 compressor/limiter/gate, Drawmer MX30 dual gate/compressor/limiter, Drawmer LX20 dual compressor/expander, Tl Audio C5021 valve compressor, and TL Audio VP5051 valve channel strip.



WRH



Clavia's new third-generation Nord Lead synthesizer augments its familiar virtual analogue modelling with enhanced FM synthesis capabilities, and introduces a striking new visual twist to the usual controller-rich Nord user interface. Simon Trask trips the light fantastic with Clavia's new Lead...

company by the name of Clavia propelled itself onto the world stage with its Nord Lead synthesizer. At the vanguard of the 'real synth' renaissance in the latter half of the '90s, the Nord Lead included all the key elements of that renaissance: physical modelling of classic analogue subtractive synthesis, the controller-rich front panel for 'hands-on' editing, and stylish and striking case design, with an evocative name thrown in. Oh, and it was European in its parentage, if American in its ancestral heritage. For this renaissance has also been about the rebirth of the European synth industry, and Clavia can take credit for kick-starting that as well with its famous 'red synth'. While subsequent years have seen a slew of virtual analogue synths from European and Japanese manufacturers come onto the market, with the Nord Lead and its various siblings Clavia

- Looks great, especially with the
- Looks great, especially with the useful LED collars.
- User-upgradable OS.

#### COR!

- Relatively expensive.
- No onboard effects processing.

#### summary

Another evolutionary step for the Nord Lead concept, rather than a revolutionary leap. The new Lead will please fans of Clavia's synth by improving on the winning formula while remaining reassuringly the same. Whether it will win over sample same with the same of the winning formula while remaining reassuringly the same same will be same of the will will win over same will be same of the will be same of

SOUND ON SOUND

is in the enviable position of having a synth 'brand' that has proved to be uniquely and durably desirable to musicians. The company followed the release of the original model with an expander board that increased the original modest four-voice polyphony to 12 voices and added PCMCIA card-based patch storage via a rear-panel slot. Version 2.0 OS software (which required a new EPROM chip) was also released, introducing a number of tweaks such as an additional filter type, aftertouch sensitivity via MIDI, a synth-generated delay effect, a random arpeggio mode, and arpeggio note transmission via MIDI, along with 10 analogue percussion kit Programs in ROM.

Then, two years after the release of the original Nord came the Nord Lead 2. This provided 16-voice polyphony and a rear-panel PCMCIA memory card slot as standard, upped the number of audio outs from two to four, added a second rear-panel foot controller input, introduced two-way keyboard splits, and added new sonic features such as a sine wave option and sync'able noise in the oscillator section, distortion, and more keyboard tracking options in the filter section. Essentially it was an evolution of the original Nord and subsequent expander and 2.0 software.

The Nord Lead 2 was released in 1997, so it's taken twice as long for Clavia to come up with the next Nord Lead. In the meantime the company has turned to the interfacing and integration of hardware and computer-based software with the Nord Modular and Nord Micro Modular, and introduced the Nord Electro, a performance instrument dedicated to reproducing classic electro-mechanical organ and electric piano instruments (look out for an SOS review soon!).

So does the long wait for the Nord Lead 3 mean that we can expect any dramatic advances or changes in the Lead concept and functionality? Or, like the Lead 2, is the latest model an evolutionary instrument? Clavia came up with a winning recipe when they developed the original instrument, and the challenge in keeping the Lead line going is perhaps to not upset the overall flavour, but throw in enough new ingredients to keep it fresh and still relevant in a changing world.

#### Flashy Looker

The first thing to notice about the Nord Lead 3 is that Clavia have kept to essentially the same 'red synth' design. The front-panel layout has been rejigged a bit, but the overall appearance will be very familiar to Lead users. Consequently Clavia's Lead synth looks as desirable as ever. The sprung wooden Pitch Stick and thin mod/morph wheel controller are still in place, but just above them you'll notice a new feature: the Nord Lead has finally got an LCD screen. Appropriately enough, perhaps, it's an '80s 'retro' two-by-16-character backlit affair; Clavia are having nothing to do with large graphical touchscreens (although probably large graphical touchscreens will be considered retro one day). One of the nice consequences of having the LCD is that you get a display of Patch,

Performance and parameter names. Four mode buttons above the display - Master Clock, MIDI, Synth, and Sound — operate in conjunction with the adjacent up/down/left/right Navigator buttons and the large parameter value Edit/Patch Select knob to navigate you around a relatively small number of parameters in the display. Because the synthesis parameter editing is done via the wealth of dedicated front-panel knobs and buttons in the main panel, and the Nord Lead doesn't have a huge number of parameters beyond the patch edits, parameter editing via the LCD isn't particularly arduous.

Clavia have kept the four-octave keyboard span of the Lead 3's predecessors

(though like them, it has a five-position Octave Shift function on the front panel to give an effective span of eight octaves). This in turn means that the synth retains its 'cutely compact' size and balance of proportions. However, for the first time the Nord Lead series gets an aftertouch-sensitive keyboard. The keyboard action is light yet not insubstantial, and has a sprightly bounce to it,

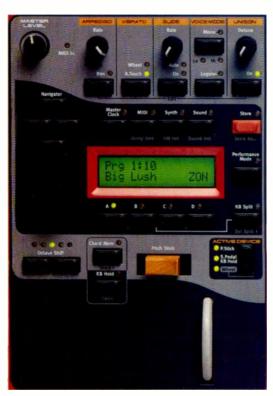
while the travel is reasonably deep, so you need to pick up those fingers and thumbs and articulate clearly. All in all, it's quite a satisfying keyboard to play.

#### **Lights Fantastic**

Getting back to the looks, easily the most striking visual aspect of the new Lead is the colourful latticework of red and yellow-green LEDs that lights

up in the main synthesis editing panel. For the most part, this is down to a new feature on the Lead 3 — the stepped circular LED 'collars' around all 26 sound editing knobs, which illuminate in segments to show the current position of the control. The knobs themselves are of the infinite rotary type (ie. you can keep twisting them round in either direction). The LED collars themselves do have start and stop points, roughly speaking at the five and seven o'clock positions.

When you call up a Program, the appropriate LEDs light up in each collar to roughly indicate the associated parameter value. For the most part these are red; however, if the parameter value is



The Performance Controls allow the setting up of arpeggios, voice modes (mono, legato), vibrato, voice detune, keyboard splits, pitch-bend, and modulation.
The LCD, new to the Nord Lead 3, is also found here.



The three comprehensive LFOs offer a variety of waveforms and an impressive range of frequencies and modulation destinations. To the left, the Morph Assign controls govern the allocation of morph functions to controllers such as the mod wheel, keyboard velocity, and aftertouch. The infinite rotary encoder knobs and their LED 'collars', which contribute so much to the visual appeal of the Nord Lead 3, are particularly in evidence here.

#### CLAVIA NORD LEAD 3

zero then the LED is vellow-green. Because the there is no physical position as such for each knob, when you twist a knob it automatically 'picks up' the LED parameter position and 'moves' the collar LEDs in the direction that it's being turned. It's a very neat (though presumably not cheap) solution to the problem of how to reconcile physical controllers with virtual parameters and at the same time provide meaningful visual feedback on parameter settings. And at the same time, the profusion of LEDs means that the front panel is lit up like a Christmas tree, especially in the dark. Perhaps most strikingly of all, thanks to the Nord Lead 3's multi-parameter morphing function, when you move the wheel you can get multiple LED sweeps all going on at once, in clockwise and anti-clockwise directions, depending on the parameter polarity. It's a great kinetic effect, especially if you're using the wheel to create rhythmically pulsing timbral effects. And it also has the advantage that you can see at a glance which parameters are being controlled from the wheel. Software synths would kill to have a hardware control surface like this.

#### **Performing Lead**

Where the previous Nord Lead models were designated Lead Synthesizers by Clavia, the Nord Lead 3 is entitled Performance Synthesizer instead. This no doubt reflects the fact that the synth is no longer solely useful for monophonic leads as a result of the growth in its polyphony (it's now up to 24 notes — see the 'Quick Spec' box at the end of this review). Presumably, Clavia have retained the Nord Lead name, rather than opting for, say, the Nord Ensemble, for continuity reasons. However, they're also seeking to emphasise the keyboard performance aspect, with ready access to new features such as glide (mono or poly), mono (high or low priority), legato (mono or poly) and vibrato (from wheel or aftertouch), as well as the established arpeggiator (on/off, rate, and keyboard, internal master or MIDI sync, plus up, down, up/down and random directions, and a range of 1-4 octaves). You can even enable these options individually for each of the four patch Slots A-D, to which Programs are assigned for keyboard split and layer performances (see the box on synth architecture above). Each Slot can even have its own arpeggio settings; together with the other slot-assignable functions, this opens up a wide range of live performance possibilities. Other useful new features are Keyboard Hold and the Chord Memoriser (both accessible from dedicated buttons below the LCD window). If you enable Keyboard Hold, any note(s) you play on the keyboard will be sustained until you play one or more other notes, which in turn will be sustained. In conjunction with the arpeggiator, this acts as an arpeggio latch function. The Chord Memoriser function remembers any group of notes being played on the keyboard when you press its button; you can then trigger the chord from individual keys (suitably transposed of course). This function

#### Synthesis Architecture & Audio Outputs

Like its predecessors, the Nord Lead 3 is rooted in DSP-based modelling of classic subtractive analogue synthesis, and champions the sort of knob-intensive dedicated parameter access that got lost during the '80s in the transition from analogue to digital synths. Essentially, then, the synthesis architecture is comprised of two oscillators routed via a mixer through a filter and an amplifier, with modulation from filter and amplitude envelopes, two LFOs and associated modulation sources. However, the oscillator section can also be turned into a two- or four-operator FM synth whose output is routed through the filter and amplifier sections.

This synthesis architecture generates Programs, or synth patches, which can be stored in up to 1024 (8 x 128) onboard memories - representing a major increase in the available writable memories over previous models. Like the earlier Leads, the Nord Lead 3 has four Slots, labelled A-D and accessible from dedicated front-panel buttons, and each Slot can be assigned one Program. When you press an individual Slot button, its parameter settings are automatically assigned to the front-panel knobs and buttons for editing (you'll see the LED settings change). The assigned Slot is the individual one selected or, where more than one Slot is active, the one whose associated LED is flashing.

Being able to assign up to four Programs to the keyboard using Slot selection enables keyboard layers and (now, on the Lead 3 only) split textures to be created quickly and easily. When Keyboard Split mode is enabled, the Slot A and B Programs fall to the left of the (user-definable) split point and the Slot C and D Programs to the right. These Slots don't just point to the Programs but contain copies of the Program data, which can be edited individually within the Slots. Again as on the previous models, the four Slots can be accessed multitimbrally via MIDI, enabling up to four Programs to be played independently, with dynamic voice allocation.

Performances let you store combinations of Programs that you assign to the four Slots, along with associated performance, split/layer and other settings such as control pedal assignments, audio output routing, pitch-bend range, master tempo, and the Slot active for editing. The Nord Lead 3 has 256 onboard Performance memories, giving you ready access to a great variety of split and/or layered textures or MIDI multimbral ensembles, and greatly increasing the sonic versatility and power of the synth.

The Nord Lead 3 increases the number of audio outs to four from the two of its predecessors. You can assign each Slot to any one of the four outs (by selecting M1-M4) as a mono signal, or assign it as a stereo signal to Outs A and B (by selecting S1) or C and D (S2). If you want all four signals automatically summed to a single (mono) out, plug a cable into Out B only.

can be turned on or off for individual Slots. What's more, if you play the same note(s) multiple times while holding Shift and Chord Memoriser, you can stack voices to create bigger sounds.

#### **FM Returns!**

While Clavia's newest Lead has style aplenty, ultimately it needs to be backed up by substance. The Nord Lead's strength, and ultimately the reason for its durability, has always been that it has real sonic substance to back up the style. Clavia have even dropped the Virtual Analogue tag in favour of Advanced Subtractive because, as they put it in the manual, "it can do so much more".

Falling firmly into the "so much more" category, the basic FM capability of the previous models is expanded somewhat on the new Nord Lead by the introduction of a new Dual Sine FM option for the oscillators and an associated ability for the two oscillators to be combined in a four-operator configuration.

De combined in a four-operator configuration.

Clavia have also introduced a new FM mode called Differential FM, which is the type of FM that Yamaha used in its DX synths. FM on the Nord Lead 3 is not as sophisticated as Yamaha's six-operator implementation with its multiple algorithms (ie. operator configurations), but it's



The two oscillators can now be used for FM synthesis in addition to their analogue modelling duties.

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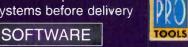


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#### **CLAVIA NORD LEAD 3**

worth bearing in mind that you can use FM in one oscillator together with traditional analogue in the other, and route both through a versatile multimode analogue-modelled filter. Yamaha didn't add traditional filtering to the FM mix until the SY85 in the early '90s, at which time it seemed like an acknowledgement of the failure of FM in the face of sample-based subtractive synthesis.

The Nord Lead remains resolutely sample-free, and while the reintroduction of FM has a certain retro '80s appeal, it more importantly highlights the enduring sonic uniqueness and validity of FM synthesis (see 'The Bluffer's Guide to FM' box in the review of the Yamaha DX200, elsewhere in this month's SOS). And it seems entirely appropriate that Clavia should have opted to utilise FM rather than go the Yamaha and Korg route of integrating modelled acoustic instruments alongside modelled analogue synthesis. The Nord Lead is about creating interesting electronic synth sounds, and FM fits in well with that modus operandi. In fact, the revelation of the Nord Lead is that it gives FM synthesis the real-time editability and responsiveness that it always deserved but lacked. Anyone who ever got a headache as a result of trying to edit FM sounds via the poky interface and endless button-pushing on Yamaha's original DX synths will appreciate this. And it's an object lesson in what a difference a user interface can make. When you're twisting parameter knobs and listening to the real-time sonic interaction of the parameters, you're just dealing in sound, not mathematical abstractions. I'd love to see Clavia do a full-blown virtual implementation of FM synthesis like Yamaha, but with a Nord-style front panel and interactivity.

As it is, the FM synthesis on the Nord Lead 3 still offers plenty of sonic versatility, and lets you create, for instance, classic FM electric pianos and basses, bell-like sounds and metallic drones. Both oscillators can be independently put into Dual Sine FM mode. Oscillator 1 has a simpler implementation, in that the Carrier and Modulator represented by the two sine waves have a fixed 1:1 frequency relationship. With Oscillator 2, you can change the coarse (partial) tuning of the Carrier and the fine-tuning of the Modulator. When both oscillators are in Dual Sine FM mode, you can use the Osc Mod knob to set the amount by which the output of the (modulated) Oscillator 2 Carrier modulates the Oscillator 1 Carrier — effectively creating a four-operator configuration.

The Nord Lead 3 lets you select from six different types of oscillator modulation for each of the two oscillators. I've already mentioned FM and Differential FM. Ring Modulation will also be familiar from the Nord Lead 2. However, there are three other options. The fourth is Filter Frequency Modulation, in which the signal of Oscillator 2 frequency-modulates the cutoff frequency parameters Frequency 1 and Frequency 2 in the Filter section. With the fifth, Distortion, the mixed output from the two oscillators is routed through a distortion processor, with the Modulation knob



controlling the amount of clip distortion. Finally, there is Distortion Modulation, in which the combined output of the two oscillators is amplitude-modulated by a third, 'hidden' oscillator whose pitch is controlled by the Modulation knob, and the result is routed through a distortion

The Amp and Filter Envelopes maintain their easily editable ADSR configuration, but the filter has been enhanced, and offers six single types to choose from, or six 'Multi Filters' representing the single types in parallel or serial combinations.

#### The Internet Connection

Upgrading the operating system software on the previous Nord Leads required a new EPROM chip to be fitted, and by a dealer for warranty reasons. However, with the Nord Lead 3 Clavia have stored the OS software in Flash RAM, which means that it can be overwritten whenever a newer version comes out. OS update files can be uploaded into the synth via MIDI as SysEx data dumps and written to the RAM. So no third-party intervention is now needed.

First, however, you need access to an Internet-connected computer in order to be able to download the latest update from Clavia's web site. The data is provided as a MID file, which means it can be loaded into most, if not all MIDI sequencing software (Clavia say they will also be making available a special OS Dump Utility for Windows and Mac users). First, you put the synth in Receive mode, by holding down the Performance Mode and Store buttons while switching on the synth), then press Play on your sequencer. The data is then played out over MIDI in real time. A status bar in the synth's LED window keeps you informed of progress, and is followed by messages telling you that the Flash RAM is being erased and written with the new data. The Nord Lead 3 then does a quick software reboot, after which you're up and running with the new OS, without any need even to turn the synth off and on again.

The instructions for the OS update are to be found in a sub-directory of Clavia's web site (www.clavia.se/nordlead3/softupdates.htm) and in a 'Readme' file available for download on the page; this file also contains a history list of new features and bug fixes. SOS's review model came with version 0.98 OS

software installed, but Clavia had posted version 1.04 on its web site, so I took the opportunity to check out the updating process and found it to be straightforward and smooth-running. And while you might perhaps think the OS file would run to megabytes of data, it's actually a surprisingly small 158K. If you run your sequencer at 120bpm, the MIDI transfer takes a couple of minutes; Clavia suggest that you slow your sequencer down if you have any transfer problems, but I found everything OK at 120bpm.

Providing such ready software upgradability and putting it in the hands of the users of course raises the spectre of customer as eternal beta-tester. However, while each new OS version so far has included some bug fixes, the Nord Lead 3 — at version 1.04, anyway — doesn't feel like an instrument which is incomplete or sub-standard. And each new version has also included new or enhanced features — most dramatically, perhaps, the increase of polyphony from 18 to 24 voices which happened with v0.98.

Also available for download from the Clavia web site is the latest version of the Nord Lead 3 manual in PDF format. In sharp contrast to the OS file, the manual file runs to almost 7Mb in size (or a bit over 6Mb if you choose the zipped version). That's a fairly hefty download on a dial-up connection, but it's worth it. The synth does come with a spiralbound printed manual, but the PDF version has the advantage of Find searchability and clickable links in the Table Of Contents, the Index and the body of the document. You can also download the factory Programs from the web site, and Clavia says it will be making new sets available for free download.

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#### **CLAVIA NORD LEAD 3**

processor — a good way to create weird enharmonic sounds. You can readily switch through all these options from a single button and audition the results, allowing you to try out a wide range of sounds from the same source material.

Another area in which the Nord Lead 3 has been developed significantly from its predecessors is the filter section. You now have a choice of Single Filter and Multi Filter modes. The former gives you a choice of six filter types: Band-pass, High-Pass, Low-pass, Band-Reject, Classic (a Minimoog-style low-pass filter), and Distortion Low-pass (a low-pass filter with adjustable feedback loop for overdrive-type distortion). 24db, 12db and 6db roll-off options are available, you have filter cutoff and resonance knobs, and you can turn keyboard tracking on or off.

Alternatively you can select the Multi Filter Mode, which gives you six options that represent various combinations of filter types in parallel or series, with predefined roll-offs. Here the Freq2/Distortion knob lets you set a second cutoff frequency for the additional filter. All these options significantly increase the range of sounds you can generate, and as with the oscillator mode selections, you can quickly audition the various options from the dedicated 'multi-step' buttons.

The Unison feature is worth a mention, as it has undergone significant development. When you activate this feature from its dedicated front-panel button (which you can do per Slot within a Program), you get five simultaneous voices per note, with two in the left channel, two in the right, and one in the centre, giving a good stereo spread. You can detune these voices against one another using the Detune knob to fatten up the sound. But even more impressively, Unison mode doesn't reduce the available polyphony — playing a single Program in Unison mode still gives you 24 voices!

Finally, the Morph function, which on the Nord Lead 2 lets you create two 'snapshots' of synthesis parameter settings and 'morph' between them from the modulation wheel has now metamorphosed, so to speak, into a Multi-Morph function, in which you can create four Morph Groups, each able to change up to 26 parameters. In addition to the modulation wheel you can control separate morphs from keyboard velocity, keyboard range, and aftertouch/control pedal. This can get pretty amazing, because you can use these morphs together. So you can be generating one morph from aftertouch while at the same time moving the mod wheel to generate another morph. In each case the morph isn't just a straight A-B change, but is relative to the position of the controller at any given moment, so you have a fine degree of control over the multi-morphed sound.

#### **Conclusions**

Clavia have done a fine job of developing and enhancing the sonic versatility and flexibility of the Nord Lead in a way which could be described as organic — existing Nord Lead users will find the Nord Lead 3 a natural outgrowth or extension of

#### Previously in SOS...

- NORD LEAD REVIEW: MAY 1995 www.sospubs.co.uk/sos/1995 articles/may95/clavianordlead.html
- NORD LEAD V2 OS: DECEMBER 1996 www.sospubs.co.uk/sos/1996 articles/dec96/clavianordleadv2.html
- NORD LEAD 2: SEPTEMBER 1997
   www.sospubs.co.uk/sos/1997 articles/sep97/clavianordlead2.html

their instrument, and will take to it like the proverbial duck to water. The enhanced FM synthesis capabilities, new oscillator modes and new filtering options are all welcome additions, and particularly effective is the way the FM-generated sounds blend into the overall rich, warm sonic character of the synth, while giving it a broader range. And it's good to see that Clavia have responded to criticisms of the earlier Leads by providing keyboard aftertouch control, an additional two audio outs, a MIDI Thru socket, an LED window, and a much healthier number of Program and Performance memories. Also praiseworthy is the ability for users to upgrade the OS themselves via the Internet.

On the other hand, the Nord Lead 3 is a pricey instrument but it still doesn't have features taken for granted on many other synths, namely built-in multi-effects processing, an onboard multitrack sequencer, and a disk drive. Whether or not the absence of these features matters on a purist's synthesizer like the Nord Lead, which certainly isn't trying to be an all-singing all-dancing workstation, is ultimately an individual decision.

All in all, though, the Nord Lead 3 is a worthy if not earth-shattering or mould-breaking addition to the Lead series.

#### information

- Nord Lead 3 keyboard £1895; rack £1695.
- Prices include VAT.

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- E hinh2@aol.com
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- W www.clavia.se

## Nord Lead 3: Quick Spec

- Synthesis: subtractive 'virtual analogue' and FM.
- · Polyphony: 24 voices.
- Multitimbrality: four-part.
- Keyboard: 49 keys, attack velocity- and channel aftertouch-sensitive.
- Programs: 1024 (8 x 128).
- Performances: 256 (2 x 128).
- · Arpeggiator: Yes.
- Effects: No.

- Sequencer: No.
- · Disk drive: No.
- · Audio inputs: No.
- Display: Two-by-16-character backlit LCD, three-digit LED.
- Top-panel controllers: Pitch Stick, Mod Wheel.
- Rear Panel: Control pedal and sustain pedal inputs; Audio outs A, B/Mono, C and D; MIDI In, Out and Thru; stereo headphone output (see below).



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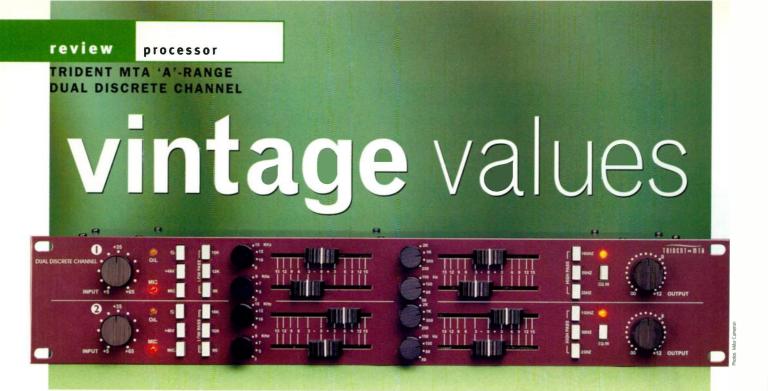
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## TRIDENT MTA 'A'-RANGE DUAL DISCRETE CHANNEL

he Trident consoles had their origins in mixers developed during the '70s for the London recording studios of the same name. Feedback from the leading recording engineers of the day was influential in the development of the consoles, and they quickly acquired a reputation for a desirable sonic character which remains popular to this day. Many original Trident consoles are still used in specialist studios around the world, particularly in America, and there are several companies currently making replica consoles or 'producer modules' based on the favoured Trident designs.

The Trident MTA 'A'-range dual-channel preamp and equaliser reviewed here is built by Fletcher Electroacoustics — probably best known for their line of strikingly green Joemeek processors — in association with Malcolm Toft, the original managing director of the long-defunct Trident Audio Developments. Barry Porter designed the electronics of the Trident 'A' and 'B' ranges with Malcolm Toft being responsible for the facilities and ergonomics of the original consoles. Ted Fletcher was designing Alice mixing consoles as a contemporary of Porter (who left Trident to work for him in 1976), and has comprehensively updated the electronics of this new module to endow a performance commensurate with the 21st Century.

Although the handbook refers to the 'A' range as being conceived in 1974, the console from which this input and EQ module design derives was, in fact, first marketed in the summer of 1972 as the Triad 'A' range. OK, I admit to being sad enough to have searched my magazine archives to check the dates of the original advertisements — I don't get out much...

#### Something Old, Something New

Perhaps the first thing to make clear is that this is not an 'exact' recreation of the original 'A'-range module. Although the controls of the new 'A'-range Continuing the trend for reinventing the classics, this reworking of the original Trident 'A'-range input module seeks to recreate the sound of the '70s. **Hugh Robjohns** steps back in time.

unit are similarly arranged and specified, the underlying electronics have been thoroughly updated, as already mentioned — after all, analogue electronics and performance expectations have come a long way in a quarter of a century. Several aspects of the original design had to be updated in any case to allow reformatting as a stand-alone processor. Having said that, the designers claim to have kept the sonic character very much along the lines of the original, in spite of the better noise figures, wider and more uniform frequency response, and diminished transient distortion.

The 2U rackmounting box is well constructed, with a distinctive and unusual plum-coloured front panel and horizontal faders showing the gain of each of the EQ bands. Two completely independent channels are provided, each with selectable mic and line inputs, switchable phantom power, and a stepped gain control. Polarity inversion switches can affect both mic and line inputs, but the unit otherwise retains absolute polarity regardless of whether the EQ is switched in or out. The equalisation sections each incorporate a trio of high-pass filters and another of low-pass filters, in addition to four separate equaliser bands. The top and bottom sections have shelf responses while the two mid-bands are bell-shaped. Every band is provided with four selectable turnover frequencies, overlapping nicely to allow very musical tonal correction. The sliders are labelled for ±15dB of gain, with centre detents.

The 'A'-range processor requires only 190mm of rack depth (not including the connectors) and

# TRIDENT MTA 'A'-RANGE DUAL CHANNEL £2699

#### pros

- Delightful musicality of equalisation.
- Subtle sonic personality in the mic preamp.
- Distinctive but agreeable ergonomics.

#### cons

- Panel markings imprecise.
- Some stiff competition at this price point.

#### summary

A reinvented classic dual-channel mic preamp and equaliser derived from the Trident 'A'-range console of the 1970s, bringing old-world musicality up to date.

SOUND ON SOUND

"The predominant reason for buying this 'A'-range processor is undoubtedly its equalisation, which is simply magical!"

doesn't get warm at all. The rear panel is clearly labelled and equipped with the ubiquitous IEC mains inlet and integral fuse/voltage selector. Six XLRs provide mic and line audio I/O connections, though the line inputs may also be connected through separate, paralleled TRS quarter-inch jack sockets. There is no mains isolator switch on either rear or front panel — once this unit is plugged in it is continuously powered. On the review model there was also no indication of the fuse rating (100mA) or power consumption, either on the unit or in the handbook. However, the review unit was a hand-assembled production version, and I gather that this oversight is to be corrected on the final production units.

Internally, the components are all conventional types mounted on high-quality fibreglass PCBs — one for each channel mounted one above the other. Numerous daughter boards support and interface the front-panel switches and LEDs. A PSU module is mounted on the rear panel and supplied from a tiny transformer fixed to the right-hand side of the chassis. The type and positioning of the mains transformer has been chosen to minimise any stray flux interfering with the four large inductors in the EQ circuitry, and soft steel top and bottom panels help to minimise any effects from other equipment mounted above and below in a rack. Although noise

and hum figures are very low, users may find that careful selection of adjacent units may produce further improvements.

Mic preamps designed in the era of the original 'A' range employed transformers to match impedances, unbalance the microphone signal, and provide much-needed voltage gain, but with the side effect of causing some frequency response aberrations and distortion. This remodelled design retains an input transformer to preserve the sonic character, but reduces the ratio from the original 10:1 down to 4:1. This improves linearity but requires more gain from the input amplifier something modern electronics can do rather better than was possible in the '70s. Consequently, the original dual-transistor front end has been replaced by a modern high-end integrated amplifier (an MC33078 bipolar op amp, to be precise), with an 11-way switch incrementing the gain in steps of between 3dB and 6dB. A quad JFET op amp provides additional gain stages and the polarity inversion facility.

The original console module used the same input stage to handle both line and mic inputs, but these two functions have been separated in this recreation to improve flexibility and performance. The balanced line input is accommodated with one of Ted Fletcher's 'Superbal' electronically balanced



#### TRIDENT MTA 'A'-RANGE DUAL DISCRETE CHANNEL

input circuits, based around another JFET op amp.

The output level control allows full attenuation at its counter-clockwise end and a further 12dB of gain above its nominal 0dB position. The scaling of the input gain control is rather less well calibrated, particularly at its bottom end. With the output control at its 0dB position and all EQ switched out, the maximum mic input gain was found to be 62dB (3dB short of the panel marking). However, the minimum gain was found to be 16dB rather than the 5dB marked at the end of the scale — a pedantic point, but one that may cause confusion for some users. The line input gain ranges between -9dB at the minimum setting to +20dB at the maximum, with the mid-position equating to around +2dB.

#### The Equaliser

The raison d'être of this unit is its comprehensive but highly musical equalisation facilities. Band filtering is something often overlooked these days, but the importance of removing subsonic and ultrasonic signals can not be over-stressed, especially now that ubiquitous nearfield monitoring precludes hearing the bottom octave of a recording. The 'A'-range processor employs Sallen and Key filters with 12dB/octave slopes and minimal phase shifting, which sound smooth and unobtrusive yet remove sonic rubbish very effectively. Two banks of

buttons select low-pass filtering at 9, 11 and 13kHz, and high-pass filtering at 25, 50 and 100Hz.

The four-band equaliser looks to be a traditional design with shelf responses for the top and bottom sections and bell responses for the two middle bands — the Q value of these is

around 1.2, which is pretty broad and contributes to the very musical nature of this design. Two discrete Class-A transistor amplifier stages are employed in the equaliser, one for the top and bottom bands and the other for the mid-bands. These are based on the original topologies, but have been improved with a constant current source in the first stage to dramatically improve headroom and reduce transient distortion — a red LED warns of impending clipping.

The two mid-band sections employ large hand-wound inductors as part of their frequency selective circuitry — an improvement over the 'pot-core' elements used in the original because of space restrictions within the console module. However, these inductors are prone to picking up stray magnetic fields (notably from external PSU transformers), which is why a faint trace of residual hum may be audible in some situations when the EQ is switched in.

Each of the four EQ bands is equipped with a three-position rotary switch to select the turnover frequency, and a horizontal fader to adjust boost or cut up to 13dB (despite the 15dB calibration markings). The top and bottom shelf sections can be switched between 8, 10, 12, and 15kHz, and 50,

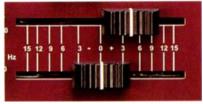
80, 100 and 150Hz respectively, while the two mid-bands offer 0.25, 0.5, 1 and 2kHz and 3, 5, 7, and 9kHz — all nicely overlapping and providing a fine degree of control.

The output stage is a complete redesign from the original as it has to interface with the outside world rather than a console's fader and routing section. Another MC33078 op amp is employed to drive the output XLR in an autobalancing configuration which maintains signal level even if connected to an unbalanced destination.

#### **Listening Test**

As a mic preamp, this new 'A'-range unit is very competent, with extremely low distortion, respectable noise performance, and a very pleasant, yet subtle character. It is not as warm and rounded as a typical valve stage, but has more body and personality than the rather clinical-sounding precision preamps available these days. In direct comparison, I found it was not as fulsome and natural at the bottom end as my own GML preamps, but was certainly preferable to the (highly competent) input stages of a little Mackie 1402VLZ mixer during a recent location recording session.

The predominant reason for buying this 'A'-range processor is undoubtedly its equalisation, which is



The controls are slightly inaccurate in their calibrations — these main EQ sliders are calibrated for ±15dB where a range of only ±13dB actually appears to be available — but the sound is magical.



simply magical! OK, so the sliders are a marketing hook (the same facilities could have been incorporated into a 1U case with conventional rotary controls if the 'classic styling' had been dispensed with), but the fact remains that the sound of this equaliser is delightful. This is a very musical tool indeed, living up to the claims of the original 'A'-range console as 'the first truly musical sound mixer'. This is not a technical tool for correcting poor recordings - it is intended for delicate, creative tailoring and enhancement duties, helping to 'unveil' subtle tonal characteristics and enable instruments to stand out in a mix without losing their subtlety and character, or taming the less desirable artifacts of a signal source without seeming to 'change' the overall sound in a negative way.

#### Conclusion

At this stratospheric UK price the 'A'-range Dual Discrete Channel is positioned well above a lot of very good products and will have to face up to competition from high-end names including Avalon, Millennia, Focusrite, and Summit. However, with its unique character, musical equalisation and high build quality I'm sure it will find a niche in the market.

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PC AUDIO RECORDING: BASIC PRINCIPLES

# Reeping AUDIO RECORDING USING A PC SOUNDCARD: BASIC PRINCIPLES IT SIMPLES

n last month's PC Musician feature I concentrated on the mastering stages of computer recording. However, judging by the number of queries that keep popping up on our forum, there are plenty of musicians out there who have problems at the other end of the chain. Some are new to soundcard recording and bewildered by the maze of options, while even experienced musicians face plenty of pitfalls given the sheer number of features modern soundcards have to offer. So, this month I'm going to explain all of the ins and outs of PC soundcard recording, including some of the different ways you can connect mics and quitars to a basic soundcard, your monitoring options, and how to add effects during a recording. I'll also be covering how to track down problems when using soundcard mixing utilities, and how to make the most of the huge dynamic range provided by today's 24-bit converters.

#### **Line Inputs**

The basic function of an analogue soundcard audio input is to convert incoming analogue audio signals to digital data which can be stored and processed in the computer. Getting the best sound quality in your recordings, then, is a matter of feeding the soundcard an analogue level sufficiently high to take advantage of the full range of its A-D converters, but without exceeding their input range ('clipping'). This process is complicated by the fact that different source signals can have wildly differing levels.

Nearly all soundcards provide what are generally known as line inputs. These are suitable for signals whose level is similar to that emerging from the average box of electronics, such as a MIDI synth or hi-fi. Most consumer electronics devices have output levels that conform to this -10dBV level, which is nominally 300 milliVolts RMS, and their input sockets also expect signals at a similar level. More expensive professional gear, by contrast, generally has inputs and outputs that operate at the +4dBu level, at a nominal 1.23 Volts RMS.

Many soundcards allow their inputs and outputs to be switched between these two levels, so that you can optimise performance with whatever line-level gear you are connecting to them. The only time you need specifically to match the input sensitivity of your soundcard to the output level of

As with any recording system, the first goal of recording on a PC is to preserve as faithful a copy of the source sound as possible. Achieving this, however can be a complicated business.

Martin Walker goes back to basics.



the source signal is when recording from another record or playback device such as a DAT or Minidisc machine. Assuming your mix was correctly recorded onto this device in the first place, you will already have a signal whose peak level is within a few dBs of digital clipping at the nominal level. When transferring this signal to your soundcard you should therefore choose the same nominal sensitivity as your DAT recorder output.

Recording hardware synths can be a lot more confusing, since although their nominal output level may be specified as ·10dBV or +4dBu, the actual levels at the output socket will vary hugely depending on how many notes are playing, how

Soundcards that use AKM's AK4524 converter chip — such as Terratec's EWX 24/96 — have an analogue input gain control, and you can use this without compromising your digital resolution. If you use the level controls on some other cards, however, you may simply be throwing away digital resolution.

#### **Digital Recording**

One issue that causes a lot of confusion is how to transfer an existing DAT or Minidisc recording to a computer without having to pass it through another set of A-D converters. To create a true bit-for-bit digital copy, you will need a soundcard with a digital input, and a suitable digital output on your hardware recorder. In addition, your soundcard will normally need to be set to 'External Clock', so that it locks to the clock embedded in the incoming signal from your DAT or Minidisc recorder. If you ignore this, the original and computer soundcard clocks will be totally unrelated, and although your music won't be passing through an A-D or D-A converter, you are likely to get clicks and pops during the transfer.

Some soundcards, however, have caught people out by having a digital input handled by the Emu10K1 chip. These cards include the SB Livel and Platinum models, and the Emu

APS. The chip has an advanced sample-rate converter built in, which re-clocks all incoming signals to its fixed 48kHz internal clock. Although this has the undoubted merit of allowing digital inputs to be mixed with analogue ones in real time, it's not possible to get bit-for-bit transfers of digital data. These cards' digital outputs are also fixed at 48kHz, whatever sample rate you have chosen for recording, which can make them difficult to interface with other gear that prefers 44.1kHz.

By the way, soundcard inputs are nearly always provided in stereo pairs, and while you can obviously record a mono signal by only using one of the two channels, this may not be an option during digital transfers. However, most audio editors will let you extract the left or right channel from a stereo recording, and this can then be imported as a mono file into your multitrack audio sequencer.

many simultaneous MIDI channels are sounding, and what values have been set for controllers such as MIDI volume and expression. Levels may also vary enormously depending on the settings of various parameters within a patch, especially the amount of filter resonance, which makes it difficult to predict peak levels even from note to note.

If you are using only a single sound from a multitimbral synth, try to increase the output level of this single sound internally to minimise the noise contribution of the synth's output electronics. For the same reason, always leave your synths' physical output level controls at maximum. Once you've done these things you can just choose the soundcard input sensitivity that lets the synth's peak recording levels get closest to OdBFS without actually clipping.

#### **Level Controls**

If your soundcard has input level controls, it's convenient to use these as a final tweak on incoming signal levels so that their peaks get closest to digital clipping without actually getting there. However, some level controls on lower-cost cards operate in the digital domain, which means that the input signal has already passed through the A-D converter before it reaches the control. If this is the case then setting them at any value other than maximum means that you are simply throwing away bits of digital information. One example of this type is Echo's old 20-bit Darla card (by contrast, the 20-bit Gina and Layla had analogue input gain controls, so didn't suffer from this limitation). There are also plenty of soundcards with digital output level controls, and for the same reason you should leave these at maximum for serious work, although they might be useful for adjusting the level of a monitor mix when you're not actually recording the result.

You should only ever use a soundcard's input level control if it operates in the analogue domain, ie. before the A-D conversion process. Here it will simply vary the level without compromising digital resolution, although if this analogue level control isn't right at the beginning of the analogue circuitry, it will still be possible for an input signal to clip at this stage however much you turn down the level control. This can be particularly confusing where soundcard designs incorporate two level controls at different points in the signal chain, such as an input control and master level control. If you're not careful you can get distortion at the beginning of the chain but still have peak output levels way below digital clipping. I seem to remember having problems of this sort when I reviewed the Emu APS card, for instance. This is further complicated in the case of soundcards



# PC AUDIO RECORDING: BASIC PRINCIPLES

that offer recording of multiple inputs, since it creates more opportunities for total signal level to exceed digital clipping, even though the individual input signals are well within safety margins.

The situation is exactly the same as the one you face when dealing with the input gain and channel faders of a hardware mixer, except that soundcards rarely offer pre-fade listen facilities to help you optimise the level at each stage. The solution is to send a 1kHz sine wave signal into your soundcard's input (most synths will be able to generate a suitable waveform). This lets you hear the onset of clipping very clearly, and if you spend a little time experimenting with input levels you can get a feel for how best to set up your soundcard level controls to optimise signal level at each stage as it passes through the soundcard mixer.

Thankfully, most recent soundcard designs incorporate high-resolution internal DSP mixing that avoids multiple input problems, but the input and output level controls may still compromise your recordings — do read your manuals very carefully to see if any such limitations exist, or else you will be simply throwing away some of your data.

#### **Soundcard Mixing Utilities**

This brings us neatly to the other difficulties involved in using soundcard mixing utilities. Many problems during recording, from missing signals to ghostly versions of existing backing tracks being added to each subsequent recording, can be traced to incorrect settings in these utilities. Obviously I can't cover each and every soundcard, but there are some basic issues that apply to nearly all of them.

First of all, some soundcards declare themselves in full to Windows, and therefore get the option of the Volume Control icon on the Taskbar. Launching this gives you a simple Recording/Playback mixer whose faders depend on the individual capabilities of each card. This Windows mixer is perfectly usable, but if a dedicated utility is also provided you should always use this in preference, since it's likely to offer more features. Examples include the Creative Mixer in the case of the Soundblaster Live! range, Echo's Console, and M Audio's Control Panel.

The most common mistake is to lose the input signal altogether. This is nearly always caused by the input in question being muted in the utility, or the appropriate fader being pulled down. A related problem is when you can hear the input signal, but your recordings are still blank, which may be because your soundcard provides separate controls for monitoring and record selection and levels. These can be extremely confusing: you just have to make sure that you have selected the appropriate input for recording.

The popular SB Live! and Platinum soundcards provide particularly comprehensive mixers stuffed to the gills with features, and have caught plenty of musicians out. For instance, you can use them to record from multiple inputs simultaneously if you use the 'What U Hear' source in the Record Control utility, and use its slider as a master level control.



Then you have to change to the Play Control page of the same utility, or open a second instance of the SB Live! Mixer, to set up relative recording levels for the different input signals.

#### **Recording Microphones**

Having covered the basics of line-level I/O, setting up recording levels, and making the most of the mixing utility, let's turn our attention to some more specialised recording. Although every soundcard provides at least stereo input at line level, there are two popular sound sources that have very different requirements: the microphone and electric guitar. Microphones can vary quite a lot in their output level, depending on type, but all require a far more sensitive input than line level, with lots more amplification needed to get them anywhere near the recording levels required to keep background noise at bay.

Some consumer soundcards, such as Creative Labs' SB Live! model, offer a choice of mic inputs as well as line inputs, and these can provide a useful introduction to recording mic signals. However, although huge advances have been made in soundcard technology over the past couple of years, placing a sensitive mic preamp inside a computer is still a little optimistic, and you are likely to get significantly better results using an external preamp. Some cards, like the SB Live! Platinum and Emu APS, move the sensitive components onto a separate circuit board in a drive bay, which is a little further away from the motherboard, but for the best results they should be outside the computer altogether.

One way to achieve this is to buy a two-part soundcard design comprising a PCI expansion card

Some consumer soundcards, like Creative Labs' SB Live!, have so many inputs and options that unless you're careful you can lose the input or playback signals altogether.

## Incorporating Outboard Effects

Many musicians moving to a PC-based system already have outboard effects processors, and want to integrate these into their computer setup. By far the easiest way is to allocate a spare soundcard output as an Aux Send, and then connect this to the input of your effects unit. You can then route various amounts of specific tracks to this output, just like the Aux Send system of a traditional hardware mixer, or send the whole of one specific track through this output if you want to use an Insert effect. Whenever you want to record the treated track onto your hard drive as an audio file, you can solo it and route it back into your soundcard input.

This approach works well if you have an external hardware mixer, and if you have a soundcard with 'zero latency' you can adopt the same approach without an external mixer, using the mini-mixer of your soundcard for real-time monitoring of the rack effects alongside the other sequencer tracks. However, you won't have much success if you don't have 'zero latency' soundcard monitoring available, since the rack effects will then all be delayed by the latency value. You may be able to compensate for this with insert effects by dragging the relevant tracks ahead of the rest in your sequencer, but it's not a very workable solution.

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▶ and a stand-alone or rackmount case containing the mic preamps. There are now various models available, such as Aardvark's Direct Pro 2496 with four switched mic/line inputs, Echo's Mona with four multi-purpose mic/guitar/line inputs, and Seasound's Solo, with two mic, two instrument, two line, and two auxiliary inputs. These all contain very high-quality mic preamps, and are an ideal solution if you want to record several instruments simultaneously. With prices starting at around £500, however, they could be too expensive for musicians who simply want to record vocals or a single instrument in mono or stereo.

M Audio's Omni I/O is an extremely useful add-on to their Delta 44 or Delta 66 soundcards, and essentially provides two mic/instrument preamps (identical to those on their more upmarket DMP2) with balanced/unbalanced inputs respectively, along with four additional line-level auxiliary inputs and a selection of outputs. Moreover, a breakout cable is now available that lets you connect it to any soundcard, and at under £200 it is, not surprisingly, proving very popular.

Another option is to forget installing a soundcard and go for an all-in-one USB solution. Many, such as Edirol's U8 Digital Studio, have inputs for mic, guitar, and line inputs, and although it's unlikely that these will have particularly high-quality mic preamps, they will certainly give those on consumer soundcards a run for their money. A more upmarket solution is Swissonic's USB Studio D, which provides two balanced mic inputs of high quality and two instrument inputs, along with a further selection of phono and line inputs and a comprehensive monitoring section.

Many musicians choose to amplify and condition their mic signals using a voice channel — a rackmount unit containing a single high-quality mic preamp, usually a built-in compressor to even out recording levels, and perhaps a high-quality EQ section as well. These start at about £150, and you can simply connect their analogue outputs to the line inputs of any soundcard. Some models, such as the new Joemeek VC1Q, even have an optional 24-bit/96kHz digital output, suitable for direct connection to a soundcard digital input, so that no analogue signals enter the computer at all. You could, of course, use the mic preamps of a small hardware mixer instead.

Whichever route you choose to go down, one further point to bear in mind is that most condenser mics require +48V phantom power, so if you plan ever to use such a mic, make sure that your chosen preamplification device can supply this.

#### **Electric Guitars & Basses**

Electric guitars have much healthier output levels than mics, normally by a factor of 10 or more, but whereas mics generally demand a fairly low input impedance from a preamp, guitars need a very high one to avoid loading their pickups. So, even if your soundcard has a sensitive mic input, if you use it for directly recording an electric guitar or bass guitar, it will probably sound extremely thin and weedy. If

#### **Lowering Latency**

As PC processors get ever faster, and soundcard drivers are further improved, it's becoming easier to reduce soundcard latency sufficiently to monitor input signals with real-time plug-in effects. Values of 6mS to 12mS are now becoming more common, with promises of 3mS with some WDM drivers. Your music application may default to a conservative value for soundcard buffer size, but in many cases you can reduce this significantly before audio glitching starts to occur. I've discussed this technique on various occasions in the past (most recently in SOS December 2000), but now that so many soundcard drivers offer ASIO, EASI, DirectSound, and MME drivers, it can be confusing knowing where to look to adjust the appropriate buffer size, especially since every software application takes a slightly different approach.

Steinberg let you alter ASIO, DirectSound, or MME settings while running *Cubase VST*—you just select the appropriate driver from the drop-down box in the Audio System Setup page, and then open the ASIO Control panel and choose a new buffer size. Emagic provide the stand-alone *Logic Audio Device Setup* utility, while in *Cakewalk Pro Audio* and *Sonar* you can find similar settings in the Audio Setup window.

Where you have additional settings inside the soundcard driver utility, there may be several ways to adjust latency. For instance, most Terratec cards offer 'ASIO Buffer Size' and 'DMA Buffer Transfer Size'. The difference between these two is that ASIO Buffer Size alters only ASIO Latency (and can also be changed inside most audio applications), while DMA Buffers affect the latency performance of the MME driver.

you don't want to mic up your guitar cab, then, you'll need a way round this problem.

I've already mentioned some two-part soundcard solutions with either switched mic/guitar inputs, or completely separate ones, but the cheapest solution for a guitarist with a more basic soundcard is to connect the line-level output of an existing guitar amp to the soundcard's line-level input. This won't give a sound remotely like that emerging from the amp's speaker, but with the help of EQ, cabinet-simulation and distortion plug-ins you should be able to improve matters.

If you don't have a guitar amp, you can use an impedance converter or a DI box between the guitar and a mic input to provide suitable matching. However, if you do a lot of guitar recording, the new breed of physical modelling preamps such as the Line 6 Pod, Johnson J-Station, and the new Behringer V-Amp provide the most convenient way to get a wide selection of guitar sounds, and can be plugged straight into a line-level soundcard input. The J-Station also benefits from having a co-axial digital output.

#### **Balancing Acts**

When dealing with the tiny signals emerging from a microphone with a balanced output, most musicians can see the advantage of using a balanced cable and balanced amplifier input. Balancing works by splitting the signal into two opposite-phased components, feeding them down two central cores of a screened cable, and then inverting one of the phases and adding it to the other, so that any interference picked along the cable will be cancelled out. This can greatly reduce hum and buzz picked up from mains power wiring, thermostats, light dimmers, computer monitors, and so on, as well as radio interference.

However, many musicians still can't quite see the point of buying a soundcard with balanced line-level I/O, especially when the vast majority of MIDI synths that will get connected to it have unbalanced outputs anyway. The problem is one of ground loops. Each time we connect a new synth to

#### **Further Reading**

I've already reviewed many of the products mentioned in this feature. You can find them in the following back issues, many of which are now also available in full on the SOS web site:

- Emu APS (January 1999).
- Creative Labs SB Live! (May 1999).
- Swissonic USB Studio D (March 2000).
- Aardvark Direct Pro 2496 (April 2000).
- Lexicon Core 2 (May 2000).
- Echo Mona (October 2000).
- Seasound Solo EX (December 2000).
- M Audio Delta 66 & Omni I/O (January 2001).

#### The @865 is available at the following stockists:

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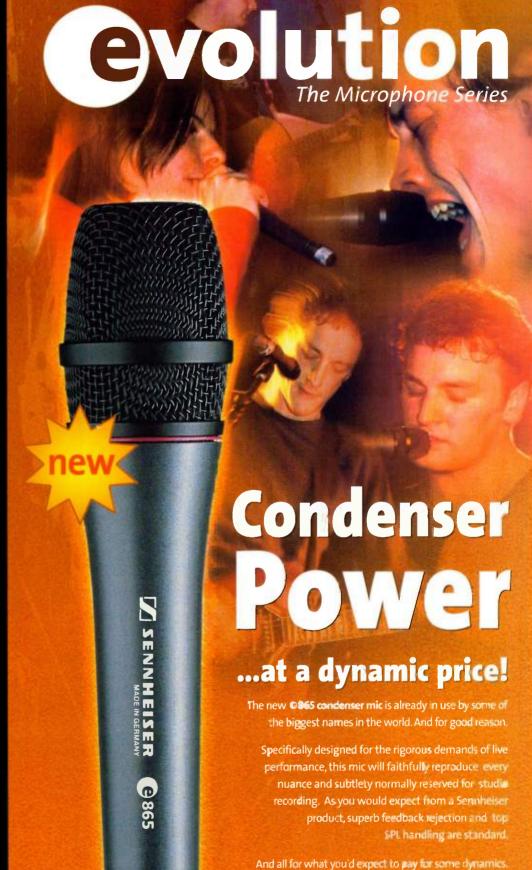
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#### PC AUDIO RECORDING: BASIC PRINCIPLES

earth via its mains cable, and then connect it a second time via an output cable to the soundcard or mixer, we create a ground loop, which causes small currents to flow and hum levels to rise. The problem can be even more obvious when connecting soundcards with multiple inputs and outputs to other gear. If you connect all of these inputs and outputs to an external mixer or recorder, for instance, you will once again have created lots of ground loops. The chances are that since all the cables take the same path and are of similar length, you won't compromise background hum levels too much, but the situation tends to get worse when your PC has multiple soundcards installed, since the paths become more convoluted.

Since it's very dangerous to disconnect the mains earth wire inside a UK mains plug to break the loop, one answer is to buy a soundcard with balanced I/O, and to choose mixers and other gear which also have balanced I/O. Then you'll never get a ground loop, and your hum and buzz levels will be minimal. This is particularly important if you want to make the most of the dynamic range of 24-bit converters — and as you can see from the screenshot, using balanced I/O can lower the background hum levels considerably.

To connect the remainder of your unbalanced synths and so on to your multiple soundcard inputs, you can make up psuedo-balanced cables including a small resistor to break the loop; these can lower background hum levels considerably. Paul White has explained how to make these up on various occasions in SOS (most recently in Q&A, June 2000), and it's well worth the effort.

#### Latency & Monitoring

Input latency is one of the biggest problems for those using computer-based recording systems, and both understanding the problem itself and finding a solution can be very confusing. Latency is a time lag between the input signal being recorded and you hearing it from inside a software audio application, and acts exactly like the delay you hear when listening off-tape with a reel-to-reel tape deck, making it difficult to play along in time. However, unlike tape delay, it's possible to reduce soundcard driver latency by changing the size of its software buffers (see box on previous page).

Many soundcards now offer 'zero latency' direct monitoring to bypass the problem altogether, which works by routing the input signal directly to the output of the soundcard, normally via a softwarecontrolled level control on the soundcard itself. If your soundcard offers this option then you will be able to set it up using the soundcard mixer utility see your soundcard manual for more details. In some cases your audio application can also switch this feature in and out on demand: in Cubase VST. for example, you may see a box labelled 'Direct Monitoring' in the Audio Setup page, which will automatically let you monitor the input signal with 'zero latency' whenever you engage record mode. For a more comprehensive explanation of latency, read my feature in SOS April 1999.

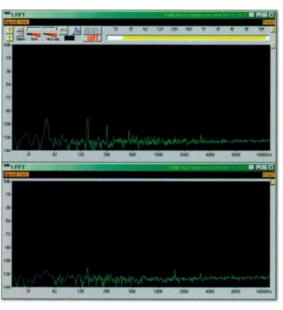
#### **Adding Effects During Recording**

The reason that latency is so annoying is that it prevents you using software plug-in effects on the signals you're recording, yet many singers find it harder to pitch their vocals without hearing a little reverb in their headphones during a recording, and guitarists may want to hear effects such as rhythmic delays. However, it's almost impossible to play along when you're hearing your performance delayed by more than 20mS or so.

If your soundcard isn't capable of providing latency under 20mS then there are still a couple of ways around the problem. The first is to buy a soundcard that incorporates hardware DSP effects, as these aren't prone to latency. Examples include the Aardvark's Direct Pro 2496. Creative's SB Live!. Emu's APS, Lexicon's Core 2, and Yamaha's SW1000XG. If your soundcard doesn't have such options, you can of course add effects to the signal being recorded using a rackmount effects unit patched into the Aux

Send/Return loop of a hardware mixer, if you have one (the traditional approach). Both options will normally allow you to monitor the input signal with effects while making the actual recording 'dry', so that you can add different reverbs and effects later on in the context of the whole track.

Buying a soundcard with balanced I/O can greatly reduce background noise levels, as seen here. The top trace shows the residual noise from an Ego Sys Wami Rack 24 output connected to a balanced input on my hardware mixer using an unbalanced cable, while the lower one shows a 2odB drop in hum levels, achieved simply by replacing the lead with a balanced one.



If you have a soundcard with built-in DSP effects, such as Yamaha's SW1000XG, you can bypass latency problems altogether and add effects during audio recording, using a utility like XGedit95.



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KORG D12

# digital dozen

# KORG D12 DIGITAL RECORDING STUDIO

nother month, another hard disk digital multitracker. The competition between manufacturers seems to generate new machines at an ever increasing rate. Not that those looking to purchase are likely to be worried; prices are falling and specifications rising. There are already a number of eight-track machines, including the Boss BR8, Fostex VF08, Roland VS890 and Tascam 788, and now there is also an increasing number of 16-trackers available, such as Akai's DPS16. Fostex's VF16, Korg's D1600, Roland's VS1880, and Yamaha's

AW4416. However, there is precious little choice for you if your needs stretch beyond eight tracks, yet your budget can't stretch as far as 16 - so far only the Akai DPS12 has provided an intermediate track count.

Korg's new D12 12-tracker is designed to fit neatly between these two markets. While clearly related to the larger D1600, with an impressive feature list, this machine retails in the UK for £600 pounds less than its larger sibling. So which corners have been cut to make this price possible?

#### Baker's Dozen

The D12 is capable of simultaneous playback of 12 uncompressed, 16-bit, 44.1kHz tracks, with four tracks of simultaneous recording. Like a Baker's dozen however, Korg offer something extra in terms of track count as each of the 12 playback tracks has eight 'virtual' storage tracks. A 24-bit mode is also available (with reduced track count) although, as the A-D/D-A conversion is only at 20-bit, you need to record via the unit's digital inputs to get the full benefit of this.



If eight tracks feels a little cramped, but 16 is just too expensive, then maybe 12 is the answer. **John Walden** investigates the new Korg D12.

The physical size of the D12 has been cut down, having more now in common with Korg's original D16 (reviewed back in SOS February 2000) than the D1600, yet the unit still remains fairly robust. There are four analogue inputs provided, all located along the unit's front edge. Inputs 1 and 2 will take XLR connections but, unlike the D1600, no phantom power is provided. Input 1 also has a dedicated guitar input on an unbalanced quarter-inch jack and, when used with the built-in guitar-oriented effects, makes for very easy direct recording of guitar or bass tracks. There is a built-in microphone, situated at the bottom left of the control surface, and the quality of this is perfectly suitable for catching those vocal or quitar ideas before inspiration disappears in a maze of mics, cables and preamps.

# KORG D12 £799 Excellent audio quality.

- Good range of effects.
- Competitive price.

- No phantom power.
- Some tracks only available as stereo pairs.

The D12 is a very capable digital multitracker which includes most of the functionality of the larger D1600. If you know you need more than eight tracks, but you can't really afford to go up to 16, then the D12 is a worthy and workmanlike option.

SOUND ON SOUND



Other analogue connections include a single Aux Out on a quarter-inch jack socket, stereo Monitor and Master Outputs on RCA phono sockets, and a quarter-inch Phones output jack socket. Digital I/O is offered in the form of coaxial S/PDIF sockets. Also featured are front-panel Footswitch and Expression Pedal inputs on quarter-inch jack sockets, and rear-panel MIDI In and Out.

A SCSI connector is provided on the back panel for the connection of external storage drives, and there is also the option to install a laptop-style CD-RW drive within the D12's own casing for audio and data use - Korg's own-brand model will set you back an extra £300. This side of the unit's operation is exactly the same as on the D1600 (see that review's 'Import & Export Duties' box for full details) song data can be copied or backed up to CD, audio files can be input and output as WAV files, and mixes bounced to stereo can be written to CD as audio tracks.

#### Push, Slide, Twiddle

The layout and functionality of the D12's control surface is almost identical to that of the D1600, but with two obvious exceptions: the D12 has a smaller number of channel faders and does not feature the D1600's touchscreen display. In addition to the Master fader, the D12 has nine 45mm channel faders controlling the playback levels of the recorder's six mono tracks and three stereo tracks. The stereo format of the latter channels is fixed — each has a single fader, and single sets of controls for EQ, sends and balance. Above each fader is the pan/balance control and the single button used to switch between playback, mute, input active and record enabled modes. There are no dedicated Solo buttons, but a Solo/Monitor option provides a virtual equivalent via the LCD when needed.

The absence of the touchscreen on the D12 will only be an issue if you have experienced the D16 or D1600. On these units, this facility does speed up some operations considerably. This said, moving around the LCD using the D12's cursor keys is no more difficult than with any similarly equipped piece of high-tech recording gear. If you've never had a touchscreen, you probably won't miss it!

The D12's mix automation is identical to that of the D1600. A built-in snapshot-based automation system provides up to 100 mixer snapshots per song, with each Scene holding volume, pan, EQ and effects settings. No crossfading between Scenes is provided. If the D12 is used in conjunction with a MIDI sequencer, it can be set to transmit mix data via MIDI, so that any fader movements or changes to pan, EQ or effects sends can be recorded to the sequencer. Playback of the MIDI data to the D12 then reproduces the required mix automation. As the faders aren't motorised, the Scene button provides a Mix View that displays virtual fader and pan pot moves in real time on the LCD.

The D12's EQ and effects offer identical facilities to those of the D1600. Fairly basic three-band EQ, with sweepable mid-band, is provided on both input and playback channels. Effects processing is based around Insert, Master and Final Effects types. A maximum of eight Insert Effects are available and can be allocated either to input sound sources or playback channels (but not to both at the same time). These include various guitar multi-effects and amplifier simulations, compression, limiting, gating and parametric EQ. The two Master Effects have sends from each channel,



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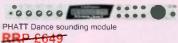
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**M&K MPS SPEAKER SYSTEM** 



iller & Kreisel Sound were founded more than a quarter of a century ago, and they now manufacture a range of both consumer and professional speaker systems. Their new MPS series comprises speakers for a broad range of listening environments, from small editing suites up to large theatres and cinemas. The individual units of the system are designed to be used within multi-speaker configurations, such as those required for surround mixing, but they can also be used to create a more traditional full-range stereo setup with two satellite speakers and a subwoofer, and it is such a system which is under evaluation here. M&K are unusual in specifying their speakers in terms of the capacity of the listening room, and the review system — namely a pair of MPS2510 powered satellite monitors, a matching MPS5310 powered subwoofer and M&K's bespoke LFE4 Bass Management Controller — is designed for listening rooms with a capacity of around 3500 cubic feet.

#### MPS2510 Powered Midfield Monitor

The MPS2510 is available in both passive and active versions, and is designed for midfield use at a distance of at least six to eight feet from the listener. The speaker is magnetically shielded and has received approval for use in THX pm3 monitoring rooms, when used with the dedicated subwoofer and bass controller.

The active version measures roughly  $320 \times 270 \times 410$ mm (hwd). This is around half the height of

# **M&K MPS SPEAKER SYSTEM**

**Hugh Robjohns** tests an innovative full-range speaker system, which somehow manages to get 12 separate drivers working in harmony.

most other pm3-compliant speakers, which could be useful in locations with vertical positioning limitations. The arrangement of drive units within the box is unusual, with twin mid-range drivers and a column of three tweeters - M&K specify that the tweeters should be on the inside edges of the stereo pair. The bass/mid-range units are 110mm in diameter, while the soft-dome tweeters are 25mm units, set in a face plate which is slightly dished to act as a waveguide. A removable front grille offers some protection to the tweeters, and small foam baffles mounted directly above and below the two outer tweeters play an important role in controlling high-frequency dispersion. Two sets of four threaded inserts in the base of the speaker allow it to be mounted onto a suitable support bracket.

The rear panel of the MPS2510 features a comprehensive selection of controls, including a unique facility for user-selectable vertical directivity, which allows optimisation of the speaker for different monitoring environments.

# M&K MPS SPEAKER SYSTEM

#### pros

- Very high standard of monitoring accuracy.
- Designed to cope with a range of different multi-speaker monitoring configurations
- LFE4 provides excellent integration of satellites with subwoofer.

#### cons

The UK price of such high quality...

#### summary

High calibre professional monitoring system with approval for THX pm3 rooms. With the optional MPS5310 subwoofer, these speakers make a very well-integrated system, but the MPS2510 is also sufficiently flexible to use on its own or with subwoofers

SOUND ON SOUND

"My first observation was of the sheer detail extracted by these speakers.
Reverberation, room ambiences, and mechanical noises of acoustic instruments being played were all very apparent."

The Narrow position provides a tightly controlled high-frequency directivity, helping to keep HF energy from splashing off the ceiling or mixing console surfaces, while the Wide position is intended to provide better coverage for a larger listening area.

A very brief examination with my Audio Toolbox test set suggested that the three tweeters operate at different levels, with the central one being around 9dB louder at 10 kHz than the top and bottom units. Switching to the Wide mode seemed to increase the centre drive level by a further 3dB. As all three tweeters are driven by the same amplifier it seems unlikely that there is any clever interspeaker phasing going on to produce the claimed directional characteristics.

The speaker includes a switchable 24dB/octave high-pass filter for matching it with a separate subwoofer, should you want your system to accurately portray information below 80Hz. With the filter switched out, the energy level drops off smoothly below around 70Hz (this is a sealed cabinet, remember), but is still generating a useful audible output below 60Hz. Though a subwoofer can be used with the MPS2510s directly, M&K recommend using their dedicated LFE4 Bass Management Controller for the best results, and this option would become a necessity if creating a surround monitoring system (see 'LFE4 Bass Management Controller' box for more details).

The MPS2510's rear panel is dominated by a large heat sink for the two discrete 150W amplifiers — one driving the low/mid-range speakers and the other driving the tweeters. Above this, balanced and unbalanced audio inputs

MPS-2510P 00251110567

RIGHT CHANNEL

MPS-2510 POWERED MONITOR

OUT

UNBALANCED
OUT

RIPUT

VARIABLE

VARIABLE

FIXED

AVIS: RISGIDE DE
CHOC ELECTRICUE
NE PAS OUVRIR.

The balanced and unbalanced inputs of the MPS2510 each have linked outputs for directly feeding a separate subwoofer unit.

are provided on XLR and phono sockets respectively, with linked outputs for feeding a subwoofer. Power is delivered to the unit via a fused IEC connector, with associated switch and status LED. A second power status LED is recessed into the front panel of the monitor in such a way that it is only visible when the main axis of the speaker is directed accurately at the listener — a useful aid for physically aligning the system.

#### **MPS5310 Powered Subwoofer**

The MPS2510s are substantial units to heave around, but the subwoofer is definitely a job for

two! It weighs a substantial 37kg, and measures roughly 590 x 390 x 430mm (hwd). As with the satellite speakers, the front grille of the MPS5310 is removable, although I guess that there may be little desire to take it off given that the cone has the M&K logo printed on it in large white letters, along with the words 'Discover Deep Bass'! The sealed-box design boasts an in-room response which is claimed to be flat to 20Hz and, unlike subwoofers with vented cabinets which exhibit a sharp roll-off below the limit of their flat response, the MPS5310's curve rolls off much more gently below this.

The main panel of the subwoofer's amplifier unit hosts a pair of phono connectors which receive the left and right inputs from a pair of satellite speakers. A single balanced input is provided on an XLR socket, and this can be used for connecting an external bass management system, such as M&K's own LFE4, when working with multi-channel monitoring setups. User facilities include a polarity switch and a rotary control for setting the subwoofer gain — there are calibrated positions marked for unity, +3dB and +6dB. A switch provides a THX reference input level instead of the variable gain option, and further switch allows the EQ curve to be set to the THX standard.

There are three low-pass filtering options available, selected using a three-way toggle switch. For a simple stereo system using MPS2510 satellites there's a fixed 80Hz low-pass filter. For more complex installations, or for incorporating the MPS5310 with equipment from other manufacturers, the turnover frequency can also be adjusted manually to be anywhere between 50 and 125Hz, with a 24dB/octave slope. The THX mode bypasses the low-pass filtering altogether, relying instead on an external bass management system to filter the signal feed.

The bottom of the panel carries the IEC mains inlet and fuse holder, with a power switch at the top of the rear panel for ease of access. A 350W amplifier chassis drives the two 12-inch bass speakers, one of which faces the front while the other is mounted in the base of the cabinet with its magnet assembly on the outside. This dual-speaker arrangement is designed to maintain the internal volume of the main sealed cabinet, irrespective of the movement of the cone. In this application, as the front driver moves out to generate a compression wave in the room, the base driver moves into the cabinet keeping the cabinet volume constant and thereby reducing the degree to which unequal pressures on the back of the speaker diaphragm might create second harmonic distortion.

#### **Listening Test**

With a complete system consisting of a pair of MPS2510s and an MPS5310 with the LFE4 controller, my first observation was of the sheer detail extracted by these speakers. Reverberation, room ambiences, and mechanical noises of

#### **M&K MPS SPEAKER SYSTEM**

acoustic instruments being played were all very apparent, but in a perfectly natural and correct proportion. This is the hallmark of a true monitor speaker — acoustic information being presented accurately, not glossed over to seem hi-fi or overblown to the point of fatigue.

The second point I noticed was the near-perfect integration between satellites and subwoofer. Though, it took quite a bit of experimentation to locate the optimal site for the single MPS5310 in my listening room, the whole system sounded extremely smooth and well-integrated once it had been located and balanced carefully. The crossover frequency is quite low compared to many systems and this probably helps the integration, with the subwoofer adding just the right amount of weight to bass instruments, yet without affecting the stereo imaging or clouding the lower mid-range in any significant way. The bass was tuneful, although not quite as fast as with some integrated monitors - a common side-effect of many subwoofers, in my experience.

The stereo imaging was very wide and spacious, extending well beyond the speakers with the right material, and providing good left-right stability over a reasonable working area in the Narrow setting. Switching to the Wide mode brought a perceptible high-frequency lift, with an edginess becoming apparent on otherwise silky-smooth vocals, and percussion becoming noticeably sharper. To my ears it sounded like a small but deliberate EQ change, though without affecting the stereo imaging particularly — I was unable to confirm any convincing and worthwhile extension to the stereo listening area, anyway. However, this may, to a large extent, be down to the acoustic properties of my listening room.

As M&K indicated, using the speakers on their sides or with the tweeters on the outside both had a damaging effect on the stereo imaging. I also noticed that moving my head along a vertical axis close in front of the speakers resulted in some very obvious phasing and lobing, particularly between the tweeters, although at a typical working distance of, say, eight feet this is unlikely to be a significant problem.

Male and female voices were naturally portrayed in both speech and singing, a testament to the neutrality of these speakers. Acoustic instruments were also rendered very well and with accurate dynamics and believable scale. I felt at times that there was a touch of congestion or mild clouding in the mid-range — the 500-1500Hz region — but that the high and low frequency areas were very detailed and precise. I don't want to overemphasise this hint of mid-range congestion, though, because only the very best full-range three-way monitors would probably better it.

In terms of power handling, these speakers were more than sufficient for my listening room (capacity 3200 cubic feet), demonstrating almost real-life dynamics on percussion and without any evidence of power-compression problems. They

#### LFE4 Bass Management Controller

The LFE4 Bass Management Controller is a 1U rackmount unit with no front-panel controls at all. Its function is to redirect bass frequencies from up to six inputs to one or more dedicated subwoofers, with filtering circuitry optimised specifically for M&K studio monitoring speakers.

Designed primarily for 5.1 surround setups, the unit is also sufficiently flexible to be used for simple stereo (LR or 2.0), Dolby Pro Logic (LCRS or 4.0), Dolby Digital (5.1), and DTS (5.1) applications. Surround systems using even more channels can be accommodated by a sister product, the LFE6, which provides bass management for up to 10 channels. The rear panel of the controller has balanced XLR inputs for five input channels from the individual surround speaker feeds appropriately high-pass filtered versions of these signals are then fed to an associated bank of five outputs. In addition, there are two LFE channel inputs, one at +4dBu nominal level and one with 10dB more gain to comply with the extra headroom requirements of Dolby Digital. All the input signals are combined, low-pass filtered and then routed to a pair of identical subwoofer outputs. A wall-wart PSU powers the unit via a screwlocking four-pole connector. Although there is no power switch at all, a front-panel LED indicates when the unit is powered up. A pair of 4mm binding posts on the rear panel allow chassis and signal earths to be linked or separated, as required.

The crossover point is at 80Hz, and fourth-order (24dB/octave) Linkwitz-Riley filters are used. Though signals in the individual speaker feeds are passed through the LFE4 at unity gain, the input sensitivity of

each signal can be adjusted over a ±12dB range, if necessary, using 270 degree trimmers. These trimmers, while useful, are a little fiddly to set up precisely compared to the more conventional multi-turn trimmers used in much other professional audio equipment. The subwoofer output operates at a level 15.5dB below that of the main inputs, as defined in the THX specification.

Aligning the whole system for stereo use was quick and easy, only requiring a pink noise source at +4dBu nominal level routed to each of two main inputs in turn. With the monitors switched to their calibrated gain setting, each satellite speaker's level trimmer was adjusted until the sound pressure level at the listening position reached the required level — pukka studios, mastering suites or dubbing suites would use the recommended theatrical calibration level of 85dBC (with slow averaging), though I personally find 79dBC a more comfortable nominal monitoring level for working within typical semi-domestic listening rooms.

Once the satellite speakers were aligned, I simply reconnected the noise source to the zero-level LFE input to drive the subwoofer directly, trimming its input gain such that its output SPL was 3dB less than that for the satellites. This was in recognition of the limited bandwidth involved and the correspondingly lower energy measurement on a broad-band SPL meter. Aligning the subwoofer was actually an iterative thing, as its level was dependent on its position in the room — minimisation of modal standing waves can only be found by dragging a subwoofer around the floor to find the position in which it gives the flattest bass presentation.

seemed to have plenty of headroom too, and even listening at high levels for extended periods I did not suffer any listening fatigue at all, which is another very good sign!

#### On Balance

Overall, the combination of MPS2510s and the MPS5310 subwoofer makes impressive listening. It is a powerful, well-balanced system with excellent integration between the satellites and the subwoofer. I must admit to being highly sceptical of the use of so many drivers (particularly the three tweeters) when I started this review, but I have to say that the arrangement does seem to work well, as long as you stay close to the 'sweet spot'. I would imagine a full 5.1 surround rig based on this system would be highly impressive, accurate, and conveniently compact.

In fact, the relatively small size of the MPS2510 satellites, their THX pm3 accreditation, their ability to deliver high sound levels and natural dynamics, their imaging and tonal accuracy, and the associated bass-management facilities should all help to place this system near the top of anyone's short-list for high-quality surround monitoring.

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n equaliser is a processor which is designed to deliberately alter the tonal quality of audio passing through it. It does this by using a number of filter circuits, which are capable of applying gain to audio signals within specific frequency ranges — both positive gain, referred to a 'boost', and negative gain, referred to as 'cut'. The term equaliser comes from its early uses in compensating for the tonal side effects of early telephone systems, but in today's music studio it serves both corrective and creative purposes. However, there are a number of different types of equalisers now available, and the numerous controls each offers can seem very confusing when you're starting out in music recording.

So what we're going to do this month is to look at each general type of filter commonly used for equalisation, and show you how these are put together into equalisers such as those you can

often see reviewed here in the pages of SOS.

#### High-pass & Low-pass Filters

The simplest filter circuits in common use within equalisers are high-pass and low-pass filters.

A high-pass filter (sometimes called a low-cut filter) progressively reduces the level of any audio frequencies below a user-specified 'cutoff' frequency, while leaving the level of those above this point comparatively unchanged. On the other hand, the low-pass filter (sometimes called a high-cut filter) reduces the level of frequencies above the

cutoff point, leaving those below comparatively unchanged.

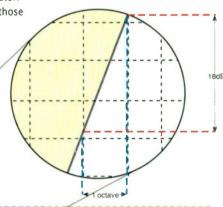
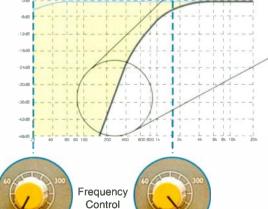
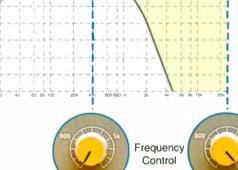


Figure 1. Graphs of gain change over the frequency range of the Focusrite ISA430's high-pass and low-pass filters. The two plots on each graph show the effects of their respective cutoff frequency controls.





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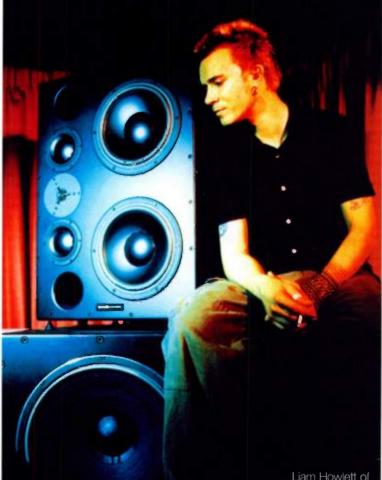
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The graph in Figure 1 shows the gain changes caused by some real-life high-pass and low-pass filters - in this case the ones in the equaliser section of the Focusrite ISA430 Producer Pack. reviewed back in SOS November 1999. The left-hand graph shows the action of the high-pass filter, while the right-hand graph shows the low-pass filter, with plots for two cutoff frequencies shown in each case. The first thing to notice is that the cutoff point is not actually where the gain reduction starts. This is because the definition of the cutoff point of a filter is that point at which there is 3dB of gain reduction, and this is worth bearing in mind when using any filtering - even though the controls of the filter may indicate that gain reduction is only happening within a certain frequency zone, there will almost always be some gain change outside this zone as well.

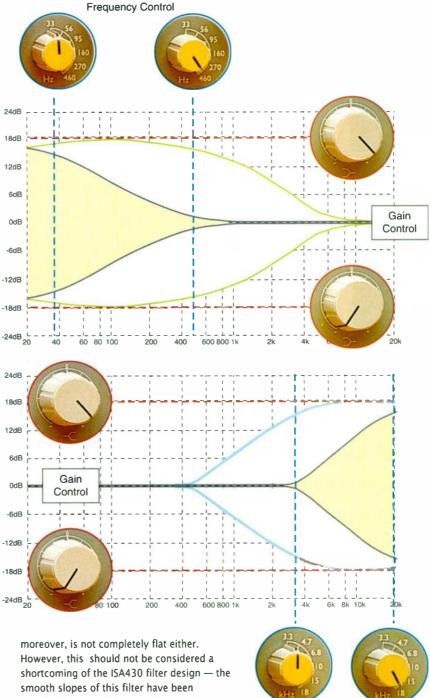
You'll also notice that the nominal cut portion of each graph is not a straight line, but rather that the increase in gain reduction occurs smoothly, only becoming more regular well below the cutoff point. When it does become regular, the slope of the filter's gain reduction can be measured as shown in the close-up above the right-hand graph. Here this slope is 18dB over the space of one octave (an octave being a frequency doubling, in this case from 200Hz to 400Hz), and this is usually written as 18dB/octave. This slope in the Focusrite ISA430's filters is quite steep — ideal for surgically removing any sonic rubbish outside your required band of frequencies whereas other equalisers often have gentler 12dB/octave or 6dB/octave slopes.

#### **Shelving Filters**

While high-pass and low-pass filters are undoubtedly useful, they are only really useful for cutting, rather than for boosting. This is because, if you switched around the circuit design of the filters shown in Figure 1 such that they boosted rather than cut, they would do so at 18dB/octave and any signal passing through them would soon distort from lack of headroom. For this reason, general high- or low-frequency tonal shaping tends to be done using a shelving filter instead.

A shelving filter is designed to apply an equal gain change to all frequencies beyond a user-selected shelving frequency, rather than applying a progressive gain change beyond a cutoff point. Such filters require not only a control for selecting the shelving frequency, but also one for selecting the amount of cut or boost applied.

Figure 2 shows gain-change plots for real high and low shelving filters, again those of the Focusrite ISA430, showing the effects of the different controls. Once more, you can see that the real filter plots are in no way 'ideal' shelves, in that the gain isn't immediately and uniformly applied beyond the shelving frequency. For a start, there is considerable gain change before the shelving frequency is reached, and the shelf itself,



However, this should not be considered a shortcoming of the ISA430 filter design — the smooth slopes of this filter have been specifically created that way because they are sonically pleasing, allowing you to change the tonal qualities of audio in a very musical way. While it is now possible to generate much more theoretically ideal shelving filters in the digital domain, these have been found to be less useful for audio processing than those filters which have been tweaked 'by ear'.

#### **Peaking Filters**

Though shelving equalisers tend to be useful for gentle, overall tonal adjustment, they are less useful for those advanced applications where it is necessary to target specific frequency bands with greater accuracy — a bit like using a shotgun for sniping! To affect a frequency band that isn't at

Frequency Control

Figure 2. Graphs of gain change over the frequency range of the Focusrite ISA430's low and high shelving filters. The four plots on each graph show the effects of the Frequency and Gain controls available to each filter.

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either extreme of the frequency spectrum, a peaking filter is required. Such a filter allows you to selectively emphasise or attenuate a limited band of the audio spectrum, and usually offers at least two controls — one to set the applied gain and one to specify the centre-frequency of the band to be treated.

The gain change graph for one of the ISA430's two peaking filters is given in Figure 3, showing the effects of the two main controls. The gain change is at its maximum at the centre frequency, and it tails off smoothly and fairly rapidly on either side of this.

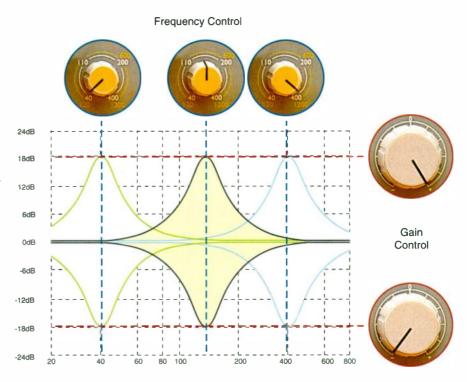
More advanced equalisers also offer another control for tweaking the effects of their peaking filters. This control is given different names in different EQ units — Resonance, Bandwidth, Q — and alters the width of the band of frequencies affected by the filter. Figure 4 shows the effects of the Resonance control on the peaking filter in the ISA430. The narrower bandwidth has a higher resonance, or Q value, and allows more precision when dealing with localised frequency problems such as hum, noise, or vocal sibilance. On the other hand, the wider bandwidth has a lower resonance and is better for more general tonal shaping of your audio.

#### **Combining The Filters**

Now that we've shown how each of the different basic filter types work, lets look at how they are used to form the different sections, or 'bands', within a range of typical equlisers. Shelving filters are probably the most common, with simple fixed-frequency implementations often used in domestic hi-fi amplifiers as tone controls — the Treble tone control will typically be the gain control of a high shelving filter, while the Bass tone control will be that of a low shelving filter

Fixed-frequency shelving filters such as this are ideal for beginners to equalisation, and are often used within budget mixing consoles for the high and low EQ bands. The shelving frequencies are chosen to affect mainly the frequency extremes while leaving the mid-range largely unchanged. For example, the Mackie 1604VLZpro mixer has frequencies of 80Hz and 12kHz, and the Fostex VM88 digital mixer has them at 100Hz and 10kHz. More expensive mixers, such as the Audient ASP8024, provide a frequency selector switch for the shelving bands, and high-end consoles, such as those by Neve and SSL, offer smoothly variable shelving frequency controls.

In all but the most budget of mixers, variable frequency peaking filters are also provided to give the user control over the tonal characteristics of the mid-frequencies. These 'swept' or 'sweepable' mid-bands provide controls for centre frequency and gain, and can be useful in a variety of situations. When high and low shelving filters are combined with swept peaking filters, this configuration is sometimes called a semiparametric equaliser. The Mackie 1604VLZpro and Soundcraft's Ghost mixers both provide



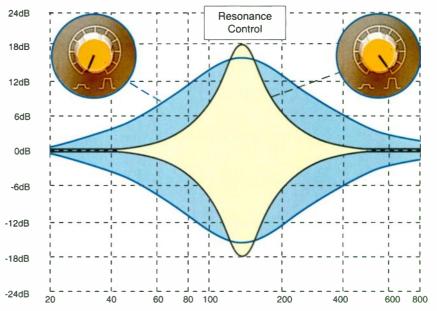
examples of semiparametric equalisation, the Mackie offering one mid-band and the more expensive Soundcraft offering two.

Fully parametric equalisers are much less common in the analogue domain than semiparametric ones, offering swept high and low shelving filters alongside at least one swept mid-band with resonance control. Such equalisers can only be found on high-end analogue consoles or within dedicated EQ modules, sometimes with the option to switch the outer bands between shelving and peaking modes.

However, in the digital domain, such equalisers are much more common, because of the ease of creating them in digital code. The Yamaha AW4416, for example, has a four-band fully

Figure 3. Graph of gain change over the frequency range of the lower of the Focusrite ISA430's two peaking filters. The four plots show the effects of the Frequency and Gain controls available to the filter.

Figure 4. Graph of gain change over the frequency range of the lower of the Focusrite ISA430's two peaking filters. The four plots show the effects of the Resonance control at maximum positive and negative settings of the Gain control.







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parametric EQ, while Emagic's Logic Audio Platinum includes a five-band EQ plug-in as standard. What's more, such equalisers can offer displays of the frequency-response modifications generated by the current control settings, for immediate visual feedback of the setting in use.

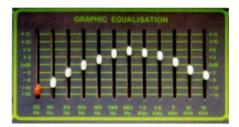
Cheap high-spec digital equalisers are powerful means of tonal adjustment, but it must be remembered that such devices rarely sound as musical as their analogue equivalents — hence the continuing demand by audio professionals for quality analogue equalisers such as those manufactured by Avalon, Focusrite, Millennia, Oram, and many others. In fact, beginners will often get better results recording with a simple analogue EQ unit than attempting to fix tonal problems in the mix using an extremely complex multi-band plug-in.

High-pass and low-pass filters are sometimes included within the equaliser sections as well, though they are more often separated from the main equaliser sections in voice channels and mixing consoles. High-pass filtering is more common than low-pass filtering, and a switch engaging a fixed-frequency high-pass filter is not unusual within the preamp section on mid-price mixers. Variable-frequency filtering is usually only found in high-end desks and outboard equalisers.

# **Graphic Equalisers**

Another common filter configuration is the Graphic equaliser. This is a collection of usually between 10 and 30 individual filters whose fixed frequencies are spaced evenly throughout the entire frequency range — common spacings include one filter every octave, half octave or third octave. Some graphic equalisers use only peaking filters, though others have the filters at the extremes of the range with shelving responses.

The reason for this type of EQ's name is that the gain controls for all these separate filters are a row of vertical sliders which serve as a graphical representation of the resulting overall EQ curve.



A simple graphic equaliser, showing a general mid-range boost, along with cuts at both frequency extremes.

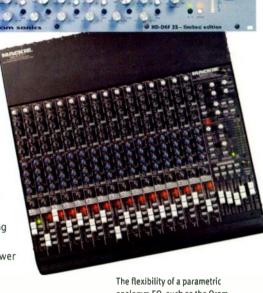
Even though most of the individual filters are peaking filters, the overall EQ curve that they produce is much smoother than you might expect, because they all interact — in fact, because of this interaction, the EQ curve may not very closely match the slider positions if extreme settings are used. Because of its intuitive operation, this type of equaliser is often used in live environments

where speed is of the essence.
However, graphic equalisers are less common in the studio, as parametric designs usually have a more desirable sonic character — budget graphic designs in particular can adversely affect the quality of treated audio.

A mid-point between the graphic and parametric equaliser is also worth mentioning, called the 'paragraphic' equaliser, which is available within some plug-ins. This offers six or seven parametric peaking filters, where the gain of each is provided on a slider, making for an attractive and intuitive user interface while still offering the power of flexible peaking filters.

# **Action Stations**

That pretty much covers all the bases as far as the basic types of equaliser are concerned. Now that you know a bit more about the ways in which one EQ unit differs from another, you ought to find it much easier to select the correct type for your needs. But that's not all you need to know, of course, if you're going to use EQ successfully, so look out for the forthcoming SOS workshop on getting the most out of all these types of equalisation in practice.



The flexibility of a parametric analogue EQ, such as the Oram Hi-def 35, can have a high price-tag, and if you're equalising on a budget you're likely to have to settle for a simpler semiparametric design, such as on Mackie's 1604VLZpro.

# **EQ Jargon Buster**

- ATTENUATE: to reduce the signal level.
- PEAKING FILTER: a filter which boosts a specific band of frequencies.
- BAND: a single filter within an equaliser.
- BANDWIDTH: a measure of the width of the frequency range altered by a peaking filter.
- BOOST: to increase a signal's level using a filter.
- CENTRE FREQUENCY: the frequency at which a peaking filter applies maximum gain.
- CUT: to reduce a signal's level using a filter.
- CUTOFF FREQUENCY: the frequency at which a high-pass or low-pass filter has attenuated the signal by 3dB.
- EQUALISER: audio processor which uses a combination of different filters to alter the balance of frequencies in an audio signal.
- FILTER: a circuit which alters the level of a limited range of frequencies.
- FILTER SLOPE: the gain change per octave of a high-pass or low-pass filter.
- GAIN: the amount by which a filter circuit alters a signal. Can be positive ('boost') or negative ('cut' or 'attenuation').
- GRAPHIC EQUALISER: an equaliser which uses a large number of regularly spaced, fixed-frequency filters, each with an

- individual gain fader.
- HEADROOM: a measure of the maximum signal level that a given equaliser's circuitry can handle.
- HIGH PASS FILTER: a filter which progressively attenuates frequencies below a certain frequency.
- LOW PASS FILTER (LPF): a filter which progressively attenuates frequencies above a certain frequency.
- OCTAVE: a doubling of the frequency.
- PARAMETRIC EQUALISER: an equaliser with at least one swept peaking filter with bandwidth control.
- Q VALUE: a measure of the width of the frequency range altered by a peaking filter.
- RESONANCE: another term for Q value.
- SEMIPARAMETRIC EQUALISER: an equaliser with at least one swept peaking filter.
- SHELVING FILTER: a filter designed to alter the level of all signals beyond a certain frequency by a user-definable amount.
- SWEPT FILTER: any filter which allows the user control over its characteristic frequency.
- THIRD-OCTAVE: a regular spacing of the filters in a graphic equaliser, where one filter occurs every third of an octave.

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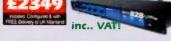
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or meters of the c. rd The C. rd ha a unit in Mixer and integrates seamlers by th Cubice & Emacic. We have secured a in miss supply these cards at a very





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# plus

# Propellerhead *Reason* recording software

# Macintosh G4

hese days, most musicians with an interest in home recording use some sort of computer recording or sequencing system.
Even those who prefer to use dedicated hardware systems or tape-based multitrack recorders may well still use computer software to compile and master their tracks before burning them to CD.

For those who do use their Mac or PC as the core of their studio there seems to be an endless number of tantalising software packages available. These include samplers, audio editors, mastering processors, hundreds of digital effects, virtual analogue modelling synths, as well as mixers, multitrack recorders and sophisticated sequencers. Once armed with an appropriately specified computer it really is possible to have an entire studio in just one Mac or PC-shaped box.

And that brings us to this month's prize of an Apple Power Mac G4 450MHz loaded with Propellerhead's *Reason* all-in-one virtual studio which will provide one *Sound On Sound* reader with an extremely powerful computer recording setup.

This excellent prize, worth £2503, has been kindly supplied by Jigsaw Systems, while the UK distributors of Propellerhead's *Reason*, Midiman, have donated the software.

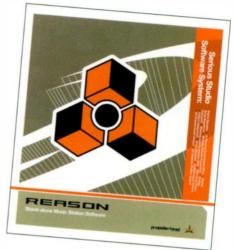
Most Sound On Sound readers will already be familiar with Midiman, who have built their reputation by providing problem-solving products such as handy MIDI interfaces and timecode sync boxes — largely for use with computer systems. Jigsaw Systems, on the other hand, might not be

quite so well known to musicians; they are Europe's largest independent reseller of Apple computers, peripherals, and software, although they also sell PC/Windows systems. The company has 65 employees including three full-time telephone support engineers who provide a free service to customers. Jigsaw are also prepared to get their hands dirty fixing computer equipment and operate as an authorised Apple repair centre. The repair department employs three bench engineers and several configuration engineers who fit memory, expansion cards, and other parts free of charge, before orders are shipped.

The computer part of the prize consists of an Apple Power Mac G4 450MHz with 128Mb RAM (expandable to a maximum 1.5Gb), a 30Gb hard drive with space for up to three more drives, a DVD-ROM drive, an ATI Rage 16Mb graphics card, three PCI slots, two FireWire ports and two USB ports. The screen for the Mac is a tasty LG 15-inch FL575MS TFT LCD display, worth £499 just on its own.

Jigsaw have taken particular care to optimise this computer for music rather than Internet or office use and have therefore equipped the Mac with a Stealth serial port instead of a modem. The serial port also means that anyone who is upgrading from an older system can still use all their pre-USB serial MIDI devices and peripherals with the new system.

The Mac's three expansion slots allow plenty of room for extending the capabilities of this system while the powerful G4 engine should be able to handle the processing demands of any software



currently on the market.

To ensure that any musician new to computer music has a usable system straight away, Jigsaw have pre-installed the Mac with Propellerhead Software's Reason Virtual Music Station software, donated to this competition by Midiman. Reason contains just about every facility a musician might need to make music, and a few more besides - all in software form. These music tools include a 14-input automated digital mixer, 99-note polyphonic synth, Roland-style drum machine, sample-playback unit, analogue-style step sequencer, loop player, multitrack sequencer, eight effects processors and over 500Mb of synth patches and samples. Our reviewers were so impressed with this product (reviewed in March 2001) that they commented "it would be impossible to be too positive about this package". Reason currently retails for £299 in the UK.

If you want to win this fantastic prize then you will need to complete the entry form included on this page or online. All the questions need to be answered and the tie-breaker completed. Make sure you add your full address and daytime phone number before posting your entry to the usual Sound On Sound address. Paper or online entries must arrive by the closing date of 31st August 2001.



the small print 1 Only one entry per person is permitted 2 Employees of SOS Publications Ltd, Jigsaw Systems. Midimun and their Systems. Midiman 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 chinige the specificatiom of the prize offered. 5. The judices decision is final and legally binding, and no correspondence will be entered into. 6. No other correspondence is to be correspondence is to be included with competition entries 7 Peass ensure that you give your DAYTIME telephone number on your entry form. 8 Frize winners must be prepared to make themselves available in the event that the competition organisers wish to make a personal presentation

# What sort of port has the Mac been given instead of a modem?

- a. Stock port
- b. South port
- c. New port
- d. Serial port

# Which one of the following is not a feature of Reason software?

- a. Multitrack sequencer
- b. Loop player
- c. Dish washer
- d. Automated digital mixer

# What hardware feature does the G4 have to enable the system to be expanded in the future?

- a. Three expansion slots
- b. An 'expand' button
- c. Planning permission for an extention
- d. Enough room to store encyclopedias

# Tie-breaker A great many tasks which would have once been performed by a hardware box can now be done by computer software, but there are limits as to what is currently possible. There are no home computers which will leap off the desk and start washing the dishes, for example. In your wildest dreams, what task would you most like to see the computers of the future tackle and why? Answers in no more than 30 words please.

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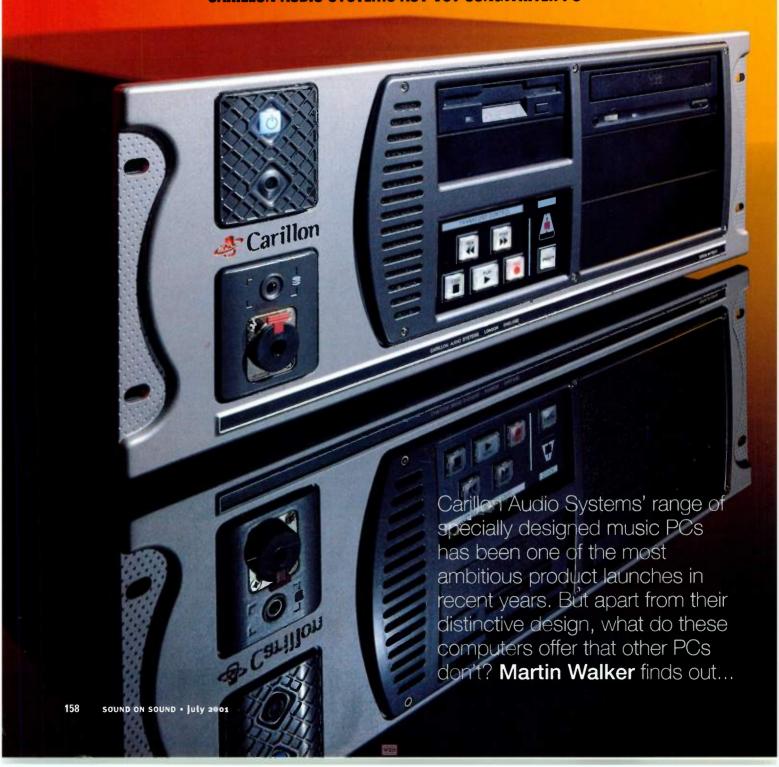
Post your completed entry to: Jigsaw Apple Mac G4 competition July 2001, Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ, UK.



CARILLON AC1 AUDIO PC

# what a carillon.

**CARILLON AUDIO SYSTEMS AC1 VST SONGWRITER PC** 



he original Carillon was an automated bellringing system using a sequence of pegs in a grid to make music, which dates back to the 13th century. It is therefore claimed to be the world's first digital music production system, and has given its name to a major new company, Carillon Audio Systems. Carillon's business is purpose-designed audio PCs, and there was a huge amount of interest in their range even before the first models rolled off the production line, reflecting their decision to go much further than most manufacturers in customising their computers for music recording and production. This decision has not only given their computers a distinctive appearance, with their precision die-cast aluminium alloy rackmount front panels, but has produced several other unique features.

One of the major bugbears of using a computer in the recording studio is acoustic noise. Specialist retailers have incorporated noise-suppressing tweaks into their computers for some time, but Carillon have made theirs a central part of the AC1 (Audio Computer) design. Their machines have a case made from 2mm thick steel, low-noise CPU and PSU fans, and all hard drives encased in SilentDrive sleeves as standard. As a consequence, many people witnessing demonstrations have apparently not even noticed that the AC1 was already switched on.

Another perennial problem afflicting PC musicians is that of technical support and problem-solving. You don't have to look very hard on the web or in the pages of SOS to realise just how many pitfalls there can be in getting a PC to work reliably for musical applications, and the technical support offered by non-specialist retailers is often useless in this department. One of Carillon's major selling points is their comprehensive support system (see box). A third feature unique to Carillon is the Loopstation, a source of free samples which users will be able to download over the Internet (see box).

The special features of Carillon's music computers were set out in a widely available 32-page catalogue, which won the company a lot of admirers. With PC component specs and prices in constant flux, some of the prices and fine details were almost inevitably out of date before the ink was dry, but what was important was that

it specified a complete range of 16 standard models (see Other Models box), ranging from the VST Foundation System at £1399 to the UltraSynth 8 at £4849, capable of running eight standalone soft synths simultaneously, each with individual audio outputs. Although other specialist retailers have been able to put together systems with similar specifications on demand, the Carillon catalogue allowed potential customers to spend

hours poring over the various specs and prices to decide which was most suitable for them. The only remaining uncertainty was whether Carillon could actually deliver the goods, and this is what I'm going to explore in this first review of a specimen Carillon PC.

# First Impressions

I must admit to feeling a frisson of excitement as I opened the boxes containing the Carillon review system (sad, isn't it?). The heaviest one contained the main system case, and the specially designed casing looks just as

attractive in the flesh as it does in the adverts. The left-hand side of the front panel is divided into two areas, one containing a blue illuminated mains power switch and a recessed reset button, the other a hard drive activity indicator and a Neutrik stereo quarter-inch locking jack socket, internally connected by screened cable to a similar socket emerging from the back panel. You can use this link in any way you wish - it might make a handy front-panel headphone socket for instance - and Carillon supply suitable adaptor cables for each of their systems so that you can connect your soundcard inputs or outputs to it. This is especially useful if you want to avoid regularly using the phono and 3.5mm jack sockets some soundcards provide, and the two 15-inch adaptor cables supplied with my VST Songwriter system for its Yamaha SW1000XG were of excellent quality.

Also accessed from the front panel of the review system were a 1.4Mb Teac floppy drive, a 40-speed Teac CD-ROM drive, and the one non-standard extra l'd asked for in the review model — Carillon's RTM1 transport control panel (see Optional Extras box).

The AC1 case can, obviously, be bolted into a rack, and since the front-panel rack ears are backed with vibration-absorbing rubber gaskets, external vibration is prevented from entering the



# CARILLON AC1 VST SONGWRITER PC £1699

# nros

- Good performance and looks.
- Very low acoustic noise as
- Excellent support package and remote fix facilities.
- Good value for money considering all the extras.

# cons

- Loopstation not functional at time of review.
- The AC1 only has enough front-panel space for one built-in control panel.

# summary

The Carillon AC1 is an extremely impressive PC range, designed from the ground up for music, which has been very carefully thought out from start to finish to provide high performance, low acoustic noise, and long-term reliability.

SOUND ON SOUND

# Specifications Of Review PC

- Case: Carillon AC1, 4U rackmount, with die-cast aluminium front panel, 2mm thick steel sleeve, and low-noise PSU.
- Processor: Intel Pentium III 866MHz with radial-fin heatsink and low-noise fan.
- Motherboard: Asus CUSL2-C with Intel 815EP chipset.
- System RAM: 128Mb PC133 SDRAM.
- Hard drive: 20Gb Quantum Fireball, 7200rpm, Ultra ATA/100, mounted inside SilentDrive sleeve.
- · Floppy drive: Teac 1.4Mb 3.5-inch.
- Graphics card: ATI Rage 8Mb AGP.

- Monitor: 15-inch IBM 6333 E51.
- CD-ROM Drive: Teac 40-speed.
- Modem: Conexant SoftK56 data, fax, speakerphone internal modem.
- Keyboard: Chicony with custom-coloured key caps to match system audio software.
- Mouse: two-button PS/2.
- Installed soundcard: Yamaha SW1000XG.
- Installed software: Cubase VST 5.0, Cakewalk Pyro, Yamaha TWE Wave Editor, XGedit95 (unlicensed), extensive Carillon help files, Fix, and Loopstation.

# CARILLON AC1 AUDIO PC

computer for greater reliability, while any internal vibration due to disk drives and fans won't be transmitted to the rest of the rack and amplified. For desktop or floor-mounting use, you can screw squidgy Sorbothane feet to the bottom of the case to achieve the same end.

# **Matching Accessories**

The 15-inch monitor in my system was an IBM model, though Carillon are planning to supply equivalently specified unbadged monitors in future, and the mouse was a standard two-button job. While the entire Carillon range uses a standard Chicony keyboard, each system is enhanced by the addition of self-adhesive stickers listing shortcuts attached to those keys that provide important functions for the main software application in the bundle. In the case of the review system this was Cubase 5.0, so the keypad displayed shortcut commands to launch the Channel and Master mixer panels, carry out transport functions, and use the locator and cycle functions, while the majority of letter and number keys on the main part of the keyboard also displayed command options. Shift, Control, and Alternate key labels have different colours that link with additional command options on other keys, and the shortcuts are marked clearly and comprehensively enough to help both novice and professional. Although they seemed to be stuck onto the key tops, rather than being part of the mouldings, the labels had all been attached squarely and looked capable of withstanding heavy-duty use. My only reservation was that in the subdued lighting of many studios it's often difficult to see the controls on any black keyboard, and I did find it slightly less easy to use than my standard beige one for this reason.

# **Internal Affairs**

My next task was to find out what electronic



components Carillon had used in their design, and to do this I needed to gain access to the interior of its case. A total of seven screws needed to be removed before the 2mm thick steel cover could be slid rearwards, and of course you would need to unbolt the ACI from a rack to do this. Once

inside I was pleased to find an Asus CUSL2-C motherboard. already widely recommended by many industry experts for various applications including music. It uses the Intel 815EP chipset, provides one AGP and six PCI slots, and three slots for installing up to 512Mb of RAM. In the VST Songwriter review system a single 128Mb strip of PC133 SDRAM had been fitted, along with a Pentium III 866MHz processor - thanks to continuously falling PC prices, all models specified in the catalogue and current ads as 800MHz now feature an 866MHz processor for the same price. Carillon use only Intel processors and chipsets in their range, mainly because they are compatible with more

soundcards and give consistently good floating-

point performance. The processor had been fitted

with an efficient radial-fin heatsink and low-speed

The AC1's front-panel audio socket is mirrored on the back panel and could, for instance, be set up to route to the soundcard's audio input, or serve as a headphone socket.

The RK8 MIDI Controller is another optional front-panel extra, and provides eight assignable knobs which transmit MIDI Controller numbers to your sequencer or soft synths.

# **Optional Extras**

Many of the standard Carillon systems can also be purchased as a 'Plus Pack', which includes extras such as a MIDI controller keyboard, monitor speakers, microphone, synth, and all essential cables. Prices are competitive, and Carillon supply quality gear such as Rode NT1 mics, Roland keyboards, and speakers ranging from Yamaha's low-cost YSTM8 active models through to others from Genelec and Quested. Each of the standard systems can also be supplied with a selection of recommended upgrades such as a CD writer, a more advanced version of the main music software, or additional soundcard I/O, again at fairly competitive prices.

For the review PC I asked to try out the RTM1 transport control panel. This is included in the higher-end Pro Tools LE and Nuendo Workstation systems, and is an optional extra for the others. It has backlit buttons for Play, Stop, Record, Rewind, and Forward, along with a latching On/Off button for the metronome. It connects to the system using the COM2 port which is not available on the back panel, and appears to software as an

emulation of the JL Cooper CS10. Once I had Cubase 5.0 up and running I could use the transport panel instead of its PC keyboard shortcuts. It worked beautifully, and its buttons have a far more positive action.

The metronome had also been carefully designed, with an upper metronome symbol that flashes once per beat, while the latching on/off button also flashes on the first beat of each bar. You have to enable the Click function inside Cubase, but once this has been done the transport metronome on/off button enables and disables the flashing indicators.

The other panel currently available is the RK8 MIDI Controller (shown above), which is pre-installed in the VST Native Workstation and UltraSynth 8 systems. This provides eight rotary knobs that by default send out data for controllers 7, 10, 14, 15, 16, 17, 18, and 19. The first four functions are therefore Volume, Pan, Cutoff, and Resonance — the most sensible choices for most musicians. An XG/GS mode is also available on bootup, which changes the Cutoff and Resonance parameters to

suit these standards. These controls can be accessed from inside most music applications, and a floppy driver and template disk is included providing scripts to be used within *Cubase* to map the default controller settings to any other function, including EQ and effects send/return duties. *Logic* users can use the Environment window to perform similar allocations.

I was impressed by both the RTM1 and RK8, and although they are a hefty £99 each when bought as accessories, they cost a more affordable £69 each when bought at the same time as an AC1 system. My only disappointments were that the AC1 front panel has only space for one or the other, but not both, and that unless you work with your PC at arms' distance, they would be far more convenient in cased form on the end of a flying lead. Unfortunately, due to their COM port connection they would then need a separate PSU, but I still feel that many musicians would then find them more useful and desirable. However, Carillon tell me that desktop versions are a strong possibility for the future.



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# CARILLON AC1 AUDIO PC

# ▶ fan for reduced noise.

Two of the PCI slots were already occupied by a Yamaha SW1000XG soundcard and internal Conexant modem, while the AGP slot contained an ATI Rage graphics card with 8Mb of video RAM — once again, this replaces all 4Mb models specified in the catalogue but with no price increase. One of the remaining PCI slot positions was unavailable due to the installation of a backplate housing two additional USB sockets, but I doubt that anyone would complain at this, since a total of four USB sockets and three spare PCI slots is likely to be more than adequate for any musician.

The single Quantum Fireball 20Gb hard drive had been fitted into a SilentDrive sleeve, while even the PSU featured low-hum transformers and a low-turbulence fan for lower noise. The internal wiring loom was extremely neat, so much so in fact that you would need to cut some of the clips if you wanted to add another hard drive in the future. Overall, the internal construction was to a very high standard, but with easy and unobstructed access to both PCI and RAM slots for possible upgrading.

The back-panel motherboard socketry was fairly standard, consisting of a pair of colour-coded PS/2 mouse and keyboard connectors, the two USB sockets already mentioned, a 25-pin D-type parallel port for printer or dongle, and a single 9-pin serial COM port. The second COM port is used internally if you take advantage of any of the panels described in the Optional Extras box, but it would be possible to bring it out via a bracket if you ever needed a second rear-panel COM port. Thankfully, the optional AC97-compliant onboard game audio support components were absent from this version of the motherboard, so the associated Mic In, Line In, and Line Out sockets were missing from the back panel as well. While having such facilities may initially seem a good idea for the musician, they nearly always end up being disabled to avoid problems when using professional soundcards.

# **Bundled Software**

Carillon currently install Windows 98 SE on all their systems, and sensibly include the original CD-ROM

and printed manual as well, since it's almost inevitable that you'll need these at some point in the future. They were supplied in a handy transparent holder that also contains support CD-ROMs or floppy disks and manuals for the motherboard, graphics card, monitor, and modem. Each system also contains a small bundle of additional software comprising Cakewalk's Pyro CDburning application, Emagic's Zap! lossless audio compression utility, and a bonus pack of shareware and freeware VST Instruments and plug-ins. The bundled VST Instruments include Fxpansion's DR002 Drum Player and Mysteron, MDA's DX10 and JX10 synths, a virtual Stylophone, and (my personal favourite) Big Tick's Rainbow synth, while the bonus plug-ins include a Distortion and Equaliser from D-Sound, and 30 from

the MDA collection. Although there's nothing here that you couldn't download yourself for free, it's a nice touch to have them installed and ready to use.

Also supplied with my particular system were the full packaging and printed manuals for *Cubase* 5.0, and the original box containing support material for the Yamaha SW1000XG, although both were already installed and ready for use.

# **Silent Service?**

Once I'd reassembled the case, connected up the keyboard, mouse, and monitor, I was ready for one of the most interesting parts of the proceedings — powering up and listening to the



One of the reasons why the AC1 is so quiet is that its hard drive (top left) is encased in a SilentDrive sleeve.



The soundcard specified in the review system was Yamaha's SW1000XG.

# Non-standard Carillon Systems

The basis of Carillon's sales philosophy is that they manufacture a limited, though varied, range of standardised systems, which can be chosen from their catalogue. However, I also had various discussions with Carillon to establish the options available to those who may not want a standard system.

For obvious reasons Carillon won't sell DIY
PC-builders their case on its own, but for those
already with a soundcard and audio software, they
will supply two bare-bones PC systems starting at
£1099 — one with a Pentium III 866MHz
processor and 128Mb of RAM, and the other with a
1GHz processor and 256Mb of RAM. This allows
them to supply a full working system that comes

with a guarantee, and you still get the same basic software bundle as their standard systems. Carillon are also happy to custom-build a system to your specification, although you won't get the same in-depth custom help files, and it is likely to cost slightly more.

If you have existing software protected by a dongle, they will happily install it on a new machine if you provide them with the serial number and version details. It's not practical for them to install your existing hardware, and if you subsequently install other hardware and software then the situation will be much the same as with any other vendor — Carillon can only really sort out any problems due to or caused by the parts of the

system under their guarantee. However, you always have the option in extreme cases to run the supplied recovery disk to restore the system to its original configuration (see Carillon Support box for more details).

I did query why a multi-boot option wasn't installed as standard, but agree with Carillon that this approach can be daunting, especially since you may need to install applications twice — once in each Windows partition. They also pointed out that the Windows end-user licence agreement only permits one copy of the operating system to be installed on a computer. However, they will offer dual-boot capability as an option for about £99, to cover the cost of a second Windows licence.

# Iwant

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I want... I want

# CARILLON AC1 AUDIO PC

▶ AC1. As I expected, the background noise levels were a great deal lower than those of standard PCs, and at switch-on I could scarcely hear any noise at all apart from the 'snark' of the floppy drive being accessed during boot up and the one-off 'beep' of the built-in speaker. There was also a small amount of drive noise when accessing data, but due to the SilentDrive sleeve, this was again much lower than average.

Once the AC1 started to warm up, the thermostatically controlled PSU fan did speed up and become somewhat louder, but the overall noise level was still considerably lower than that of any other desktop production PC I've ever heard. Once bolted into a rack it would of course be further reduced, since this fan exhausts from the rear of the casing. I've installed nearly all the available noise-reduction options on my own PC over the last year or so, and this proved to be slightly quieter than the AC1. However, this is mainly because I use an even slower power supply fan, and accept that the exhaust gets quite hot. With my engineer's hat on I wouldn't be happy to do this as a matter of course on every model emerging from a production line, and on this basis I think the Carillon AC1 won the contest. To my knowledge it's certainly the quietest production PC available, which should make a lot of musicians very happy.

# **Basic Setup**

On bootup, the AC1 took about 45 seconds to reach the desktop, which turned out to be awash with helpful shortcuts to all the main applications and Carillon-specific information (see Support box). The screen display was set to 1024 by 768-pixel resolution, and looked crisp and clear, with no obvious geometric distortion. There was initially a fairly wide border around the periphery of the 15-inch display area, but it only took me a couple of minutes to tweak the monitor settings and gain almost an inch on the diagonal measurement. I was a little surprised that 32-bit True Colour had been selected, since many music developers recommend 16-bit for reduced overhead, but it's easier enough to change on the fly, and I had no video-related problems during the review.

The Task Manager had been suitably disabled, as had the Active Desktop, Power Management,

# Carillon Tech Support

Carillon's tech support has been carefully thought out as part of their package. The usual telephone support lines are available. but there are also various other features already installed in every computer. The first is a comprehensive help system called Carillon How, which is customised to each specific package. This covers the basics of connecting up your chosen system, including all the things that people often forget, such as installing the dongle, how to test both MIDI and audio aspects of your software and hardware, and how to get started with audio and MIDI recording, mixing, adding effects, and mastering. It answers the majority of questions musicians tend to ask, and should save quite a few tech support calls. Carillon Help adds to this with a comprehensive FAQ section and a link to the Carillon web site to read the latest information about drivers and

If you still can't sort out a technical problem after reading the tutorials and FAQs, Carillon Fix is an altogether more sophisticated approach to fault finding. You log onto the Carillon support web site and book a suitable 45-minute time slot with an engineer, and then a few minutes before the allotted time launch the Carillon Fix Remote software. When the engineer phones, this software answers automatically and checks the agreed password, whereupon your PC can be remotely interrogated to track down the fault. A chat window is available so you can have a 'conversation' with the engineer to

help narrow down the problem, and you can even ring a mechanical bell in the Carillon offices to attract attention!

I had a trial session hosted by Carillon's Robin Vincent, and it was most impressive, although a little spooky to see my mouse pointer moving by itself. He tracked down a small fault very quickly, and then used the Fix software's graphic overlay and pen facilities to jot down notes on my screen as he demonstrated various features of Cubase, and even wrote a short section of music for me by remote control. Although this sort of technique isn't totally new for music PCs (Red Submarine started a similar system a couple of years ago), it can help to sort out a wide variety of software and hardware problems. and in most cases will avoid the frustration of sending your PC back to Carillon to have it returned with 'no fault found'.

If the worst happens and the Remote Fix approach can't find the problem, or it diagnoses your PC as having a faulty component, Carillon will arrange collection of your machine and aim to have it fixed and back with you within three working days. Even if you've managed to completely scramble the contents of your hard drive, a recovery CD-ROM and support floppy are provided with each system containing a complete hard drive image taken from your particular serial-numbered PC. You'll lose any additional data stored on your C drive since you first ran your Carillon PC if you run them, but at least you'll return to a clean system.

System Sounds, Windows animation, and screensavers. Auto Insert Notification was correctly disabled inside System, while DMA is automatically enabled for hard drives using this motherboard. A fixed swap file of 512Mb had been created, and in fact I could find nothing that hadn't been correctly set for musical purposes — this should save a lot of hassle for the novice in particular. During my time using the AC1 I became increasingly impressed by the manufacturer's attention to detail. For instance, when I opened *Internet Explorer* I found that a large number of shortcuts had been added covering Internet music, magazines and forums (yes, *SOS* was included), media contacts,

# Loopstation Online Sample Library

Another string to Carillon's bow is the Loopstation. The system was originally designed as a 'Sample Jukebox' for musicians to audition sample CDs in music shops, most notably in Turnkey's Charing Cross Road store in London, but Carillon have now incorporated a new online Loopstation application into their AC1 range. It's designed to search and preview from a selection of 5000

samples available free of charge from the Carillon web site, which they hope to expand to 50,000 by 2002. Third-party samples will also be offered at a substantial discount to Carillon owners.

The idea is that you narrow down the sound you are looking for through a series of choices, such as 'by instrument' or 'by style', and then further refine your selection to, for example, 'Ambient', then 'downbeat chillout', and so on. At the end of your search you'll be able to preview whatever fulfils your full list of criteria, and then download it to store on your hard drive.

Carillon provide around a thousand WAV files on your hard drive with the system, along with the *Loopstation* software, and very good they sound too. However, the web site still

wasn't up and running by the time I finished my review, although Carillon hope that it will be by the time you read this. Assuming that this is the case, it should be a valuable asset to owners, and although the Internet is not the ideal delivery medium for samples I still anticipate that lots of musicians will want to take advantage of this ambitious scheme.



The one optional extra fitted to the review AC1 was the dedicated front-panel transport control.

comprehensive lists of manufacturers and developers of music equipment, plug-ins, and soft synths, as well as the Carillon and Turnkey home pages.

# **Performance**

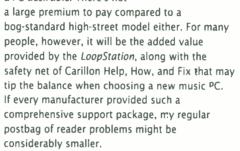
With an 866MHz Pentium III processor, there's plenty of power under the bonnet for music applications, and the Asus CUSL2-C motherboard is also a good performer. I was pleased to see that *Cubase* 5.0 had already had the most recent revision 3 update patch installed, and that the Yamaha SW1000XG drivers were also the latest version 2.50. However, in an entry-level system like the review model with a single hard drive, audio performance can be significantly affected by how this is set up, so I was keen to examine this aspect.

The 20Gb Quantum Fireball hard drive had been divided into a C partition of about 4Gb labelled System, formatted as FAT32 with 4K clusters, and containing Windows 98SE and all the applications. The remaining 15Gb in the D audio partition was again formatted using FAT32, this time with 8K clusters, and is intended for audio recording, playback, and sample storage. Splitting the drive in this way is the most sensible approach, and although the audio partition didn't have 32K clusters as most experts recommend, the difference in write speeds between 8K and 32K is often marginal. I was more concerned to see how much audio performance was lost by Carillon's splitting off the faster outer section of the drive for Windows and applications - some hard drives (notably the IBM Deskstar range) provide considerably higher sustained transfer rates at the outside than further in.

However, I needn't have worried: the *Dskbench* utility reported the read and write speeds for the Quantum Fireball drive's C partition at about 34Mb/second and 33Mb/second respectively, while those for the D partition were 33Mb/second and 32Mb/second — excellent figures capable of running over 100 44.1kHz/16-bit tracks, with a difference of just 3 percent between the two partitions. If you wanted to tweak this you could use a utility like *Partition Magic* to resize the C partition to about 2Gb, since 4Gb is quite generous (as supplied, only 1.3Gb of it was being used).

# **Final Thoughts**

The Carillon range is an ambitious new approach to designing a complete PC system that should appeal to quite a few musicians. There's no denying that the AC1 looks good, sounds quiet, performs well, and, for possibly the first time in the chequered history of music PCs, makes owning a PC desirable. There's not



The only aspects of the philosophy that I couldn't check out in detail were the Internet end of Loopstation, which is expected by early summer, and the product information and ordering web site, which should be online by the time you read this. Some potential customers have also been frustrated by the wait before the first systems rolled off the production line, but I do find it encouraging that Carillon refused to ship anything until they were sure that everything worked correctly. I had absolutely no operational problems during the course of my review, and can see why many professional studios as well as individual musicians are seriously considering the purchase of one or more Carillon systems. Even Mac-based studios are apparently interested in the UltraSynth 8 system as a stand-alone soft-synth workstation. What more can I say? EDE



The AC1's keyboard is customised by Carillon with the keyboard shortcuts appropriate to your choice of software.

# information

YST Songwriter System as reviewed £1699; RTM1
Transport Panel £69 if ordered with AC1, or £99 separately.
Other systems range from £1399 to £4849, with 'bare bones' AC1 systems with no soundcard or music applications starting at £1099. Prices include VAT.

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# Other Carillon Systems

Carillon's brochure currently lists 16 packages of computer, soundcard and software, tailored for specific needs and budgets. For instance, the £3299 UltraSampler 160 is designed as a high-powered sampling workstation based around Nemesys' *GigaStudio* 160, and provides suitably impressive amounts of RAM, hard disk space and individual outputs. Serious scorewriters are catered for by the £2999 Sibelius Symphonist system, while those looking for more conventional recording and sequencing systems will find a wide range, from simple setups offering stereo I/O to a powerful *Nuendo*-based workstation.

Of course, some compromises are always necessary to reach the right price points. In most cases, Carillon's choice of cards and software seems eminently sensible, but one could raise doubts about the soundcards specified in a couple of their systems. The Audiotrak Maya card supplied with the most basic VST Foundation system offers good driver support and latency figures, for example, but may represent a false economy as its 18-bit audio quality is significantly inferior to the likes of the only-slightly-moreexpensive, 24-bit Marian Marc 4 and M Audio Audiophile. Carillon's £1599 Emu Sampling system is based around Emu's APS card. Although popular, this card is looking a bit long in the tooth now, and Emu announced some time ago that they would undertake no further driver development - so while I have no doubt that it works perfectly well in the system as Carillon supply it, buyers may find themselves in a hole when it comes to upgrading their software or operating system. Sam Inglis

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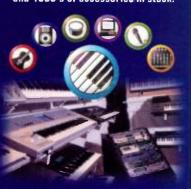
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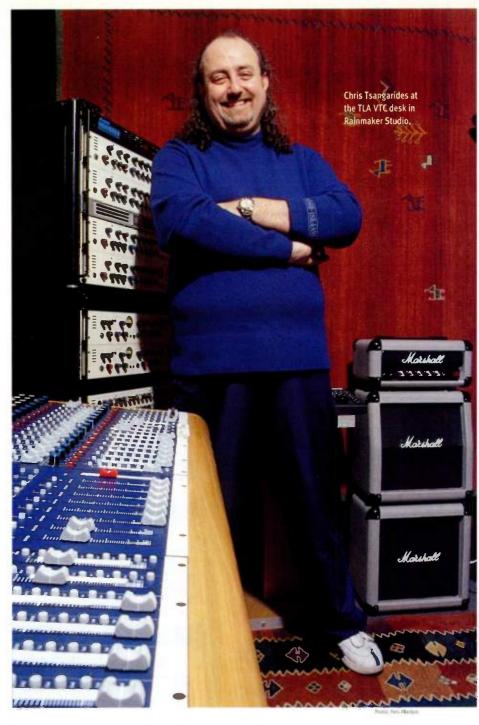
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chris tsangarides

Over the last three decades Chris Tsangarides has produced some of the biggest names in heavy rock and has perfected the art of capturing the excitement of a loud, live band on record. **Tom Flint** finds out about some of his trademark production and engineering techniques including his work on the latest Gary Moore album, *Back To The Blues*.

hen my son turned 14 years old I suddenly became cool to him because his friends were talking about Black Sabbath, Judas Priest and Thin Lizzy. He thought, 'Hang on, my dad did that - the old git's not so bad after all!'," laughs engineer and producer Chris Tsangarides. Since he first became a producer in the late '70s, Chris has cemented his image and reputation by working with almost every conceivable type of metal band, ranging from punk metal experimentalists The Tygers Of Pan Tang to speed-metal pioneers Anvil. As his production credits demonstrate, however, he has also worked within a wide range of other musical styles. Notable luminaries from Chris' impressive CV include Ian Gillan, Helloween, Killing Joke, Jan Hammer, Japan, Phil Lynott, Girlschool, Magnum, Ozzy Osbourne, Yngwie



# heavy rain

Malmsteen, Bruce Dickinson, Depeche Mode, Exodus, The Tragically Hip, Concrete Blonde, Thin Lizzy, Judas Priest, Black Sabbath and many more.

Almost since the beginning of Chris' career, artist and bands have approached him hoping to have their recordings benefit from his unique production touch. Yet Chris is philosophical about his reputation and what it really means in the music industry: "You don't start out thinking 'I'm going to be a rock producer,' because you don't know what's going to happen. Like an actor, you get stereotyped into a role, but for every metal

band I've done there has been something that wasn't metal, and that is fantastic. In sales terms my biggest successes have been non-metal bands like Concrete Blonde and Tragically Hip and we've sold millions of records with these groups who play an alternative style of music.

"Concrete Blonde were a very original three-piece with a female vocalist and a fantastic guitar player who sounded like Chet Atkins on acid. It was the respect they had for work that I had done on rock projects like Thin Lizzy which led them to pick me. Similarly, I recorded an

PRODUCER CHRIS TSANGARIDES & RAINMAKER STUDIO Chris Tsangarides:

"I am the luckiest bastard in the world really. 'What do you do for work daddy?' 'I go and make a load of noise and sometimes they give me some money for it. Fantastic."

American band called Christine In The Attic who were a very early techno band with violins, samplers and all sorts of things and they asked me to produce them because they loved Judas Priest's *Pain Killer*; and then I did Exodus' album because they liked Concrete Blonde. If you look at the correlation between those types of music you think 'What the hell's going on?', but all people look at things differently."

# **Starting At Morgan**

Chris' musical interest was first aroused by the performance of Jimi Hendrix on the Lulu show. "Something happened to me," he explains. "It sounds a bit daft now but something came out of the TV screen. It got to me, touched me or whatever you want to call it. That was my first interest in music as a way of expression."

At first, Chris had concentrated on the performance aspects of music while studying economics at college, and had given little thought to the possibility of recording it. However, a schoolfriend who had landed a job as tape-op at Morgan Studios while Chris was completing his economics qualification suggested he try to become a recording engineer. "I explained to him that I didn't know anything about knobs and dials but he said it would be like an apprenticeship. He told me to write to every studio in England. I got the standard rejections, but then Morgan had an opening and because he was my buddy he got me an interview. So I had two interviews, got the job and that was that.

"At Morgan I'd walked into one of the major independent recording studios of its day. There was Black Sabbath in Studio Four, Yes in Studio

> Three, Jethro Tull in Studio Two and Rod Stewart and The Faces in Studio One. And I thought 'This is pretty damn good,' but after about two weeks of working from 10 in the morning until four am the next day and getting paid an absolute pittance I asked for a day off. They said 'no. you're the new boy, you do all the crap.' So that was the end of the star trip and I realised what it was about. Really all that boot-camp stuff was just to see if you could hack it and take the demands. After about a month it started easing off just a little bit and I got a day off here and there.

"The wages were £75 a month in 1974 and the overtime was 75p an hour after 6pm and at weekends. My first pay packet was £300, so just figure out how many hours I worked! My take-home was £200, so it was £50 a week for working virtually 20 hours a day. The tape-ops at Morgan doubled as assistant engineers — you would do anything that had to be done but you'd also run the tapes back and forth perched by a big multitrack machine. Morgan was so tight they didn't even have counters, so you would have to

sit there scrubbing it as it went through and marking the the verses on the tape with chinagraph pencils. You got to know just by feeling the length of time in your head how far to rewind to get back to the first verse. On particularly boring sessions I mastered the art of reading a book at the same time. That lasted about a year.

"Then I was tape-op on Judas Priest's second album and the engineer got taken sick and they said 'Go on then, carry on.' I didn't know what I was doing but I jumped in and carried on — it was sink or swim and luckily I swam, or at least floated! Then I went back to tape-opping and got to engineer bits and pieces as they came in — cheaper sessions, Jingles, little things that were suitable for a trainee to do."

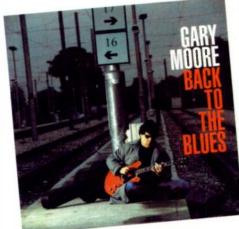
Eventually, Chris got given the chance to engineer and produce a session all of his own. The project was a success and he never looked back. But the track was a far cry from the heavy rock and serious alternative music he is now known for. "A chap came to Morgan with a funny idea for a song and he wanted a very cheap studio rate and somebody who was a bit zany to work on the track — so the studio said I could do it!

"This chap arrived with a Punch and Judy man and an ex-singer called Joy Sarney who had become a housewife in Southend. We recorded this song called 'Naughty Naughty Naughty' which was a love song between Joy and Mr Punch. The bloody thing was atrocious but it was a hit single. So this chap thought he'd found his production team and started bringing in these rockabilly acts for us to work on. After about three months I'd been engineering all the time so I became an engineer. It will haunt me, but I'm grateful because it was a break and it gave somebody confidence in me. He thought my touch had helped him have a hit and therefore he wanted to repeat the successful formula and that is how it works in this business.

"So I became a recording engineer, and with that I got some pretty damn fine sessions. I got to engineer Japan's second album Obscure Alternatives, and I got to do all the bands that were going through Morgan at the time like Colosseum II. Because I was into guitar, I formed a good relationship with Gary Moore who was in Colosseum II. Gary was signed to a company that was owned by the recording studio, so they put me on his album Back On The Streets. About 10 minutes into that session I was told I was the producer. I thought it was a joke but after a couple of days I realized they were serious! I thought 'What do producers do?' So I said to Gary, 'You play, I'll record and that will be that,' so that's what we did. That album had the single 'Parisienne Walkways' which was a big hit. Through Gary I met Phil Lynott and Thin Lizzy. Suddenly I was a producer."

# **Recording The Blues**

The straightforward live-in-the-studio approach Chris used so successfully on Back On The Streets



▶ has remained his preferred style of recording bands, and he used it again on Gary's most recent album Back To The Blues. The whole of Back To The Blues was recorded at Chris' new South London studio, which operates under the name Rainmaker, and is based around a TL Audio VTC valve desk and an Otari RADAR hard-disk recorder. The studio occupies a space in an enormous business complex called The Music Bank along with a large PA hire company and two huge rehearsal studios upstairs, known as Waterloo Sunset. The session for Back To the Blues was set up in one of the Waterloo Sunset rooms and then recorded over a period of just a few days.

"On Back To The Blues we said we'd go for three or four takes and if we didn't get what we wanted, we'd move on. It was all about performance and music. If a blues record doesn't move you then forget it, you've failed. But with him we would normally get it within three of four takes. We'd listen the next day and if we weren't happy we'd have a go again."

Chris holds strong opinions when it comes to the rights and wrongs of recording and these have shaped the way he now approaches a recording session. "I always get the sound right at source," he insists. "All this 'fix it in the mix' crap is crap, essentially. There are a few things that you can do with the technology we have these days, but if people are live musicians it ain't gonna happen!

"If it's a band that plays live I'll try to record most of it in one go. I tend to use the spill as the reverb. It always depends where I am, because I work in so many different locations that I have to cut my cloth accordingly, and in certain places I can't do what I would normally do. In those situations I would perhaps use a guide guitar and bass so that the drummer has somebody to play with and can get the feel, and then overdub the rest on top of that."

Despite Chris' preference for a natural-sounding recording, he still uses the technology at his disposal to give the music on record the same feel as it would have in a live situation. "You have to do unnatural things to make recordings sound natural," he explains. "With this studio setup I don't have to do much to it, because I use valves and valve compressors. They're not necessarily compressing much, but they beef up the signal and add to it. I used just a little compression for *Back To The Blues* but for some things I'll compress very heavily because compression can be your friend if used properly.

"The types of compressors you use on different instruments allow you to do different things with them. I tend to go for compressors which have a character and a sound to them. For example, on drums I tend to use my Chiswick Reach stereo compressor over a subgroup of all the drums and then possibly the Summit valve equaliser over the entire thing. Any reverbs that I might want to use or not will go on the entire group so it all sounds like it's one. Then it goes to the RADAR, and that's the drum sound done. The drummer remarks

'Gosh that's just what it sounds like when I play them,' and that's the idea, but that's always the hard bit. Again, you have to do unnatural things to get it to sound natural. To me, the producer's role is to get that over in the most exciting way possible. There's no picture when you listen to a radio or CD, so to make something sound natural you have to go through some electronic jiggery-pokery."

# **Entering The Vortex**

One particular production technique which Chris has perfected and used on a great number of his recordings is something he has named the Vortex. Once again, this is a method Chris has developed to enhance the excitement of a recording whilst aiming for a natural overall sound. If anything can be identified as a Tsangarides trade mark it is the Vortex. Chris tells the story: "I was

working as tape-op in the 1970s with Brand X, who were Phil Collins' jazz-rock fusion side band. Each person got to do a solo on the album, but when it was the turn of quitarist John Goodsall, no-one was interested in recording his one-minute musical jerk-off so they said to me 'You can do this,' and then went to the pub. So John and I were stuck there and he was saying 'We've got to make this really heavy man, really loud man,' because he was a bit of a metal-head. He had a Marshall 4x12 with JBL speakers and a Fender quitar so it all sounded extremely harsh and lacking in bass. At first I didn't know how I was going to make it heavy, so I asked myself the question 'How does a bass bin work?' In those days there was a speaker in the back and the sound would be thrown out through a flare, so I decided to make a huge bass bin. The studio happened to have some really



The Vortex. Note that the distant mic has been moved closer to the amp for the purposes of the photo!
The amp itself is a Catamp Custom so custom-built for Tsangarides.

# **Becoming A PWA**

Chris has been labelled a PWA, which apparently stands for 'Producer with Attitude'. Chris explains how he came by the label and exactly what his attitude towards production is.

"PWA was something I got called in Canada. I was mixing a project over there and they said, 'Dude, you're a producer with attitude!' So they made me this badge with Producer with Attitude and a skull and crossbones that I had to wear.

"Part of the job is to get people in the best possible mood and then do the recording. I say 'It doesn't matter, don't worry about it. Forget your troubles and your woes for the time you're doing your recording, because it's going to be there forever and somebody might buy it and you might make somebody happy and that's the whole point of it.' Emotion is what it's about."

One of the biggest aspects of the job of producer is the management of people and time. If a band turns up late and in a bad mood following a late night, or having consumed too many mind-altering substances, Chris clearly believes there is only one course of action. "It's pointless to try to record so I send them home: or we'll just listen to some music or watch Spinal Tap again for the 1500th time. And there's a cutoff point as well where you can't do any more. Long gone, thank God, are the days of working all night. If you can't play any more and can't hear any more, go home and come back tomorrow. People are getting that kind of attitude and it's working. It's a whole lot better to do six to eight hours' concentrated work than to be in the place for 20 hours where 90 percent is arsing around, like it used to be. You can't afford to do it. And it does you in."



Chris' compressors and other gear (from top): graphic equaliser, Chiswick Reach stereo valve compressor, Focusrite ISA430 input channel, Prism Sound MEA2 EQ and MLA2 stereo compressor, RSP Hush 2000 noise suppressor, Dbx 274 (x2) dynamics processor and 120XP subharmonic synthesizer, Yamaha REV500 (x4), D6000 and SPX990 multi-effects, Summit Audio EQP200B EQ, and Esoteric Audio Research compressors (x2).

large separation screens, and so I made a good 25 to 30-foot wall on either side of the cabinet in the shape of a big flare — and bugger me, was it loud!

"Being young and naive I started getting all the mics out, miking the floors, the walls, the ceilings. everywhere. I mixed everything that was close to the speaker cabinet to the left and anything that wasn't to the right. We had a Cadec desk in that studio that was quadraphonic, so I plugged some of the microphones into this matrix quad joystick and was panning the shit out of John's lead playing. I stopped to get a cup of tea and it was still panning. I realised later on that different mics were cancelling each other out. They were going in and out of phase so as he was playing fast runs it was appearing on different sides of the stereo field giving the effect of panning. So I asked John to listen and he went 'Whoa, man! Trippy Circus Electric Eel, that's a f\*\*\*ing vortex!'

"Over time, I honed it down a bit more sensibly to just a close mic and a couple of distant mics. I'd walk around while the guy would be playing and find a sweet spot and put the mic there. If it's a solo you get some great panning effects by balancing the two together. If it's a rhythm part you get this huge sound because the whole thing is spread across the stereo spectrum.

"Mic placement depends where I am recording and the type of music, but at that studio the ambient mics would be at 15 feet and about 30 feet and I'd mix those two. I would then double-track the lead or rhythm part and reverse the second track so the close mic was on the right instead of the left and the distant was on the left rather than the right, so you'd get the two close mics on either side but their ambiences opposite. If there were two guitarists in a band I would record them like that, so you got a wall of sound that had a transparency that would allow the

drums and bass to come through. If you're recording a band live you can't use the Vortex because you'd be picking up everybody else's nonsense on the ambient mics, so it has to be an overdub. In the studio it's always there, but I use it to varying degrees."

Chris now uses the Vortex as a tool to create ambient space in a recording instead of using reverb. The only exception made to this rule is when the guitarist chooses to use reverb on their amp, as Gary Moore did on *Back To The Blues*.

# Standard Issue

When it comes to the actual mechanics of recording, Chris has some favourite techniques and equipment which he uses to a greater or lesser extent on many of his productions. "In a metal or rock environment you're confined to a guitar, bass, drum, vocal scenario, and maybe the odd touch of keyboard if it's an adventurous band," says Chris, "and because of that scenario it's pretty much like everybody else sonically. The differences come from the songs and the arrangements and the way you go about recording.

"Over the years I've learnt to take advantage of the microphones I use because they are the ear that listens to the source and it's very, very important to get that right. If I'm happy with the sound acoustically but the mic sound isn't good I'll start changing the mics, because that's where it starts from. If it sounds shit on the floor there's nothing you can do about it later, so the source is all important.

"I normally go for a Neumann U47 on a bass drum, but first of all I'll ask the guy to play and hear what the sound is like. I can pretty much make an educated guess whether that microphone is going to work on that type of kick drum. It's not



■ a case of always using the same kind of microphone on a bass drum and therefore using it irrespective of what the bass drum is. The drum might not be padded enough, it could be a really huge 26-incher or a little 20-inch one, so I make a mic choice, be it condenser, dynamic, RE20 or whatever. The same goes for guitars, which is why you have to have an amplifier or a combo first. I don't particularly like heavy guitar sounds made from synthetic sources. I have heard stuff and thought it sounded really good, but then you put it next to a real guitar and you realise it doesn't, so your mind plays tricks with you all the time.

"If I'm recording a metal band, as far as guitars go I would use a Shure SM56, 57 or 58 because the pressures and distortion levels they can handle lend themselves to that kind of colour. But for a clearer or purer tone, like Gary Moore, I would use Neumann U87s. The 87 will be close up, which is still a good nine inches away from the speaker, and I would put another one further away. On Back To The Blues, for example, he was playing either a Fender Dual Showman head or a Marshall DSL50 or 100 through a 4x12 cabinet, and Gibson Les Paul, 345 and 335 guitars. The guitar channel went into my Chiswick Reach valve compressor on the way in with no EQ. I used a bit of compression from the Chiswick, so the needle was just moving. We still wanted the guitar to sing and do its thing. The

bass drum and snare went through a Focusrite compressor. I used the EAR compressors on the bass and everything else went through the EQs on the desk."

# Here Comes The Rainmaker

In recent years, Chris has scaled down his freelance production work so he can concentrate more of his energy on other activities: his production company, web site, studio, his own band projects and record label, all of which go under the name Rainmaker. "There are quite a few different bands and band names, but one project called Monochrome that we did was incredibly successful in Korea — someone's got to be!" laughs Chris. "That was a hybrid of me playing metal music on the guitar and bass over programmed synths and traditional Korean percussion instruments which were used to create different drums and loops. We went on tour and ended up at the Seoul Olympic stadium and I hadn't played a gig in 20 years! I couldn't care less if the thing sold just one copy, but the fact that I could make my own racket was great, and it was a bonus that we could tour. It opened up my eyes again to that excitement "

Chris also intends to run Rainmaker as an independent record label and is on the lookout for new talent. His activities are a reaction to the way

Chris Tsangarides:
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# Rainmaker Studio

Although Chris has been accumulating his studio gear over a number of years, the studio itself is relatively new and is centred around a TL Audio VTC valve desk. Almost everything else in the studio is valve-based too, including two vast racks of compressors which Chris uses to process almost everything. The entire room is set up so the equipment can be easily removed and taken to another location for recording.

"For recording I use a 16-bit RADAR 24-track digital recorder. That has become the machine of choice of guitar-type people and bands because it's more like a tape and it sounds, dare I say it, even better than analogue. If you use some nice valves on the way to it from the VTC desk and the Chiswick Reach, it gives a bit of saturation that you don't get from digital. But the beauty of the RADAR is that when you come to mix you don't really have to do anything, because nothing's changed. The RADAR plays back exactly what it records.

"Using valves is old-fashioned, but today they're making them for the year 2001, which is the way it should be. You shouldn't 'retro' stuff, you should use what you've got to the best of your ability. This desk I have

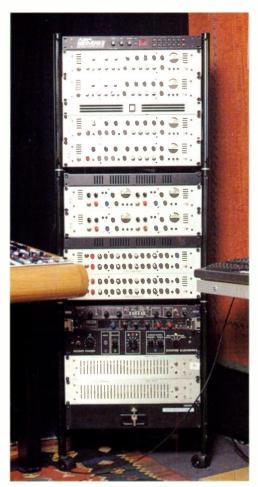


here wouldn't have been possible years ago because now there's the electronics that go between the valves, which have made the whole thing smaller, cheaper and more reliable. On the VTC there are different valve stages to choose from, so I can decide whether I want two or

three stages before it gets to the tape recorder.

"I'm not an old dinosaur. I do use technology, anything going — bring it on, *Pro Tools*, Emagic *Logic*, whatever, fantastic. I do all that and I have my own band that mixes the rock side with the dance side and it's

great fun and as valid as any sort of music, but don't let that technology rule your musical creativity. If you've got a computer recording setup in your bedroom, fantastic, but we still need the big studios to take that stuff from your bedroom and make it sound massive like it should be."



Chris is a big fan of TLA gear, and as well as his VTC desk owns an entire rack full of their Ivory-series input channels, compressors and EQs.

the music industry has changed in recent years, to the point where independent labels now serve the majors.

"The independent record labels act as the A&R departments for the major record labels and the independents are the ones who go out to the gigs to see what's going on and sign up bands for not a whole lot of money. Some of them make these amazing records, then the major comes along, they see how many hits are on the web site and how many copies are sold, and then the band gets signed. The risk factor is removed.

"There are now only five big record companies, which are basically owned by the hardware manufacturers like Sony. They've bought the record companies so they have access to catalogue, so they can repackage it for their next invention that they're intending to sell to everybody. be it MP3. DVD or whatever. All power to anybody that can make any money out of this business, but if we don't invest in people were going to shoot ourselves in

the foot, because you can't have any more catalogue if people aren't writing songs. How many times can you rerelease Frank Sinatra on a new Minidisc, CD, cassette, DVD?"

Chris is adamant as to the best method for discovering new talent: "You have to go to crappy little pub gigs. There's a nice little circuit in London. It's down to the bands finding enough money to get to it and to get their rehearsals and shows together and sometimes play to three people and a dog - which is completely soul-destroying - but if you keep going, maybe somewhere along the line somebody will sign you. It's really, really hard, but there are some up-andcoming English bands doing really well on small labels, doing gig after gig to build up a base which is how it used to be. There is a bit of a resurgence in that, but it's small and it is the independents doing it."

After so many years in the music industry it would be easy to become cynical and disenchanted. But somehow, Chris has remained optimistic, cheerful and ambitious.

"I've been doing this for coming up 27 years and my head might be a bit old but my heart is still 16 or 17. I still think 'Whoooa, look at this new toy, I must have that.' That enthusiasm is what it's all about. I am the luckiest bastard in the world really. 'What do you do for work daddy?' 'I go and make a load of noise and sometimes they give me some money for it. Fantastic." [553]

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- SD SYSTEMS STM99 INSTRUMENT MICROPHONE SYSTEM
- ANTARES ATR1A AUTOTUNE INTONATION PROCESSOR

# **SD Systems STM99 Instrument Microphone System**

Trying to keep a microphone in the optimum position on an acoustic instrument is often difficult, especially when recording brass, woodwind and string instruments, where the musician is likely to move about during the performance. SD Systems, a Dutch company based in Amsterdam, have therefore developed their new STM99 modular microphone system specifically to meet this challenge.

The new design comprises a medium-sized condenser microphone (with interchangeable capsules) together with five different mounting accessories which allow it to be fitted onto pretty much any brass, woodwind or string instrument. The CL89B mount holds the microphone in a suspension cradle atop a small tripod, the rubberised legs of which clip to the bell of a wind instrument. The CLGS mounts a similar cradle on a gooseneck with a clamp for attaching to some appropriate part of the instrument, and the CLDR is a similar design optimised for mounting on drums. The CLBS mounts the suspension cradle directly on the bridge of a double bass or cello, Finally, the CLSTD allows you to mount the mic on a conventional stand for miking static sources.

A detachable two-metre cable links the capsule's head amp to the remote preamplifier body which provides the XLR output to your mixer. There is no clip provided for securing the preamplifier to a mic stand or clothing.

The three capsules available provide cardioid (SCC), omnidirectional (SCO) and supercardioid (SCH) polar patterns, and all require phantom power of 12-52V. Since the microphone is always likely to be used close in to the source, the specifications are necessarily

at odds with most general purpose microphones. There is therefore greater emphasis on high maximum SPL handling (all three capsules handle at least 131dBSPL at 0.5 percent THD) than on low self noise or high output level.

The published frequency-response plots for all three capsules seem substantially flat between 30Hz and 20kHz, with the exception that the omnidirectional capsule

exhibits a noticeable peak between 5kHz and 10kHz, and the supercardioid has a tendency to roll off gently from 5kHz.

I was supplied with the SCC cardioid capsule and the CLGS gooseneck clamp. The mounting was nicely engineered and extremely versatile. The neck could be bent into a 'U' shape, with the tightest radius being around 3cm, and was sufficiently stiff to remain where it was placed — vital when small changes in positioning can have pronounced effects on tonal balance. The neck's length and the orientation of the suspension cradle were fully adjustable, while the clamp's spring-loaded jaws were extremely strong and rubber-sleeved, providing a firm grip without the risk of damaging the instrument. I tried the mic fitted to a clarinet, as well as trying it on top of a Leslie cabinet, and the suspension did a good job of minimising the transfer of mechanical vibration in both cases. However.



a windshield was required when working with the Leslie — none is provided, but the capsule's standard size allowed me to use one from another microphone.

The microphone proved to be quiet enough for any normal use, with more than adequate output level and a well-balanced sound. The cardioid polar pattern and close placement kept spill pickup to the bare minimum — this could make life a lot easier both in the studio and

on stage. Once a sweet spot was found, the mounting ensured that even the performer's most energetic gyrations made little impact on the recorded sound.

The STM99 is not cheap, but it is well-designed and is certainly of studio quality. If you want to record instruments without inhibiting the performer's freedom of movement, this could be the solution you have been looking for. Hugh Robjohns

# information

- \$\mathbb{E}\$ STM99 with choice of capsule, £499.95; SCC, SCO and SCH capsules, £236.95 each; Shockmounts priced between £95 and £120. Prices include VAT.
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# **Antares ATR1a Autotune Intonation Processor**

The original Antares ATR1 made a huge impact when it was first released, making possible natural-sounding, real-time pitch correction. Now it has been given a cosmetic face-lift and a software upgrade, to produce the far prettier ATR1a. A cost-effective upgrade is also available for existing ATR1 owners, incorporating all the new processing features of the newer machine. The upgrade kit comprises a small integrated circuit (IC). together with an IC extraction tool and instructions. Antistatic handling precautions need to be taken, as always, and the replacement must be aligned identically to the original — a small dot is provided for this purpose and the orientation of the written labelling should not be relied upon.

The most useful new feature is the Make

Scale From MIDI function, which provides a faster means of specifying the scale to which audio is to

be tuned. The desired scale notes can be played directly into the ATR1a over MIDI, in any order and at any speed. If you make a mistake, it's a simple matter to start again, and in general I found it rather faster than having to enter each note individually via the unit's menus. The other improvement is the ability to track pitches down to 25Hz, rather than the previous 50Hz, making the ATR1a much more useful for work with bass instruments. I managed to successfully tighten up fretless bass parts with very natural-sounding results.

In short, the upgrade provides some worthwhile extra enhancements to an already



impressive product. What's more, I'm pleased to see that existing ATR1 owners can upgrade their own machines cost effectively, albeit without the snazzy new colour scheme. Paul White

# information

- £ ATR1a, £699; upgrade kit for ATR1, £45.83. Prices include VAT.
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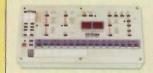
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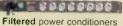
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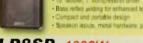
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Information

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Best known for his collaborations with Elton John, Gus Dudgeon is one of the most successful British record producers ever. He talks to Sam Inglis about his work.

ne of the problems producers of my era have is that we're very often written out of the picture as being someone to approach, because artistes and A&R think 'He's going to want a big budget, he's bound to want some ridiculous advance and he's going to want to be in Abbey Road.' But that's not the case at all. I don't really mind where I work at the end of the day, as long as I don't have to work on an SSL desk. That's my only stipulation." Gus Dudgeon is at pains to make clear that he's not a prima donna or a control-freak producer, and that being at the top of his profession doesn't mean he will inevitably choose big, high-profile projects rather than working with new artists or in project studios.

"If there's something really superb on a demo, my attitude is 'Great. Let's keep it.' I don't have a problem just because it's somebody else's work. There have been occasions where I've worked on projects that another producer's already worked on, and if there's something the guy has done that's really great, I'm not about to go 'Hey, I can do even better than that!' I've been doing it too long, and my ego doesn't need that kind of stroking. My manager will turn around and say 'You realise that if you do that, he's entitled to a point?' Well, f\*\*k it. If what he's got on that record is adding to the value of that record, and I lose a point as a result, why should I care? It could very well go on to sell more records.

"Mind you, I can say that, because luckily this industry has provided me with a bloody good income, so I'm not worried about making money. What I'm more concerned about is working and

The music industry has, indeed, done rather well by Gus Dudgeon. After a lengthy stint as an engineer in Decca Studios, he took the plunge and became a freelance producer in the late '60s. The gamble quickly paid off through hits such as David Bowie's 'Space Oddity' and John Kongos' 'He's



Going To Step On You Again', but the cornerstone of Gus' reputation was his enduring creative partnership with Elton John. A string of hugely successful singles and albums in the '70s cemented their status as a team comparable to George Martin and the Beatles, or Tony Visconti and David Bowie.

# Decca Days

In his time at Decca, Dudgeon engineered such now-classic records as the Zombies' 'She's Not There' and John Mayall's Bluesbreakers With Eric Clapton LP, as well as helping to audition Tom Jones, Lulu and the Rolling Stones for the label. "I was at Decca for five and a half years," says Dudgeon. "Up until then I'd worked at the original Olympic Studios, which was off Baker Street, but I was only a teaboy there, and I was terrified of the idea of ever getting on the console - I never

thought I'd ever get near it. The thing I loved about it was just the volume and actually hearing real low end! At home I had a Dansette, like most kids, and it never had any bottom end on it. I did suss out that to get bottom end you had to have a bigger speaker system, so I had an external speaker which I managed to rig up in a separate box, but you still couldn't hear a great deal of bottom end. So when I first went into this control room and actually heard bass, it was like 'Bloody hell! That's bloody marvellous!' I just loved the power of the big speaker system, I'd never heard anything like it.

When I was an engineer, sessions were three hours long, and there wasn't time for perfection. You hired in anything between four and 15 musicians, all of whom were incredibly good at just sitting straight down and reading and playing a chart, and the session would begin right on the hour. In three hours you very rarely did less than two, and very often three songs, so we strove to get the best we could in the time allocated, but spending nowhere near the same length of time you'd use up nowadays. I only did four-track sessions at Decca, I never even got as far as eight-track, so by the time I was starting to do my first productions, eight-track came in, then 16, then 24. Obviously, as soon as you get more tracks it makes the whole job a hell of a lot easier, because you don't have to commit to a balance at that particular point, and you have time to consider your overdubs. What I was used to was committing to a balance, and once that balance was done you were buggered on the mix, if you hadn't got the majority of it right in the first place. You had the whole rhythm section on one track, the vocal on another, maybe the backing vocals on another and whatever orchestration or solos on the other tracks. So your balance was pretty much set at the end of the session, and you'd probably spent an hour recording each song. There was a

# The Classical Ethos

"The classical engineers at Decca had a bit of a snobby attitude towards the pop guys, but then I started doing a few classical things — not engineering but editing - and then I found out that they get up to just as many things as the pop guys do, they just don't do it in quite such a blatant way," laughs Gus Dudgeon. "I did about four or five days' editing on a big classical project, a version of Wagner's Ring cycle, and I was putting in sections that were a quarter of a bar long, on analogue tape. The scary part was that in the pop department we used a block to cut the tape - not the classical guys, though. It had to be done with a pair of brass scissors, so you had to get the angle of the cut just right! You had to wear white cotton gloves, and after you'd done the join, you then had to dust it with chalk. By the time I'd finished, I probably did about 50 or 60 edits in the course of those four or five days, and when you played the tape it looked like a zebra crossing going past! Brown, white, brown, white, a long bit of brown, then white again... It was ridiculous. Their cheating was just as bad as ours, and I've been a bit more relaxed about the whole classical ethos

mixing stage, but you'd probably only spend half an hour or so mixing the four-track down. That's

my argument against technology-led recording. There was f\*\*k-all technology then, and there's tons of it now, and records haven't really got that much better. They sound louder and they're more beefy, sonically, but that's nothing to do with the performance - that's all to do with the technology. When I play an old record I did from that period, they do sound a bit thin and scrawny, but it's only the sound you're talking about, you're not talking about the performance, and I think there's an awful lot of sound and f\*\*k-all performance nowadays. Very few records have feel, although many of the best programmers understand that, and have a technique to insert feel. But it never quite makes up for the real thing."



the Bonzo Dog Band, with whom he worked on the Doughnut In Granny's Greenhouse and Tadpoles LPs.

# **Balancing Acts**

Perhaps because he was so used to committing a balance to tape as a Decca engineer, Dudgeon's production style involves doing a lot of the mixing

# Record Breakers

Although Gus Dudgeon is still a keen seeker after new musical talent, and goes to two or three gigs every week, he's not a fan of most modern sample-based music. It's ironic, then, that he's about to be honoured for his own contribution to the genre. "When I was a kid and the first Guinness Book Of Records came out it was the Pokemon of its day, it was the ultimate thing to have. And I remember thinking 'Wouldn't it be great to get into the Guinness Book Of Records?' It was one of those weird dreams that I had when I was a kid, but then it faded away. But then I was working on something else recently, and the tape jockey said to me 'Didn't you do 'He's Going To Step On You Again' by John Kongos?' And I said 'Yeah'. And I was driving home after that, and I thought 'Wait

a minute, that was 1971. That might have been the first ever use of a sample!', because the whole record is built on a loop, and I mean an actual analogue tape loop, going round and round, lifted from an African tribal dance recorded in some jungle somewhere. And although they haven't printed it yet, the Guinness Book Of Records have actually sent me a fax saying that they recognise it as the first sample ever used on record, which I was delighted about.

"I remember playing this loop to the musicians, and they said 'Yeah. Now what happens?' And I said 'Well, you're going to play on top of that.' And the drummer was like 'What? It's got drums on it already! And it's not an even length, it's two and a quarter bars long - I can't play to that.' So I said 'You just go straight down the

line. Believe me, you can play to it.' It took about half an hour to persuade him to even put the cans on and try. but once they got into it, they were there. All the time they were doing it I was terrified. No-one had ever done it before. I was thinking I was going to have my arse sued off, but the point was you could never have faked it. If I'd played that and said to somebody 'Let's recreate this,' you couldn't have done it. And it is a fabulous loop - not that I created it in the first place.

"The guy who did the demo had created the loop because he wanted some drums to play to - he just lifted this bit off and made a quick loop out of it, and that's why it was only two and a quarter bars long, because as long as it stayed in time, he wasn't concerned about whether it

started at point A and finished at point B and went back to A again. The reason it was two and a quarter bars long was because that was how long it took the tape to go round once without being too wobbly or too tight to move. So we just repeated what he'd done on his original demo, went through the process of making up the loop, dubbed 10 minutes or so of it onto a 24-track machine, finally got the drummer to understand it would work, dubbed the drums on, and then the rest of the musicians. The entire record is based on that loop. It runs loudly throughout the entire song. So consequently it is the very first record to ever use a sample, and produced by me, of all people! I'm probably the very last person anyone would think of as being the sample pioneer!"

▶ as he goes along, even to the extent of printing level changes on individual overdubs to tape as the musicians lay down their parts. He feels that having a good monitor mix is crucial to getting the best and most appropriate performance out of a singer or musician: "Everybody that's working on the project — engineers, musicians, even someone you've just brought in for an hour to do some backing vocals — it's great if they can hear a great, full mix in the cans or the monitors, and have some idea what it is that they need to project over, where they need to pitch it, how quiet or loud they need to sing or play.

"I've been on odd sessions sometimes where people have the weirdest monitor balance. When we started Rocket Records [Dudgeon and Elton John's record label], we signed Neil Sedaka, and I went to one of his sessions in Los Angeles. I walked in and I thought 'This is obviously a joke balance that they've just quickly thrown up,' but two hours later, no one had changed anything. They were doing overdubs which were so out of whack with where I would have heard them in the mix, and the whole mix was so way off, I was thinking 'I don't understand how you can work that way,' but the musicians didn't seem to think it was weird — or maybe they did, but they didn't like to say so!

"I have to start with the bass and drums. Within the drum kit you have every frequency you're ever going to have, from the highest high to the lowest low. Once you've got the drum sound together, someone can come in and say 'What do you think of this bass sound?', with it in solo. But you don't know how good it is until you've put it up against the drum kit, because it may be a great bass sound in its own right, but does it work with the bass drum? And if it doesn't you sometimes have to alter it quite drastically to make it work. So working on that principle, whatever I do, be it piano sound or guitar sound, I'll always try to sit it in the mix where it should be. If you get a great

# **Console Choices**

Apart from his forcefully expressed distaste for SSL consoles, which he dislikes because of their sound, Gus Dudgeon doesn't insist on any particular choice of studio gear. He does, however, have fond memories of the consoles made by now-defunct American company MCI: "The MCI desk in my opinion was the best-sounding desk of all time, because it didn't have any quirks or weirdness about it. I came across the MCI desk by accident, when we went to do the stuff in France with Elton. I went to the chateau when I was checking the studio out, and in order to get into the control room you had to walk through the live area. There was a band playing, called Zoo, and as I walked through the studio. I could hear their drummer

playing. I walked from the studio into the control room, and I heard exactly the same sound. That had never happened to me in my entire life. I kept walking in and out of the control room and into the studio, and I thought 'I can't believe this. I'm hearing, near as dammit, exactly what I'm hearing out there.' And it turned out to be an MCI desk. The nearest you get to MCI nowadays is the Focusrite, of which there are very few - I think there's only two left in the UK, sadly - and you can also tweak a Euphonix to sound a lot like an MCI. Most of the Focusrite outboard boxes you can buy all have that kind of MCI quality. People love them, but they don't realise that there was a console once where the whole console sounded like that."

guitar sound and it sounds great in the intro, and then as the track builds it sort of disappears and starts to get swamped out, I would actually increase the level going to tape as it went down, so that when you set up the monitor balance again a week later for doing another overdub, you wouldn't have something that started at the beginning and was fine, and then disappeared, and then at the end in a quiet bit would suddenly be loud enough again. I would try to make sure that if something's getting lost in the mix, I'd bring the level up so it matches. All the time I'm recording, everyone who's working on it knows everything that's going on and can hear everything that's being played throughout the song, and won't be saying 'Can you turn that up at that point? It's disappeared in the cans.' So, in fact, at the end of the day, the mixes aren't a massive surprise."

# Mix Matters

Although he's always been happy to let others handle routine engineering duties on his productions, Dudgeon likes to tackle the mix

# Recording Elton John's Piano

Many of the tracks on Elton John's classic '70s albums were based around live studio takes, with Elton playing piano alongside a drummer. bassist and the other members of his band. This was clearly the only way to capture the feel of a band performance, but it did pose obvious problems when it came to recording the piano in sufficient isolation to permit it to be treated independently of other instruments, or notes to be dropped in. Gus Dudgeon explains his innovative solution: "When I first started off, we did it the same way anybody does - you lift the lid up. I never close the lid on a piano. It's the worst thing you can possibly do. Taking the lid off is even better, if you can get the lid physically off. The lid

is only there to bounce the sound out into the hall when you're playing live with an orchestra. The problem is that you lose separation in a studio situation, because it's very unlikely you're going to be able to get the piano somewhere isolated, so with rock & roll you'd like to be able to keep it shut to keep some of the noise out. But the trouble is, when you do that you've got the mics only a matter of inches from the strings. so you're going to hear all the harmonics which you're not supposed to hear, and the sound's going to be way out of balance, because you cannot get a balanced sound across the whole keyboard unless you've got a mic every couple of feet, which would be ridiculous.

So I started off the traditional way, and then when it started getting a bit more complicated, and I really wanted to get the mics up higher and higher to get the most natural sound. I found the thing to do was take the lid off, and then get a carpenter to build the shell of another piano, upside-down. So, in other words, on top of the original frame of the piano we built another one about three times as deep, so physically the piano was now about 10 feet tall, and it was padded inside. We had two holes at the side, and we just poked the mics in there, and then you could get the mics high above the strings. You could put the



piano right in the middle of the rhythm section, and you might just hear a little bit of low rumble from the bass or the bass drum or something, but you could usually filter that out without spoiling the piano sound in any way. I think we had about three built altogether. There are upside-down piano frames dotted all over America!"

himself along with the engineer, and his approach to mixing is also distinctive. "The way I used to work was to do however many mixes I thought I needed to cover everything," he says of his work on the Elton John albums. "Every mix I did I was trying to get the whole thing, knowing full well that the chance of getting it absolutely right all the way through in one hit was fairly slim. But I would do enough mixes — maybe eight, 10, however many it took — and then when I got to the point of thinking I'd probably got it all there somewhere, I'd divide the song up into small sections on a piece of paper, and I had a sort of heiroglyphic system I used to mark them. I'd play one and tick it, and think 'That's a great intro,' but then I'd play the next one and think 'Actually, that's an even better intro,' so I'd tick that and put a circle round it, meaning 'That was good, but this is possibly even better.' And then once I had columns of heiroglyphics across the whole song down the side of the page, a bit like a musical score in a way, I could see that there was probably one section I'd never quite got right, but I wouldn't just go



Elton John and Gus Dudgeon have been one of the most enduring artist-producer teams ever, responsible for a string of hit singles and number one albums throughout the '70s.

and do that section. I'd think 'Right, this is my opportunity to maybe try a couple of things I haven't tried earlier on, where I've been a little bit cautious about that drum fill that really could have come up a bit, maybe I could give that an extra push,' but make sure I covered the one section I hadn't really covered before. I'd probably do a couple of takes that way, and then I'd go back and listen to those bits. If I had those covered, I might in the process of that decide that actually, the first verse of these new takes is better than *any* of the others. And then I'd just cut all the bits together on the analogue master. So it was kind of like a Neanderthal method of producing the same result as computer mixing."

Since then, console automation and computer-based mixing have become widespread — a development which, you might think, would have enabled Dudgeon to perfect and simplify his approach to mixing. Surprisingly, however, he finds that the reverse is true: "I have a problem with computer mixing. I'm never satisfied with my computer mixes. I keep trying, and I keep trying different ways of doing it, and I'm never really happy. When I go back and listen to the older stuff, pre computer consoles, that I've done, I'm much happier with it, and they're all hand-cranked. I find that when I'm doing computer mixing it's too relaxing,





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because you can do a mix and sit back and do absolutely nothing at all knowing that the computer will repeat the mix, and listen to it over and over again, and know that you can change anything. I get over-critical, so my mixes come out too linear. I don't like mixes that are too linear, I like mixes where occasionally something comes out that's a bit of a surprise.

"If you lift a drum fill at a certain point, you're listening back to the drum fill thinking how happy you are with it, and then you think 'Oh, but actually the bass disappears slightly at that point. I think I'll just poke that up,' so you poke the bass up a bit, and then the third time around you notice that the piano's got slightly lost at the same point, so you poke the piano up, and you just go round in circles. So actually what happens is that the mix that had nice highs and lows, and had some sort of dynamics, is getting slowly flattened out again. What happens is that the whole mix has just got louder, so you pull the whole master level down and stick a fat compressor over it, and you've just got a flat mix, so eight hours later it doesn't sound like you did any work at all. The amount of people who will tell you that their rough mix was better than the master mix — it happens all the time. Now why is the rough mix good? It's probably good because you did it in one hit, you probably said 'Look, just roll the tape, I'll run off a quick one.' And there'll be things wrong with it, but if you could just stop there and say 'Look, the only things that are really wrong are these half-dozen points. There's a bit where the voice gets lost here, the beginning of that solo which I missed...' And if you could go back and say 'Let's just take that and tart up those few bits that are wrong using the computer, so as not to lose the essence of the rough mix,' that should be your mix. But you never do, because you always think 'This is my chance to make it even more fabulous!

"What I have started doing recently is doing semi-computerised mixes, using the computer to do absolutely crucial things that are just a pain in the arse, like that little percussion thing you had to drop in on that track because that's the only place you could fit it in, and you hadn't printed it at quite the right level or it needed a different EQ or something. I'll let the computer look after that sort of thing, but still do a lot of the mixing by hand, because it's much more involving. It's like being a member of the band, in a way, all of a sudden you're part of the playing process. And I'll still cut the bits together."

# **Out Of Engineering**

Apart from handling the mix, Gus Dudgeon makes a point of not getting involved with the engineering on projects that he's producing — not only because of the potential pitfalls associated with trying to produce and engineer at the same time, but because he wants to get a positive contribution from others. "As soon as I quit engineering, which I was quite glad to do, my only concern then was finding an engineer that I could

work with who understood what it was I was after. And I actually found that wasn't that difficult. I've worked in loads of studios, and I've found that engineers are keen, if asked, to put forward their ideas — which I welcome. As soon as the engineer realises you're asking him to give you his opinion, and his core values, and he's able to demonstrate to you something that maybe he's been messing around with quietly in the back room which is quite a nifty idea, he comes alive, because he thinks 'Oh good, he's not going to sit there and say "I want such-and-such a mic on the vocal, and what kind of mic is that on the bass drum, and so on and so on...".'

"If somebody sticks a microphone in front of a

bass drum and it sounds like shit, it sounds like

shit. You've got to change it, or look for better EQ. or it could just be the way the bass drum's tuned, it could be because you're using a soft beater instead of a hard beater or vice versa, but there's usually some way round it. But as for going in and having some sort of dictatorial opinion of 'This is the way I work and this is the only way I work,' that's never appealed to me. I'm interested in someone bringing something to the party. It's like when you bring a guitarist in, if you're booking a great guitarist, you're booking him precisely because he is a great guitarist, and you say 'Right. Here's the track, have a listen to it a few times, what would you do?' And there might be specific things you want, but let him have free rein with his ideas, let him show you what he

can do.

"I get hands-on when it comes to the mix, and I'm pretty hands-on when it comes to the monitor balance, because I've got a thing about monitor balances, but that's it. I think you're sitting on people's creativity if you're too demanding. And also, what are you going to learn? You're not going to learn anything from anybody if you've got an attitude of 'I know what to do,' because probably what you'll be doing is following

# The Trouble With Songwriters...

"If you tell a songwriter, 'I think this section's great, and this section's great, but you could really do with a better verse," or whatever, they always say 'Yeah, yeah, you might have got a point, I'll do something about it,' but they never do," says Gus Dudgeon, "What they do is go off and write another song which they think is better. So you never get from A to Z. You always get as far as K and then they stop. It drives you mad. I would love to be a terrific songwriter who people brought songs to, and then I could sit down and write the missing bits, but songwriting's not a skill that I have."

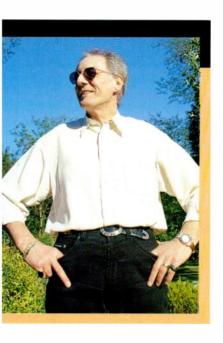


One of Gus Dudgeon's major projects in the '90s was XTC's major-label swansong, Nonsuch.

# Remastering Elton John For CD

A project that has occupied much of Gus Dudgeon's time in the last couple of years is remastering Elton John's back catalogue for CD. Like so many others. Elton John's '70s albums had been victims of a shoddy original transfer to the digital domain: "I was complaining about it for years, and eventually someone in America listened and said 'OK, you've been moaning about it for a long time. you go and do it," says Dudgeon. "No-one used to bother in the early days of CD mastering, they just used to look for the loudest peak, set it, and then f\*\*k off and have a cup of tea while the CD master ran off. I wish they'd go back to the engineer sometimes and ask them if they'd like to be

present at the mastering and do the thing properly. It's a real art. The early ones were awful, embarrassing. Some of them were even back to front - the left and rights had been switched, which is pathetic. There was a live Elton album called 17/11/70, which obviously fades in with applause on the original vinyl and fades out at the end of side one, and then fades in again on side two. At the point on the CD where they crossfaded trying to go from side one to side two, the whole thing goes completely out of phase, so the audience goes all strangled and horrible and it sounds like it's coming down a phone. The person who did this obviously couldn't give a tuppeny f\*\*k."



the same old routine for years, which works for you. But there's not going to be a flash of inspiration from anybody else, because they're going to think 'He doesn't want to hear what I've got to offer.' There's never been a session I've done without learning something. Sometimes it's a new way of doing things, or sometimes it's 'Don't ever do that again!', but it's impossible to do a session without learning something."

These days, it's clear that it's the potential for learning something new, or doing something unique, that inspires Gus Dudgeon to take on new projects. In recent years he's worked with an eclectic selection of artists including XTC, The Frank & Walters, Fairport Convention and Menswear, and his current projects are equally diverse. He's remixing an old single by Bonzo Dog

Band drummer 'Legs' Larry Smith — a version of 'Springtime For Hitler' from the Mel Brooks film *The Producers* — for an imminent re-release, and has been compiling an album of classic soca tracks which includes a forthcoming single on which he'll have a rare composition credit. On top of this, he's been producing a live album recorded at a recent tribute concert to Burt Bacharach, featuring Dionne Warwick, Elvis Costello, Bob Geldof, Lynden David Hall, Paul Carrack and many other singers as well as the great songsmith himself, and also managing a new band called Slinki Malinki.

Somehow, Gus Dudgeon even finds time for his other lifelong passion — tending the impressive grounds at the back of his immaculate 16th-century Surrey house. And the jewel in the crown, naturally, is his rock garden...

Gus Dudgeon:
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Gus Dudgeon is an active member of the Music Producers' Guild, and joined the panel for their recent Making Music tour. The MPG can be contacted on +44 (0)20 7731 8888 or via www.mpg.org.uk.



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ALESIS MIDIVERD	
ALESIS NANOVERB	£99
ALESIS NANOCOMPALESIS MEQ 230	£89
ALESIS MED 230	€170
AL FOIC DIA DOO	L1/3
ALESIS DM PRO	
ALESIS DM5	£269
ALESIS SR16 APHEX C104 APPLEMAC G4 PACKAGES FROM	£195
ADUEV 0404	
APHEX C104	£145
APPLEMAC G4 PACKAGES FROM	£2059
BOSS BR8 EX-Demo	£400
DOCC CT3	0000
BOSS GT3	£289
BOSS SP303	£LOW
BOSS DR202 BOSS ME-33	£179
DOCC ME 22	CL OVA
DO33 ME-33	ZLOVV
BOSS EQ-20	£LOW
BOSS CD 20	EL OW
BOSS RC-20 BEHRINGER MX8000A INC M.BRIDGE BEHRINGER MX2004A	EL OW
DEMDINICED MANOUVA INIC 14 DESIGNE	
DETIRINGER MABUUUA INC M.BRIDGE	£999
BEHRINGER MX2004A	£249
BEHRINGER MX602A	£74
REHDINGED THRE HITTEA	5350
BEHRINGER MX602A BEHRINGER TUBE ULTRA BEHRINGER TUBE COMPOSER	£259
BEHKINGER TUBE COMPOSER	£259
DISTRICT TO BE COMPOSER DISTRICT TO BE COMPOSER DISTRICT VOCALIST W. STATION EX. DIGITECH VOCALIST W. STATION EX. DIGITECH VOCALIST PERFORMER DIGITECH VOCALIST VR DIGITECH STUDIO QUAD 4 DIGITECH RP2000	£140
DIGITECH VOCALIST W STATION BY	CVEDVION
DIGITECH CTUDIO VOCALICE CO	LVERT LUVY
DIGITECH STUDIO VOCALIST EX	£/39
DIGITECH VOCALIST PERFORMER	£269
DIGITECH VOCALIST VP	£310
DICITECH CTUDIO OLIAD 4	COCO
DIGITECH STUDIO QUAD 4	
DIGITECH RP2000	£LOW
FLHU GINA	+ 1h4
ECUO DADI A	0040
ECHO DARLA	
ECHO LAYLA	£779
ECHO MIA	FLOW
EMACIC LOCIC ALIDIO SILVED	£150
ECHO DARLA ECHO MIA ECHO MIA EMAGIC LOGIC AUDIO SILVER EMAGIC LOGIC AUDIO GOLD EMAGIC LOGIC AUDIO PLATIINUM EMAGIC AMTA	
EMAGIC LOGIC AUDIO GOLD	£310
EMAGIC LOGIC AUDIO PLATINUM	£429
EMAGIC AMTR	FLOW
CHACIC MTA	CLOW
EMAGIC MT4	
EMAGIC UNITOR 8	£LOW
EMU MO PHATT	
	FVERY LOW
EMILESOCOLI	EVERY LOW
EMU E5000U	EVERY LOW
EMU E5000UEMU PROTEUS 2000	£VERY LOW £VERY LOW £VERY LOW
EMAGIC UNITOR 8 EMU MO PHATT EMU E5000U EMU PROTEUS 2000 EMU PLANET EARTH	£VERY LOW £VERY LOW £VERYLOW £VERYLOW
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EMU PLANET EARTH EMU B3 EMU VIRTUOSO EMU XTREME LEAD ENSONIQ PARIS ELECTRIX FILTER FACTORY ELECTRIX WARP FACTORY	£VERYLOW £VERY LOW £VERY LOW £VERY LOW £CALL £289 £349
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VAMAHA CSSY EX-DEMO	€700
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YAMAHA CS6R EX-DEMO YAMAHA CS1X YAMAHA CS2X YAMAHA DJX II EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA MSP10 EXCLUSIVE DEALI YAMAHA S30	£599 £VERY LOW £CALL £199 £139 £649 £VERY LOW
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS2X YAMAHA DJX II EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA MSP10 EXCLUSIVE DEAL! YAMAHA S80 YAMAHA S30 YAMAHA S03	£599 £CALL £199 £139 £648 £VERY LOW £LOW
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS2X YAMAHA DJX II EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA MSP10 EXCLUSIVE DEAL! YAMAHA S80 YAMAHA S30 YAMAHA S03	£599 £CALL £199 £139 £648 £VERY LOW £LOW
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS2X YAMAHA DJX II EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA MSP10 EXCLUSIVE DEAL! YAMAHA S80 YAMAHA S30 YAMAHA S03	£599 £CALL £199 £139 £648 £VERY LOW £LOW
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS2X YAMAHA DJX II EX-DEMO. YAMAHA DJX IIB EX-DEMO. YAMAHA DJX IIB EX-DEMO. YAMAHA SS0 YAMAHA SS0 YAMAHA SS0 YAMAHA SS0 YAMAHA SS0 YAMAHA SSO YAMAHA SSO YAMAHA SSO	£599 £VERY LOW £CALL £199 £130 £649 £VERY LOW £LOW £449 £1449
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS2X YAMAHA DJX II EX-DEMO. YAMAHA DJX IIB EX-DEMO. YAMAHA DJX IIB EX-DEMO. YAMAHA SS0 YAMAHA SS0 YAMAHA SS0 YAMAHA SS0 YAMAHA SS0 YAMAHA SSO YAMAHA SSO YAMAHA SSO	£599 £VERY LOW £CALL £199 £130 £649 £VERY LOW £LOW £449 £1449
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS2X YAMAHA DJX II EX-DEMO. YAMAHA DJX IIB EX-DEMO. YAMAHA DJX IIB EX-DEMO. YAMAHA SS0 YAMAHA SS0 YAMAHA SS0 YAMAHA SS0 YAMAHA SS0 YAMAHA SSO YAMAHA SSO YAMAHA SSO	£599 £VERY LOW £CALL £199 £130 £649 £VERY LOW £LOW £449 £1449
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS2X YAMAHA DJX II EX-DEMO. YAMAHA DJX IIB EX-DEMO. YAMAHA DJX IIB EX-DEMO. YAMAHA SS0 YAMAHA SS0 YAMAHA SS0 YAMAHA SS0 YAMAHA SS0 YAMAHA SSO YAMAHA SSO YAMAHA SSO	£599 £VERY LOW £CALL £199 £130 £649 £VERY LOW £LOW £449 £1449
YAMAHA CS6R EX-DEMO YAMAHA CS1X YAMAHA CS2X YAMAHA DJX IIB EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA BJX IIB EX-DEMO YAMAHA S80 YAMAHA S80 YAMAHA S30 YAMAHA S03. YAMAHA REV 100 YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA RM1Y EX-DEMO	£595 £VERY LOW £CALL £195 £133 £645 £VERY LOW £LOW £495 £145 £495 £275 £265
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX II EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA SON YAMAHA SON YAMAHA SON YAMAHA SON YAMAHA SON YAMAHA SON YAMAHA SUTON YAMAHA SWA	£599 £VERY LOW £CALL £199 £138 £644 £VERY LOW £144 £149 £275 £275 £276 £286 £296 £296
YAMAHA CS6R EX-DEMO YAMAHA CS1X YAMAHA CS2X YAMAHA DJX II BX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA BJX IIB EX-DEMO YAMAHA S80 YAMAHA S80 YAMAHA S30 YAMAHA S03 YAMAHA REV 100 YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA RM1X EX-DEMO YAMAHA RM1X EX-DEMO YAMAHA RM1X EX-DEMO YAMAHA MISOP	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £104 £144 £499 £277 £266 £399 £299
YAMAHA CS6R EX-DEMO YAMAHA CS1X YAMAHA CS2X YAMAHA DJX II BX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA BJX IIB EX-DEMO YAMAHA S80 YAMAHA S80 YAMAHA S30 YAMAHA S03 YAMAHA REV 100 YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA RM1X EX-DEMO YAMAHA RM1X EX-DEMO YAMAHA RM1X EX-DEMO YAMAHA MISOP	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £104 £144 £499 £277 £266 £399 £299
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX II EX-DEMO. YAMAHA DJX IIB EX-DEMO. YAMAHA DJX IIB EX-DEMO. YAMAHA SS0 YAMAHA SS0 YAMAHA SS0 YAMAHA SS0 YAMAHA SOS YAMAHA SOS YAMAHA SOS YAMAHA SUZOE EX-DEMO. YAMAHA SUZOE EX-DEMO. YAMAHA SUZOE EX-DEMO. YAMAHA SUZOE EX-DEMO. YAMAHA MS5P YAMAHA MS5P YAMAHA MS5P YAMAHA MS5P YAMAHA MS5R EX-DEMO.	£595 £VERY LOW £CALL £199 £138 £644 £VERY LOW £444 £144 £499 £275 £276 £286 £399 £290 £290 £290 £290
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX II EX-DEMO. YAMAHA DJX IIB EX-DEMO. YAMAHA DJX IIB EX-DEMO. YAMAHA SS0 YAMAHA SS0 YAMAHA SS0 YAMAHA SS0 YAMAHA SOS YAMAHA SOS YAMAHA SOS YAMAHA SUZOE EX-DEMO. YAMAHA SUZOE EX-DEMO. YAMAHA SUZOE EX-DEMO. YAMAHA SUZOE EX-DEMO. YAMAHA MS5P YAMAHA MS5P YAMAHA MS5P YAMAHA MS5P YAMAHA MS5R EX-DEMO.	£595 £VERY LOW £CALL £199 £138 £644 £VERY LOW £444 £144 £499 £275 £276 £286 £399 £290 £290 £290 £290
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX II EX-DEMO YAMAHA DJX II EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA S80 YAMAHA S30 YAMAHA S30 YAMAHA S03 YAMAHA REV 100 YAMAHA SU200 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SWAMAHA RYTO YAMAHA RMIX EX-DEMO YAMAHA MS5P	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £104 £144 £499 £277 £266 £399 £299 £199 £199 £299
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX II EX-DEMO YAMAHA DJX II EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA S80 YAMAHA S30 YAMAHA S30 YAMAHA S03 YAMAHA REV 100 YAMAHA SU200 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SWAMAHA RYTO YAMAHA RMIX EX-DEMO YAMAHA MS5P	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £104 £144 £499 £277 £266 £399 £299 £199 £199 £299
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX II EX-DEMO YAMAHA DJX II EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA S80 YAMAHA S30 YAMAHA S30 YAMAHA S03 YAMAHA REV 100 YAMAHA SU200 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SWAMAHA RYTO YAMAHA RMIX EX-DEMO YAMAHA MS5P	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £104 £144 £499 £277 £266 £399 £299 £199 £199 £299
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX II EX-DEMO YAMAHA DJX II EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA S80 YAMAHA S30 YAMAHA S30 YAMAHA S03 YAMAHA REV 100 YAMAHA SU200 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SWAMAHA RYTO YAMAHA RMIX EX-DEMO YAMAHA MS5P	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £104 £144 £499 £277 £266 £399 £299 £199 £199 £299
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX II EX-DEMO YAMAHA DJX II EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA S80 YAMAHA S30 YAMAHA S30 YAMAHA S03 YAMAHA REV 100 YAMAHA SU200 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SWAMAHA RYTO YAMAHA RMIX EX-DEMO YAMAHA MS5P	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £104 £144 £499 £277 £266 £399 £299 £199 £199 £299
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJXI IB EX-DEMO YAMAHA DJXI IB EX-DEMO YAMAHA BJXI IB EX-DEMO YAMAHA SSO YAMAHA SSO YAMAHA SSO YAMAHA SSO YAMAHA SUZOD EX-DEMO YAMAHA SUZOD EX-DEMO YAMAHA SUZOD EX-DEMO YAMAHA SUZOD EX-DEMO YAMAHA RMIX EX-DEMO YAMAHA RMIX EX-DEMO YAMAHA RMIX EX-DEMO YAMAHA MS5P YAMAHA MUSOR EX-DEMO YAMAHA TSIR EX-DEMO YAMAHA MT400 YAMAHA DSP2416+ FREE AX16AT YAMAHA SW1000XG YAMAHA RY9 EX-DEMO YAMAHA RY9 EX-DEMO	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £445 £144 £499 £275 £266 £399 £299 £199 £488 £349 £1345 £1345 £1345
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX II EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA S80 YAMAHA S30 YAMAHA S30 YAMAHA S30 YAMAHA S00 YAMAHA SU20 EX-DEMO YAMAHA SU700 YAMAHA SU700 YAMAHA SU700 YAMAHA MOY70 YAMAHA MOY70 YAMAHA MOY70 YAMAHA MOY80 YAMAHA MOY80 YAMAHA MOY80 YAMAHA MS5P YAMAHA MS5P YAMAHA MS5P YAMAHA MS5P YAMAHA MS5P YAMAHA MS5P YAMAHA FS1R EX-DEMO YAMAHA MT400 YAMAHA MT400 YAMAHA MT400 YAMAHA MS9P	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £449 £144 £499 £275 £295 £199 £295 £199 £485 £344 £134 £135 £1455
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX II EX-DEMO YAMAHA DJX II EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA S30 YAMAHA S30 YAMAHA S30 YAMAHA S30 YAMAHA S03 YAMAHA S03 YAMAHA S03 YAMAHA SU700 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA MY70 YAMAHA MY5P YAMAHA MY5P YAMAHA MY5P YAMAHA MY5P YAMAHA MY5P YAMAHA MY400 YAMAHA DSP2416+ FREE AX16AT YAMAHA SW1000XG YAMAHA PSR9000 YAMAHA PSR9000 YAMAHA PSR9000 YAMAHA PSR9000	£599 £VERY LOW £CALL £199 £133 £645 £VERY LOW £LOW £444 £144 £149 £276 £276 £399 £299 £199 £485 £346 £133 £1459
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX II EX-DEMO YAMAHA DJX II EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA S30 YAMAHA S30 YAMAHA S30 YAMAHA S30 YAMAHA S03 YAMAHA S03 YAMAHA S03 YAMAHA SU700 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA MY70 YAMAHA MY5P YAMAHA MY5P YAMAHA MY5P YAMAHA MY5P YAMAHA MY5P YAMAHA MY400 YAMAHA DSP2416+ FREE AX16AT YAMAHA SW1000XG YAMAHA PSR9000 YAMAHA PSR9000 YAMAHA PSR9000 YAMAHA PSR9000	£599 £VERY LOW £CALL £199 £133 £645 £VERY LOW £LOW £444 £144 £149 £276 £276 £399 £299 £199 £485 £346 £133 £1459
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX II EX-DEMO YAMAHA DJX II EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA S30 YAMAHA S30 YAMAHA S30 YAMAHA S30 YAMAHA S03 YAMAHA S03 YAMAHA S03 YAMAHA SU700 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA MY70 YAMAHA MY5P YAMAHA MY5P YAMAHA MY5P YAMAHA MY5P YAMAHA MY5P YAMAHA MY400 YAMAHA DSP2416+ FREE AX16AT YAMAHA SW1000XG YAMAHA PSR9000 YAMAHA PSR9000 YAMAHA PSR9000 YAMAHA PSR9000	£599 £VERY LOW £CALL £199 £133 £645 £VERY LOW £LOW £444 £144 £149 £276 £276 £399 £299 £199 £485 £346 £133 £1459
YAMAHA CS6R EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX IIB EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA MSP10 EXCLUSIVE DEAL! YAMAHA S80 YAMAHA S30 YAMAHA S30 YAMAHA S30 YAMAHA S03 YAMAHA S03 YAMAHA REV 100 YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SW100 EX-DEMO YAMAHA WIXE YAMAHA WIXE YAMAHA WIXE YAMAHA MIXE YAMAHA MIXE YAMAHA MIXE YAMAHA SW1000XG YAMAHA SW1000XG YAMAHA SW1000XG YAMAHA PSR9000 YAMAHA PSR9000 YAMAHA PSR9000 YAMAHA PSR9000 YAMAHA PSR940	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £LOW £LOW £444 £499 £275 £299 £299 £199 £199 £198 £485 £348 £1455 £LOW
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX IIB EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA BSD IIB EX-DEMO YAMAHA SSO YAMAHA SSO YAMAHA SSO YAMAHA SOS YAMAHA SOS YAMAHA SUZOD EX-DEMO YAMAHA MSSP YAMAHA MSSP YAMAHA MUSOR EX-DEMO YAMAHA FSIR EX-DEMO YAMAHA PSIR EX-DEMO YAMAHA DSP2416+ FREE AX16AT YAMAHA SW1000XG YAMAHA PSR9500 YAMAHA PSR9000 YAMAHA PSR740 YAMAHA PSR540	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £244 £145 £276 £399 £299 £199 £199 £145 £145 £145 £145 £145 £145 £145
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX IIB EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA BSD IIB EX-DEMO YAMAHA SSO YAMAHA SSO YAMAHA SSO YAMAHA SOS YAMAHA SOS YAMAHA SUZOD EX-DEMO YAMAHA MSSP YAMAHA MSSP YAMAHA MUSOR EX-DEMO YAMAHA FSIR EX-DEMO YAMAHA PSIR EX-DEMO YAMAHA DSP2416+ FREE AX16AT YAMAHA SW1000XG YAMAHA PSR9500 YAMAHA PSR9000 YAMAHA PSR740 YAMAHA PSR540	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £244 £145 £276 £399 £299 £199 £199 £145 £145 £145 £145 £145 £145 £145
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX IIB EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA BSD IIB EX-DEMO YAMAHA SSO YAMAHA SSO YAMAHA SSO YAMAHA SOS YAMAHA SOS YAMAHA SUZOD EX-DEMO YAMAHA MSSP YAMAHA MSSP YAMAHA MUSOR EX-DEMO YAMAHA FSIR EX-DEMO YAMAHA PSIR EX-DEMO YAMAHA DSP2416+ FREE AX16AT YAMAHA SW1000XG YAMAHA PSR9500 YAMAHA PSR9000 YAMAHA PSR740 YAMAHA PSR540	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £244 £145 £276 £399 £299 £199 £199 £145 £145 £145 £145 £145 £145 £145
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJXI IB EX-DEMO YAMAHA DJXI IB EX-DEMO YAMAHA MSP10 EXCLUSIVE DEALI YAMAHA S30 YAMAHA S30 YAMAHA S30 YAMAHA S30 YAMAHA S03 YAMAHA S03 YAMAHA REV 100 YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA MSP10 YAMAHA SW10 YAMAHA SW10 YAMAHA MSP YAMAHA MSP YAMAHA MSP YAMAHA MSP YAMAHA MSP YAMAHA PS1R EX-DEMO YAMAHA MS90 YAMAHA PS1R EX-DEMO YAMAHA PSR S10	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £LOW £LOW £444 £149 £296 £296 £399 £296 £199 £199 £485 £145 £145 £145 £145 £145 £145 £145 £14
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJXI IB EX-DEMO YAMAHA DJXI IB EX-DEMO YAMAHA BS0 YAMAHA S80 YAMAHA S80 YAMAHA S80 YAMAHA S03 YAMAHA SU200 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SW100 EX-DEMO YAMAHA MS5P YAMAHA MS5P YAMAHA MS5P YAMAHA MS9P YAMAHA PSP YAMAHA PSP YAMAHA PSP YAMAHA PSP YAMAHA PSR	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £244 £145 £275 £266 £399 £299 £199 £199 £488 £348 £1345 £1455 £1455 £1455 £1455 £199 £275
YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJXI IB EX-DEMO YAMAHA DJXI IB EX-DEMO YAMAHA BS0 YAMAHA S80 YAMAHA S80 YAMAHA S80 YAMAHA S03 YAMAHA SU200 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SU200 EX-DEMO YAMAHA SW100 EX-DEMO YAMAHA MS5P YAMAHA MS5P YAMAHA MS5P YAMAHA MS9P YAMAHA PSP YAMAHA PSP YAMAHA PSP YAMAHA PSP YAMAHA PSR	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £244 £145 £275 £266 £399 £299 £199 £199 £488 £348 £1345 £1455 £1455 £1455 £1455 £199 £275
YAMAHA CS6R EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA CS2X YAMAHA DJXI IIB EX-DEMO YAMAHA DJXI IIB EX-DEMO YAMAHA BJXI IIB EX-DEMO YAMAHA S80 YAMAHA S30 YAMAHA S30 YAMAHA S30 YAMAHA REV 100 YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA RM1X EX-DEMO YAMAHA RM1X EX-DEMO YAMAHA MS5P YAMAHA MISSP YAMAHA MISSP YAMAHA MISSP YAMAHA MISSP YAMAHA MISSP YAMAHA MISSP YAMAHA PSP YAMAHA FS1R EX-DEMO YAMAHA PSP YAMAHA SW1000XG YAMAHA SW1000XG YAMAHA SW1000XG YAMAHA PSR9000 YAMAHA PSR9000 YAMAHA PSR9000 YAMAHA PSR9000 YAMAHA PSR9400 YAMAHA PSR940 YAMAHA PSR SY76 YAMAHA VL70M EX-DEMO ZOOM RT323	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £445 £1445 £276 £296 £199 £199 £485 £1455 £1455 £1455 £1455 £1455 £1455 £1455 £1455
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YAMAHA CSGR EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX IIB EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA BST I EX-DEMO YAMAHA SSO YAMAHA SSO YAMAHA SSO YAMAHA SOS YAMAHA SOS YAMAHA SUZOU EX-DEMO YAMAHA RM1X EX-DEMO YAMAHA MS5P YAMAHA MU9OR EX-DEMO YAMAHA FS1R EX-DEMO YAMAHA DSP2416+ FREE AX16AT YAMAHA SW1000XG YAMAHA PSR9000 YAMAHA PSR9000 YAMAHA PSR9000 YAMAHA PSR940 YAMAHA PSR9540 YAMAHA PSR9540 YAMAHA PSR9540 YAMAHA PSR9540 YAMAHA PSR9540 YAMAHA PSR340 ZOOM RT3234 ZOOM RT3234 ZOOM GFX74	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £244 £145 £279 £266 £399 £299 £199 £488 £348 £1455 £1455 £1455 £159 £279 £279 £279 £279 £279
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YAMAHA CS6R EX-DEMO YAMAHA CS1X YAMAHA CS1X YAMAHA DJX IIB EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA DJX IIB EX-DEMO YAMAHA S30 YAMAHA S30 YAMAHA S30 YAMAHA S30 YAMAHA S30 YAMAHA S03 YAMAHA SU700 EX-DEMO YAMAHA SU700 EX-DEMO YAMAHA SWOO EX-DEMO YAMAHA WAMAHA SWOO EX-DEMO YAMAHA WAMAHA SWOO YAMAHA WAMAHA SWOO YAMAHA MUSOR EX-DEMO YAMAHA MUSOR EX-DEMO YAMAHA MUSOR EX-DEMO YAMAHA SWOO YAMAHA SWOO YAMAHA PS1R EX-DEMO YAMAHA PS1R EX-DEMO YAMAHA PSR S000	£599 £VERY LOW £CALL £199 £133 £644 £VERY LOW £LOW £144 £499 £276 £399 £299 £199 £199 £485 £1455 £10W £644 £148 £148 £1455 £10W £648 £377 £256 £189 £278
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Photos Mark Even

Hoontech may be a new name to most SOS readers, but those interested in affordable multi-channel digital audio cards for Windows platforms may want to get to know them better. **John Walden** puts their Soundtrack DSP24 and ADC/DAC2000 package to the test.

he world of computer audio continues to evolve at an ever-increasing rate. When it comes to choosing the right audio I/O hardware, the range of possibilities is now staggering. Almost every combination of number of analogue inputs, analogue outputs, digital connections, sample rates and bit depths is now catered for. Furthermore, as Martin Walker's reviews of the Marian Marc 4, M Audio Audiophile 2496 and Terratec EWX 24/96 (in the March and April 2001 issues of SOS) demonstrated, even high-quality 24-bit, 96kHz audio recording is reaching a price point that almost everyone can afford.

Given the strength of the competition, it would take a brave manufacturer to attempt to break into this market. However, South Korean company Hoontech are attempting to do just that, with a range of PC audio systems. These start with the Soundtrack Audio DSP24 Value pack which, at £116, provides a PCI card offering 24-bit/96 kHz recording with driver support including ASIO 2.0 and GSIF. However, the subject of this review is the Soundtrack Audio DSP24 and ADC/DAC2000 bundle. This system also supports 24-bit/96kHz recording, but includes a range of digital ins and

# power to your pocket?

# HOONTECH SOUNDTRACK AUDIO DSP24 & ADC/DAC2000 PC RECORDING INTERFACE

outs and a rackmountable breakout box that provides eight-in/eight-out analogue connectivity. At a current price of £340, it seems to offer a great deal of functionality for a very modest outlay (see the Fully Specified box for details). Perhaps the most obvious comparision is the M Audio Delta 1010, reviewed in the January 2000 issue of SOS, which has a current 'street' price of over £500, though the Delta 1010 uses balanced analogue connections throughout whereas the Hoontech only has one pair of balanced inputs and outputs, the remainder being unbalanced. So is the Hoontech package a credible solution for the PC musician needing high audio quality and lots of connectivity but having to work on a very tight budget?

# The Complete Package

The Soundtrack Audio DSP24 and ADC/DAC2000

# HOONTECH SOUNDTRACK DSP24 & ADC/DAC2000 £340

# pros

- Plenty of functionality in a single package.
- Drivers seems to give reliable performance with a range of applications.
- Low latency.

# cons

- Other components perhaps do no make the most of the 24-bit converters.
- Documentation is poor.

# summary

A well-featured multiple in/out audio system with stable performance and low latency, but let down by weak documentation.

SOUND ON SOUND

package contains three hardware components: a PCI card, a daughterboard and a breakout box. The Audio DSP24 PCI card is fairly compact. Its rear plate features Mic In, Line In and Line Out sockets, all on stereo mini-jacks, plus a 44-pin D-Sub connector for linking to the external I/O provided by the ADC/DAC2000 rack unit. The card itself uses the popular Envy 24 I/O controller chip and the AC97 codec converter chip, providing fairly modest 18-bit A-D and D-A conversion — suitable for general Windows multimedia use and basic monitoring, but probably not for high-quality audio recording.

The main body of the card also features a

number of other connectors. These include a CD-in socket to allow you to bring in audio from your CD-ROM drive, but the most significant is the connector for the XG DB1 daughterboard (so called because it also works with Hoontech's Digital XG card, based on Yamaha's XG technology). This provides a choice of stereo in/stereo out digital signals via co-axial S/PDIF, optical S/PDIF or AES-EBU. It has a standard back-panel mounting plate like a PCI card but it does not

so, for example, it could be placed over an unused ISA slot rather than hogging space that could otherwise be used for another PCI card.

need a slot on the motherboard

The ADC/DAC2000 external I/O box is in a 1U rack format and seems sturdily built. The front panel features a stereo headphone jack with gain control, two balanced XLR inputs (plus a small button to switch their phantom power on/off) and eight unbalanced quarter-inch input jacks. Connecting a signal to the first two unbalanced inputs overrides any signal at the XLRs. Inputs 1 and 2 have built in preamps, and whichever source is being used (unbalanced or XLR), the two gain controls provide between -12 and +40dB of level adjustment. From left to right, the rear panel of

the rack unit houses two 44-pin D-Sub connectors, a wall-wart power supply input (if needed), one MIDI in and two MIDI outs, eight unbalanced quarter-inch output jacks and two balanced XLR outputs. The lower of the 44-pin connectors links to the PCI card via the suitably supplied cable (about six feet in length). The upper connector is not used in this system but could provide a link to other audio hardware.

The converters in the external rack use AKM's AK4524 Codec chips (as used on the M Audio Delta 66 and some other popular soundcards, and in contrast to the M Audio Audiophile 2496, which uses the better-specified AK4528 chip) on all stereo inputs and outputs. These converters provide 24-bit/96 kHz recording and themselves offer a 100dB A-weighted signal-to-noise ratio. The actual audio performance of the Hoontech system, of course, also depends upon other factors such as the quality of the analogue circuitry and the screening used on the PCI card. Disappointingly, neither the manual supplied with the review unit nor the Hoontech web site provided any further detail on the overall audio performance that might be expected of the system, or on the specification of the preamps for the XLR inputs.

Also included with the system are two CDs. One contains the various drivers and controller software, while the second provided a customised version of Emagic's *Logic Audio* (*Logic Soundtrack 24*), which is essentially a tailored version of *MicroLogic AV* v4.2. While no Mac support is available, the driver support for the PC appears to be very comprehensive. Every flavour of Windows is catered for along with ASIO 2.0, DirectSound and GSIF (*Gigasampler*) support. With the ASIO 2.0 drivers, support for latency values of approximately 3mS and 7mS is available at 96kHz and 44.1kHz sampling rates respectively, so providing all else is happy in your PC, software synths or samplers should prove very responsive.

#### Installation

Two slim printed User Guides are provided with the system: one for the PCI card and one for the external rack unit. It has to be said that the documentation is not of the highest standard. Throughout, it suffers from a rather poor translation into English and, while the installation procedures are described well enough, the explanations of the system's functions are poor. For the more experienced user this will perhaps just be an inconvenience, but it could certainly make a novice's first experiences with the system very frustrating. For example, the external rack unit has a 12V power supply socket on its rear, but no power supply is included with the system. Page nine of the rack unit's manual recommends using an external power adaptor. However, don't rush off to Argos before you read page 15, where the very last paragraph of the manual provides the information that the 44-pin D-Sub cable supplies the necessary power via the PC! Hmmm... Checking the Hoontech web site produced a

#### **Fully Specified**

- 10-in, 10-out 24-bit/96kHz full-duplex recording supported.
- 2x balanced (XLR) inputs with built-in preamps providing up to +40dB gain and switchable phantom power (48V).
- · 2x balanced (XLR) outputs.
- 8x unbalanced quarter-inch jack line-level inputs (-10dBV).
- 8x unbalanced quarter-inch jack line-level outputs (-10dBV).
- S/PDIF co-axial, optical and AES-EBU I/O connections via XG DB1 daughterboard.
- Audio DSP24 PCI card: Envy 24 I/O controller chip and AC97 codec rated at 95dB S/N ratio (A-weighted).

- ADC/DAC 2000 external rack: AKM AK4524 converter chip rated at 100dB S/N ratio (A-weighted).
- Stereo headphone output with volume control (quarter-inch jack).
- MIDI connectivity (1-in/2-out giving 32 MIDI channel output).
- Up to four systems can be combined to give 40-channel I/O with sample-accurate sync.
- Direct monitoring of input signals for zero latency.
- Drivers: available for Windows 95/98/ME/2000/NT, including ASIO 2.0 (providing latency down to 3mS) and GSIF (Gigasampler).

#### HOONTECH SOUNDTRACK DSP24 & ADC/DAC2000

slightly updated version of the documentation and, very usefully, this included a few pages on how to configure the system for use with Logic Soundtrack24 or full versions of Cubase, Logic, Cakewalk and Gigasampler.

Once I had installed the PCI card and daughterboard, made the necessary connections, and rebooted the test system, Windows automatically detected the new hardware and provided the usual prompt for drivers. Driver installation was duly completed without incident and, once done, a whole new series of entries appeared under the Windows Control Panel Multimedia Properties dialogue. The next step involved installation of the system's

control software, which essentially consists of three components: the External Links application, the Internal Mixer and the External Mixer (see screenshots, right). This installation, and that of the customised version of *Logic Audio* from the second CD, took just a few minutes and passed without incident.

#### **Software Control**

After installation, the External Links software is automatically loaded and displays as an icon on the Windows taskbar. The documentation describes the External Links software as the 'command centre' of the PCI card. As shown in the screenshot, it provides a graphical representation of the various inputs and outputs of both the PCI card, the XG DB1 daughterboard and the external rack unit. As in Propellerhead's Reason software. virtual cables can be used to make the required patches between the various ins and outs. Unfortunately, some of the graphics are perhaps not as well designed as they might be, and neither manual provides much in the way of detailed explanation of how things should be configured in order to achieve particular results. That said, a small amount of experimentation was all that was needed to get signals both in and out of the unit.

The Internal Mixer and External Mixer applications serve the PCI card and the rack unit respectively. Each provides a series of faders for the various audio signals (see screenshots) plus pan, mute and solo buttons where appropriate. The Internal Mixer basically replicates the usual Windows soundcard controls, but the External Mixer is obviously of much greater relevance in terms of multitrack audio recording. The File menu of both the External Links and External Mixer application allows a Hardware Settings dialogue to be opened, from where the digital Clock Settings and Device Settings (to adjust audio buffer size) can be made. No real surprises here but, again, the description of these settings in the current



documentation would be insufficient to help the novice user.

#### In Use

Testing the audio quality of the Hoontech, my overall impression was one of respectable, if unremarkable, audio performance. Comparisons with the Yamaha DSP Factory/AX44 breakout box combination (the latter featuring 20-bit converters) that was already in the test PC consistently showed the background noise levels of the Hoontech to be 2-3dB higher than on the Yamaha, whether using the unbalanced or the balanced

The External Links window — something of a triumph of graphics over functionality!

The Audio DSP24 Internal Mixer is used to control the levels of the PCI card audio sources.





analogue inputs. In addition, with the monitoring level turned up and no signal present, the analogue outputs of the Hoontech were noticeably noisier than those of the AX44. Given that the Hoontech system boasts 24-bit converters, this might seem a little disappointing, but it must be born in mind that it provides quite a lot of hardware at a pretty low price point. The

The Audio DSP24 External Mixer provides level control for the external rack unit.

# twin Quima



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This dual/stereo | OEMEEK compressor offers 'master' control in all senses of the

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#### twin Quima



The TwinQ offers 24/96 digital connectivity with this digital module. No drivers, no fuss, just a pure digital output on S/PDIF (and AES/EBU with adaptor).

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#### computer recording system

#### HOONTECH SOUNDTRACK DSP24 & ADC/DAC2000

best-quality analogue circuitry comes at a price and, while Hoontech's converters themselves may be well specified, it is perhaps understandable that some of the other components within the rack or the shielding on the PCI card are not off the top shelf. Given the price, this unit is clearly being targeted at the home studio user and, in that context. where the benefits of the whole package have to be considered, its audio performance is likely to be perfectly acceptable.

All the ins and outs seemed to function well enough. In particular, the co-axial S/PDIF connections on the XG DB1 produced excellent playback and recording quality and, given the choice, for stereo

recording I'd work via these digital connections rather than the analogue inputs on the ADC/DAC 2000. The balanced inputs on the rack unit are useful in that they provide phantom power, allowing a suitable condenser microphone to be used, but the preamps themselves do not seem to be of a very high standard (which is, again, understandable given the price). Strangely, the phantom power switch on the review unit did not seem to be working and the phantom power could not be switched off.

Hoontech make great play of the stability of the drivers for the Audio DSP 24 range, the range of Windows flavours supported and the low latency values possible. While I was only able to test the system under Windows 98 SE, in the main, these claims seem justified. First under the spotlight was the supplied version of Logic Soundtrack24. As mentioned earlier, this is essentially a version of Emagic's MicroLogic AV and, for someone new to PC multitrack recording, would provide enough functionality to make fairly polished recordings without offering too many bells and whistles to get in the way. The software supports recordings



of up to 24-bit/96 kHz and a maximum of 16 mono or stereo audio tracks. Each track has basic three-band EQ and two Aux Sends for applying global effects. The effects include a small number of Emagic's plug-ins such as a basic reverb, delay, chorus and flanger, and the program also allows DirectX effects to be accessed. However, no insert points are available to apply effects to individual channels. On the 800MHz Pentium III test system. I was easily able to record four tracks at 16-bit/44.1kHz while playing back a further eight plus some MIDI parts without the Logic System Performance Monitor getting into too much of a sweat. A suitable upgrade path is available from Logic Soundtrack24 to either Logic Gold or Platinum for users who find themselves outgrowing the supplied software.

Performance with the full version of Logic Platinum (v4.7) was even better. Using the ASIO 2.0 drivers, I was easily able to achieve simultaneous recording of eight tracks with playback of a further eight plus some MIDI parts and a few plug-in effects for good measure. Subjectively, within the context of an overall mix,

The supplied version of Logic Soundtrackas in full swing. The **Arrange and Mixer Windows** provide most of the action, but a reasonable level of audio and MIDI editing is also possible.





The analogue and digital I/O connectors are shared between the front and back of the rackmounting preamp unit, the inputs being sensibly located on the front.

"Throwing a range of other applications at the Hoontech didn't seem to bother it either. For example, Acid, Sound Forge, Cool Edit, Sonar and Reason all behaved remarkably well..."

the audio quality obtained was quite usable. Feeding a MIDI click through the ADC/DAC2000 and recording it to an audio track resulted in a delay of about 16mS between the two signals — no worse than many other audio devices I've used and a lot better than some

Throwing a range of other applications at the Hoontech didn't seem to bother it either. For example, *Acid*, *Sound Forge*, *Cool Edit*, *Sonar* and *Reason* all behaved remarkably well in brief tests. Testing the latency in *Reason* using a sampling frequency of 44.1 kHz, I was able to select the lowest latency setting available (*Reason* gave this as 6mS, while the Audio DSP24 ASIO Control Panel displayed 8mS). Playback performed very well and, as a consequence of the low latency value, playing new parts via a MIDI keyboard felt extremely responsive.

#### Conclusions

There is no doubt that Hoontech's Soundtrack Audio DSP 24 and ADC/DAC2000 system provides a very flexible range of I/O configurations. The drivers appear to be very stable and the low latency values achievable via the ASIO 2.0 drivers make it very suitable for use with software synths and samplers. The system also appears to work quite well with a range of popular audio software.

The audio quality is perhaps not exceptional but, given the range of hardware features provided at what is a modest price, this is hardly surprising. The Hoontech simply represents a different balance between quality and quantity than, for example, some of the other 24-bit/96kHz soundcards currently available, which tend to provide only stereo in/stereo out connectivity.

Hoontech would appear to be pitching this system at the home studio owner. For such a person needing to record multiple inputs (perhaps with enough basic microphones to record a full band performance) rather than just mono or stereo overdubs, achieving the highest audio quality is unlikely to be absolutely critical. Flexibility, reliable performance, low latency and low cost would therefore make the Hoontech well worth considering. My main reservation would be the supplied documentation. SES Computing, the UK distributor, informed me that Hoontech are very conscious of the weaknesses in this area and that a new version of the English documentation is in development. They indicated that it will soon be available via the web and hope it will be shipping with production units by the time you read this. Fingers crossed, as the current documentation lets down what is otherwise a very respectable budget-level system. 🖾

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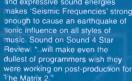


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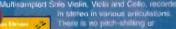
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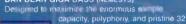




Multi-ampted Soro Velin. Vicit. Ins Colo. recorded in stree in various aniculation. There is no people business of unnatural transposition infile tommonly found in other string for me. The bow and instrument books represented and the body resonances and the eventones are true throughout all of the instruments.

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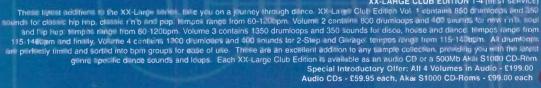
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#### STUDIOMASTER 162BP



If you need an affordable compact mixer with a decent audio path, a simple to use layout and no unnecessary complexity, be sure to check out this new rackmount model from Studiomaster. **Paul White** evaluates the 162BP.

tudiomaster's 162BP is a delightfully simple, inexpensive general-purpose mixer designed for rackmounting. The 6U box provides sixteen simple mixer channels (the last two operating either as mono or stereo channels) with two mono auxiliary busses, one stereo auxiliary return, and a stereo mix buss. Each channel has a single phantom-powered XLR mic input, and the 14 mono-only channels also have a single balanced line input, an insert point and a balanced direct output, all of which are on quarter-inch TRS jacks. The direct outputs mean that the 162BP could be used as a bank of independent recording preamps if required - for example, in the studio where mic inputs are required for a multi-channel line-level soundcard, or in live situation where there are a couple of eight-track recorders to feed. The last two channels each have two line inputs to accompany their single XLR, but no inserts or direct outputs.

# simply masterful

#### STUDIOMASTER 162BP RACKMOUNT MIXER

The main output for the mixer is on balanced XLRs with TRS jack insert points for both left and right channels. Auxiliary sends and returns are all provided on balanced TRS jack sockets, with unbalanced phono connections to their left for recording to and monitoring from a stereo recorder. Mains power is provided to the mixer via a standard IEC connector, and there is a single switch for applying 48V phantom power globally to all the mic inputs. Note that a system of internal jumpers on each channel of the mixer lets you isolate any selection of channels more permanently from this phantom power source, allowing dynamic, ribbon and capacitor mics to be used alongside each other. A similar system allows you to select the source for each channel's direct output. By default, this is after the channel fader, but it can also be set to be pre-fader or pre-EQ instead.

### STUDIOMASTER 162BP £416

#### pros

- Good sound quality with musical EQ.
- Direct outputs on the first 14 channels
- Straightforward design and layout.
- Routing of phantom powering, auxiliary sends and direct outs can be customised by the user.

#### cons

- Limited mid-band EQ range.
- No EQ bypass or channel mute buttons.

#### summary

An affordable and practical little mixer, with direct outs that also make it suitable for use as a multitrack recording front end.

SOUND ON SOUND

#### At The Controls

Each channel has a Gain control, which provides up to 60dB of gain for the mono-only channels and up to 50dB of gain for the final pair of mic inputs. The stereo line inputs on channels 15 and 16 can have their sensitivity switched to suit professional +4dBu or consumer -10dBV nominal operating levels. All the channels have high shelving EQ operating at 12kHz, and low shelving EQ operating at 60Hz (for channels one to 14) or 45Hz (for channels 15 and 16). All channels except the final two also have a mid-band sweepable from 250Hz to 6kHz.

All channels have access to two auxiliary sends, one wired pre-fader (labelled Mon) and one post-fader (labelled Aux), though the pre/post-fade assignment of either of these sends can be changed on a per-channel basis, if necessary, via more internal jumpers. Following the send controls, each channel has a Pan control (Balance on the two stereo channels) and a PFL button with associated red LED that also doubles as a peak warning light. There are no routing or mute buttons and level control is via a 60mm fader.

The master section of the mixer is simpler than most, with 60mm master faders for the left and

16

The two stereo channels offer balanced mono mic inputs and balanced stereo line inputs, though there are no insert points or direct outputs. The master output section includes balanced main XLR outputs, TRS jack sockets for the mix buss insert points and balanced auxiliary/monitor sends, plus phono sockets for the stereo tape sends and returns.



Each of the fourteen mono channels features balanced mic and line inputs, a balanced direct output and an insert point. There are three possible direct output sources, selectable via internal jumpers.

right mix channels, and stereo bar-graph meters which double as PFL level indicators when a channel PFL button is depressed. Both auxiliary sends have master level controls, and the single stereo return also has a level control which feeds it directly to the main mix buss. Record Level and Playback Level controls adjust the send and return for a stereo master recorder attached to the rear-panel phonos, though there's no tape-return mute button or any monitor source switching. Finally, there is a stereo Phones output (with level

control) and a power switch with blue status LED.

#### On The Session

Studiomaster mixers have never really had the benefit of industrial design in the same way as, say, Soundcraft or Mackie units, but in my estimation their sonic performance has been undervalued. They have a warm, solid sound with a very usable EQ section. Though the mic amps are nothing esoteric, they are quiet, clean and musical sounding. I'm glad to say that although the 162BP is at the budget end of the Studiomaster range, it seems to share the same circuit building blocks as the company's larger consoles and I have no problems with its audio performance at all. Inevitably, having a three-band EQ with swept mid-band is a little limiting compared with a fully parametric design, but provided that this mid-band is used either for very gentle boosting or for cutting, it works well. My only real reservation with the mid-band is that it doesn't go below 250Hz, when many of the 'boxiness'

problems that mid-range cut is ideally suited to addressing actually occur below this frequency.

There are functional features missing that I would have liked to have had, such as EQ bypass buttons and channel mutes, but this has to be balanced against price. This is a low-cost mixer where most of the budget has gone into performance rather than frills, and this is the way I like it. Visually, the mixer is tidy and easy to navigate, though the knob colours might not be to the taste of some users.

#### **Pure & Simple**

Overall, the 162BP is a straightforward mixer that sounds good, and the direct outs on 14 of its channels make it a useful interface between mic-level signals and any line-level recording system. Because it isn't a multi-buss console, though, it isn't really practical to use the 162BP for monitoring multitrack playback as well as for recording. At a push, in a live eight-track recording environment, it would be possible to use the prefade sends on eight of the channels to create a mono headphone mix of the off-tape signals, just to check everything had recorded OK, but this is hardly an elegant solution.

While it may be true that the 162BP is a little basic in the features department, if you're on a limited budget and want to spend your money on audio quality over fancy facilities, then it represents good value. 🖾



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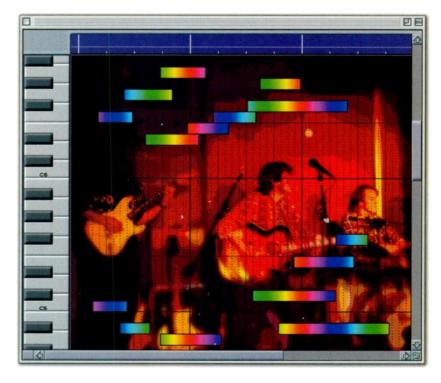
# feel-god factor

ost of us are aware of the 1966 James Brown classic 'I Got You (I Feel Good)', and few would disagree that James Brown sounds like he does indeed feel good when he sings it. And judging by the song's considerable success — people the world over instantly recognise the infectious vocal catch phrase - it would probably be fair to say that it has made a lot of listeners feel good too, and want to join in the party. Many people tap their feet, dance, and sing along when the song comes onto the radio. What gives this track such a feel-good quality?

Obviously, the meaning of the words and the contour of the melody will be important. However, it's not really what James Brown sings, but how he sings it, which has such a profound impact. This 'how' is referred to as the 'groove' or 'feel' of the vocal line, and it is essential to the feel-good factor of this song (which I will refer to from now on simply as 'I Feel Good').

To grasp the essence of what we mean by the word 'groove', try the following. Go stand in the middle of the room and simply say the phrase "I feel good" in a mundane, everyday kind of way. This kind of delivery isn't likely to do much to make you feel good, is it? Now try singing the phrase à la James Brown, or listen to the performance of the man himself, if you happen to have the record to hand. Much of the immediately apparent difference between the two renditions is down to the extra groove imparted by Brown in his performance. This shows how groove can transform a potentially uninspiring vocal phrase into a killer hook, yet this is usually achieved through comparatively small inflections in the timing and accentuation of the basic rhythm and melody line.

But the groove of 'I Feel Good' doesn't solely inhabit the vocal line. The overall groove of the song also results from the grooves of the other parts woven together into the arrangement. If you took away the groove of the instrumental parts of 'I Feel Good', it would actually feel rather average. And this is not just the case with this track, but also with most other styles of music - whether soul, rock, dance, jazz, or classical - even though the groove of each will be very different. Groove is



Do you find that your MIDI tracks lack the magic of real performances?

Simon Millward looks at the inner workings of one of James Brown's most famous songs and shows you how the musicians' techniques can be used to improve the feel of your own sequences.

the very essence of great musical performances, and playing with groove is something that great musicians do naturally.

The problem for home recordists is that they often cannot afford to get real performers to help them record their own music. For these composers, the only other option is to use a sequencer and a set of MIDI sound sources to create something akin to a real performance. However, even if the MIDI sound sources can fool the ear into thinking that real instruments are playing, many programmed MIDI parts lack the groove of real performance, and so the result still sounds mechanical and unmusical.

The good news, though, is that many sequencers, both hardware and computer-based, now include groove-manipulation features, usually in the form of a number of 'groove quantise' functions which can make numerous small changes to a performance in order to inject a live feel into it. However, before we delve more deeply into the wonders of groove quantisation we must first take a look at what quantising itself is.

#### What Is Quantising...

Quantising is concerned with sorting out performance timing inaccuracies by shifting MIDI notes closer to the main beats of the bar or their

might only shift your recorded hi-hat notes toward the 16th-note divisions by a certain percentage of the distance they are away, a process which is often called 'iterative quantise' because it can be carried out repeatedly until the required timing tightness is achieved.

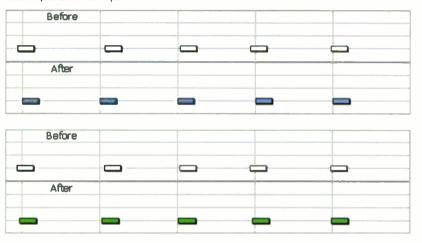
Figure 1 shows these two different quantisation processes in action. The white bars show the original note events as they might be viewed in a sequencer's piano roll editor, with the vertical lines showing the positions of the exact beat divisions to which this performance is to be quantised. The blue bars show the results of hard quantising, with every note moved exactly onto the nearest division, while the green bars show the effects of an iterative quantise where notes are moved 50 percent of the way towards the divisions. In the latter case, the performance is tightened up while still retaining some of the feel of the original performance.

#### ... And How Is Groove Quantising Different?

Groove quantising differs from corrective quantising in a number of ways, the first of which is that the grid lines to which a groove quantise function is set need not be exactly on any division of the beat. This means that groove quantising actively seeks out timing irregularities which other kinds of quantising attempt to eradicate with their strictly regular quantising grids. By defining a new set of grid lines, often over the space of several bars, it is possible to recreate some of the feel of a real musical performance, where the notes don't fall exactly on the beat. Real musicians almost never play in a rigidly quantised manner, so groove quantise provides us with a means of capturing a natural rhythmic feel and imposing it upon our own musical material.

However, groove quantising doesn't restrict

Figure 1. The white notes in each case show an original unquantised 16th-note MIDI part in a piano roll-style editor. The blue notes show the effects of hard quantisation, while the green notes show the effects of the more subtle iterative quantisation technique.

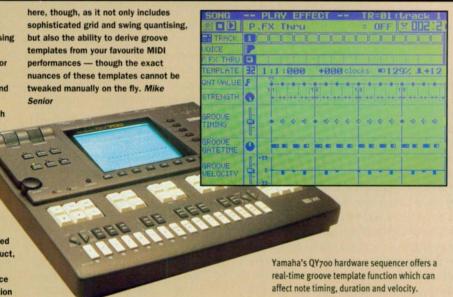


divisions. You might use it for shifting all the hi-hats in a MIDI recording onto exact 16th-note divisions, for example — a process often referred to as 'over' or 'hard' quantising. Alternatively, you

#### **Groovy Hardware**

Even though there is a wide range of software applications which include sophisticated groove functions, the options for groove manipulation using dedicated hardware units are more limited. The most common such facility provided is a shuffle or swing control. The most basic hardware sequencers, such as those in the Boss DR660 and Alesis SR16 drum machines, have only off-line swing functions with a limited number of strength levels, whereas more advanced units, such as the Roland MC505, offer a range of preset groove templates (including swing) which can operate in real time and with variable strength.

Even though the facility to design your own groove templates was available as far back as 1989 in the sequencer for Roland's R8 Drum Machine, Yamaha's RM1X and QY700 sequencers provide the most advanced implementation of this in a current hardware product, allowing you to tweak the timing, velocity and duration of each beat division while your sequence plays back. Roland's MC80 is also worth a mention



itself merely to altering the rhythm of the target MIDI recording. As I mentioned above, groove isn't just about timing variations, but is also to do with variations in dynamics and note lengths as well. Some of the more flexible groove quantising functions not only allow you to define 'groove templates' with quantising grid lines at any required position in the bar, but also allow you to set individual velocity-scaling and/or durationscaling values for each grid line. Any note quantised to a given grid line will then also have its velocity and duration altered accordingly, to provide more convincing results. The most advanced groove quantising facilities can even extract a groove template from an exisiting MIDI or audio part allowing the feel of any performed parts thus to be imposed upon the programmed parts which accompany them.

#### Simple Ways Of Adding Groove To Your Timing

In spite of the complexity of the most flexible groove quantising systems, even simple sequencers offer ways in which to get your MIDI parts sounding less mechanical. For a start, even the most basic of sequencers will usually allow you to place individual elements of the arrangement on different tracks, and to shift these in time against each other.

One easy and surprisingly effective trick is to put all your hi-hat programming onto a separate track and then to shift this with relation to the rest of the sequence. If you shift hi-hats early, it usually increases the sense of urgency within the part, whereas delaying them can help give a more

#### **Ernest Cholakis' DNA Grooves**

It can help when learning about groove manipulation to explore any preset groove templates provided with your chosen sequencer. If you happen to use a software MIDI + Audio sequencer, then you may well already have access to one particularly good set of such presets in the form of the DNA grooves. These are the brainchild of Ernest Cholakis of WC Music Research and Numerical Sound, and were first developed in 1992 as a means for injecting more of a human feel into MIDI sequences. They have since been licensed for use within all the major sequencers, so you may already have them without realising it!

Cholakis analysed how the world's greatest drummers put their rhythms together and found that the rhythmic blueprint of each drummer was very distinctive, involving an extremely complex set of constantly changing performance parameters. No two bars were ever rhythmically exactly the same and all the acoustic performances analysed involved an

enormous amount of subtle timing detail.

However, Cholakis realised that it would be possible to mimic the nuances of such drummers by extracting a number of different two-bar groove templates from a single performance, and then using different ones to subtly change the groove over time.

The DNA templates are the result of this analysis, and are so well designed that they are worth exploring in detail if you can. Depending on the collection which is available on your own sequencer, you may be the owner of up to twelve folders worth of DNA grooves, each containing up to sixteen individual templates extracted from the same drumming performance. They are all two bars in length, in four/four time, and their resolution is set mainly to 16th notes. If you mix and alternate different templates within the same group, you can produce coherent groove variations within your tracks and ensure that, as in a real acoustic performance, there are no precise repetitions of timing characteristics.

get the same effect by putting all the off-beat notes of a pattern onto a different track, which you then delay.

Figure 2 shows a set of hard-quantised 16th notes (the white bars) which have had a classic 16th-note shuffle groove applied to them. In this case it is a pronounced shuffle, with every other 16th note being moved about a fifth of the way towards the following one — this equates to about 23mS at a tempo of 120bpm, which is a significant delay. However, most systems which allow you to



Figure 2. The effects of 16th-note shuffle on a regular pattern of MIDI 16th notes, such as a hi-hat part.

laid-back feel. This trick can also work well with other elements of the drum kit, such as the snare or kick parts, though the trick tends to work at its best if the delayed tracks can be contrasted against other tighter parts. Another great way to use this technique is to apply it to any rhythmic punctuations in the arrangement, such as cymbal crashes and drum rolls — moving them early can increase the sense of excitement, while moving them late induces expectation in the listener.

The most simple of the dedicated groove manipulation facilities is the ability to add 'shuffle' or 'swing', where every other division of the beat is delayed by a user-definable amount. The charts are full of songs with this distinctive feel, and it is particularly characteristic of a lot of hip-hop music — the Akai MPC60's swing function was very influential in the creation of the hip-hop and rap swing grooves of the '80s and '90s. If you don't have access to this function, you can sometimes

impose a shuffle groove will allow you to vary this delay for a more or less subtle effect. What's more, some more advanced implementations also allow you to decrease the velocity or duration of notes occurring on the delayed beats, which can help to lighten these notes in a natural way.

#### Understanding Basic Groove Templates

More complex grooves than the simple shuffle are most easily accessed using the groove templates which are available to more advanced sequencers. However, the effects which such templates produce can be recreated manually using more simple equipment, once you understand how they work.

To start with, let's take a look at the effects of the simple templates shown in Figure 3. The first of these is designed to bring earlier, or 'push', all notes which fall on the first and third beats of a "The timing of each instrument in a live performance constantly changes from section to section, so a fixed one- or two-bar groove template will only ever provide a certain amount of live feel."

four/four bar (highlighted in red). As I've already mentioned, the pushing of individual parts against the rest of the arrangement can help to create a sense of urgency, but a similar lively feel can be achieved by pushing individual beats within the bar. In this case, any notes on either of the pushed

on the second and fourth beats of the bar (again highlighted in red), and this might be used to create a lazy or 'laid-back' feel. Both of the delayed beats have been moved about an eighth of a 16th note late, which is around 15ms at 120 bpm.

There are two things which it is also worth noticing with both of these templates. Firstly, the beat divisions around those being pushed or delayed have been placed strategically, in order to provide a natural timing progression with an authentic feel. And, secondly, none of the other beat divisions are exactly metronomic, these minute short-term fluctuations in timing being vital for creating the impression of a real live feel.

#### **Groove Timing In Practice**

Given the number of currently available tools

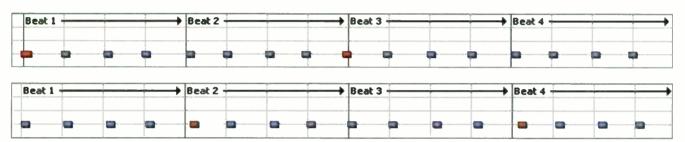


Figure 3. The effects of two groove templates from the DNA Grooves collection on regular 16th-note MIDI parts. The upper shows pushed first and third beats, while the lower shows late second and fourth beats.

beats are moved early by about a seventh of a 16th note, which is around 18mS at 120 bpm, and yet this comparatively small timing change can have a great impact on the feel of a programmed drum kit. The fact that the pushed beats are the first and third is particularly well suited to popular styles where there is usually a bass drum hit on the first beat of the bar.

The second of the two templates, by way of contrast, is designed to delay all notes which fall

for improving the groove of your MIDI timing, combining them effectively can be a bit of a balancing act. Even if you have one of the commercially available collections of pre-programmed groove templates within your sequencer (see the 'Ernest Cholakis' DNA Grooves' box for one example), that doesn't mean that getting a good groove will suddenly be a one-step process.

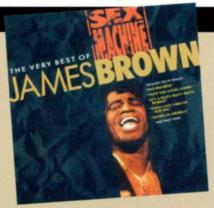
To start with, the nature of your song's musical

#### Arranging A Feel-good Groove

We can learn a lot about how to improve the groove of our own music by listening to the work of established masters of groove, such as James Brown. Probably more than any other popular singer/performer of recent times James Brown was preoccupied with groove, and throughout his career he has challenged what can be done with it — he was one of the first popular artists to use two drummers on stage, for example.

So lets have a closer look at what makes the groove of 'I Feel Good' work as it does. For a start, the song is remarkable for its comparatively sparse arrangement, in particular the dryness of the drums, and the fact that the main musical interplay occurs between the lead vocal and the carefully woven saxophone lines. Keeping the arrangement uncluttered like this can really give a groove room to breathe, so it's worth bearing this in mind when building up your tracks.

The next thing to notice is that each of the different instruments accents different beats in the bar, to create a number of subtly conflicting grooves — great for providing tension in the arrangement. Take the first main section of the track, for example. The voice and saxophone parts



James Brown's 'I Got You (I Feel Good)' is included in a number of compilation CDs, including this one on the Polydor label.

resolve onto alternate first beats. The drum part emphasises the second and fourth beat of each bar where the snare falls, and only provides a bass drum downbeat at the beginning of every two bars. The reverberant guitar stab accentuates the second beat of every second bar, and serves to punctuate the end of the saxophone phrases. All this is glued together by a cyclic bass line which

accents the first beat of each bar and also the eighth note just after the guitar stab.

What is important about this is that all of these elements of the arrangement are partly responsible for the groove. Many MIDI musicians seem only to consider groove when programming their drum parts, but that approach is unlikely to yield the best results. What's more, the fact that the different parts of 'I Feel Good' have different grooves shows why it is a good idea to use several different groove templates within a single song for the best results.

Another factor which helps to make the groove of 'I Feel Good' work so well is that the individual parts in the arrangement are constrasted in the mix in order to throw each of their different grooves into relief. For example, the rounded bass and rich saxophone sounds are used to define these parts against the small snare drum and the rhythm guitar. Likewise, the long reverbs on both the lead vocal and the rhythm guitar are set against the dry, tight drums. Using contrast in this way helps each individual feature stand out, allowing their overlapping grooves to combine for more variety and life.

arrangement will greatly determine how effective any given groove template will be. Many sequencer-based musicians fall into the trap of programming extremely busy drum parts, for example, which make it very difficult to inject any life, even with sophisticated groove templates. Your arrangement will usually need room to breathe if you're going to generate a convincing groove.

Applying groove-manipulation tools selectively to individual rhythm parts is well worth the effort

since it allows you to match the kind of feel which is achieved by accomplished drummers much more accurately. A real drummer, for example, would rarely play the bass drum and snare at precisely the same moment, even when supposedly playing them together, and this effect would be difficult to achieve using a single groove template for an entire MIDI drum performance.

One way around this is provided on the more advanced sequencers, where MIDI notes can be

#### **Up Close & Personal**

Looking at the timing of the main groove of I Feel Good in a little more detail reveals more about why it works so well. A number of sequencers offer facilities for the extraction of groove timing from audio tracks - a procedure I'll be covering in depth in the next part of this series. Using this facility within Cubase VST, I extracted the timing of the main four-bar groove of 'I Feel Good'. From the resulting file I generated the black trace on the two graphs in this box. The graphs show the relative timing of each eighth note compared to a strictly regular metric grid - points which occur above the axis are late, while those below are early.

Look at the upper of the two graphs first, where two further traces are superimposed to show the relative timings of the snare drum (red line) and kick drum (blue line) hits. The first thing to notice is that the snare drum always tends to be earlier than the kick, showing a realworld example of the push-pull groove which I've already mentioned in the main body of the article. The other eighth notes all tend to be later than the kick and snare beats.

Next, notice that the snare drum is at its latest on the fourth quarter note of the first bar, and accelerates towards its earliest occurrence on the second beat of the fourth bar, whereupon it slows back down to where it started. This pattern of speeding up through the middle bars of the groove helps generate a more exciting feel and also allows the groove to slow down through the

These two graphs show the timing of every eighth note of the main groove in the second verse of 'I Feel Good', relative to a totally regular timing grid. These timing variations are measured as an offset in ticks, and there are 480 ticks per eighth note here. In both graphs, all the eighth notes have been joined with a black trace. In the upper graph, a blue line joins kick drum beats and a red line joins snare beats. In the lower graph, the blue line shows the saxophone line, while the red line shows the bass part's answering phrase.

beginning of the four-bar section, lending weight to the beginning of the pattern. A pattern of acceleration and deceleration such as this is characteristic of many great grooves.

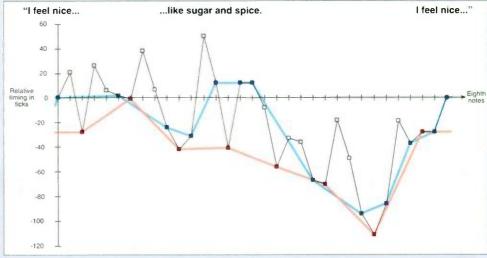
But how does the kick drum relate to this? Interestingly, it not only follows the snare drum's acceleration and deceleration, but it also shows another more short-term trend which recurs twice as frequently. Note the 'V' shape around the second and fourth eighth notes of the second bar, which is then repeated, albeit dragged earlier by the snare drum, toward the same eighth notes of the

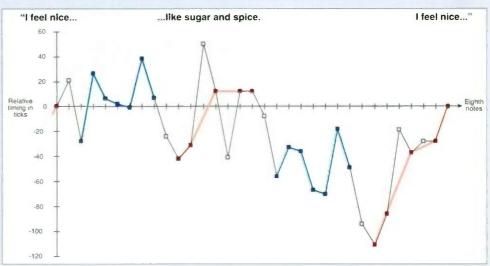
fourth bar. This 'V'-shaped pattern works in a similar way to that formed by the snare-drum beats, lending weight to the downbeats of the groove's first and third bars.

Now have a look at the second graph, where the timings of the saxophone and bass parts are highlighted — the blue lines show the phrase where the saxophones and bass play together, while the red lines show the answering phrase by the bass on its own. To take the blue traces first, each of these phrases shows the distinctive 'M' shape of the part's groove — an even smaller-

scale timing pattern than that exhibited by the kick drum part. The red traces, on the other hand, reinforce the bass drum's two-bar groove. However, all these lines show the influence of the overall speed variations of the snare drum.

This micro-level view of 'I Feel Good' shows how a complete groove is built from a number of different large-scale and small-scale grooves occurring within individual parts. However, it also shows that these individual grooves interact in great real-life grooves such as that within 'I Feel Good'.





pulled only part of the way towards a groove template's timing grid, in a similar way to when using iterative quantise. In this case, you could try applying the same template with different strengths to each of the parts of your track in order to get a more natural feel.

However, some styles of music rely on specific relationships between the different rhythm instruments, which a single template might be unable to reproduce. For example, many shuffle grooves rely on a bass drum and snare which are quantised tightly to the beat while the hi-hat alone is quantised to the shuffle groove. The only way to deal with this would be to mix and match different groove templates. One particularly good combination is to apply the first groove template in Figure 3 to your bass drum part and the second groove in Figure 3 to your snare drum part, creating a dynamic 'push-pull' groove which can be really lively and effective.

It should also be remembered that the timing of each instrument in a live performance constantly changes from section to section, so a fixed one- or two-bar groove template will only ever provide a certain amount of live feel. Using a selection of grooves for different sections of a single part, on the other hand, will be likely to humanise and enliven your material much further. I've found that hi-hats in particular benefit from slight variations in groove, as these help maintain the interest of the listener. For similar reasons, some of the commercially available groove collections offer variations on their basic templates, providing subtly different related templates which alter the groove throughout the track and cater for specific musical features such as drum fills and solos.

But try not to get carried away with the advanced groove quantise functions in isolation from other simpler techniques at your disposal, such as altering relative timing between parts, using normal hard and iterative quantise functions, and applying simple shuffle processing. Also bear in mind that tempo manipulation can also be employed to create the right feel. For example, a classic tempo manipulation might involve slowing the tempo for the verses and speeding it up for the choruses. You can make slowing down the tempo sound more natural if you delay one of the elements of your drum pattern during the tempo transition - this can work really well with the snare, in particular. Likewise, pushing an individual rhythmic element can help make increases in overall tempo sound more convincing.

As you can see, there are a lot of ways in which you can manipulate the groove in your MIDI timing. However, learning to use these various techniques to your advantage takes time, so don't necessarily expect to get a killer groove on your first try. However, with a little practice you may be

Simon Millward is the author of the successful Fast Guide To Cubase VST book, now in its third edition and available through SOS Mall Order at <a href="https://www.sound-on-sound.com/shop">www.sound-on-sound.com/shop</a>

#### Tempo In 'I Feel Good'

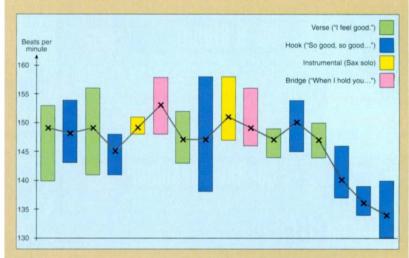
The groove of 'I Feel Good' depends not only on the micro-level timing variations of individual beats, but also on the tempo variations through individual sections of the song. The most consistent example of this in 'I Feel Good' is that the hook sections (with lyrics such as "So good, so good, I got you") all tend to accelerate, increasing the momentum into the sections that follow. However, most of the other sections of the song don't offer any such clear tempo trend or pattern, which provides another indication of how much the groove can vary even between repetitions of the same section. It's this constant reinterpretation of recurring musical sections, reflecting and complementing the inflections of the vocal delivery, which sets real performances of songs apart from programmed equivalents.

While there are few evident short-term tempo trends, there are some more long-term ones which can be seen by looking at the graph within this box. The vertical bars of the graph show the range of tempos within each major section of the track, while the average tempos of the sections have been indicated with crosses. The most obvious thing which can be seen is that there is a considerable overall deceleration towards the end of the song and, moreover, that this deceleration begins from the very first of the final hook sections, rather than just happening at the

very end of the song. This slowing down helps lend an air of finality to these particular occurrences of the hook, even though you've already heard the hook four times before this point in the song.

The next thing that's worth pointing out on the graph is that the average tempo increases for the instrumental and bridge sections, which helps add extra excitement to the track where the arrangement reaches its most sparse and where the vocal is at its most impassioned. Because a tempo hike can help up the excitement, many producers increase the speed of their sequences for the choruses of their songs. However, there are other places within the structure of the track where an increase in tempo might be more natural, as we can see in 'I Feel Good'.

The final trend that can be seen from the tempo graph is that the range of tempos within the last two verses is significantly less than that within the first two verses. This gives the impression that the musicians are settling into the main groove the more times they play it, making it more fluid in the later renditions. You can create a similar effect within your own songs by applying a progressively stronger iterative quantisation to each repetition of the musical sections in your music — though be careful not to overdo this, as you don't want your track to start sounding mechanical during the fade-out.



surprised at how dull some of your original parts quickly seem in comparison with their groove-enhanced versions.

#### Feeling Groovy

This month we've looked at how timing can affect groove, and how to use this understanding to your advantage when working on your own music. However, timing is by no means the only relevant factor in the creation of convincing grooves, and next month I'll be delving deeper into the role of accents and note durations. In addition, I'll show you a number of techniques for extracting your favourite grooves from audio recordings.

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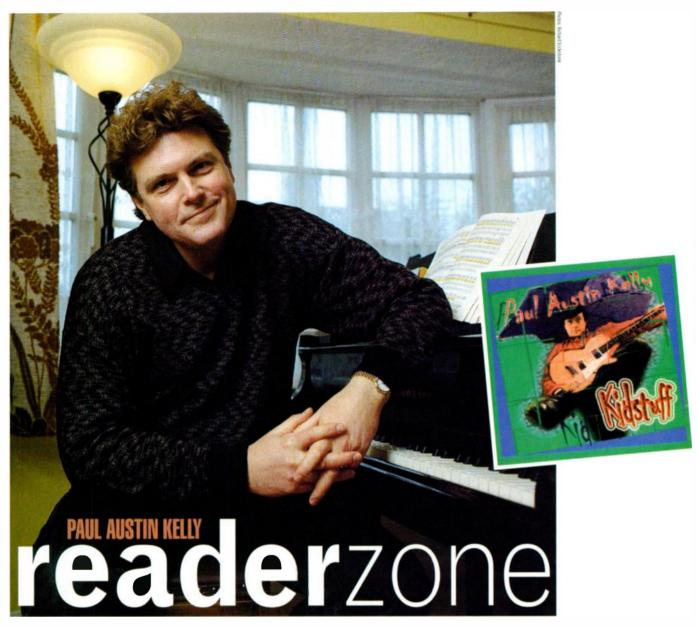


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aul Austin Kelly brings a new meaning to the expression 'crossover artist'. As a classically trained tenor, he's sung on most of the world's leading operatic stages, from Covent Garden and Glyndebourne to La Scala and the Metropolitan Opera, as well as singing as tenor soloist in choral works - most recently, Bach's B Minor Mass at Notre Dame cathedral in Paris. When his demanding professional schedule allows, however, he devotes as much time as possible to mastering the synthesizers and digital workstations that occupy his own recording studio; and the music he records here could not be further removed from the classical repertoire. Blending country and western, rap, rock and pop, Paul's plan is to create a new kind of music for children.

#### **Poet's Corner**

"I'd gone back into songwriting because I was unhappy with a lot of the work I was doing in classical music," he explains. "The kind of stress you get in classical and opera singing takes its toll, and I wanted to have projects of my own that were completely under my control. When you're doing operatic performances you've got a thousand other things coming at you that all affect your performance in one way or another. I was away from my family, spending a fair amount of time singing opera in Italy. To communicate with my son, I started writing poetry; I emailed the poems to him, and he would email back his comments. It was just a lark at first, but I got really into it after a while.

"I ended up with a collection of about 40 or 45 of them which I thought were really usable, and started peddling them around. I got good responses, but people also said that if you try to sell children's poetry, it's difficult if it's rhyming, because they have trouble selling it internationally. It's very tricky to translate something into another language so that it still has a good rhyme scheme. As things went on, I sort of forgot about it, because I was busy singing opera. And then I remember waking up in the middle of the night one night, with one of the poems in my head, and it was just coming out as a song in my

#### Main Equipment

- Roland VS1680 digital multitracker.
- . Korg Triton workstation.
- Roland HPD15 HandSonic percussion unit.
- HHB Circle 5 Active monitors.
- HHB CDR850 CD writer.
- Lexicon MPX100 effects processor.
- · Line 6 Pod guitar preamp.
- Joemeek VC3 voice channel.
- Neumann U87 and Audio Technica AT4033 mics.
- Tascam DA45HR 24-bit DAT recorder.

report by:

sam inglis



Most of Paul's equipment fits on a shelf across the curve of his bay-windowed studio room.

"I think there's a real need for kids' music that features valid, interesting musical forms and quality performances."

dream. I'd already started building a studio, simply because I wanted to do some recording, so I got up and I went downstairs, and put the song down just using the synthesizer. I used the Triton's arpeggiator to loop a bass track for it and then put the vocals down the next day. The more I looked through those poems that I'd written, the more I realised that I had in fact written most of them in some sort of song form. And that was it!"

Paul has already produced an 11-song album of his own compositions, Kidstuff, and is currently hard at work setting poems by children's writer Michael Rosen to his own music. He's found that his recordings of the material have met with a much more enthusiastic response than the poems alone: "I had initially contacted illustrator Korky Paul about possibly illustrating one of the poems, and he had said the same thing, which was that his editor was very reluctant to publish much rhyming stuff. Although he loved the poem, he was going to have a difficult time selling it to his editor. A couple of months ago, though, I sent him a copy of Kidstuff, and then the reaction was completely different. He said 'Oh wow, we've got work to do, this is fantastic, I love the CD, and I can think of several things I would like to do right away.' It was a completely different ball game."

#### Home Recording — Kids' Stuff?

In fact, Paul's experience with pop music goes back as far as his classical training, and in setting up his own studio he was rekindling an interest he'd had since childhood. "I'm a crossover artist the other

way, really - I started out for 10 years doing pop music when I was a kid, and I went to music school and branched into classical music from that. So now I feel like I'm crossing back to my roots. There was a huge gap in time where I didn't have a chance to do a lot of recording, but when I was 12 or 14, I remember my dad bringing home a Tandberg reel-to-reel that had sound-on-sound features, so that I could do two tracks, and even mix in a third track if I was really clever. I spent hours with that machine, and I would set up another old Bell reel-to-reel tape recorder he had, that was even old at the time, to get all kinds of bizarre combinations of sounds going, and then add in sounds through my Fender guitar amp. I wrote a lot of songs when I was a kid that I would arrange with whatever electronics I had at hand, and put them all together on that two-track. And that was really the experience I'd had in recording until just the past couple of years. But even that was useful - I learned how to splice fairly well, and work hands-on with tape. I had no professional tools at all, but I made the most of all the consumer tools I could get hold of."

Paul's current setup is not tape-based, but centres around a Roland VS1680 digital multitracker and a Korg Triton keyboard workstation. Other key equipment includes a Roland HPD15 HandSonic percussion controller, Line 6 Pod guitar preamp, Neumann U87 microphone, Joemeek VC3 voice channel, and a Tascam DA45HR 24-bit DAT recorder for mastering, along with acoustic, electric and fretless bass guitars, while his living room houses a Steinway grand piano. He explains how he arrived at

► fell in love with the way my voice sounded going through that mic."

#### **Hardware VS Computer**

As Paul does very little MIDI sequencing (see 'Out Of Sequence' box), his Roland VS1680 has an absolutely central role in the recording process. He explains why he chose this particular unit: "Electronically, what I wanted was something hands-on, so I love the idea of a digital studio in a box. It was a lot more appealing to me than spending 12 hours a day with a mouse. I felt that I was spending more time with computers than I wanted to anyway - all my business stuff and correspondence is done on a computer, so I really liked the idea of having faders and everything hands-on, a more traditional approach. I started out with a Yamaha MD8 Minidisc recorder when I was first putting the studio together, and it was a nice sound, but it was so limited. Even at that point I was sending off emails to Bob Katz and driving him crazy with questions, but he was always very friendly. He didn't recommend the Roland, but thanks to the SOS reviews and a helpful chap named James at the Guitar, Amp and Keyboard Centre in Brighton, who actually let me bring it home and play around with it, I was really wowed by it. It's a wonderful way to work. I immediately put the other effects board in so that I had more options; I haven't yet upgraded to the 1880 even though the A-D converters are greatly improved, because I'm waiting for the 24-track version."

Electric, acoustic and bass guitars all feature prominently in Paul's tracks, and a key tool is his Line 6 Pod preamp: "I want to upgrade to the Pod Pro eventually, just to get a slightly cleaner sound, but I use the Pod for everything. I'll put anything through that — I'll even put the Neumann mic through it and use it on my voice, occasionally, just to get a different colour to the vocal sound. I use it for the guitars, I've used it with the Triton, I even put the bass through it once. It's a wonderful unit.

"With acoustic guitar, what I've been doing more recently, using two tracks, is Dl'ing one track and miking the guitar on the other. Recently I started using the Neumann on the Yamaha guitar. Before that I'd been using the AT. They're both great sounds, but they're very different; it depends on whether you want a fuller sound or one with more bite. But I've really got to love the way the guitar sounds double-tracked Often I'll put the DI through the Pod."

"When the Korg Triton was reviewed in Sound On Sound, I immediately popped down to the Guitar, Amp and Keyboard Centre in Brighton — I'd liked the Trinity a lot when I first heard it, and according to all descriptions the Triton was an improvement on it. So I went down and played it for a couple of hours, driving them crazy with questions. I like the fact that it has the sequencer and sampler built in — even though I don't use them a lot, when I do need them they come in really handy. They're really easy to use, very accessible, and since space is a bit of a problem for me I needed to try to compress as much as I could into the room I've got."

#### Mastering Kidstuff

Unlike most home projects, Paul Austin Kelly's recordings have benefited from treatment by one of the world's leading mastering engineers. "I had Bob Katz at Digital Domain in Florida do the mastering on *Kidstuff*, and an amazing change came over the whole thing," says Paul. "He gave me a lot of tips, too. When I used the Korg Triton for the bass tracks, he didn't like some of the things I was choosing. Listening back to it and hearing what he was doing, he would take some of the bass tracks and EQ them and thin them out and give them more definition. So now, if I decide not to use the

fretless Yamaha, and I want to use the Korg for a bass part, I know how to go about choosing the right bass for that particular song. If I run it through a preamp I can also EQ it to an extent so that I can bring more definition out. It brings more clarity to the mix, and there's less muddiness to the bottom end."

If you're interested in hearing 'before' and 'after' examples of what top-class mastering did to Paul's songs, check out the audio snippets on the SOS web site.

www.sound-on-sound.com/sos/jul01/ articles/readerzone0701.htm

#### **Into The Mix**

"I've gotten more into using the Automix features on the VS recently," says Paul. "At first, every time I wanted to do something I couldn't do by twiddling a knob, I'd think 'Oh, if I'm going to do that, I'll have to Automix it', so I'd just leave it out, because I wasn't sure what I was doing. And having to deal

with the Roland manual was a nightmare. So I ended up getting what they call on the VS Planet bulletin board the 'brown bag', which is the 'alternative' manual. If you went on the web site and asked for the 'brown bag', somebody would email you this alternate Roland manual that someone wrote while working for Roland. This person left, but the manual's still in existence, it's just unofficial. And it was much more helpful: it cleared up all the fogginess in the original Roland manual and helped me to understand Automix. So now I'm using that a lot more for individual parts and adding effects within the tracks that you can't actually do on a live mix.

"I kind of like the idea of just tracking everything and then doing a big mix session, that's always the way I imagined it, but it never seems to work out that way. I seem to want to satisfy my ears as I go along, so I end up mixing as I track, so that what I hear in the headphones when I'm putting on a new track is fairly close to the way I'm imagining the whole song sounding. I tend to work that way anyway. I tend to go into the studio with the song basically complete, and the sound of the song in my head the way I want it. The rest of the time is spent trying to capture what I hear in my head, rather than sitting down and experimenting to



Three important parts of Paul's sound: the Korg Triton, his all-purpose synth; the Line 6 Pod preamp, which processes far more than just his guitar; and his two Joemeek VC3s, one of which helps him achieve just the vocal sound he likes.





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see what I come up with. I don't tend to work well that way, and I do tend to have preconceived notions of how I want the final product to sound.

"I don't use a lot of compression. If I use the Triton for bass parts they tend to be a bit compressed anyway, so I don't add anything on that. I use compression on the electric bass, some on the voice just to keep it a bit more controlled and give it more of a commercial pop sound, and a bit more on acoustic guitars. I tend to add compression as I'm tracking, and not on a mix. I do drive things fairly hard, right to the point of distortion, and then pull it back. If I find that the master levels are too high, I bring everything down and start working the levels back up again.

"One of the other things I came into contact with when I was working with Chris Blaclik at Soundtrack Productions was the Tascam DA45HR, which I think is still the only 24-bit DAT machine available. He used two of them at the same time to record all his opera productions. He did direct lines through the mixer right into the DA45 and the sound quality was fantastic. Mastering from 24-bit into the HHB CD burner works really well — there's good dithering on the Tascam, and masters always sound very clean and full of life. I record at 24-bit on the Roland, mix directly to the Tascam, and then dither from the Tascam to the HHB."

#### **Respect For Kids**

Although the realm of home recording is a long way from the classical world in which he's spent his professional life, Paul Austin Kelly has realistic and purposeful ideas of how he wants to use his studio, and is very clear about what he wants to achieve with his music. "I still very much enjoy singing classical music, and certain operatic work, but it's

Paul's electric guitar is an unusual — and incredibly heavy — custom-built Les Paul copy, bought second-hand from a Brighton music shop.

fantastic having this project that's completely my own," he declares. "If it's good, it's my fault, if it's bad, it's my fault, and that's a great feeling. I remember cottoning on to pop music forms at a very young age, because most of the children's records I heard then were really rubbish. They not only weren't recorded well, they weren't performed well, and on most of them, if there was an original composition or song, it was just awful. And I think that there were a lot of people out there making some money producing children's works who just didn't have any respect for kids. I think too many people condescend to children musically - yet children could really benefit from something that has all the facets of the contemporary pop or folk music that adults listen to. I'd like to push that and try to find out where the market is, because I think there's a real need for kids' music that features valid, interesting musical forms and quality performances." SSS

Paul Austin Kelly and his Walking Oliver record label can be contacted via www.paulaustinkelly.com

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Dune

#### **Bass Devils**

Recording Venue: Home.
Recording Equipment: Pentium II
450MHz PC with 128Mb RAM and
Turtle Beach Pinnacle soundcard,
Steinberg Cubase VST 3.7
sequencer and assorted plug-ins,
Zoom 1204 multi-effects, Sherman
QMF Filter, Roland M480 line mixer.

This is straightforward four-to-the-floor dance music influenced by Leftfield, Chemical Brothers and Underworld. As such, you'd expect it to be intelligently constructed, with good use of dynamics, transitions and a touch of melody.

The first track kicks straight in with some classic sounds and use of effects. A touch of reverb is used on the simple offbeat bass line, while the drum sounds generated by the Novation Drumstation provide the hard kick and sizzling aerosol-hissing hi-hats. It's fairly standard to use in-tempo echo on synthesized loops, and this is applied to some of them, to a greater or lesser degree, as the mix morphs and builds. Occasionally the rhythmic effect of the echo is made more pronounced, by panning of the dry sound more to one side of the mix and the wet sound to the other. There's a point near the end of the mix when the main synth riff and the echo are

sent to the reverb. This widens the stereo image, as well as creating a sound with a lot of depth — a nice touch.

With 'Headliner', the second mix, the Bass Devils go for a harder-edged sound, especially in their choice of waveform for the main loops. Once again, the effects and stereo voices conspire to create a wide stereo image, and the reverbs which seem over-the-top on headphones come across really well on a larger speaker system, especially when the volume is cranked up. This is definitely not music to mix on headphones anyway, unless you're just double-checking levels and placement of the panned sounds.

One of the things I like about this CD is that duo Darren Coates and Andy Petrie keep it fairly simple. It's so tempting to keep adding parts, instead of looking for that killer loop or sound, and consequently to end up with a bit of a mess. This material, by contrast, is focused, with transitions and builds that are well handled. There is some noticeable distortion here and there, however, which could be

#### **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.

due to slight overloading of an outboard effects unit input stage, or even mishandling of a compression plug-in. It's quite hard to pin down, but is most in evidence on the dying chords of the third mix. Otherwise, this is a fine set of mixes which could only be improved with some punchy compression.

Bass Devils perform live in the Ipswich area. Check them out at <a href="https://www.mp3.com/">www.mp3.com/</a>
BassDevils.

# Jake & The Electric Nudes

Recording Venue: Home.
Recording Equipment: Pentium PC,
Yamaha A3000 sampler, Novation
Nova virtual analogue synth,
Behringer MX2642A mixer.

This four-track demo CD shows maturity of sound manipulation and mix techniques. I especially like the use of filtering on the loops coming from the Yamaha A3000, but my favourite effect is the swishy, filtered, reverse–reverb chorus. This was

achieved by running the percussion track back through a Novation Nova synth.

Other noteworthy sound choices include the tuned kick drum and bass-synth combination of the first mix. UK and Detroit techno influences are in evidence here, as the simple bass pattern drives the groove energetically, leaving the snare, hi-hat and claps to create rhythmic interaction in the



upper-mid frequencies.

Track two is the one that features the filtering I mentioned above. It kicks in with a single chord, stabbed, and held by a reverb decay time of seven seconds or so. This chord dies away just in time for the next





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#### QUICKIES



#### Smoothcheesehoard

The prize for the silliest band name this month must go to Christian Smooth (drums, samples) and Daniel Cheeseboard (keys, vocals, guitars), and their album, Paprika Gentlemen. In an attempt to add a little live spice to their sequenced material. they've recorded real drums alongside the triggered sounds, but sensibly they've kept the drum sound dry, and it sits well with the dance-orientated samples and keyboard sounds. Compressing the bass drum to bring out the punch was a good idea, but more extreme EQ and some experimentation with microphone placement would have helped too (see the 'Doctor's Advice' box for some drum EQ suggestions). I especially like the longer kick sound on 'Wolf In The Door', and initially thought it was the result of a different mic position. In fact, some short, gated reverb has been used subtly, to make the bass drum note last longer, and this also complements the bass synth sound. Musically, Smoothcheeseboard offer a wide selection of styles, from the heavy, youthful 'Shocking' to the funky, yet surprisingly mature 'Wolf In The Door'. The last mouthful ('Silent') offers most to the commercial taste, but suffers from poorly recorded vocals.

#### DI Invicta

Despite the fact that his name sounds like a brand of sanitation unit, DJ Invicta (aka Rory Cuthbert) manages to flush out a few good tunes. He works particularly hard on his sounds, attempting to emulate Wurlitzer piano voices using a Casio CZ5000, even resorting to using the gain control on his multitrack to emulate a tremolo effect, a time consuming and tedious job - full marks for patience. I can't remember much about the Casio CZ5000 now (even though I used to own one, a long time ago), but couldn't a similar effect have been achieved with VCA modulation? Rory isn't afraid to experiment with

limited equipment: one track features a drum beat (played), pitched up on the multitrack and sent to a Zoom effects processor, where it's treated by resonant wah and hall reverb. The reverb's a bit long for the the artificially fast beat, but the resonant wah introduces an interesting whistling effect, generated mostly from the pitch of the snare. Overall, it's a début demo with some lively ideas.

#### **Andrew Scott**

Andrew's aim is to write music for established heavy rock artists, but he's finding it hard to get a foot in the door. Instead of sending material to the record company, Andrew, you should try the artist's publishers, management, or even - as suggested in a recent SOS article the lawver! The recordings would also benefit from better lead vocals to sell the songs; it's worth paying a session singer to provide these, if you're serious about your aspirations. From a technical point of view, the voice sinks into the track too often and needs compression, careful EO, and a bit more gain to lift it above the busy musical sections. The guitars have been well played and recorded, and the drum programming is also very good. I'd have used more short, punchy reverb on the snare and substituted the sixteenth-note hi-hat parts for eighth-note ones - the former are too obviously artificial on a sequenced drum machine for a rock production. Finally, it would be worth trying to write some more obviously commercial material. Even heavy rock acts like to get some chart recognition (and their business associates like it even more).

#### The Absolute Darlings

Playing the main festivals in the South West has helped lift the profile of The Absolute Darlings, and this two-track CD is the latest of three they have produced. It's difficult to assess properly because of the lack of recording details, but has been exceptionally well recorded, particularly the second song. Here a full bass guitar and drum sound underpin the acoustic and electric guitars and languid vocals. One criticism of the production in general is that it's a little clean sounding, and there's a hole in the warm mid area 150-400Hz - which is only filled when the backing vocals appear. A little more lower-mid on the guitar sounds would have helped in these sections. This is a band who have yet to fulfil their commercial potential and the CD should Interest most listeners enough to want to hear more. Check them out on their website.

www.absolutedarlings.co.uk



#### Danny Hogan

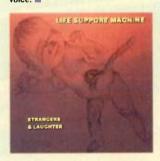
**Dublin-based Danny lists as his** influences "anything that's done with conviction". His CD begins with a spoken email address over a short piece of music and a scratched record sample. It's off-the-wall enough to catch your interest and draw you quickly into the first song, a dance/rock crossover with overdriven guitar, synth bass, strings and a straight dance beat. Danny's voice is good, and well mixed, with just the right amount of short reverb to keep it tight and punchy. However, the guitars are a bit peaky in the upper mids and sound a lot better with a heavy 6dB cut at 1.5kHz. This also improves the sound of the whole mix, so a less extreme cut could be applied as a post-production EQ, provided presence was added to compensate. The second song has the better mix, although it could still be made more exciting with heavy compression, presence and a slap-back delay (about 120mS) applied to the lead vocal.



#### Sean Tomlinson

Unable to find a band in his home town of Hull to play this original material, Sean has decided to go it alone, with only the aid of a trusty Yamaha MD8 Minidisc 8-track.

Primarily a guitarist, he has been teaching himself keyboards as an aid to songwriting, and the first song demonstrates that he can hold his own. The piano is a little low in the mix (lack of confidence?), but the assured guitars are to the fore. I especially like the Les Paul/Fender 185 combination for the lead guitar on the opening, but it's too loud even the lead vocal is lower in level! Proof that Sean is more than just an axe-wielding monster is found on the acoustic guitar tracks, of which 'Because Of You' is a good example. The vocal level is better, but a touch of reverb wouldn't go amiss. A vocal plate with a pre-delay would be suitable; this could also have been added to the piano, in smaller measure. The final song demonstrates that Sean is both a good guitarist and a good singer/songwriter. It also shows a little more balance in the mixing, as the guitar takes a back seat to the voice.



#### Life Support Machine

Another SOS reader unable to find like minded-musicians in his area, Rob Mitson has also gone the solo route. His CD opens with an anti-drugs song - a cynical look at drugs culture, with some clever lyrics. It starts well, sounding like Fun Boy Three and at this point is pretty commercial. However, it loses the plot halfway through, developing into a sort of concept number. No monitoring system is listed in his gear, but many of the mixes are bass-light, which suggests that the speakers used gave a false impression of the bass content in the tracks. This might have been because they were located in a corner, or just that they were bass heavy. Some post-production has been done, using Pro Tools, and presumably different monitors were used then, so it should have been spotted. Track 11 ('On the Bend') has about the right amount of bass and could be used as a yardstick to measure the other mixes by.

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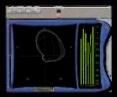
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# doing the

n my May 2001 column I talked about pitching for a media music job, which I believe is the second most difficult task that faces a media composer. Assuming the pitch is successful, you then have to actually make the music, which is by far the easiest part of the process. Then comes the final and most terrifying experience for any music maker: delivering the job!

#### It Ain't What You Do

Please read the next sentence very carefully.

The difference between palming off a worthless piece of tosh and having a musical masterpiece rejected is in how you present it.

Whether you are trying to secure a record contract, publishing deal, media music commission, or whatever, remember that the person you hand your work to is the one person on the planet you need to impress. So should you tell them about the problems you had during the production? Or what could have been done better if only you'd had this or that piece of gear? Of course not. But how many times have you played your music to people and spent the whole time saying what you would have done different, or how it's not bad for something knocked up with your meagre gear or limited studio time?

When you deliver your music, be positive and professional about the finished result. That doesn't mean coming across as a big-headed tosser who thinks the world doesn't deserve your talent, but at all costs avoid negativity.

#### **Better Late Than Early**

Don't deliver anything until the very last moment. This will take balls, as the closer the deadline comes, the more anxious (and possibly threatening) calls you'll receive. Be calm, be reassuring, speak with confidence. No matter how tempting it is to give in and deliver the work early, bear in mind that the closer you are to their deadline, the less chance they have to find your replacement. Being early just means that they have more time to ask you to change "a few things", or reject your work out of hand and get someone else.

When delivery day arrives, be on time. If you get there an hour early, just wander the streets. Have something with you to read while you wait in reception (I suggest a copy of *Sound On Sound*, or perhaps the collected works of Charles M Schulz). Just don't sit there looking nervously at your watch! When it's time to play your work, *don't* qualify, quantify, apologise, rationalise, or shit yourself.

#### **Compose Yourself**

Be confident, engaging, and interested in whatever they were doing when you came in. Don't tell them

# business

#### **BIG GEORGE'S GUIDE TO COMMERCIAL SUCCESS**

about your nightmare journey, or how politically astute your cab driver was — unless the tale is hilarious and will take less than a minute to recount. In general, stick with the subjects they bring up, as who cares about you and your life anyway? I think of this as kissing arse without using my tongue.

If they have any comments about your work — and they will — let them voice these without leaping to defend yourself. If they seem doubtful about accepting the work, look confident, understand their concerns, but point out that it will still work perfectly. If they insist that it doesn't fit the bill, don't look hurt: sort out exactly what needs doing. If it really does need a tweak, then tweak it! It's highly unlikely that they'll sack you, as they gave you the job in the first place, and unless they asked you for a transcendental ambient mood and you gave them Metallica through a fuzzbox, it will all work out fine.

Here's a true story: I once delivered a piece of work to an ad agency and the head honcho was showboating to his team. He made some insightful comments, like "I think it needs more MIDI" (that's not exactly what he said, but you get the picture). So, rather than flipping his desk over and setting off the sprinkler system, I went away and did nothing for two days, then brought exactly the same piece back. I played it to his Royal Highness and, perhaps because there was no audience, he said it was perfect. Was I tempted to tell him I'd done nothing, making him look stupid? Of course. Did I tell him? Well, put it this way: I don't do ads any more...



Big George explains how to stay cool under pressure...

#### A Music Business Revolution

For the last few months I've been asking you to get in touch with me regarding your efforts to license your own independent record releases via the MCPS — or your reasons for not trying to do so — and send me a copy of the said record (see the April, May and June issues). So far I've received less than two dozen CDs, which is pretty pathetic given the size of SOS's readership. I need these as ammunition in my quest to overthrow the suits who have turned the music industry from a seedy place that actually nurtured and believed in the talent it ripped off, to merely an exercise in amassing market share and increasing musical

The music industry is fast becoming nothing

more than a celebrity vehicle. If Dale Winton put out a record it would be a hit. Why? Because he's a celebrity. The fact that he probably can't sing for toffee has nothing to do with anything. He would get radio airplay, his record would be stocked in all the shops, and the media in general would support him. Is this the way it should be? If you don't think so, send me your work, your horror stories about the way your industry has treated you, and any ideas you have on how to change things for the better now. The address is: Big George, PO Box 7094. Kiln Farm, MK11 1LL. Or email me at big.george@sospubs.co.uk. For instant access to my previous rants in SOS, go to my web site: www.biggeorge.co.uk.



# sample shop

# Our regular look at the hottest new sample CDs and CD-ROMs.



#### Ultimate Orchestral Percussion

(DS SOUNDWARE GIGASAMPLER CD-ROM SET)

Anyone who has ever tried to use samples of a rock or jazz drum kit in orchestral music will already know that the sounds simply gon't work in this context. Although you may get away with some of the cymbals, orchestrai drums are entirely different beasts, with huge bass drums ranging from 36 to 40 inches in diameter, and snare drums that often incorporate gut snares and calfskin heads - not very rock and roll! In addition, orchestral music often uses a battery of exotic percussion sounds including blocks, glockenspiel and thundersheets that have been difficult to source. Until now.

Donnie Christian and Sean Lane are two professional orchestral percussionists who have come to the rescue by forming DS Soundware and producing the Ultimate Orchestral Percussion library, spanning four CD-ROMs full of sounds specifically recorded for use in an orchestral setting. To help them sit more easily in this context they are recorded in stereo from a short distance away (typically six to eight feet) rather than close miked. This gives them a typical stereo placement and a little of the natural hall acoustic, so that for most applications you can put together a percussion section without having to worry about

panning or choosing suitable reverb

There are three snare drums a maple 7x14 Gladstone, a bronze 6.5x14 Ludwig, and a maple 5x14 Anniversary Pearl - and two Ludwig Concert bass drums with 36-inch and 40-inch diameters. All are presented with left and right single strokes, allowing you to create more realism if you want to 'roll your own' rim hits, open and closed ruffs (a ruff is a percussive embellishment), and complete rolls - and all with four different velocity layers. There are also three speeds of crescendos and decrescendos, as well as extras such as bass-drum brush swirls and mallet hits. I found the different playing styles easy to incorporate into a single performance, the snares have a wonderful presence, and the bass drums are simply huge.

The other instruments on the CD are also comprehensively presented. They include Hinger Touch-Tone Timpani played with a choice of four mallet types at four different velocities, and four different tambourines with left and right-hand strokes, thumb rolls, shake rolls, and crescendos. The cymbals include an 18-inch Zildjian K, 18-inch Sabian crash, 19-inch Zildijan Classic, and 20-inch Sabian crash, and are scraped, choked, hit by sticks and mallets, or on the bell, as well as being available in crescendos. decrescendos, and rolls. Also on the menu are some Deagen Orchestral Chimes (tubular bells). available in both undamped and footpedal-controlled damped versions a Fall Creek Glockenspiel, a rosewood Xylophone, a selection of wood blocks and, to finish, a wonderful collection of exotic percussion. This includes a thundersheet, cowbells, metal and bamboo chimes, Chinese bells, bowls and nipple gong, ratchet, and anvil.

Recording quality is generally excellent, and of course there is absolutely no looping, although there is a tad more background

noise than normal on a few of the quieter hits, due to the more distant mic placement. One timpani hit has a rogue noise near the end at one velocity, but to their credit DS Soundware have already placed a free replacement file on their web site. Overall, this library should prove a godsend to anyone writing orchestral music, film scores, or in fact any music where rock drums and percussion just aren't suitable. Highly recommended. *Martin Walker* 

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#### Ultimate Timpani

(DS SOUNDWARE GIGASAMPLER CD-ROM SET)

As its name suggests, the Ultimate Timpani Library is somewhat more specialised than its stablemate, Ultimate Percussion. The more general CD actually includes a fairly comprehensive set of recordings of the same Hinger Touch Tone timpani that's sampled in this collection. However, for Ultimate Timpani they have been fitted with calfskin heads (very susceptible to variations in weather conditions, and so rarely fitted nowadays), for a warmer and more resonant sound. They've been recorded at eight different velocity levels, too (compared with the four of

*Ultimate Percussion*), and using five different types of mallet.

Also included are rolls at four velocities, with release triggers for more realistic endings, whose length is determined by the mod wheel, along with three lengths of crescendo and decrescendo rolls. and hand-muffled strikes at eight velocities. Special effects, such as finger and hand strikes rather than mallets, are also included, and there are glissando rolls. bowl hits, detuned tones, and even rolling glissandos with a cymbal resting on the drum head (I loved that one). Some are even controllable by the mod wheel for added pitch effects.

I was half expecting to find this collection a little too specialised for general use, but instead was immediately impressed by the improvements over the already good timps of the Ultimate Orchestral Percussion collection, and in the wider range of timbres offered by the new mallet types. In addition, the effects are not gimmicks, but genuinely useful sounds that will probably find their way into film scores fairly soon. Once again recording quality is excellent, and the extra velocity levels do add significantly more realism. A few tiny extraneous sounds have crept in once again - there's a stray stick hit during one of the glissando rolls, for instance, that

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### Downtown Strings

(POWER FX AUDIO CD)

The history of the string section in black urban music is a rich and varied one, from the power-house soul of Motown and the sweet melodies of Curtis Mayfield, through the cheerful cheese of disco, right up to the multi-platinum sales of today's street soul and rap. Hoping to tap into this tradition is Swedish company Power FX, with Downtown Strings, a 79-track, 77-minute collection of string loops and riffs especially written for today's R&B/hip hop producer.

After the suitably funky demo, the CD's first seven tracks are taken up by orchestral phrases performed by the Moscow Session Strings, in various keys, grouped by bpm. The tempos on offer range from 85 to 120, and the phrases and riffs are presented in tightly-played two- to four-bar loops. A few miss the mark, straying into a more traditional classical style, but most are spot-on, providing loops that would work well as a main sampled hook or happily sit in a more supporting role.

Tracks 9-48 concentrate on loops and riffs supplied by a string quartet. These tracks follow the popular construction-kit format: each loop is played as an ensemble, then split into its solo component instruments and repeated — in this case violin one, violin two, viola and cello. Again, all the loops are well chosen and many of the phrases would work well if used individually.

Next up are 60 upright bass loops, again grouped by bpm and recorded in the key of C. These loops are funky, well played and instantly usable. A couple of familiar bass lines creep in here and there, but on the whole these bass grooves are an excellent way to add a bit of upright magic to the bottom end of a track.

After the upright bass are two tracks containing 17 harp loops, riffs and glissandos in various keys. Although this is the shortest section on the CD, the samples included are excellent, and incredibly well suited to the smoother end of modern R&B. Providing only two tracks worth of such usuable material seems a little stingy, and I was left wanting more.

The final 24 tracks on the CD are scales played over two octaves on each of the featured instruments — violin, viola, cello and acoustic bass. Each scale is repeated in three different musical styles (pizzicato, forté sus and tremolo), for added flexibility, and they will appeal to producers who prefer to program their own string parts, or customise the loops already included.

So does Downtown Strings hit its target? Overall, yes. The quality of the material is generally excellent: the strings are warm and clean, and the playing throughout is superb. The phrases are well chosen and have the necessary 'loop appeal' to work well within the majority of urban production styles. I can see samples from this collection slotting effortlessly into the forward-thinking Spooks/Outkast style of hip hop, while R&B producers requiring a smooth string vibe can pretty much pick and choose from what's on offer

With its emphasis on phrases and loops, *Downtown Strings* also has a lot to offer producers of other styles (including the more soulful end of two-step and garage) who are looking for the sound of "real strings" in a convenient one-stop package. Oli Bell

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#### The Electro Jazz Retro Funk Thing

(POWER FX AUDIO CD)

To bastardise a well-worn advertising by-line, 'It Does Exactly What It Says On The CD Cover'. Here's the small print: this is a toolkit to enable you to create frighteningly realistic mid- to late-'70s syrupy underscore electro jazz-funk grooves. If you've ever aspired to making music that sounds like the score to *Starsky And Hutch*, with a hint of laid-back Steely Dan and a dash of the Ohio Players thrown in for good measure, this is the disc you've been waiting for.

After the obligatory demo on track one, there are 14 self-contained grooves on offer. Each one starts with its own short demo, then all the constituent parts are broken down into drum loop, top loop, percussion, hi-hat, vintage analogue bass line, piano part, rhythmic synth pads, FX loops and hits. The lead instruments are played with real flair by someone who obviously has the funk, and the drums, which sound real to me, are recorded to sound as though they come from the '70s - well, I was convinced!

Next up are an extra 153

separate electro (ish) backbeat loops, ranging from 125 down to 80bpm, in five-bpm increments, and very tasty they are too — as are the dozen stand-up bass figures (too few, in my opinion). Apart from the imaginative choice of musical key and the varying tempos, what I like best is hearing the odd grunt and 'yeah' from the red-hot player, whose name is Josef Kallerdahl.

At this point of the review I must fall back on another hackneyed old cliché: This Is A Disc Of Two Halves, the second half being quite a disappointment. The endless Clavinet, Rhodes and Wurlitzer chords, figures and FX aren't so bad; it's the analogue synth pads and below-average drum hits that are, frankly, surplus to requirements.

Why do so many sample CDs start off so promisingly, then cram in loads of stuff you don't need at the end? We've all got at least a million kick and snare samples, and we know which one of the three we use is best for our next track. It would have been so much better if they had given us another couple of dozen double-bass twangs, courtesy of Mr Kallerdahl.

As for the sleeve info, fortunately they haven't used up five pages telling us what mic was used to record a particular beat, the angle it was placed at, how far away it was and who put it there — we buy sample CDs so we don't need to bother with that kind of thing ourselves! On the other hand, the lack of a decent typesetter makes navigating through the track listings in a moodily-lit studio a bit of a bother.

If I could score this disc in two halves, it would be 5-1, as the first half is sexy, usable and convenient, whereas I doubt whether the second half will get anywhere near as much use as the first. Big George Webley

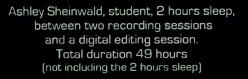
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# net notes

Want to write really great songs, sell millions of records and discover that money can't buy you happiness? There are plenty of sites on the web that aim to help you be a better songwriter, but there's also a lot of worthless rubbish out there.

Sam Inglis tries not to waste too

earching the web can be a frustrating experience. When you're desperately trying to track down a manual for that ancient drum machine, or the story behind an obscure record, the tiniest fragment of information can seem like gold dust. On other occasions, however, the problem can be one of too much information. Sometimes it seems as though everyone in the world has their own site devoted to your hobby, and sorting the accurate and useful from the pointless and incorrect can be a daunting task.

much time...

This is definitely the case when it comes to looking for advice on songwriting. A search on Google (www.google.com) using the keywords 'songwriting advice' returns over 14,000 results - and you don't have to be looking through them for long to realise that there's a lot of crap out there. The Internet is full of important-sounding songwriting Guilds, Organisations and Associations, many of which seem to be populated entirely by illiterate hippies explaining how they drew inspiration from the deaths of their hamsters or the plight of the rainforests. Useful advice is a lot harder to come by than self-congratulatory backscratching, and although there are plenty of self-proclaimed 'experts' who boast of their 50 years' experience in songwriting, few of them are likely to have written a song you've actually heard. So is there anywhere on the Net where you can find useful, practical advice from people adequately qualified to dispense that advice?

Well... it depends. If you find this sort of thing valuable, then you're in luck: "Feeling and emotions remind me of the strings of a guitar. Once they are touched in one way or another they begin to resonate. Whenever I have felt touched by a performance of any kind was when the performer was totally immersed in his feeling experience. I could sit and have my own experience as the performers' emotions channeled themselves through his face. torso, voice and hands, every note becoming an echo." There's no end of material like this on the Internet; this particular gem comes from www.scoop-net.com/ iss/isstips.htm. If, on the other hand, you want to know how to resolve the chord sequence in your half-finished verse, or whether that chord sequence can be arranged in a country style, or whether people will get your clever lyrical allusions, it's less easy to know where to look. Similarly, Alexis Boggs III of Illinois may be only too happy to tell the world how he wrote his epic 'Jesus Gave Us Dolphins', available exclusively over the Internet from Boggs Records, but finding genuine insight into the creative processes of successful songwriters is harder.

## Here Is The Muse

An obvious starting point is The Muse's Muse web site (www.musesmuse.com). This is one of the most popular songwriting sites on the Internet, incorporating news, chat areas, bibliographies, links and a free, archived monthly newsletter.

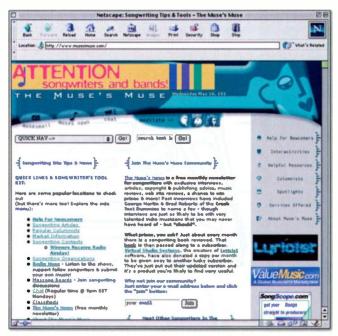
Indeed, so popular is the site that they have recently launched their own range of merchandising, but I'm afraid I won't be sending off for my Muse's Muse mouse mat just yet. While the site, and particularly the archived newsletter, do contain a vast amount of information. I found it much more useful on the business side of songwriting — where there is a lot of sound, albeit US-centric, advice on publishing, self-promotion, getting your songs heard and so forth - than on the craft itself, where articles tend to bear titles such as 'Finding Your Mermaid'. The site also collects together a lot of interviews with songwriters, but warns "Interviews are just as likely to be with very talented indie musicians that you may never have heard of - but should." Hmmm.

Another site which very much doesn't subscribe to the 'less is more' ethos is Jeff Mallett's Songwriter Site at www.lyricist.com. The main feature of this site is a colossal list of links — which are, again, stronger on the business side of life as a songwriter than on the creative side. This, alas, is also true of The Lyrical Line (www.lyricalline.com), the slick design of which conceals various hokey articles such as 'Men

Songwriters are from Mars, Women Songwriters are from Venus' and 'Step One: Touch Somebody' along with a truly pathetic selection of book/record plugs masquerading as interviews. Equally cheesy advice is available at many other sites, including www.senet.com.au/~scala/, while one more worth visiting than most is the Craft Of Songwriting site at www.craftofsongwriting.com/index.htm, which offers some basic but informative articles, a chat room and a discussion board.

## **Critiqual Mass**

Many of these sites are based around the practice of 'critiquing' songs, a process whereby people offer their lyrics or demo recordings for dissection by anyone who feels that they have something useful to say about them. Personally, I'd be a bit dubious about the lyrical judgements of anyone who can torture the English language to the extent of using the word 'critiquing', but I suppose that's Americans for you. However, whether you want to subject your carefully honed material to the thoughtful criticism of other songwriters, search for like-minded writing collaborators, or ask for practical advice on chords and scales, the best place to go is almost



The Muse's Muse is one of the Net's most popular songwriting sites.

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# **net** notes

certainly not a web site but a news group, rec.music.makers. songwriting. To get a flavour of the discussions that take place on this busy newsgroup, browse the archive at groups.google.com/ groups?q=rec.music.makers. songwriting&hl=en&lr=&safe=off& site=groups. With over 73,000 threads archived, there's a fair chance that whatever you want to ask has already been answered, so don't jump in without running your questions through the archive's search engine first. Like most songwriting web sites, rec.music.makers.songwriting produces a lot of rubbish, but it can also put you in touch with keen writers who are willing and able to offer detailed advice on anything, from specific choices of words for the second line of your chorus to hiring an orchestra. And while songwriting hints on web sites tend to consist of vaque platitudes and statements of the blindingly obvious, here you'll be able to get responses which are at least specific to your own problems.

Even here, however, some songwriters will find more useful advice and like minds than do others. It's very easy to get the impression that every online songwriting community, be it a web site or a newsgroup, is either secretly affiliated to the Joni Mitchell fan club, dedicated to praising God, or premissed on the belief that there are only two kinds of music: country and western. Many seem to see rock music as a daring innovation, and electronic music as the height of experimentation. And despite a fairly extensive search, I couldn't find a single serious attempt to provide useful advice on writing rap or hip-hop on the entire World Wide Web, although both have been best-selling musical genres in America for several years.

## **Further Afield**

If you look away from sites directly aimed at 'songwriters', there's a lot of useful material on writing in general and music theory to be found, much of which could be very valuable both in broadening your songwriting

options and getting out of the dead ends that half-finished songs often seem to present. In the former category, you could check out The Internet Writing Journal at www.writerswrite.com. This monthly online publication is archived on the site, and can be searched for relevant articles. which include advice on writing and publishing songs. Here too, however, the songwriting articles have an alarming tendency to contain material such as "It has been my experience that the great songwriters I have met and studied are people who passionately love Life for the sheer adventure of it and they let Life lead them into Truth."

On the music theory side. there's a lot of useful information. at sites such as Marc Sabatella's lazz Improvisation Primer at www.outsideshore.com/primer/p rimer/index.html. This, as the name suggests, is primarily intended for musicians who want to learn how to play jazz, but it provides a very clear and thorough explanation of harmony, scales and modes. If, however, you want to learn from the undisputed masters of the pop song, or indeed if you just want some insight into the nature of obsession, there's much to be



Obtain free access to the magazine of the respected Berklee College of Music at the college's web site.

said for Alan W Pollack's detailed musicological analysis of every track the Beatles ever recorded. His 'Notes On' series can be found at rmb.simplenet.com/public/files/awp/awp.html, and makes scarily compelling reading.

One of the most widely respected American institutions teaching the theory and practice of contemporary pop and jazz music is Berklee College in Boston, which can boast an impressive list of alumni, including Quincy Jones, Melissa Etheridge, Donald Fagen and Branford Marsalis, Most of us couldn't afford the time or the fees required to actually attend their courses, even if we could meet the entrance requirements, but the next best thing is a visit to their web site. Their regular

magazine, Berklee Today, is archived online at www.berklee.edu/bt/, and includes both technical articles about composition, arranging and songwriting, and interviews with prominent ex-students, including successful songwriters.

No matter how much help you get from the Internet, there will always be times when inspiration fails to flow, creative juices dry up, and your muse locks herself in the bathroom and refuses to come out. At this point you have two choices. You can either go and write Westlife songs, or you can get your computer to write your songs for you... in which case you need the Alanis Morissette Lyric Generator at www.brunching.com/toys/toy-alanislyrics.html.

## **Wordly Goods: Free Online Dictionaries**

The web is often at its strongest in areas with obvious connections to the world of education, and the field of technical resources for those writing or studying poetry (and song lyrics) is well stocked with good sites. If you're looking for an online rhyming dictionary, for instance, you're spoiled for choice. Lycos' Rhymezone, duplicated at www.rhymezone.com and rhyme.lycos.com/, offers a sophisticated range of options and acts as a thesaurus and a standard dictionary as well, allowing you to search not only for rhymes but definitions, synonyms, antonyms, and so forth. It will even search for your word in the collected works of Shakespeare, should you wish it to. Be warned, however, that like all the online rhyming dictionaries I found, it takes its rhymes from American English rather than our old-fashioned kind - I asked it to find rhymes for 'missile', and the results it came back with included epistles, tin whistles and 29 types of thistle. The Word Together rhyming dictionary

(www.togethersoftware.com/search.asp) was even more generous, claiming that 'weasel' and 'tinsel' were also 'optimum rhymes' for 'missile'. This is a much more basic site than Rhymezone, but does allow you to specify the number of syllables you wish to rhyme; you could also check out <a href="https://www.writeExpress.com/">www.WriteExpress.com/</a>

online.html.

Many lyricists also find a thesaurus invaluable, and again there is no shortage of electronic examples. The grandaddy of all thesauruses, Roget's, is apparently available at (where else?) <a href="https://www.thesaurus.com">www.thesaurus.com</a>. Getting there can be frustrating, though — when I visited the site, it tried to open annoying ad windows, and then promptly disappeared before I could even enter a word. Another established name in the world of thesauruses (thesaurii?) is Merriam-Webster, and their online contribution can be found at <a href="https://www.www.com/cgi-bin/thesaurus">www.www.com/cgi-bin/thesaurus</a>. Yet another online thesaurus lives at <a href="https://www.wordsmyth.net">www.wordsmyth.net</a>.

Alliteration — the repetition of similar consonant sounds on stressed syllables within a line — can be a very powerful tool in lyric writing, and a resource that is, as far as I know, unique is the Vocabulary of Alliteration at <a href="https://www.xs4all.nl/~in/Poet/VocAll.htm">www.xs4all.nl/~in/Poet/VocAll.htm</a>, which is basically a huge list of words ordered by stressed consonants. If, for instance, you want to find words in which stressed 't' sounds are prominent, you simply select that letter from the list.

Most of these sites, and many others, are listed in the comprehensive round-up of online dictionaries at www.yourdictionary.com/diction1.html.

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# performer notes

More invaluable MOTU-related user tips, including effective mix automation and the use of grouped controls, as well as customised Mixing Board layout editing, plus loop editing and crossfading.

ast month, I looked at making imported audio loops work with sequences (and vice versa), but both Digital Performer and the audio-only recording application AudioDesk are pretty good at 'authoring' loops, too, so if there's a decent groove that you're dying to make into the basis of a sequence, read on...

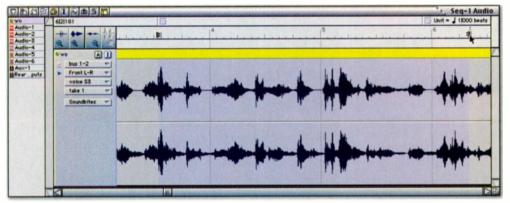
soundbite to begin editing it. You'll then need to click and drag over the appropriate section of audio to select it, and if Audible mode is selected in the Audio Graphic Editor's title bar, you'll hear the selected audio playing at this point. When you've selected the correct portion of audio, hit the 'U' key while holding down Apple (ie. Command), or select

screenshot below). At first, you should place the end repeat indicator just outside the soundbite, in an area of silence this can help in making sure you get a good, rhythmic start to the loop. Hit play and listen. As the cycle plays over and over, try dragging the start marker so that the loop starts right on the beat. You'll almost certainly need to turn off the resolution grid via the square blue button at the top right of the Audio Graphic Editor, and maybe zoom in a little to allow finer adjustments. You could even type very detailed values into the Memory 'Start' box in the Control Panel. No matter how you do it, there's no need to stop playback.

When you've found a good

make the Memory Cycle region into a discrete soundbite; you can then dispense with Memory Cycle altogether. First, you have to make sure that only the audio track you've been working on is visible in the Audio Graphic Editor — open the track list on the left of the window if necessary, by clicking on the 'T'-like icon in the title bar. Holding down the Alt key and clicking on the track you're working on hides all the other tracks. Once this is done, clicking on either of the Memory Cycle repeat indicators will select the time region they enclose, and you can then use Apple-'U' (Trim) again to discard unwanted audio.

After this, it might be wise to go to the Soundbites window and delete (or hide) all the 'offcut' soundbites from the original imported audio, so that things don't get confusing later on. You should then be left with a single, loopable soundbite that you can drag, copy and duplicate to your heart's content. As described last month, the Set Loop and Repeat functions are handy for making instant, properly looped copies of soundbites. You may also need to use some of the other techniques described last month to get your sequences to play in time with the loop (or vice versa).



Setting the boundaries of a loop section using the Memory Cycle function.

Stage one of loop-making is getting the audio into *DP*. If your material is on DAT, vinyl or some other external source, record it into an audio voice track (stereo or mono, as appropriate) in the normal way. Make sure you get at least one second of audio either side of the section you want to loop — this can make things easier later on. If you're using material from CD, you can drag a CD track icon directly into a stereo voice track in either *DP*'s Tracks or Audio Graphic Editing windows

Once you've imported the raw audio, the next task is to locate the intended loop section and isolate it. Working in the Audio Graphic Editor, listen to the audio first, mentally noting times and positions of the section you wish to loop, then double-click on the

Trim from the Edit menu. This gets rid of the remaining audio which surrounds your selection. Now the Memory Cycle function can be used to help you audition the perfect loop. You can turn on Memory Cycle by hitting '7' on the keypad, and can then drag the start repeat indicator in the time ruler to roughly where you think the loop should start (see

loop start point, you can begin dragging the Memory Cycle end repeat indicator, and within a short time you should have a usable, rhythmically accurate loop. If you can't get a click-free or musically convincing result, don't panic — there's a way to deal with that (see the 'Looping the Unloopable' box).

Now all you have to do is

## **DP** Mix Automation Tips

Mixing by mouse can become a pretty annoying and tedious affair — especially when your mouse is as awful as mine. *DP*'s superb automation can improve the situation no end, but when you're trying things out for the first time, or setting up rough mixes, automation can be more

## Quick DP3 Tips

To aid identification of sections in your arrangement, drop markers into your recording on the fly as you play it back by holding down Control and hitting the 'M' key. You can then give the markers meaningful names by holding Alt and clicking on them.

Make a specific section of your arrangement fill the full width of the Graphic Editing window fast, by simply holding down the Apple and Alt keys and clicking and dragging the mouse over the time ruler above the region you want to examine in more detail.

When you're working with track-hungry arrangements, you can fit more Mixing Board channels on your monitor at once by selecting Narrow mode, which depicts the channels in a more compact format. Simply hold down Apple and Shift and press the 'N' key.

For faster zooming in or out of the Audio Graphic Editing window (vertically or horizontally), use keyboard shortcuts: hold down the Apple (ie. Command) key and press any of the arrow keys.

## Setting Up MIDI Controllers The Quick Way

If you hanker after a hardware controller for *DP* but can't stretch to a Mackie HUI, you might like to check out the 'Attach MIDI controller...' function in the Mixing Board. This allows an external source of MIDI controller data (like the Kenton Control Freak or a Yamaha 01v mixer) to control fader or pan movements in real time. Synths capable of sending MIDI controller data from their front-panel controls (such as Yamaha's popular CS1x) work well, and any synth's modulation wheel can be used.

To map specific hardware controls to particular *DP* functions, just select 'Attach MIDI Controller...' from the Mixing Board's mini-menu, and then click on a fader or pan knob. A red flashing box will appear around it to indicate that *DP* is 'listening' for MIDI data. Waggle a knob or fader on your external MIDI device, and you should instantly see the response on the Mixing Board. You can then hit Return to to lose the green selection box, or go on clicking faders and pans and attaching controllers.

A group of faders can be made to respond to the same MIDI controller by clicking on them while holding down the Shift key, and *then* sending MIDI data.

To undo controller assignments, select 'Clear MIDI Controller...' from the mini-menu. This causes a flashing green box to appear around any fader or pan with a controller attached to it. Controller assignments can then be cancelled just by deselecting the flashing boxes.

of a hindrance than a help. In this situation (and many others) *DP* offers some nice ways of getting the mixing workflow going, despite the limitations of the mouse, and can generally help to ease hardware control surface envy.

V P 公司 B B F /Inserts Sends Solo/Mute/Auto/Record ✓Pan ✓Pan Readout ✓Level Meter √Fader Readout Mute Mute rd Record Reco ✓ Auto Resize Use Narrow View Save Board Layous. Delete Board Layout MIDI Soft Synth pairs Edit Group Create Group Show All Tracks Suspend Group Show Everything Attach MIDI Controller.. Clear MIDI Controller MultiRecord Min Time and Value Change

Loading a previously saved Mixing Board layout.

## **Using Groups**

The Groups in DP3's Mixing Board provide, as you might expect, a way of getting a number of faders or pan knobs (but not auxes, unfortunately) to move simultaneously when you drag just one of them. Prime candidates for grouping are miked and DI'd pairs of quitar tracks, multiple miked snares or even whole drum kits, backing vocals recorded on several tracks, string sections and so on. You can set up a number of groups that will then be active concurrently, potentially saving a huge amount of mousing.

Setting up a group is very simple. In the Mixing Board window, you simply select 'Create Group...' from the minimenu, and name it when prompted. The mouse pointer becomes a chunky cross-hair, and selecting faders or pan knobs results in them being surrounded by a flashing green box. You then just hit Return, double-click on

your final selection, or click in a 'neutral' area such as the title bar to define the group. The faders or pans are now linked, and their values change proportionally when any one of them is moved.

Often you'll want to temporarily adjust the position of a grouped fader or knob independently of its counterparts. Clicking and dragging on

individual elements while holding down the Alt key lets you do this for single faders or knobs, and the 'Suspend Group' option in the Mixing Board's mini-menu effects a more permanent divorce. Other mini-menu options let you Delete and Rename groups.

## **Board Layouts**

When running lots of simultaneous MIDI and audio tracks, the Mixing Board can become very wide and difficult to keep tabs on, even in Narrow View (see the 'Quick Tips' box ). The conventional solution, of constantly hiding and showing tracks by clicking in the track names panel, or scrolling the window horizontally, can quickly

become a real pain.

What's needed is a way of defining a number of more selective 'views' of the Mixing Board, showing only those channels and auxes, inserts, and other sections relevant to your particular mix. DP's 'Board Layout' feature fulfils precisely this role, letting you set up and then switch between any number of layouts. You could, for example, create layouts containing only guitar and drum tracks, MIDI synth parts, or all the MIDI and audio track pairs in use with software synths.

Defining a layout is easy — you just show or hide the tracks and sections you want and then

select 'Save Board Layout...' from the mini-menu. When you've set up a number of layouts they can be reloaded by choosing them from the 'Load Board Layout' sub-menu (see screenshot, left). You'll notice there are already options here to 'Show All Tracks', 'Show All Sections' and 'Show Everything', so returning to your 'full-fat' mixer layout is simple.

Groups can work in conjunction with board layouts, and the whole mixing environment can be so significantly enhanced by using these two simple features that it's often well worth taking a few minutes to configure them to suit your needs. Robin Bigwood

## Looping the Unloopable

It's sometimes difficult to get audio loops to repeat rhythmically without audible clicks at the loop boundaries. Also, unless the the original audio is particularly well behaved, instruments may well come and go within the space of the loop, causing a quite unnatural effect every time the loop repeats.

Here's an effective way of dealing with those problematic loops. Place three of the loop soundbites back-to-back in the Audio Graphic Editor, then place appropriate crossfades over the two boundaries between them (select a time region

and hit the 'F' key while holding down Control). This should produce a better beginning and end to the second soundbite (see screenshot below). With the crossfades in place. select the second soundbite and bounce it to disk with the Import option set to 'Add to Soundbites Window'. Select and delete all the original soundbites, then drag your newly bounced soundbite from the Soundbites window back into the Audio Graphic Editor, Place a few of these back-to-back and you should find they sound much better, without the need for any further crossfades.



# **cubase** notes

This month we focus on the score editor in *Cubase VST Score* and *Cubase VST/32*, and offer a handy tip for recovering corrupt Songs.

roducing musical notation is a precise art, and a large gap exists between the perfect MIDI recording and the perfect musical score. One significant difference is that the nuances of timing which make a MIDI recording sound like a real performance are not represented in a score, but left to the performer interpreting that score to add. Indeed, attempting to represent these nuances accurately is likely to lead to a hugely confusing score full of bizarre note lengths, rests, and timing. The first step in creating a score, therefore, is to quantise the music to be scored: although the mechanical feel imposed upon the music is not what you want to hear, from a notation point of view it's perfect for what you want to see. If you need to preserve the original for playback purposes, you should save a new copy of the song specifically for destructive score editing.

You can quantise a part in the Arrange window by selecting it and pressing the Q key, and you can also quantise the music currently displayed in the score editor, again by pressing the Q key. The quantise resolution can be set in either the score editor's or the Arrange window's toolbar, and should be set to the shortest note length used in the part (or parts).

## **Display Quantise**

It's worth remembering that Cubase has two types of quantise: the standard quantise, as described above, which destructively changes the notes, and the Display Quantise, which applies quantise only to what we see in the score editor. The Display Quantise settings are found in the Staff Settings dialogue on the Score menu (note that the Score menu is greyed out when the score editor isn't open as the top window).

Once the music is quantised, the Display Quantise Notes value is responsible for setting the smallest note length that can appear on a stave. For this reason, you should always set it to the smallest note length used on the stave. This is important to know because even if your music contains demisemiquavers and you have quantised to a resolution of 32, *Cubase* will only display the score properly if you have also set the Notes value of Display Quantise to 32.

The Rests value of Display Quantise should be set to the smallest note length you would want on a single beat. This can seem slightly confusing at first, but is easily explained with a few examples. What the Rests value doesn't do is set is the smallest rest that will appear on a stave, which is what you might expect after thinking about the Notes value. In the uppermost example, right, Notes is set to 16 and Rests to 4, which are the default values. As you can see, there's no problem in displaying quaver or even semiquaver rests. I've then

## **Switching Modes**

The score editor features two different modes, Edit and Page, which offer different ways of displaying and working with your score. Edit mode displays your score bar-by-bar, and is primarily intended for editing note-related information, composing and entering music. Page mode, on the other hand, offers a page-by-page display of your score, showing you exactly what will get printed to the finished page. This is the mode where you can add extra graphic symbols for your score and fine-tune the way it will look.

You'll probably find yourself

switching between Edit and Page modes quite frequently and because it can become tedious to access the Score menu each time, the best thing is to assign a key command. To do this, choose Preferences / Key Commands from the Edit menu and click on the Score tab. The Edit Mode or Page Mode command appears at the top of the list. Click in the Key column for this command and press a key combination on your keyboard. I use Shift+1 for this, as no other key command uses this convenient combination by default. When you've chosen, click OK. Mark Wherry

changed the Rests value to 16, given that 16 is the smallest rest length in the example; in the lower example, you can see what has happened to the crotchet on the third beat. By doing this, we're telling *Cubase* to use semiquavers as the smallest note length on a beat, which is why we suddenly have more rests in the music. You

Notes). If, however, your music contains a combination of straight and triplet rhythms, the Auto Quantise flag should be activated. If you've activated Auto Quantise, two more flags become available to you: Dev. (Deviation) and Adapt. Deviation tries to detect notes that are slightly on or off the beat and pulls them into time,



Altering the Rests value of Display Quantise changes the way note lengths are shown.



should always leave the Rests value as the default 4, and change this only if note lengths are appearing longer than you want.

There's also an option called Auto Quantise. You won't need Auto Quantise if your music contains only straight notes, or only triplets (in which case you should use a triplet 'T' value for but generally you don't need to turn this on because the music should have already been quantised. If there are triplets in your music that haven't been interpreted as triplets in the score editor then turn the Adapt flag on, otherwise leave it off. This feature works on the assumption that if one triplet rhythm is found, there

## **Cubase Tips**

Following April's tips about overcoming the difficulties involved in creating LM4 programs, reader Andrew Mockford writes to tell us of a PC-only editor which, he says, is much more usable than the Wizoo one. Visit <a href="www.inet.hr/">www.inet.hr/</a> <a href="www.inet.hr/">www.inet.hr/</a> <a href="maiskoy">mrisiskoy</a> for more details. Sam Inglis

If you do most of your editing in the Score editor, it can be a good idea to make this the default editor that opens when a part is double-

clicked on the Arrange window. To do this, simply choose Preferences / General from the Edit menu, select the Editors page, set Editor to Score, and click OK. Mark Wherry

To display the kind of larger time signatures that are common on modern full scores, select Layout Settings from the Score menu, activate Modern Timesignature in the top right group, and click Exit. Mark Wherry

When entering notes on the score, the value of the note being entered can be selected using the number keys along the upper part of the keyboard; type [1] for a semibreve, [2] for a minim, and so on. This can be useful, but be aware that the shortcuts also change the snap value to the currently selected note value, which makes it impossible to enter a minim on the second crotchet beat of a bar without changing the snap value manually. Mark Wherry

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## **cubase** notes

may be others before or after. Click OK when you're happy with the settings, and check through the score to see what's happened.

## **Fixing Note Lengths**

After Display Quantise, there's another set of features to help you interpret a MIDI recording into correct notation; the so called Interpretation Flags you may have noticed under Display Quantise in the Staff Settings dialogue. Cubase's score editor is extremely sensitive, especially when it comes to rhythm, and while we can solve the problem of where the notes fall in the bar with either quantise or display quantise, the actual lengths of the notes pose another problem.

If we played four semiquaver notes on the four crotchet beats of a 4/4 bar, you'll notice that by default the score editor rounds the length of the note up so that it cleanly fills the gap to the next note. In this instance, our four semi-quavers get rounded up to four crotchets. This behaviour is toggled by an Interpretation Flag called Clean Lengths, which is active by default, and which forces notes with an ambiguous length to be rounded up to last until either the next note, or the next Rests Display Quantise position

If everything has been played into *Cubase* in real time, it's possible to have a single-voice part containing overlapping notes. Because you would never see music written like this, and as

it would actually be impossible to play on a monophonic instrument such as a flute, we need to clear up the display. One solution would be to go through your score and shorten all the overlapping notes manually, but fortunately you don't have to because *Cubase* provides a No Overlaps Interpretation Flag to deal with these problems.

## **Syncopation**

In music, a rhythm that doesn't fall on the established accented beats of the time signature is known as a syncopated rhythm. If you try to enter the rhythm 'quaver crotchet crotchet crotchet quaver' in a bar of standard 4/4 time, the third note appears tied, which is to say that it's split into one or more notes and 'tied' together to indicate the notes should be played as one without a break. To the ear there's nothing wrong with this, but it's grammatically incorrect; the two tied quavers should appear as a crotchet. Fortunately, where syncopated rhythms are concerned there's an easy way around this by simply activating the Syncopation Interpretation Flag.

The purpose of a score isn't to give the musician a concrete set of rules to follow, it's more of a starting point for interpretation, and one example of this is in music that uses swing or shuffle time. When you want the swing rhythm as a global feel to the piece, instead of implicitly writing the swing time, you write the music straight and indicate that

## Layouts

A Cubase score layout is the way in which one or more tracks appear on the printed page with all the extra visual information we specify in page mode, including the layout symbols and spacing adjustments to staves and bars. When producing written music for musicians to play, we generally need two things: a full score containing every detail of the music, and individual parts for the players. The full score and each individual part will require a separate layout.

To store all of the different layouts required, you might be thinking it would be necessary to create different versions of the song, or employ some other complicated management process that relies on the user keeping track of things. Fortunately this is not the case, as Cubase can take care of this for you. A list of layouts is managed internally and every time you open up a new combination of instruments, a new layout is automatically created.

When the same combination is called up again, the layout profile will be recalled with all of your previous work intact. In this way, we can build up layouts for our parts and the full score. You can access this list of layouts in the Layout Settings dialogue from the Score menu, sometimes known as Page Mode Settings.

Viewing parts in the score editor is easy, and selecting a combination of tracks you've opened before will recall an existing layout. If you want to recall a specific layout but you can't remember what combination of tracks it contained, choose Score Layout from the Edit menu and select the layout required from the sub-menu. The necessary parts will be selected so you can now open the Score editor in the usual way. If your score seems to be missing details you know have been added, the chances are that you're viewing the wrong layout. Mark Wherry

it's to be played with a swing.

If the piece isn't going to have a global swing feel, and there are just a couple of bars that need to be swung, then by all means go ahead and write them in.

However, if you're

However, if you're worried about that jazz masterpiece you just spent all night playing into *Cubase* in swing time, all is not lost because again, our 'quick fix' interpretation flags can save the day. When the Shuffle Interpretation Flag is active, *Cubase* will search out swing rhythms and make them straight in appearance.

and close the dialogue.

This is very useful for changing a couple of notes or bars, but it's also possible to say 'from this point onwards I want to change the settings like this'. To

do this, select the Display Quantise tool from the toolbox, and click at the precise point you want the change to occur. The vertical position doesn't matter but the horizontal position is displayed on the toolbar, just the same as when you add notes. The Insert Quantise dialogue opens, allowing you make any alterations. Click OK when you've

finished.

If and when you want to return to the original settings again, as set up in the Staff Settings dialogue, just select the Display Quantise tool again, and click at the point you want to return to the original settings. In the Insert Quantise dialogue which opens. click the Restore to Staff button. This changes the settings to the originals, which saves you having to remember and enter them manually. Mark Wherry

Mark Wherry is the author of the forthcoming Wizoo Pro Guide To Cubase Scoring.

## Insert At Record Position

As a result of every computer musician's nightmare — the loss of a song file before a backup had been made — I recently discovered a rather useful feature within Cubase VST (v4.1 or higher). This feature makes moving audio between different Cubase Songs a doddle. It's called Insert at Record Position, and is found under the Domenu within the Audio Pool.

This simple, elegant facility simply places audio on a selected track at exactly the temporal location at which it was originally recorded. This was particularly helpful to me as I was attempting to recreate a Cubase Song that had gone corrupt before backup. It was a job of mere minutes to restore even the smallest pieces of audio to exactly the locations they had occupied in the original Song. leaving me the job of recreating the lost MIDI data. Of course, this facility could also be used during remixing or when creating a new Song around existing audio: the Record Position data means that all audio will be completely in sync when imported to a new Song. Derek Johnson

Interpretation Flag functions always affect an entire musical stave, and there may be some occasions when you think, 'Wouldn't it be nice if I could just change these settings for this little section?' Well, you can! Select the notes you want to assign different settings to, and choose Do / Insert Quantise. The Insert Quantise dialogue appears, giving

us some now-familiar settings.

Alter the settings required and

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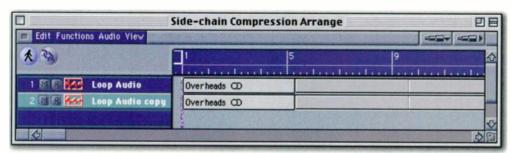
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# logic notes



This month, we show you a powerful compression technique available in *Logic*, as well as describing a workaround which increases the bank range of your Multi Instruments. Also, there are instructions on how to control a large range of *Logic*'s parameters in real time from your MIDI master keyboard's mod wheel.

hen I'm mixing, I tend to reach for a compressor whenever any of my individual tracks need a bit more beef. However, I find that compressors used in a traditional way — by inserting them directly into the channel concerned — always run the risk of compromising the natural musical dynamics of the sound. However, there is a subtle method of compression, called 'side-chain compression', which is much better in this respect.

The basic principle of the technique is that you mix compressed and uncompressed versions of the same audio, such that the compressed version dominates at low signal levels

and the uncompressed version dominates at the audio peaks. The advantage of this is that the sound is reinforced where it needs it, but without the risk of crushing any peak transients — great for adding a little body to a drum sound without destroying the player's performance dynamics, for example. In fact, so subtle can this type of compression be that it has also earned the nickname 'invisible compression'.

This technique often poses a problem for the musician working with a digital recording system, however, namely that the processing delay incurred by the compressor can cause a small delay in the returned audio,

resulting in a strong phasing effect. Fortunately, *Logic* is clever enough to compensate for such delays, which means that all audio is perfectly phase-locked to avoid this potential problem.

## Setting Up The Side-chain

In order to experiment with side-chain compression, you first need to create a duplicate track in your Arrange window for the audio you're wanting to process. Simply highlight the original track and then select the Create option from the Track submenu of the Arrange window's Functions menu. A duplicate of the highlighted track should appear under it, to which you now have to copy the upper track's audio regions. Highlight the upper track to select all its regions, hold the Mac's Alt and Shift keys (Ctrl and Shift keys on the PC) and drag aliases of these regions to the lower track. Make sure that the copied audio is in time with the originals - though if it isn't, you'll soon find out, because the audio will suddenly sound like it's being put through a phaser!

The next step is to assign the duplicate track to a new Audio object by clicking and holding on

The first step in setting up for side-chain compression is to create a duplicate of the track to be processed. Then copy the audio to the duplicate track and select a different Audio object as the track instrument.

the Audio object's Arrange window icon and then making a selection from the resulting drop-down menu. Now double-click on the new icon, which will open up the Environment window with the object selected. Make sure that the new object has the same output, pan and fader settings as the original track's object.

The next step is to insert a compressor into the new Audio object, clicking and holding on the insert point and making a



The Audio objects for the original and duplicate tracks need to be set up identically, but with a compressor inserted into the latter object.

selection from the drop-down plug-in menu. I've used the main Compressor plug-in which is incorporated in Logic Audio Platinum and Logic Audio Gold, though you can use any other compression plug-in if you prefer — each compressor will impart its own unique character, so it is worth experimenting with different types. Once you've made your plug-in selection, double-click the insert point to open the plug-in window.

## Setting Up The Compressor

The compressor settings used for side-chain compression can vary quite radically from engineer to engineer, depending on the exact effect required. Mix engineers often go for a more characteristic effect by using a high ratio and fast time constants while, on the other hand, mastering engineers will usually use much more gentle ratios and longer release times

## Extending Multi Instrument Bank Range

One of the things that initially attracted me to Logic was the ability to enter my own patch names into the Instrument objects within the Environment. But, for some reason that has never been adequately explained, it's not possible to create more than 15 banks of named patches per instrument (0 to 14), even though you can select any of 126 banks from the track Parameters box in the Arrange window. Most people don't find this too much of a limitation, but if you're using an expandable multi-timbral sound module then it can be a real problem — selecting bank 15 and typing in new patch names will

overwrite those assigned to bank 0.

Fortunately, because the patch names of banks 0 to 14 are reused for banks 15 to 29 and so on, there is a way to work around the problem. What you have to do is

to create a copy of the relevant Multi Instrument object every time the original one runs out of banks. Give each new object a slightly different name and a different-coloured icon to differentiate it from the original — to change the object's colour, highlight it in its entirety in the Environment window by clicking its header icon, select Object Colours from the window's View menu, and then select the colour you want.

To access a bank above number 14, assign the new Multi Instrument to the relevant track and select the bank you wish to access from the track's Parameters box in the Arrange window. You still can't select the bank directly from the patch names window, as this refuses to go beyond 14, but I did say that it was a workaround, didn't 1? Paul White



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## logic notes

for a more subtle flattery of stereo signals.

However, for the purposes of this example, let's set the Compressor plug-in to a fairly subtle setting which ought to be fairly general-purpose. Set the Ratio control to 2:1 and the Knee control to 0, which is as hard as it will go. The Attack can be set to its shortest setting of 0mS, while the Release is best set at around 350mS. Turn off the Auto Gain mode if you're using Logic's Compressor plug-in. Now press play and set the Threshold low enough that the gain reduction meters are registering up to about 20dB gain reduction.

Finally, adjust the make-up gain of the compressor to get the most suitable level of compressed signal for your needs. It's worth giving the new Audio object's mute button a bit of exercise as well, to compare the subtle sonic properties of the processing with the untreated original signal. If the processing isn't quite working

A good starting setup for the duplicate track's compressor plug-in is shown below. Once it's set as indicated, tweak the Gain and Release controls until you get the exact effect you're after.

# Side-chain Compression: Plug-In Bypass Track 2 Compressor Editor Threshold Gain Reduction Attack Release Peak/RMS Auto Gain O OFF Auto Gain Compressor

## Transforming Controller Messages On Input

The only hardware control which many musicians have over continuous controller values, other than the none-too-useful mouse, is the modulation wheel of their master MIDI keyboard. However, this sends out MIDI Continuous Controller message number one, and this sometimes cannot be reassigned at source for controlling, say, Continuous Controller number seven. Fortunately, Logic's Environment offers a neat way to get around this problem, in the form of the Transformer object. This object has many functions, one of which is that it lets you change any incoming controller number into any other. Here's how you get it to do this.

The first thing to do is navigate to the Click & Ports layer of your Environment and create a Transformer object there — simply select the Transformer option from the Environment window's New menu. The next stage is to cable this object between your MiDl input port (the one to which your master keyboard is connected) and the Sequencer Input object. Once this is done, double-click on the Transformer object and set up the parameters as shown in the screengrab — this will transform modulation messages (CC#1) to volume messages (CC#7). If you want to switch to any other controller, just change the number in the box in the Operations area of the Transformer object's settings window. Mike Senior

for you, try tweaking the

this can have quite a

trying this compression

technique on a number of

compressor's release time, as

pronounced effect on the sound

of the processing. It's worth also



The Environment cabling and Transformer object settings which will convert mod wheel messages to any other MIDI controller number.

different types of audio — I find it works particularly well with drums, rhythm guitars and stereo submixes.

## From Compression To Enhancement

One thing you may notice when experimenting with side-chain compression is that it can often make the bass frequencies of treated audio seem weightier, particularly if you try processing complete mixes. If this isn't a desirable side-effect for your purposes, then why not try a little EQ in the return buss? Just select a simple low cut filter from the EQ window at the top of the Audio object, and then slowly sweep the frequency upwards until you tame that extra low end.

An extension of this filtering technique allows you to simulate the effects of a number of the psychoacoustic enhancers currently available on the market. Simply raise the filter frequency such that only very high frequencies are allowed to pass - try 7kHz as a starting point and reduce the compression threshold to retain similar levels of gain reduction. However, as with all psychoacoustic enhancement, a little goes a long way, so go easy with the compressor's gain. Also, remember to keep using that bypass button, as it's easy to get used to enhancement processing and to keep adding more and more, resulting in a tinny and fatiguing sound. Mike Senior 555

## **Logic Tips**

If you want to alter the overall level of several tracks, select all their Audio objects in the Environment and then move any fader. Paul White

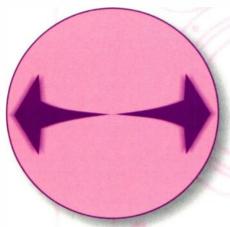
Need to save a plug-in setting for use on another track? Clicking on the triangle to the right of the Bypass button in the plug-in window brings up a useful menu which includes a Save Setting As option. This creates a folder for plug-in settings (if there isn't one already there) within the

main *Logic* folder and brings up a dialogue box allowing you to name the setting before you save it. Mike Senior

Holding the Mac's Alt key (Ctrl on a PC) before clicking on any object's cable output within the Environment window brings up a list of all active objects, allowing you to cable to individual parts of Multi Instrument objects, or to objects on different Environment layers. Dave Lockwood

When you are editing and comping audio regions, it can be important to maximise your work area in the Arrange window. In such cases, try hiding the Parameters and Tools boxes by selecting the Parameters option from the Arrange window's View menu. Whenever you need to change tool, press the Escape key and a Toolbox pops up conveniently under the cursor, disappearing again once you've selected the new tool you'd like to use. Mike Senior

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# applenotes

There are dark mutterings against Steve Jobs on planes, trains and automobiles, as **Paul Wiffen** continues to struggle with phantom crashes and difficult reboots of OS9.1 since installing OSX on his computer...

y the time you read this, I may well have either killed myself or become the Apple community's equivalent of the man who shot John Lennon only hours after asking for his autograph. In my case, it has taken me a bit longer to become so disillusioned with my former idol, Steve Jobs, that I'm approaching the 'his life or mine' point. When others were foaming at the mouth because of his decision to abandon traditional Apple interface ports, such as Serial and ADB, in favour of the disappointing USB and the visionary FireWire, my response was "well, I guess he has to drive the market forward somehow." When he performed the demonic summoning of a 20-foot-tall AntiChrist at a MacWorld Keynote speech and other Mac devotees were reaching for their crucifixes and garlic, my reaction was "We'll take Gates' money - it's the least he can give us for messing up the Western world so badly!"

## Crash Landing

However, the sheer unreliability of my iBook since I tried out OSX last month, found it to be useless for all music programs except

Native's B4 organ (even trying the Carbonised 9.1 as a way of running Cubase or Logic) and reverted to trying to run the original OS9.1, as before, has me hovering between suicidal and homicidal on a minute-to-minute basis. No-one will ever read the original opening to this month's Apple Notes, because the iBook crashed just as I was about to save after a couple of paragraphs (now I am saving every two sentences!). "But computers always crash," I hear you cry. "Surely that's not a reason for this homicidal/suicidal rhetoric?" If this were the end of the problem, you'd be right. However after such a crash it can take up to half an hour to get working again. The first 'Ctrl + Apple + Delete' never works properly — the computer boots all the way to the desktop, displays all the icons and the menu bar, but refuses to take any notice of whatever I click on with the mouse.

Restarting with Extensions Off (by holding down Shift during the re-boot) always gets me back up and running with something like *Word*, but this is one of the few programs left these days which does not need half a dozen

extensions for its most basic functions. Email, Ethernet sharing and any music software will refuse to run if certain standard extensions are not present. And the problem seems to be in these standard extensions - such as File Sharing and Open Transport, without which Quick Time, modem access and other critical things will not run - although I cannot tie it down to a particular one. Sometimes switching off one of these Extensions (now identified as part of the 'Classic Compatibility' package inside OSX) allows the iBook to reboot as normal, but often it doesn't. Bizarrely, running with Extensions off and then re-enabling the required extension can often solve the problem on that particular occasion, but then half an hour later it doesn't work if you try it again.

I even re-installed OS9.1, and this appeared to solve the problem for a while, but it turned out to be just a couple of lucky restarts which didn't lock up on arrival at the desktop. A day later I had my longest ever attempt to get back up and running, after a crash that occurred while I was visiting hi-tech distributor Arbiter. I had to repeat

'Ctrl + Apple + Delete' 15 times to get the computer working again, much to the delight of the PC technical support staff there, who were feeling solidarity with a Mac owner perhaps for the first time! Before, I've felt sympathy for (but also a vague superiority to) my impoverished PC brethren, because it seemed that the hidden

price of their thriftiness was an inordinately long time spent looking at boot-up screens and hoping that all would go well this time, but now I find myself joining them in this soul-destroying activity. (And, as we all know, a watched boot never happens — Wiffen's modern-day sayings no. 37.)

## Jobs' Worth?

The reason I feel so antagonistic towards II Duce Jobs right now is that we could have had some, if not all, of the mLAN support we need in OS9. We could have been feeling the advantages of OS-integrated multi-channel audio support for the last year, without all this radical new OS grief, were it not for one of Jobs' dictatorial edicts, delivered in the mistaken belief that new features in OS9 would reduce the number of people prepared to step up to OSX.

This time last year, at the Worldwide Developer Conference, developers saw the audio side of mLAN running under OS9; I know this because the guy who worked on it and showed it there told me (he has now left Apple, so I can reveal this without endangering the security of his job). But, one morning, Apple's answer to Marlon Brando (one of Apple employees' favourite terms for their leader is apparently 'The Jobfather') appeared and decreed "No new features in OS9."

Clearly, he hoped that saving any new goodies for OSX would create a tidal wave of people straining at the leash to purchase

## OSX MIDI And Audio At The Apple Developer Conference

The following sessions were scheduled to take place at Apple's Worldwide Developer Conference (text from Apple's web site):

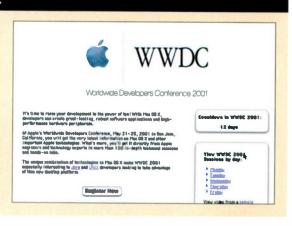
208 — Audio Services in Mac OSX
 This session discusses audio services available to applications, including the basic Audio I/O model and how audio hardware is presented to an application.
 Java APIs that provide access to these services will also be discussed.

 209 — Audio Processing & Sequencing Services

Mac OSX provides developers with advanced audio-processing capabilities. This session details how to create and use custom Audio Processing Units for applications. It also provides an introduction to creating Music Sequences using the Audio Toolbox. Java APIs that provide access to these services will also be discussed.

• 210 - MIDI In Mac OSX

With Mac OSX, MIDI developers have access to professional-quality MIDI services as a core part of the operating system. This session will discuss the MIDI APIs and services available to applications and how to interface with MIDI hardware. Java APIs that provide access to these services will also be discussed.



the new OS on its release. Whether or not this strategem has worked, I couldn't say, but those of us trying to do music under the new operating system are now paying the price. I guess that one day we'll all be basking in the warmth of hundreds of channels of mLAN MIDI and audio, available to every single application without the need for PCI card or USB MIDI interface (and OMS to drive it), but for now I'm just going to have to clear everything off my hard drive, re-install OS9.1 from scratch, and keep my hard drive OSX-free for a few months more.

## Leap Of Faith

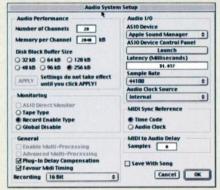
The most worrying aspect of all this is that in July, to coincide with the Keynote speech at the MacWorld show in New York, Apple apparently plan to start shipping all Macs with OSX as standard. This presumably means that the new machines announced at the same time will not run under the old OS9.1 at all. The need for the latest OS to support newer features has always pertained in the past - lanuary's crop of new G4s will not run with anything earlier than OS9.1, for example. But if this pattern is repeated, from July (just about as you are reading this, actually) you won't be able to buy a new Mac which will run Cubase or the audio side of Logic, until our friends in Hamburg have solved the issues which prevent these programs from running under the 'Carbonised' OS9.1

Until this glorious moment arrives, my faith keeps me looking onwards and upwards to the day when I can run all my favourite applications under OSX proper, with hundreds of channels of both MIDI and audio flying in and out of the FireWire port in mLAN data streams despite the fact that, at the moment, my feet plod through the mire of constant restarts and arbitrary disabling and re-enabling of Extensions. I probably won't kill either myself or Mr Jobs, but sometimes (at the moment) the thought of the latter keeps me warm at nights!

## Moving On Up: Advice On Upgrading

After some nice comments about my mLAN coverage (he should like this month's column, then!), Johan Van Maldeghem writes from Belgium "As an interface designer and usability consultant (in my day job) and a songwriter (in my evening 'iob') I have become a Mac and Yamaha believer in the last few years. Your series made me feel as though I had always chosen the right platforms. Until yesterday, that was. I was considering adding an AX88 ADAT interface from ADB (as an 8-in, 8-out solution) to my Yamaha DSP Factory card. but then I hit the following url: www.adbdigital.com/ax88/ ax88outofproduction.htm. My first question is this: is it true that Yamaha have discontinued the DSP Factory card and its support? Do you have any news on Steinberg Cubase VST 5 support? I can't imagine that Steinberg would keep upgrading the software for a discontinued card."

Our reading of the announcement at this site is that the ADB AX88 has been discontinued, rather than the DSP Factory. Instead of getting an AX88 for ADAT interfacing, Johan could put a card such as the RME Hammerfall Lite 96/32 or the Frontier Wavecentre PCI into his computer and feed ADAT audio in and out via that. The audio would not be routed through the processing of the DSP factory, but Johan could record directly into *Cubase*, then



G4 multi-processing is enabled in Cubase's Audio System Setup window. (The relevant options, shown in the bottom left corner, are greyed out because this screen was snapped on a single-processor G4.)

change his routing to output the audio through the DSP factory for processing.

However, Johan continued his question by positing a completely different setup, which I also want to comment on: "From what I have learned from your series of articles, a possible upgrade of my system (in the long run) would be to add an O1V, and install a Firewire card on my beige G3 to interface with the O1V through mLAN. Hence, my second question: for an upgrade path as shown below, do you have any news from the trenches, with any particular pitfalls that I should be aware of?"

I'll take Johan's suggested upgrade steps in turn, and give my verdict (and that of other users, as reported to this column) on each:

• Fitting a beige G3 with an XLR8 G4

processor upgrade: I have no direct experience of this upgrade myself, but have heard good reports of it from Sonorus and Frontier users. I'm still trying to track down the loan of one, to try out. · Moving to a multi-processor G4: provided you use the Cubase Audio System Setup, left, to determine how radical the multi-processor operation is (basic or advanced: Advanced mode vields faster operation, but more applications tend to fall over), you should be able to get most plug-ins to run OK under Cubase (and Logic, for that matter). There should be

a good, if not unbelievably great, increase in processing capability. Do note, however, that a few plug-ins are still not multi-processor compatible, and need multi-processing mode turned off.

- Upgrading Cubase 4.1 to Cubase 5: completely safe, in my experience; I'm sure I would have heard by now if there were any major problems.
- Changing from Mac OS 8.6 to OSX: avoid like the plague for now (see main text)!
- Installing a Firewire card in the Mac for mLan interfacing with an 01V: Again, I have no direct experience of this, and you will have to wait until the 01V version of the mLAN interface ships in the Autumn (see last month's column for more info). However, it shouldn't present a problem.

## **Developing Situation**

The Worldwide Developer
Conference at Apple's HQ in San
José this month gives us the best
hope, as it lists three very specific
presentations on OSX mLAN
implementation. (As behoves your
Apple correspondent, I had
spotted these myself, but I am
grateful to Kendall Wrightson, late
of this parish, and others, for
emailing me the info, in case I had
missed it.)

The third of the aforementioned presentations (see the Apple Developer Conference box on the previous page) covers the implementation of MIDI with the OSX operating system. In the past, there was a standardised implementation of

MIDI hardware as a 'bolt-on' to the serial ports, so that no extensions were needed for suitably written software (pretty much everything, a couple of years back) to address simple MIDI I/O devices. Now, for the first time since the débacle with the Beatles' version of Apple 10 years ago prevented Apple Computer from developing and refining MIDI Manager, the Mac OS itself will handle MIDI messages. I would suggest that this alone is a cause for dancing in the streets, but even more exciting is the fact that a presentation on audio through Apple's desktop (208) is scheduled for the conference though the phrase 'multi-channel' is not included in the rubric. People writing new audio and

music software from scratch also seem to be well taken care of, as the second seminar (209) covers the basics of music sequencing and digital signal processing.

So not only is there information on the way to help implement the new features of OSX specifically for music (ie. mLAN), but Apple are even actively encouraging new music and audio software development, which has not always been the case. I guess if you have chaps beavering away night and day on new features and support of a major new protocol, it pays to tell developers that these features are there, and explain how to use them. Nevertheless, I still think it bodes well for Apple musicians in the long term! SOS

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## VOL 01



## Hip Hop and R&B 1

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## VOL 06



## Experimental Grooves & FX

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## Hip Hop and R&B 2

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## VOI 07



## **Future Beats 1**

from Chemistan Boats
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# **VOL 12**

## Dance Vocals

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## VOL 03



Drum & Bass 1 rom Drum & Bass Cutting o Drum & Bass loops. Production is super clean with pads of punch, and the syncopated 'high energy' drum programming is second to none; the synthesized bass is decigned to move lots of miches - miss this at your mil! 9/10 (Keyboard, USA)



## World Vocals

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From Peter Siedlaczek, this is one of the most haunting and inspiring sets of vocals ever captured, "His choral releases are top-notch, with stunning fidelity and atmos-phere, and offering samples of choral singers from all over the world, in a wide variety of cultural styles."
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## Percussive Loops from

Percussive Adventures
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VOL 0



## Future Beats 2

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**VOL 14** 



## World Grooves

This version of the Festa Latina library from Best Service includes salsa, samba, merengue and or two bars, at different pitches, 120 bpm. There is also a superb collection of traditional pop latin pia and bass loops. This is a MUST for Latin producers.





P p & Rock Dru

from Steve Smith Drums From clari to fin timing and feel are rich drum sounds and the authority and precision of ming is perfect - and the recording quality is among the best I've heard ' KEY BUY AWARD (Keyboard)

VOL



"Beautifully polished and compiled. The definitive resource for the house producer looking for cutting-edge dance-floor material. Meticulous attention to detail shines quality and easy-to-manage tempo groupings." FIVE STAR AWARD (SOS, UK)

VOL 15



## Dance Drums

"The sound quality throughand most of the sounds are presented well, with just the right amounts of compression and other processing" (SOS, UK), "We've never seen quite so many drums all in one place before. A worthwhile investment." PLATINUM AWARD (FM, UK)



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### Guitar & Bass

guitar-and-bass-goods. the sound quality is first rate, the performances are inspirational, and the programming shines. 9/10" (Keyboard, USA). It is truly possible to emulate a real guitar player on a keyboard using these multi-samples.



## Drum & Bass 2

from Total Drum & Bas "Total Drum & Bass is a "Total Drum & Bass is a near-perfect example of what dance sumple librar-ies could and should be, combining thought, attent-ion to detail and consistent levels of quality and music-tanship. I can't think of another product that comes anywhere close" FIVE STAR AWARD (Sound On Sound)



## from Da Nu RnB Hip Hop

up bl y p op da flava



Legendary Steely Dan and Doobie Brothers guitarist Jeff "Skunk" Baxter is widely regarded as one of the greatest guitarists of all time. Rarely do you get the opportunity to create music with such a talented artist. Jeff's 'Guitar Licks' features acoustic to heavy metal, and everything in between:



## Hip Hop

Zero-G bring you a raw slice of Hip Hop from New Yolk City, "N.Y. Cutz is a winner. With this CD, some creativity, and a little patience and car you're guaranteed to come up with some great tracks and that's why we gave N.Y. Cutz our coveted KEY BUY. AWARD It's got the goods. AWARD It's got the goods. Rating 9/10 (Keyboard, USA)



Large Bass analog ynth le

Danceflo



## Steinway Grand Piano

In practice, these sounds has been done with law dropping realism. The sound clarity is sharp yet warm, and if you close your eyes whilst playing, you could easily be forgiven for thinking it's the real thing." (SOS, UK); triple FIVE STARS (Keyboard, USA)



## Trip Hop

"Delicious tonality, excol-lent transparent engineer-ing, and fresh playing with "eel" stamped right through it - spine tinglingly brilliant. FIVE STAR AWARD (SOS, UK). "A superbly appointed CD. PLATINUM AWARD" (Future Music). "Outstand-ing variety and value for money. 9/10" (Keyboard).



## from Houseworx!



## Pop Brass

A selection of Pop Brass from the most critically acclaimed brass collection ever. "Quantum Leap Brass sounds great, & raises the standard of professional standard of professional sampling. That, combined with the overall quality, justifies the KEY BUY AWARD." (Keyboard, USA) FIVE STAR AWARD (SOS)



## Breakboat from Haren c

A new generation of 'Raw-funkin-dirtyass-boogie-beats' from Zero-G. "This CD is at the top of its class." (Keyboard, USA) KEY BUY AWARD. "Pure inspiration-it sounds great & samples like a dream." FIVE STAR AWARD (SOS). "An absolute essential. 91%" PLATINUM AWARD (Future Music, UK)



## VOL

## Dance Drum laops from 1001 Drumloops Loop sholics could be your styles include hi Styles include hardcore, hou and all lo





## Orchestral Brass

A selection of Orchestral Brass from the critically acclaimed Quantum Leap Brass. "An impressive & versatile brass library. Just the thing for anyone who wants to put some polish on his brass! FIVE STAR AWARD" (Sound on Sound, UK); winner KEY BUY AWARD (Keyboard, USA)



VOL 24



## Pop & Funk Brans

library features the dynamic sounds of the UK's most respected horn section -The Phantom Horns (John Thirkell and Gary Barnacle.

Tremendous value - the sheer number and variety of use ble riffs and phrases is fantastic." FIVE STAR AWARD (Sound on Sound)

## VOL



## rom Ethno World





to its new position on the same drive, but the whole string of commands worked perfectly.

You need to reboot before the new partitions will be recognised by Windows, but during the reboot I entered the BIOS to temporarily disable my ailing 2Gb C: drive, and then inserted a Windows 98SE Startup disk in the floppy drive. When I exited the BIOS and rebooted. my freshly formatted 2.5Gb Active partition became the new C: drive, and I could then install Windows 98SE on it. I deselected all the optional Setup components (any that you decide you want later, you can install on demand), and it took about 20 minutes to create a new and pristine desktop.

With this first installation of Windows up and running, I then rebooted, re-enabled my old C: drive, and ran PartitionMagic from there to make the General partition Hidden and the Music partition Active. This time, when I rebooted and made my old C: drive disappear, the PC only found the Music partition, and I was able to install a second instance of Windows 98SE on it. Finally, by following exactly the same procedure, I was able to install a third instance of Windows 98SE on my freshly created Review partition.

## **A Question Of Choice**

At this stage, I made my General partition the Active one once more, and then installed BootMagic (which comes bundled with PartitionMagic) on it. If I had left the default setting in place, every time I booted I'd be presented with a little menu offering a choice of the three operating systems. However, I decided to set the BootMagic startup delay to 'None', so that it boots straight into my General partition by default, without pausing to display the menu. Whenever I want to enter the Music or Review partitions I simply hold down the left-hand Shift key during the boot, to launch the menu.

Now that my new triple-boot configuration was up and

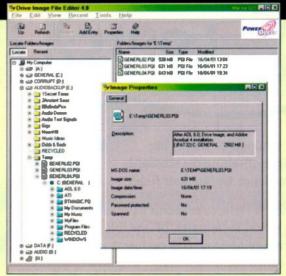
## Powerquest Drive Image 4.0

To provide additional data security for my new regime (see main text), I invested in PowerQuest's *Drive Image* utility. Unlike a simple file-by-file copier, this creates a complete Image file of a partition or drive, including all its hidden files, Registry, and preferences. You can use it to back up an operating system, so that if the worst happens and your PC suffers an unrecoverable crash, you can restore the Image file and return your hard drive to exactly the state it was in at the time the Image was taken. Given my circumstances, I was keen to see how it performed, and I wasn't disappointed.

There's no way you can copy a Windows partition while it's running, so *Drive Image* actually runs from DOS, although it has been designed to look exactly like a Windows application. You can install and run the package from Windows 95, 98, ME, NT 4.0, or 2000 Professional, and then either create a floppy 'rescue diskette' that lets you boot your PC even if its Windows partition gets completely scrambled, or launch the version installed on your hard drive from inside Windows.

There are three options on the main screen. 'Create Image' lets you select one or more partitions on any available drive for imaging, and provides optional compression at Low and High levels, should you wish to cut the image size down by 40 or 50 percent. This slows down the imaging process, but is handy if you want to save image files onto Zip or Jaz cartridges, or on CD. Also helpful in this case is the 'Span Image File Into Multiple Files' option, which allows a large hard drive image to be spread across several such removable media. I decided to save my images onto the remaining acreage of my combined 60Gb of hard drive storage, and I therefore selected 'No Compression' for fastest operation.

'Restore Image' reverses the process, saving either to



Drive Image 4.0 lets you capture an Image of the entire contents of a partition or drive, to restore later if anything goes wrong.

the original location (to allow you to return to a previous version of your drive contents), or to a new partition (to recreate the contents elsewhere on the same PC). 'Disk' To Disk' lets you copy the contents of a partition on one drive to another drive, and is ideal if you buy a new drive and don't want to reinstall applications from scratch.

Tools are also provided for creating, deleting, hiding, and making partitions active, while the Drive Image File Editor, which does run from Windows, lets you split existing image files for subsequent storage onto removable media, join them together again, and restore individual files or partitions contained within them to the original or a new location. Drive Image worked perfectly on my PC, creating 1Gb image files in less than 10 minutes, and restoring them perfectly on demand. At a price of around £40, it could prove invaluable.

running, I ordered a 30Gb IBM Deskstar 75GXP, which only cost me £115, as a new audio drive. Sadly, though, my run of bad luck wasn't yet over, since the first unit proved to be dead on arrival. However, its replacement did work well, and it was time to carry out the final stages in my master plan.

To keep noise levels low, I only wanted two hard drives in my PC, each in its own SilentDrive sleeve. However, my old 2Gb drive still contained every software application I'd installed since August 1998. So, to retain access to these until I was sure that everything was safely reinstalled and backed up to my new Windows installations, I decided to create a temporary 2Gb partition at the beginning of the new audio

drive, and then use the 'Disk To Disk Copy' function of *Drive Image* (see box) to recreate the old drive, warts and all.

Having done this, I removed my old 2Gb drive altogether, reconnected the 30Gb Seagate drive as Primary Master, and left the new 30Gb IBM drive as Secondary Master. This not only gives me access to the three Windows installations on the first drive, but also allows me to boot into the corrupted 2Gb partition whenever I need to, by changing the BIOS boot sequence, as described in SOS May 2001 - you can install up to four operating systems on each drive, if you really must!

## **After The Event**

To avoid any confusion about which partition is currently

active, and therefore which of my three operating systems is running, I chose different
Desktop colours for each — green for General, mauve for Music, and red for Review. I've already made great progress in installing the various applications required on each one, but this will take some time to complete, since some will need to be separately installed on all three partitions.

However, long-term I feel all the extra effort will be worth it. Each of my three partitions is slimmed down for more streamlined performance, I can reformat my Review partition if any review or Beta-test software throws a wobbly, and my Music partition should never be compromised in any way, ever again. Famous last words!





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# atarinotes

Your Atari can connect to loads of peripherals you might not expect it to be able to use, including removable hard drives, DVD-RAM drives, and CD writers. **Derek Johnson** plugs in.

n using this column to recount all the new and 're-surfacing' musical happenings in the Atari world, I find it's easy to forget the useful tools and utilities that work in the background while you're creating your music, a number of which have been upgraded over the last few months.

For example, Dr Uwe Seimet's HD Driver has reached v8. This established package works on all Ataris and many clones, with support for some alternative operating systems. It allows a wide variety of drives, including various flavours of SCSI, IDE/EIDE, Ultra DMA and ATAPI, to be used with an Atari. Removable media are also supported, so you can use SyQuest, Iomega, and even DVD-RAM drives. Special tools are provided for configuring lomega Zip and Jaz drives, so that you have almost all the functionality that Mac or PC users would have.

There appears to be no upper limit to drive size, though for really big drives — 1 Gb or higher — ST and STe computers will require a compatible SCSI adaptor, such as WB Systemtechnik's Link 97; in any case, you'll need one of these in order to use SCSI drives at all. DOS/Windows media

## **News Stand**

Just as I was finishing this column (at the end of May), I received notification that the May issue of netzine My Atari is available online to read, and that the April issue is available to download. The May issue's main focus is pre-ST Atari 8-bit machines, while the April issue features a breezy 12-part web page design tutorial, and a review of Hector Facundo Arena's ultra-compact, freeware, text-based Atari HTMLGen HTML tool

W www.myatari.net

compatibility is provided, making for relatively straightforward data swapping between the Atari family and Macs or PCs. The software is compatible with the latest SCSI driver standard, providing "low-level access" to SCSI, IDE and ATAPI devices such as CD-ROM drives, CD writers, scanners and so on.

Worth noting is that v8 and higher versions of HD Driver are not compatible with Steinberg's Cubase Audio, due to the fact that HDD's latest SCSI driver doesn't allow two programs to compete for the SCSI buss. UK distributors Atari Workshop note that v7.9. which works perfectly with Cubase Audio, will be provided in these cases. HD Driver v8 costs £29.95 plus p&p; updates from v7.x cost £15, while earlier versions can be updated for £20, both plus p&p. The Link 97 SCSI adaptor mentioned above costs £59.95 plus shipping, from Atari Workshop; MegaSTe and tower-case Link 97 options are available too.

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- www.atari-workshop.co.uk
- www.wbsystemtechnik.de

## **RAM Raider**

A few months ago in this column, I provided a quick rundown of the things you can do to enhance your Atari, and as a result enterprising ST user John Heyward has emailed to point out that he's selling RAM upgrade kits for the STe family. On the face of it, the STe is easy to upgrade: unlike previous Atari computers, it came with four slots capable of accommodating SIMM (single in-line memory module) RAM cards, rather than having its RAM soldered directly to its main board. The idea was that you

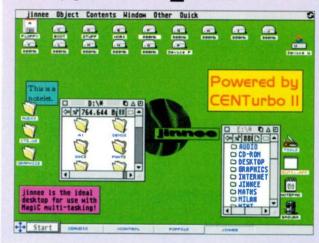
## Jinnee Out Of The Bottle

Manfred Lipert's Jinnee alternative Atari desktop has reached v2.5. To recap, this utility is compatible with all flavours of Atari, and is particularly well-matched to the MagiC 6 alternative operating system. It borrows some of the best aspects of MacOS and Windows, and provides your Atari with access to: spring-loaded folders; long file names; lots of customisation; icons for files; folders and programs on the

desktop; drag-and-drop facilities; up to 50 programs launchable by keyboard shortcuts; notepad; and recoverable waste bin. Jinnee retails for £39.95, or £99.95 if bundled with MagiC 6, plus p&p. Upgrades from earlier versions cost £15; manual and disks must be returned for an upgrade.

Atari Workshop +44 (0)1344 890008.

W www.atari-workshop.co.uk
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would simply buy the RAM you required, to a maximum of four 1Mb modules, and slot them in. But anybody who's ever taken apart an Atari will know that this procedure isn't necessarily as straightforward as it could be. Luckily, John has included full instructions for disassembling an STe, installing the RAM, and putting the computer back together. The most important points to be aware of are that you need to remain grounded during the upgrade operation, and that the screws that hold the top panel in place are not all the same size. John also makes the sensible suggestion that various parts of

your Atari could be sanitised while it's in bits!

John's RAM, mainly recycled from old PCs, costs a very reasonable £12.50 (US\$21). including shipping, for the full 4Mb. That may not seem like much in a world of cheap RAM. where Macs and PCs can have Gigabyte RAM capacity, but when you're MIDI sequencing with compact ST applications, it's tons. If you have a pre-STe Atari ST that's been modified with a RAM expansion board, but you haven't filled it with RAM, John's SIMMs should also be compatible with that.

W http://4mbste.atarl.org

## CD Drive Time

Anodyne Software's ExtenDOS Gold v3.3c is the latest release in a line of utilities that allows your Atari to use CD-ROM drives and CD writers, including SCSI models if you have appropriate interfacing. The software lets you use audio and data CDs, and is compatible with most CD-ROM formats; it also allows you to easily copy CD audio to your desktop, where it appears as WAV files. CD writers are supported for actually burning CDs, providing you have Anodyne's CD Writer Suite. ExtenDOS Gold v3.3c costs £39.95 plus P&P, and free updates can be downloaded from the Internet.

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## 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



sixteen 60mm sliders. These sliders may be assigned to a variety of MIDI control functions, which are held as one hundred templates (Targets). As the C16 is mainly a preset device you avoid the brain-ache of having to program it yourself, and you can quickly get stuck in to using it creatively. The large number of presets (ninety-eight) means that C16 is ready, out of the box, to do most of the jobs that you are likely to want it to do.

It is easy to recall one of the Target presets. First, you look up its number. Then, holding down the TARGET SELECT pushbutton, you move sliders 4 and 5 until the two-digit LED display shows the correct number.



The C16 has one MIDI IN and one MIDI OUT. It automatically merges the MIDI data it receives with the data it generates.

The C16 has extensive support for GM, GS and XG. It can generate MIDI Controllers, NRPNs, RPNs, Aftertouch, Pitch Bend, Notes and the majority of SysEx parameter change messages.

If the MIDI messages you require are not available from a preset, two programmable Target locations (98 and 99) allow each slider to be individually set up. Rather than cram such



powerful functions into an awkward user interface, we provide an easy-touse computer application (Mac and Windows versions are available for free download from our website).

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 been shipping in quantity since July 2000, and many hundreds of units have been sold. In late May 2001, 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

## These MIDI thru units have two MIDI inputs

Some of your MIDI gadgets may lack the thru sockets which are required for connecting devices together in a 'chain'. Where thru ports are provided, the signal throughput may be distorted,- so performance may be unacceptable, particularly on 'chains' of three or more.

You can solve these problems easily with our low-cost MIDI thru units. Two of our thru units have route switching and are two-input devices.

The V8, which has two inputs and eight outputs (arranged as two banks of four), is

supplied with an external mains adaptor.

The mainspowered W5 has

independent source selection for each of its five outputs.

V8 MIDI Thru Unit ...... £35.95 W5 Dual Input Thru Unit ...... £48.75

## Select a selector

These simple switch-in-abox gadgets could solve your MIDI routing problems and save vou the



inconvenience of swapping cables about.

The 3B is a novel ganged changeover switch, which will let you bypass your computer or sequencer without moving cables.

2\$	MIDI	Selector	£12.95
<b>5S</b>	MIDI	Selector	£29.95
3B	<b>MIDI</b>	Selector	£29.95
9\$	MIDI	Selector	£39.95

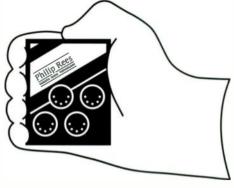
## MIDI to DIN Sync box

Classic drum machines and sequencers, such as the TB-303 and TR-808 are equipped with Sync24 ("DIN Sync") inputs. When connected up via MDS, they should start, play in time, and stop automatically by remote control from your MIDI master equipment.



The unit is easy-to-use, compact and contains an integral mains power supply.

MDS MIDI to Sync24 Converter.. £69.95



## **Functional simplicity**

## Versatile MIDI Channel Shifter & Filter

The useful CSF MIDI Channel Shifter and Filter is a convenient, compact MIDI processor unit with a built-in mains power supply. It allows you to selectively pass or reject MIDI messages by channel, or to alter their channel assignments. It also makes it possible to 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 16 position switch generally selects a MIDI channel. A 12 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:

- bypass (pass all)
- 2: mute all system messages
- mute System Exclusive messages mute MIDI Time Code quarter frame messages
- 5: mute Song Select messages
- mute Clocks, Start, Stop and Song Position Pointer
- mute Active Sensing
- mute all channel messages 8: mute all notes (on all channels)
- 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

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# spiritual enlightenment



owadays, when you think of synthesizers your mind probably makes a geographic leap across various ponds to Japan, home of Roland, Korg and Yamaha. When you think about vintage synthesizers, you will almost certainly think of the USA, home of all things Moog-y and ARP-ish. You may even spare a stray thought for the UK's quirky analogue synths — EMS and Analogue Systems among others — or the strange and frequently unfinished Teutonic species from PPG and Waldorf. However, as your consciousness flits around the synthesizer world, it's unlikely that you'll spare much thought for Italy, the the home of ghastly Ekos, insignificant Jens and uninspiring Siels. Yet Italy is the home of two of the greatest analogue synths ever manufactured. In the polyphonic world, the Elka Synthex ranks alongside the Oberheim

If the Crumar Spirit is one of the best analogue monosynths the world has ever known, how come you've never heard of it? Gordon Reid explains...

Matrix 12 and Prophet VS, in terms of both price and desirability. And in the monophonic world, there's the Crumar Spirit. a synth so obscure, and of such overwhelming eccentricity, that nobody bought it, nobody used it, and almost nobody remembers it. This month, we're going to change all that.

## Cru... Who?

You may be surprised to know that some of the world's best accordions originate in Italy. Indeed, a whole accordion industry developed around the city of Castelfidardo (on the Adriatic coast) at the tail-end of the 19th century. Next, in the first half of the 20th century, the Italians embraced traditional organ technology and then, in the '60s and '70s, they jumped on the electronic home-organ bandwagon. By this time, numerous companies were building keyboards in and around Castelfidardo. These included Elka, Eko, Farfisa, Siel, and — you've guessed it —— Crumar, whose founder was a chap named Mario Crucianelli (Cru-Mar).

Anticipating the imminent collapse of the home organ market in the early '70s, Mario Crucianelli directed Crumar down a new path, and the company soon became famous for the cheap and nasty electric pianos that were to be its hallmark for the next decade. Fortunately, Crumar's next batch of products was far more interesting, embracing primitive string and brass synthesis, and the company enjoyed a short-lived burst of fame when Emerson Lake & Palmer, Greenslade and The Enid adopted its quirky Stringman and Brassman keyboards. Unfortunately, the affordability of Crumar's instruments conjured an image of cheap shoddiness, so most serious players avoided them, no matter how innovative later models proved to be. From the groundbreaking Multiman to the company's first true synthesizers, the DS1 and DS2 (see 'Before The Spirit: The Crumar DS2' box), there was much that was unconventional about the Crumars of the late '70s. Even the cost-cutting engineered into 1982's Stratus and Trilogy helped to create unconventional synths that remain unique to

Nevertheless, Crumar singularly failed to make it into the big league, so when they announced the Spirit in 1983, nobody took any notice. The world's interest was only marginally more piqued when Crumar let it be known that Jim Scott (one of the co-designers of the Minimoog), Tom Rhea (another Moog employee best known for writing many of Moog's synthesizer manuals) and none other than Bob Moog himself had helped design it. And that's a shame, because, as you will see, the Spirit is one of the most complex, challenging, and — above all — powerful monosynths ever produced.

## **Technologically Speaking**

It's hard to know where to start when describing the Spirit. This is because it is much *deeper* than other analogue synthesizers. So let's ease into things gently, and start our tour with its one relatively straightforward section: the oscillators.

On the surface, Oscillator A couldn't be simpler, offering just one control, to select the waveform produced. Much like the Minimoog, there are six options: triangle; square; 30, 15 and five percent pulse; and sawtooth. The master tuning control lets you select the Oscillator A octave, with options ranging from 32' to 4'.

Oscillator B is more complex. Its six waveforms are triangle, 40, 20, 10 and three percent pulse, plus sawtooth, and it has four 'octave' ranges (-1, unison, +1 and +2 with respect to Oscillator A) and a detune

## **Chips With Everything**

The Spirit is a treasure trove of desirable synth chips, with a pair of CEM3340 oscillators, a pair of CEM3350 Dual VCFs, and no fewer than six CEM3360 Dual VCAs.

If this means little to you, I should point out that the 3340 provided the voicing for the Moog Memorymoog, the Oberheim OBXa, OBSX and OB8, the Roland SH101, MC202 and Jupiter 6, early revisions of the Roland MKS80 Super Jupiter, the Rev.3.x Prophet 5s, all Prophet 10s, the T8, the Pro One and the Prophet 600.

Likewise, the Spirit shares its filters with the revered Rhodes Chroma, a fantastic polysynth of huge sonic potential, let down only by its unreliability. And the 3360 VCAs were used in a huge range of instruments, including the Ensoniq ESQ1 and SQ80, the Linndrum, the Memorymoog, numerous Oberheims, the PPG Wave 2.2 and 2.3, the Chroma, the Jupiter 6 and MKS80, and some of the Prophets.

You may wonder why I've taken the trouble to list all these instruments, but there is a point. If you look back at all the synths I've named, there isn't — sonically speaking — a single turkey among them. The Spirit shares its architecture with the very best.

control that spans ±8 semitones. But what of those range settings marked 'Bass' and 'Wide'? These disconnect Oscillator B from the pitch CV generated by the keyboard, instead offering frequency ranges from 30Hz-300Hz (Bass) and 2Hz-10kHz (Wide) that you can modulate and/or use as modulators within a patch. Used with — for example — oscillator sync (oops, didn't I mention that?), this allows you to create all manner of unusual and powerful sounds, as Oscillator A tracks the keyboard, but Oscillator B drones at constant (or modulated) frequencies. Hmm... did I say that the oscillators are relatively simple? My mistake!

The filter is, as always, the next stage in the signal path. Well... no, that's not quite right. Let's start again... The dual multi-mode filters are the next stage in just one of the signal paths. Still with me? No, I didn't think so. So let's continue by looking at the filters themselves.

Crumar called the primary signal path the Filter/ADSR path, for the simple reason that the output from the oscillators passes through the filter and ADSR/VCA stages in conventional fashion. As I've already stated above, there are two filters, named U and L, for Upper and Lower. However, don't for a moment think that these are low-pass and high-pass filters. The names describe their physical positions on the control panel, not their functions.

Filter U is the more conventional of the two. This is a low-pass device with a master cutoff-frequency control, variable keyboard tracking from zero to approximately 110 percent, and a dedicated ADSR contour generator with variable depth and both positive and inverted polarities. Furthermore, a simple rocker-switch selects between the 12dB/octave and 24dB/octave cutoff slopes of the filter, allowing you to choose between Oberheim SEM/early ARP-style (12dB/oct) or Moog/late ARPstyle (24dB/oct) filtering. (There's nothing remotely Japanese about the Spirit's character, but the ARPs of early Genesis LPs leap out almost unbidden.) Filter U also offers resonance, controlled by a switch that selects between a fixed 'Low' resonance (of approximately Q=1/2) and Variable resonance, which you alter using a conventional knob.

Filter L is the weird one. This offers four modes. The first is 'Out', wherein the filter is simply removed from the signal path. In contrast, Overdrive mode "It's hard to know where to start when describing the Spirit. This is because it is much deeper than other analogue synthesizers."

## There's Always Room For A Few Digits

Inevitably, given the sophistication of the Spirit's keyboard scanning, it boasts a fair amount of digital technology under the hood. A quick glance at the schematics reveals a selection of decoders, scanners, adders, filip-flops, shift-registers, a D-A converter (to provide the pitch CV) and even a computer connector, presumably for diagnostics and servicing. But none of these lie in the signal paths. Where its sound is concerned, the Spirit is as analogue as analogue can be.

## CRUMAR SPIRIT

 introduces a distortion circuit between Filter U and Filter L, and configures Filter L as a parametric EQ that adds a peak at its cutoff frequency, but without attenuating the signal on either side of the boost. The third mode is Band-pass, which is similar to Overdrive mode but without the distortion. Finally, High-pass mode acts as you would expect, making the Spirit a more conventional dual-filter synth with high-pass and low-pass filters.

Further to this, the Spirit offers a range of controls over the modes listed above. The first of these is the Dynamic/Formant switch. In the 'Formant' position, this disconnects Filter L from the keyboard tracking, filter envelope and other filter CVs, allowing you to introduce a fixed (indeed, formant) filter into the signal path. Filter U is unaffected, so you can impose this formant on to a conventional LPF sound... nice! Furthermore, the Resonance knob always affects the parametric boost or high-pass filter resonance, whether or not you use the Low/Variable switch to disconnect the low-pass (U) filter.

Confused yet? No? Well, how about this: Filter L provides a second filter cutoff knob but, rather than controlling an absolute value for filter cutoff, it moves the cut-off relative to that of Filter U. The two filter cutoffs (U and L) are the same when the knob is in approximately the 8/10 position, thus allowing you to move the cutoff of Filter L above and below that of Filter U.

Now, if you make the two filters' cutoffs coincident and select either Overdrive or Band-pass mode for Filter L, you can play the self-oscillating filters conventionally over most of the range of the keyboard. However, if you offset them slightly you obtain a range of ghostly timbres unique to the Spirit. (This is because the 'knees' of the filters no longer coincide.) And, don't forget, you can have one filter tracking the pitch CVs while the other is stationary, so the filter characteristic can change as you play up and down the keyboard. This architecture makes the Spirit hugely flexible and, ultimately, hugely rewarding. However, the filters are far from the end of the story.

The next stage in the Filter/ADSR signal path is a simple VCA with an associated ADSR envelope. You can bypass the envelope generator using the Bypass switch, and Gate the envelope from a variety of sources. Most conventionally, you'll want to Gate it from the keyboard, using the Single or Multiple triggering option. The keyboard's priority is primarily last-note, but the Spirit also remembers the first note played. Consequently, if you release all subsequent notes while holding the first, the pitch returns to this, but without a re-trigger. This has an important and beneficial consequence: if you brush an unwanted note last, the Spirit will ignore it once you have released it, leaving the desired note sounding, and sparing your blushes. Again, I believe this to be unique to the Spirit, making it a first-class instrument for lead and bass lines. What's more, the keying system also makes the Spirit ideal for lines or phrases where you may wish to return to a 'root' drone between notes or phrases. Wonderful stuff!

There are three other sources of Gate: 'X', 'Y', and 'EXT'. So this is an ideal time to look at what is perhaps the most confusing and most powerful part of the Spirit's architecture: the modulation sources with the nattiest names in synthesis: Mod X and Shaper Y.

## What's In A Name?

When you think about it, most integrated monosynths offer little in the way of modulation sources. Sure, there's usually an assignable LFO, and some synths have dedicated LFOs for pulse-width modulation and so on. But unless you fork out for one of the better endowed dualor triple-oscillator synths, there's little or no chance of audio-frequency AM or FM, sample & hold, or an arpeggiator. Inevitably (or I wouldn't have

mentioned it), the Spirit has all of these, and much more.

Let's begin with Mod X. This offers six modulation sources: triangle wave, square wave, S&H, Shaper Y, red noise, and oscillator B. There's also a dedicated LFO, which doubles as the S&H clock if that option is selected. Then there's the arpeggiator. This has three modes, the first of which is called Ripple, and which plays any held notes in an upwards pattern at the LFO rate. The second is Arpeggio; this repeats the held notes, first at the played octave, then the one above, then the one below, thus making all arpeggios into three-octave patterns. The final mode is the confusing but rewarding 'Leap', which plays the first note in the arpeggio at the source octave, the second at +1 octave, and the third at -1 octave, then repeats the cycle. This may not sound like much, but imagine that you're holding four notes. The complete cycle is then 12 notes long. Leap arpeggios can become very complex, especially if you change one or more of the played notes during the arpeggio. I suspect that this is yet another facility unique to the Spirit, and if you've ever wanted to compose tracks in the style of Steve Reich, this is the way to do it.

Of course, you'll want to control *something* with Mod X, and a quick hunt to the far left of the control panel will lead you to the Wheel Destinations section, which allows you to direct the modulation to five destinations: the pitches of Oscillators A and B; the pitch of Osc A alone; the pulse width of Osc A; the Upper and Lower filter cutoff frequencies; or the cutoff frequency of filter U alone.

The reason why this is called the Wheel
Destinations panel (rather than the Mod X
Destinations panel) is because the modulating CV
produced by Mod X passes through the dedicated
Mod X wheel before being routed to its destination.
This gives you full control over the amplitude of the
modulation.





The Mod X and Shaper Y modulation sources are amongst the Spirit's most unusual and powerful features.

## Two Models?

Despite the Spirit's rarity, there are two models, cosmetically if not electronically. Early models were finished in the dark wood shown here (this is serial No. 00017) but some later units were housed in a gorgeous, lighter coloured case. The Spirit in the now-defunct Museum Of Synthesizer Technology was one of these 'blonde' models.

The action of Shaper Y is, if anything, *less* obvious than that of Mod X. This, too, has an LFO with a Rate knob, but in this case it's a 'triangular' generator whose waveform can be varied from sawtooth, through triangle, to ramp wave, using the Shape control. But the real power of Shaper Y lies in its Mode control, which adds four more options to the Spirit's already over-burdened feature-list.

'Free' turns Shaper Y into a simple LFO centred on 0V, thus making it ideal for simple vibrato or tremolo. In contrast, KB Hold gates the Shaper Y waveform, so you can use it as a secondary ASR contour generator whose A and R rates are determined by the Shape and Rate selected. The Reset option is similar to KB Hold, except that it describes an AD contour rather than an ASR contour (as long as you don't retrigger it before it's completed the cycle. If you do this, it resets to zero, and starts the AD contour again.). Finally, 'Run' is an unconditional AD contour that always completes its cycle, even if you take your hands away from the Spirit and start playing something else. This can be very useful for sound effects and drones that you've programmed to continue developing after you've moved your hands to other instruments.

Like Mod X, Shaper Y passes through a dedicated wheel before being presented with a list of possible destinations. These are: the pitches of Oscillators A and B (again); the pitch of Osc B alone; the pulse width of Osc B; the Mod X LFO frequency; and the cut-off frequency of filter L alone. As you can see, this list perfectly complements that of Mod X.

But hang on a minute — there's also a switch in the Wheel Destinations panel that lets you modulate (or contour) the output from Mod X with that of Shaper Y. And, if you think back, you'll remember that I've already said that one of the modulation sources within Mod X is Shaper Y. And now I've stated that one of the Shaper Y destinations is the LFO in Mod X.

Have you got a headache yet? Well, it's just about to get worse. Do you remember that the Spirit has two signal paths? The second of these is the Shaper Y path, and this passes all the sound sources, including the Ring Modulator (which I haven't yet mentioned) through a simple 6dB/octave low-pass filter and then through another VCA whose gain is controlled (or 'shaped' — hence the name) by Shaper Y. Furthermore, all the Mod X and Shaper Y modulations are still applied to this signal.

On top of that, the Mixer section allows you to mix the Oscillator A and B levels, plus Noise, within the Filter/ADSR path, to the Oscillator A and B levels, Ring Mod level, and Noise level within the Shaper Y path. And, like so much else in the Spirit, this turns out to be more than it seems. This is because — even ignoring the myriad other possibilities offered by this architecture — the U and L filters introduce tiny phase shifts in the signal that fatten up the sound considerably when you mix Filter/ADSR sounds with the same sources passed through the Shaper Y path.

## In Use

Clearly, the Spirit is a fantastically complex synth. Indeed, you would be hard pressed to emulate its intricacies using a modular instrument, if only because you would run out of CV inputs and patch leads long before you recreated all its weird and wonderful routings. But if you want to patch the Spirit in simpler fashion, you can ignore Mod X, Shaper Y, and most of the oscillator and filtering options, and play it like any other dual-oscillator synth. Unfortunately, ignoring and/or switching off all the complex bits is not straightforward, and I've seen experienced players almost reduced to tears when presented with a Spirit for the first time.

But once you've mastered it... Wow! For example, you can build a simple lead patch with just one oscillator, a touch of vibrato, a touch of filtering, and appropriate envelopes to taste. Now add a little portamento (yet another facility I've failed to mention), grab the pitch-bend wheel (there's another one) and the Spirit is showing its colours as a superb performance synth with depth and character. Now add the second filter in Band-pass or Overdrive

## Before The Spirit: The Crumar DS2

Crumar released their first true synthesizer in 1978 — a full eight years after Moog and ARP defined the market, and more than four years after Korg and Roland began their domination of the low-cost arena. Consequently, and despite a good range of features and a price of just £495, everybody overlooked the DS1. The same fate befell its more heavily endowed brother, the DS2. In many ways identical to the DS1, but with a fledgling polysynth section, the DS2 cost £645 (later rising to £725), and sold equally few.

Like the Spirit, the DS2 is a twin-oscillator monosynth with a 24dB/octave resonant low-pass filter. And, like the Spirit, the DS2's greatest strengths lie in the modulation capabilities of its twin LFOs. The warmth of a Minimoog or Pro One is far out of its reach, but it is capable of some expressive lead sounds and a huge range of sound effects.

In contrast, the DS2's polyphonic section is laughably limited, even by the standards of 1978. However, many of the monosynth's facilities act upon it, allowing it to create an unexpected range of percussive timbres.

## The Crumar Family

Because of its undoubted success as a purveyor of all cheap things piano-like, organ-like, and stringy synth-like, Crumar was never perceived as a serious synth manufacturer. In the UK, this situation was exacerbated by the London Synthesizer Centre (later known as 'Chase') who advertised every instrument at double its true price, then offered it as an "amazing, unrepeatable half-price bargain".

Despite this, or maybe because of it, Crumars flooded the market. The company's electronic pianos were very cheap by the standards of the time, as were its string machines, which cost a fraction of the prices of the up-market instruments they sought to emulate. When, in 1977, Crumar released the aptly named Multiman, it was the first of the so-called 'multi-keyboards', and this broke the ground for many instruments that followed, including Crumar's own Composer, Stratus, and Trilogy.

In the end, there were nearly 40 Crumar keyboards, two sets of 'Chase' bass pedals, three 'Bits', plus a couple of Bits and a master keyboard rebadged under the 'Unique' name in the USA. Here are a few of the more interesting ones, with a list of suggested prices guaranteed to drive your "yeah, well, mate, it's expensive 'cos it's analogue..." dealer up the wall.

Instrument	Suggested value	Comments
Organiser	£50	A portable drawbar organ that sounds great through a Leslie simulator.
Stringman	£50	Used by some surprisingly famous '70s names.
Brassman	£50	A dedicated brass synthesizer. Rare, but not sought after.
Multiman	£50	Crumar's first multi-keyboard. Known in the USA as the Orchestrator.
Composer	£100	A better multi-keyboard, with Strings, brass, mono and polysynth.
Trilogy	£125	A typical '80s multi-keyboard with strings, poly/brass and organ sections.
• Stratus	£90	The Trilogy's simplified little brother.
Bit One	£100	This six-voice polysynth caused quite a stir when it was launched in 1984.
• Bit 99	£175	A more reliable Bit One with more memories and a usable MIDI spec.
• Bit 01	£125	The Bit 99 in module form. Well worth snapping up.

As for the Spirit itself, I'd put a value of around £350 on it, but if you don't own one now, it's unlikely that you ever will. Estimates of the number built range from about just 100 to 300 or thereabouts, and those who have them seem to be hanging on to them. Sorry!

## **CRUMAR SPIRIT**

mode, set the controls, and you're moving into very expensive sonic territory. And we haven't yet touched the second oscillator and the myriad modulation options, let alone added the Shaper Y path to the signal.

Of course, no vintage synth is complete without a selection of rear-panel inputs and outputs, and — as you might expect — the Spirit is no slouch in this department, either. For one thing, it offers individual outputs for the Filter/ADSR and Shaper Y audio paths, thus allowing you to direct the two timbres to different mixer inputs and effects paths. There's also an audio input that replaces Noise in the internal signal paths, so the phenomenal filtering and shaping power of the Spirit can be applied to external signals.

As for voltage control, there's a Filter Pedal input that controls the Lower and/or Upper filter cutoff frequencies, and an Osc B input that controls the pitch of oscillator B (which is ideal for sync sounds). Of course, there's nothing stopping you from using these inputs as general CV inputs, if you wish. Oh ves, and there are conventional CV and Gate inputs and outputs too.

All of this means that, despite its 'integrated' appearance, the Spirit is a superb addition to a modular analogue synth setup. It can provide all the keyboard functions needed, and offers a bountiful supply of voltage controlled wotsits to patch into the modular system itself.

Unfortunately, we'll probably never know whether we can attribute the power of the Spirit directly to Bob Moog, but there's no doubt in my mind that, as a performance synth, it ranks alongside the Minimoog. Sure, they sound different, but they both beg you to play them. If there is a difference between the two, it's in the Minimoog's immediacy: you can hardly fail to conjure superb sounds from it, whereas the Spirit demands that you learn and understand its complexities. Above all, the Spirit is a synth that rewards patience, experience, and a lot of thought, rather than aimless knob twiddling. But once you've mastered it, all the classic analogue timbres are at your fingertips.

## And Afterwards...?

Despite its power and flexibility, the Spirit was to be the last monosynth produced by Crumar. Indeed, it was the last instrument to bear the Crumar name because, in 1984, the company launched an analogue polysynth under the name 'Bit'. Designed by none other than Mario Maggi — the man responsible for the Elka Synthex — with dual oscillators, dual contour generators, and bonuses such as MIDI, velocity sensitivity, unison, splits and bi-timbrality, it compared favourably to more expensive instruments. But the Bit One was not a DX7, and it provided none of the crisp, new sounds that dominated music from 1983 until 1988.

Nevertheless, Crumar released three incarnations of the Bit. After the Bit One, there was the improved and remarkably affordable (£499) modular version, the Bit01. Finally - in the autumn of '85 - the £699 keyboard version of the '01' appeared. Called the

Bit99, this addressed many of the Bit One's shortcomings, and remains a useful but under-rated polysynth to this day.

To give Crumar credit, even in the late '70s they were well aware that the era of analogue synthesis had passed. But whereas adding a microprocessor to an analogue synth was not too expensive — either in terms of development time or cost — designing a true digital synth was beyond its means. Furthermore, Castelfidardo did not have a large industrial base or a university with which to share the R&D burden, so Crumar turned to the USA to co-develop a generation of digital instruments to release alongside its low-cost synths.

In collaboration with a New York company called Music Technology, Crumar first produced a groundbreaking digital synth called the GDS (the General Development System) which was used extensively by Wendy Carlos. This then became the precursor to the Synergy, another pioneering instrument, and one that deserves to sit alongside

## A Little Glide

Even the portamento on the Spirit has two modes. When simply 'On', it acts in the same way as the portamento on most vintage synths, slewing the transitions between keyboard pitch CVs at a rate determined by the Glide knob. But in Auto mode, it does this only when you hold the first key while playing the second. This allows you to add portamento (or release it) by adjusting your playing technique to suit. It's just one more way in which the Spirit exceeds most other synths' performance capabilities.



the Fairlight CMI and the early Synclaviers in the pantheon of synthesizer history. But neither the GDS, the Synergy, nor the Bits could beat off the onslaught from Japan, and in 1987 Crumar ceased trading.

## **Epilogue**

Although Crumar disappeared in the late '80s, other Italian manufacturers were more fortunate. Elka were reinvented as manufacturers of MIDI master keyboards, while Siel were purchased by Roland Corporation, and survived as that company's European division. Generalmusic (GEM) manufacture digital synths and workstations to this day. But of the deceased Italian synth manufacturers of the '70s and '80s. Crumar is the saddest loss. In retrospect. they were a hugely important company because they made keyboards that were cheap enough for players who would otherwise have been restricted to lusting after unattainable instruments in shop windows. And who knows what they may have developed had they survived? If Crumar had released a polyphonic version of the Spirit it could — with perhaps the honourable exception of the Yamaha GX1 — have become the most sought-after analogue polysynth on the planet. How's that for an endorsement?

The Spirit's complement of rear-panel socketry includes an audio input, to allow external sounds to be shaped by the instrument's impressive synthesis facilities.

## The MIDI Spirit

Despite being launched at the very birth of MIDI, in 1983, the Spirit has a hole in its rear panel marked 'MIDI'. This is covered by a plastic grommet. and there are no electronics inside the synth to take advantage of any socket that might have been installed. Moreover, nobody has developed a MIDI interface for the instrument. (Who would, with a potential market of virtually zero?) Consequently, it's very unlikely that there will ever be a MIDI Spirit. Oh well. it's fun to dream.







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# Microphone Data Book

Chris Woolf

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**

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.

BR8
SP-808
JP-8000/8080
VM-3100/3100PRO

Code V012 VP-9000 Code V013 XV-5080 Code V014 Code V015 VM-7000

Code V016 Code V017 Code V018 Code V019



# Portastudio Video Tutorial (Code V020) Portastudio Advanced Video Tutorial (Code V021)

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, us ng 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

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**

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.

Code B414



# FAST GUIDE TO CUBASE VST (3RD EDITION)

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

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!



# by Paul White

The essential ingredients of Paul White's individual bestselling books have been condensed down into this superb range of pocket books. Don't let the 'basic' title fool you, these little gems offer an enormous wealth of practical advice and tips for all levels of reader in each of the subjects he covers. Keep them by your mixer or take them with you on gigs, you never know when you might need them

MULTITRACKING MIDI\_ MICROPHONES EFFECTS & PROCESSORS MASTERING HOME STUDIO DESIGN

207 pages 233 pages 207 pages 207 pages Code B392 Code B393 Code B394 Code B395 Code B396 Code B397 207 pages 191 pages 175 pages 175 pages Code B398 Code B399 175 pages

Code B390









## LOGIC AUDIO FX COLLECTION

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.

194 Pages

by Ralf Kleinermanns

by Ralf Kleinermanns

by Peter Gorges

by Thomas Adam

by Udo Wevers.

by Rainer Hain

by Reinhard Schmitz

by Dave Bellingham

by Dave Bellingham

by Ralf Kleinermanns

# WIZOO GUIDE: VST PLUG-INS

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 plugins 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.

258 Pages Code B383

# **WIZOO GUIDE: NORD MODULAR**

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 musthave for all Nord Modular owners.

178 Pages Code B249

POSTAGE:

# WIZOO GUIDE: FX

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. 142 Pages Code B403

POSTAGE: 154 Pages

Code B385

# WIZOO GUIDE: ROLAND JV/XP SYNTHS

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.

POSTAGE:

# WIZOO GUIDE: THE PERFECT MUSIC PC

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.

Code B410 298 Pages

POSTAGE: UK £4.50



## WIZOO GUIDE: ANALOG SYNTHESIS

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.

134 Pages Code B384

POSTAGE UK £2.75



# WIZOO GUIDE: LOGIC AUDIO 4 MACINTOSH

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.

204 Pages Code B388

POSTAGE: UK £3.25



## WIZOO GUIDE: LOGIC AUDIO 4 WINDOWS

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.

196 Pages Code R389

Postage:



# WIZOO GUIDE: CUBASE VST MAC

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.

Code B382

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## WIZOO PRO GUIDE TO METASYNTH 2.5

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.

Postage: by Dave Bellingham/Peter Gorges

202 Pages

Code B387

## **WIZOO GUIDE: KAWAI K500**0

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 Sound Diver patch examples, Logic environment and samples

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## **CREATIVE RECORDING I: EFFECTS AND PROCESSORS**

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.

285 Pages

by Paul White

by Paul White

by Paul White

by Paul White

by Will Ashurst

by Duncan R Fry

POSTAGE:

UK £4.00

Code B412

Code B201



## by Paul White CREATIVE RECORDING II: MICROPHONES, ACOUSTICS AND SOUND-PROOFING

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.

231 Pages Code B202

POSTAGE UK £3.50



# DESKTOP DIGITAL STUDIO

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

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

diagrams. Recording & Production Techniques takes the reader through

studio, and are described in plain English, clearly illustrated with

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.

240 Pages

UK £3.50 POSTAGE:



## RECORDING & PRODUCTION TECHNIQUES (2ND EDITION)

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.

192 Pages Code B200

POSTAGE **IJK £3.00** 



## LIVE SOUND FOR THE PERFORMING MUSICIAN

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

by Paul White 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.

285 Pages Code B376

POSTAGE:



## HOME RECORDING MADE EASY

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

205 Pages Code R352

Postage: Europe £3.75



## MIDI FOR THE TECHNOPHOBE

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.

184 Pages



# MUSIC TECHNOLOGY — A SURVIVOR'S GUIDE

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.



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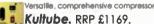
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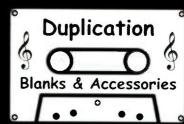
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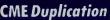
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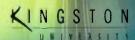
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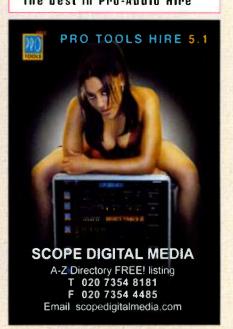
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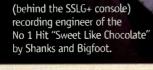
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once attended a filming of Antiques Roadshow. Many were the punters whose illusions were shattered when they heard that their prized possession had the value of a used teabag. Many took it as a personal slight, but many more failed to understand one simple truth: 'old' does not necessarily equate with 'valuable'. 'Old' does not necessarily equate with 'good', either — but you didn't need me to tell you that, did you?

Hohner Pianet, Moog MG1, Casio VL1, Crumar Roadrunner... At some point in the recent past I have seen all these items described as 'vintage', 'classic', or both. A few weeks ago I had a salesman in a local music shop trying to sell me a Korg DW8000, earnestly telling me that it had analogue oscillators ("it's a classic, guv — vintage sound"). Yeah, sure. If he's reading this article now, I'd like to say that not only have I owned a DW8000 in the past, I actually still own a rackmount version. I didn't have the heart to tell you at the time.

When someone wants to shift a crappy old analogue squeak machine, they always go on about its 'vintage/classic' status. Notice the lack of qualitative meaning in those words, yet don't they suggest something good, something inherently

desirable? The seller is probably moving the instrument on because it sounds like a bee in a watering can, has the stability of a dotcom share price, and is incapable of being satisfactorily integrated into a modern recording system, due to a frustrating lack of interfacing options.

But "They don't make 'em like that any more". And how thankful we should be! Why should I put up with the pain of interfacing antique kit when I can MIDI up a virtual analogue, or, better still, drop a plug-in instrument into my sequencer? Gone are the tuning problems, the vagaries of control voltages, the lack of patch memories. I can hear the gasps of horror even as I type, so let me tell you that I do own a collection of old analogue gear that I'd never be parted with. Am I contradicting myself, then?

Respect doesn't simply come with age; respect has to be earned. For a synth to warrant your respect, time and effort (and cash), it should earn its keep. If I can find a machine that does a more effective (or cost-effective) job than the one I have now, I'm happy to take it on. I don't pretend that I'm immune to the collecting fetish, but neither do I fool myself into believing that owning certain old machines somehow makes my music any better.

If an instrument makes the sound you want, use it. But how far you are prepared to go to integrate a specific machine into your system is really down to how badly you want its sound.

I'd go a long way to ensure that my Minimoog is available to me, but a Roland TB303? I'd rather drop another VST instrument into the virtual rack, thanks all the same.

This goes for effects processors too. I enjoyed my old 'classic' Copicats and Space Echoes, but I'm far happier to use a plug-in — the result will be cleaner, consistently repeatable, and available at the drop of a hat. By contrast the 'real thing' needs careful maintenance, a constant supply of new tape loops, and a noise gate to remove the hum and hiss that emanate from the thing when it's dormant.

Examine the economics, too. Cost up a decent 'classic' monosynth and a MIDI/CV converter (not to mention a mixer, if you have more than one synth to accommodate). Look at the price of a software plug-in. And then ask yourself whether your audience would genuinely be able to tell the difference.

I'm a great defender of the strange, the kludgy and the quirky. I believe that there are few instruments that are not capable of making a useful contribution, given the right context. I personally use odd combinations of bench-top amplifiers, long-forgotten stomp-boxes, toy keyboards, Stylophone and home-made nightmares to produce some of my favourite sounds. Would I describe any of these as 'classic' or 'vintage'? Depends on how much I'm trying to sell them for, I suppose! SS



# Paul Ward wonders whether 'classic' always means

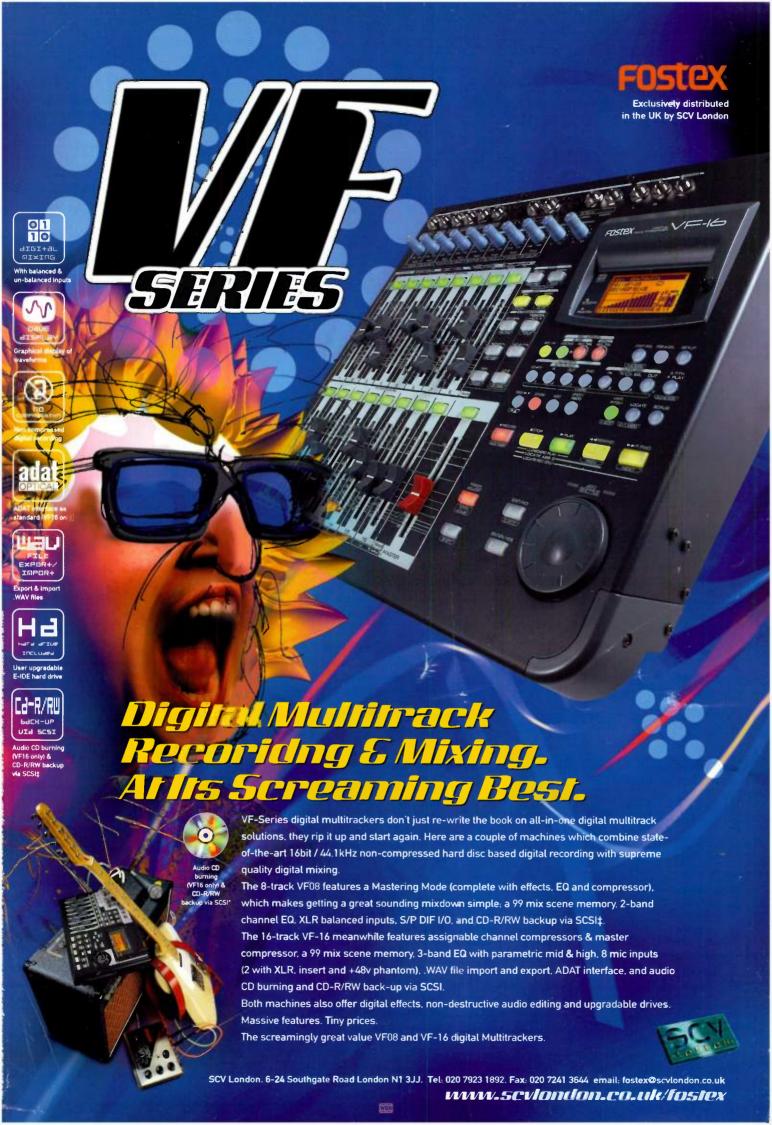
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# **About The Author**

Paul Ward is a regular contributor to Sound On Sound. He has made several albums of synth-based music and has also produced recordings for theatre and television. He has recently been recording with soul singer Deeajay and rock band Balley's Comet, and is now producing tracks for rock band Darkadia.

If you'd like to air your views in this column, please send your ideas to: Sounding Off, Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambridge, CB3 8SQ, UK. Any comments on the contents of previous columns are also welcome, and should be sent to the Editor at the same address.

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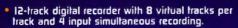
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