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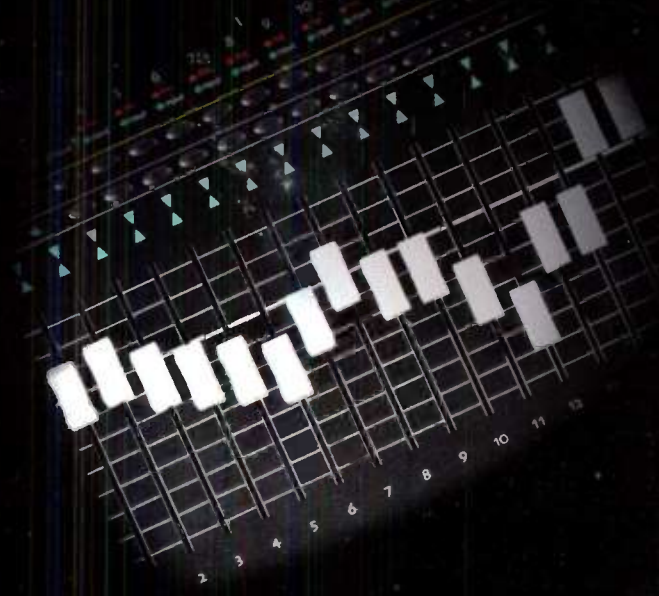

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VOLUME 13
ISSUE 3
JANUARY 1998
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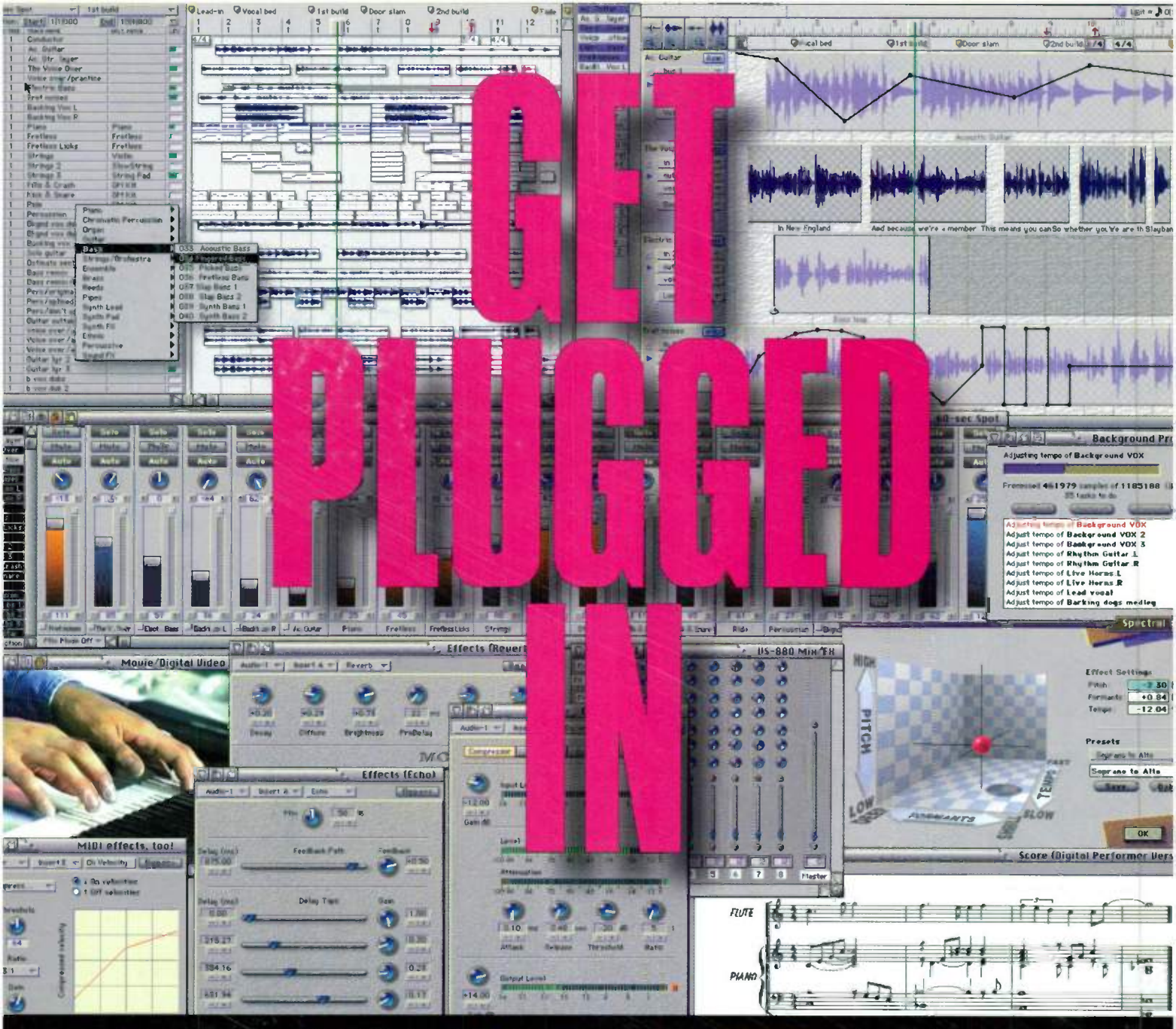

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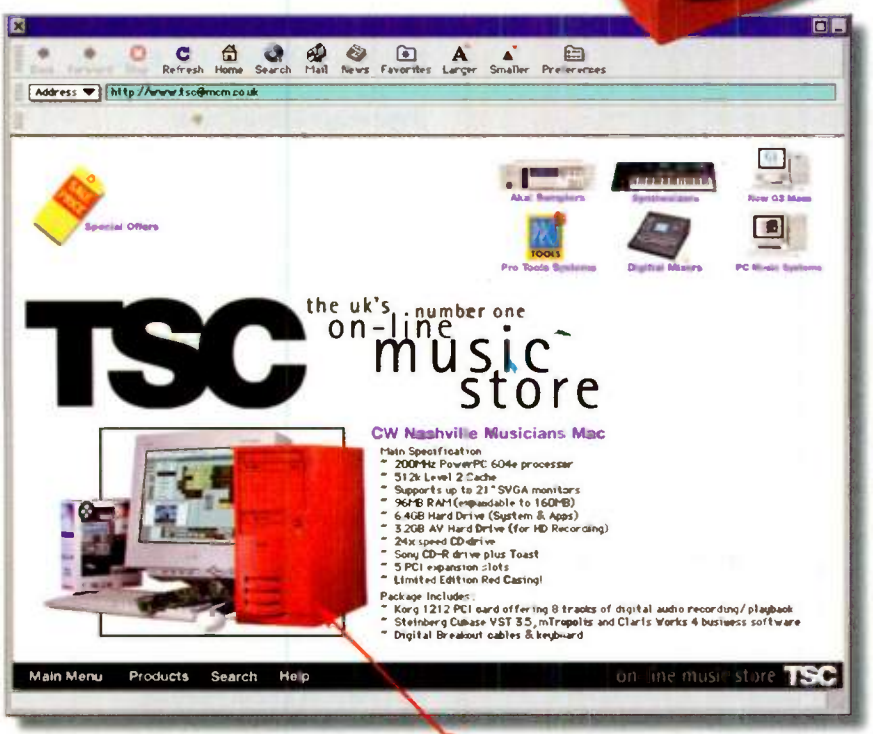

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leader

Over the past few years we've been deluged with valve equipment that promises to recreate that warm vintage sound, or to take away the clinical edge of digital recordings, but does it deliver? There's no doubt that valve equipment sounds different to conventionally designed solid state circuitry, but is different necessarily better? What do these valves actually do?

I've listened to a lot of valve mics and valve processors over the past few years, and the best of them sound truly excellent. On the other hand, though, I've also heard some very disappointing results, and it seems that the harder the designers try to produce the 'warm vintage sound', the worse the sound becomes. It's well known that valves overload in a different way to transistors, but unless you're concerned with guitar amplifiers, the valve should rarely be driven into hard overload. Take the case of a classic tube mic made back in the '50s: in those days there was no commercially available solid-state circuitry; valves were the only game in town, so just as with the solid-state devices of today, designers did the very best they could with the available components. Many of those old designs squeezed the last drop of performance out of the valves to produce the best possible frequency response, the lowest noise and the lowest distortion, yet they still sound special.

By contrast, virtually anyone can wire up a valve and bias it to run as non-linearly as possible, then claim to deliver the true valve sound, but what you get isn't true at all — it's just deliberately created distortion and bears no relation to what you hear from quality valve gear. If you've ever really experimented with one of those 'deliberate coloration' valve devices, you may have noticed that certain sounds produce horrible artifacts, such as audible clipping or excessive intermodulation distortion, but if you reduce the amount of overdrive to get rid of these unpleasant side effects, you can't really hear anything happening at all. To my mind, the only place deliberate distortion really works is when processing electric guitar and some keyboard sounds, and even then you need a speaker simulator at the end of the chain to take out the more obnoxious sonic artifacts.

So what is the true magic of valves? Well, we know that they do limit softly when overdriven, rather than producing crude clipping, but how often is the valve in a good tube mic being overdriven in normal operation? Intuitively, one might imagine that such distortion as is occurring in a properly designed, low-distortion valve mic preamp would be masked completely by the distortion inherent in whatever loudspeaker system is being used for monitoring — loudspeakers produce orders of magnitude more distortion than well designed valve circuitry, and of a subjectively similar kind.

Perhaps it's the alleged exceptional transient response of valves? But this doesn't hold up either, because more often than not the piece of valve gear in question is part of a long audio chain comprising mainly solid-state circuitry. In that case, the transient characteristics of the other gear in the chain would be the limiting factor on performance, so you shouldn't be able to hear any difference there either.

I'm convinced that whatever it is that makes good valve gear sound so sweet is actually quite subtle, and has nothing to do with gross non-linearity produced by odd biasing or deliberate overdrive. The cleaner the design of the valve circuit, the better it usually sounds, so whatever the secret is, it looks like remaining a secret for a little longer. After all, if it wasn't a secret, it wouldn't be magic, would it?

Paul White *Editor*

SOUND ON SOUND

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The Great CD-R Debate

Can you clarify something for me? I'm thinking of buying a CD writer, and while checking out recent *SOS* reviews, I've noticed frequent mentions of confusing terminology such as "consumer CD-R machines", "professional CD-R machines", "the more expensive consumer CD-R blanks", and "the lower-cost computer CD-R blanks" particularly in reviews of stand-alone writers such as the Philips CDR870 in last month's issue.

My question is: what's the difference between these different types of CD-writing hardware and blank CD-R discs, and how will they affect my purchase decision? At the moment this is turning out to be harder than buying a PC! Any help you can offer would be gratefully received.

Jon Morrish
Essex

Assistant Editor Matt Bell replies: *We've received several letters on this subject during the last month, from both consumers and retailers, indicating that there is some degree of confusion over the different types of CD-R available, and as CD-R machines of all types continue to come onto the market (Editor Paul White looks at another stand-alone CD writer, the Fostex CDR200, later in this issue), it's probably a good time to put the record straight. The main source of confusion appears to be the distinction between 'professional' and 'consumer' CD-R machines and media, but there are other categories to consider too. In fact, as the situation stands at present, there are* four *basic types of CD-writing machines available, and three different types of media: low-cost, computer-compatible CD-R discs; so-called 'consumer' CD-R discs; and now CD-RW discs. Let's consider the four types of hardware first. They are:*

1. *Computer-dependent CD writers.*
2. *'Professional' stand-alone CD writers.*
3. *'Consumer' stand-alone CD writers.*
4. *The Philips CDR870 (at present, this one literally is in a class of its own!).*

The first type includes machines such as the Yamaha CDR400tx reviewed in last month's SOS, *or the TEAC CD-R50S (see* SOS *May '97). These have few or no front-panel controls, and are entirely dependent on computers (running the right software, of course) to supply the track-indexing and PQ subcode information required to burn a CD. In other words, if you have no computer you can discount this option. Machines of this type are ideal for burning data CDs for computer backup, as well as burning audio CDs.*

Stand-alone 'consumer' CD-writers (such as Pioneer's PDR04 and PDR05, which retail for between £500 and £1000) are much cheaper than 'professional' ones (of which more in a moment) and are deemed to be mass-market hi-fi products by their manufacturers. Due to concerns within the recording industry that consumer CD-R machines will lead to everyone making endless copies of CDs for each other, rather than buying new ones, 'consumer' CD-R writers are set up so that they will only record onto a certain kind of CD-R medium — the so-called 'consumer' discs. Whereas perfectly good, computer-compatible CD-R storage media can now be bought for around £2 a disc (less if you buy in bulk from computer stockists), 'consumer' CD-R discs cost more — typically between £3 and £5 a disc. As Paul White explained in his CDR870 review last month, the reason for the extra cost is that the higher price includes a fee towards the copyright income which, it is claimed, will be lost through the spread of consumer CD-R writers. 'Consumer' CD-R machines cannot, therefore, write to the cheaper media that a computer-dependent CD-writer or so-called 'professional' machine will be quite happy with — in fact, they refuse to recognise the discs. However, once you've completed recording audio on either type of disc, and 'finalised' it in your CD writer, the result is the same; a disc that is playable in any domestic CD player.

*Turning to the stand-alone 'professional' machines, such as HHB's CDR800 (*SOS *August 1997) and the Fostex CDR200 (see page 186), these use the cheaper CD-R discs without any problems, but the cost saving on the media is offset by the higher price of the units themselves — they're typically around the £1500 mark. However, if you're going to be burning a lot of CDs, you will, of course, eventually make your money back through the use of the cheaper media, and there are usually a few extra bonuses into the bargain (both the HHB and Fostex writers, for example, include built-in sample-rate converters for use with DATs recorded at 48kHz, and sport XLR sockets, in keeping with their 'professional' status).*

Finally, there's the Philips CDR870, which, although it can simply operate as a 'consumer' CD-writer (recognising only 'consumer' CD-R discs and capable of burning a universally readable audio CD), also uses the totally new disc format CD-RW, or re-writable CDs (currently retailing for between £15 and £20 a disc). These can be recorded and finalised, and then wiped and re-used, but the catch is that CD-RWs, whether finalised or not, are not supposed to be compatible with ordinary domestic CD players. For the moment, the CDR870 stands alone in supporting the CD-RW format as well as CD-R, but this situation is bound to change soon. ❑ ▶

Above: HHB CDR800.

Right: Philips CDR870.

Zappy Days Are Here Again

Robin Morley is entitled to his opinion on Frank Zappa's albums ('Sounding Off', Sound On Sound October 1997), but we should remember that Zappa was not just a rock songwriter, but an experimental composer who greatly expanded the horizons of rock music. To those who expect nothing more from rock than a good singalong, it may seem that his use of irregular time signatures and non-diatonic harmony was indulgent and pointless. But for those of us who want something with a bit more depth, Zappa was a great inspiration. Is it 'daft' to play music that isn't in 4/4, or try to use more than a handful of triads in your compositions? Personally, I think it would be more daft not to experiment with these techniques. Simplicity can be a virtue, but it can also be ***ing boring.

Admittedly, Frank's guitar solos went on too long, but so do Noel Gallagher's.

Dave Stewart
Keyboardist
via email ❑

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* "Studio Sound" magazine (April 1997) assembled a panel of critical listeners with the sole aim of judging audio performance of five digital tape machines, regardless of cost and convenience. 5 of the 7 professional producers/engineers who expressed a preference said they preferred the sound of the ADAT XT.

WRH

Crosstalk

Seduced By Technology

I couldn't agree more with both Paul White's editorial and Craig Anderton's Sounding Off feature (in the December 1997 issue of SOS) on the subject of computer music software and hard disk recording systems. As a person who started out with the home recording package of the late '80s — a Seck 12:8:2 and a Fostex M80 8-track analogue recorder — I'm totally confused by the diversity of recording systems currently on the market, and in particular those of the hard disk variety, Mac or PC based.

As a technical author, I use a PC every day for compiling technical manuals and it seems that as soon I've settled on a suitable set of software packages to work with, new versions or upgrades come onto the market, requiring more memory, a better central processor and more storage space. And this always happen at the expense of the older version, which still has bugs that will never get fixed. The new features are never really worth the price of the upgrade and I suspect that sales are driven more by people's desire to stay compatible with the rest of the world than by real need.

I recently spent some time in a studio where recording is based around four Alesis ADAT XTs and a high-quality analogue desk. Tape manipulation was essentially the same as it is for analogue (i.e. simple) but with the benefits of digital, and though a Mac running *Cubase* was in evidence, it was used mainly to synchronise MIDI instruments and carry out tasks that used to be done with an editing block and a stack of razor blades. Storage was no problem — S-VHS tapes are relatively cheap, and with four machines on the go, running out of tracks was just not an issue!

So what of the computer multitrack? Well, I recently decided to investigate hard disk systems, as I own a fairly powerful PC. "All you need is a good quality soundcard and some software", I was told. At about £1000, it seemed attractive — until I assessed the power requirements of the PC and all the little add-ons. Computers are versatile little beasts and will do a lot of things, but they become limited when asked to perform too many unrelated tasks. Even if you leave your trusty version of *Office 97* closed, it still seems to draw some power from your machine, or load some driver which is totally incompatible with your music software. I concluded that what I really needed was a dedicated machine for music, which would mean spending about £3000 if I bought all the little luxuries.

This brought me right back to tape-based systems: most of what you need in one 19-inch case: multitrack recording, mastering, storage, and so on. And if you're not starting from scratch, you probably already own a decent mixer, which makes 'plug and play' a realistic proposition at last. No bugs, no compatibility problems — just hook up the recorder, connect something to the input of your desk, and record. Canned music in minutes! One other advantage is that I can see everything without having to switch screens and get arm-ache from the mouse.

Of course I'm not against computers in music, but I do wish the reviews were realistic and disclosed the size of the system you need to run these all-singing, all-dancing programs. And don't forget to talk about the quality of the computer: my own experience of budget computing equipment could fill this magazine from cover to cover.

Perhaps I've missed the point, but as I was told a long time ago, aim to get the music right on a first or second take, a practice which, if followed, will render extensive editing unnecessary. If you play a bum note, go away, practise, and record it again... onto tape!

John Wirtz
Somerset

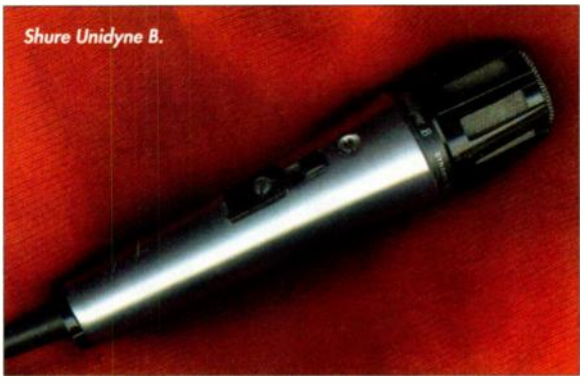
Editor Paul White replies: *I agree entirely with your views on computers, but I'm surprised that you think we play down the problems at SOS. Our reviewers tend to be very realistic as regards the machine power you need to do a specific task, and virtually every month Martin Walker warns not to mix music with other applications (especially games) on PCs. I also take every opportunity to ask people to think hard about what they need to do before they make the change to a computer-based system. It's easy to get seduced by features when what you really need are the tools to do a job.*

Being honest, you can't beat analogue tape (or hugely expensive open-reel digital) for user friendliness, so my philosophy is to record on tape and use computers for MIDI and editing — things they're good at. ❑

Wired For Sound

I have a long-serving Shure Unidyne B microphone that I want to use with my limited home recording studio. I have a PC-based system that currently uses a Soundblaster 16 Pro card, and I think I have an impedance-matching problem using this setup. Can anyone give me the technical spec of the Unidyne B and offer advice as to how I can get the best out of this configuration until I can afford to upgrade? Thanks in anticipation.

Alan Landsburgh
via email


Shure Unidyne B.

Editor Paul White replies: *Soundcards tend to have inputs for cheap electret mics which may not match conventional studio mics. They may also feed power up the mic cable to run the electret capsule, which most studio mics definitely won't like. The best option is to use an external mic preamp or mixer connected to the card's line input, though this will cost a lot more than your mic is worth. If you don't have a mixer, a cheaper solution is to use a hi-fi cassette deck (one with a mic input) as a mic preamp. With a tape inserted, set it to Record/Pause and feed the mic into the cassette deck's mic input, then take the cassette's Line Out to a line input of your soundcard. The cassette record level control will adjust your recording level, but go by the level indicator (if any) provided by your soundcard, not by the meters on the cassette machine. You'll be surprised at how good the mic amps are on most hi-fi cassette decks. The best performance will be achieved from a high-impedance mic (one with a fixed cable). If you have a mic with an XLR output, it's probably balanced and low impedance. If you have a low-impedance mic and it doesn't work too well, try a low-to-high-impedance converter (these look like an XLR socket with a jack on the other end, and are available from Tandy or Maplin). I hope this helps.* ❑

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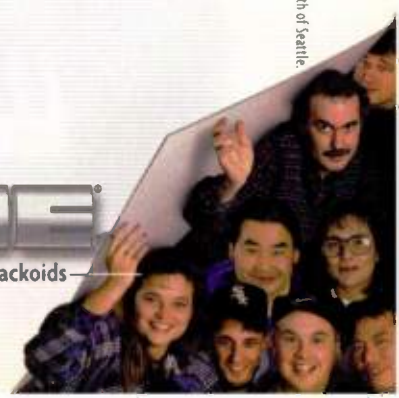
Control Room/Phones switching matrix and separate level control. Select any combination of tape, main mix, or ALT 3-4 and route them to the Control Room/Phones output OR back into the main mix. Consider the possibilities: easy assign to control room monitors, multitrack recorders, submixes, separate monitor mixes, broadcast, or 2-track tape feeds. A Mackie Designs exclusive.

Below: A few of the 400+ folks who work at Mackie Designs in Woodinville, WA, 20 miles north of Seattle.



1) On stereo channels.
2) This would make a great album title for the '90s.
3) Except possibly drummers who drink triple espressos.

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www.mackie.com

MACKIE

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Robjohns Road . Chelmsford . Essex . CM1 3AG
Tel: 01245 344001 . Fax: 01245 344002

shape of things to come

by Derek Johnson

Korgasbord

It's a busy month for Korg, with an interesting selection of forthcoming gear due for release very soon. First up is the D8 all-in-one digital 8-track recorder/mixer combo, news of which came as a bit of a surprise to us here, to say the least! Complete with internal 1.2Gb hard disk, the D8 offers a maximum of 34 minutes of 8-track, 16-bit uncompressed recording and playback at 44.1kHz. A maximum of two tracks can be recorded at once, with full playback of eight tracks. The 12-channel, 4-buss mixer features two effects sends (one feeding a built-in effects processor), and 2-band EQ, pan pot and fader per channel. Interfacing with the outside world — external hard drives or a DAT machine — is possible courtesy of the SCSI port and an S/PDIF digital interface. Fader, EQ, pan and effect settings can be saved as a scene, with 20 scenes per song. Handy features such as auto punch-in/out and "audio trigger record" are available, and certain editing operations are non-destructive. Want to add MIDI equipment? No problem: synchronisation is possible with sequencers or drum machines that support MIDI Clock, MIDI Time Code or MIDI Machine Control. Possibly the best news about the D8 is its price: £849 including VAT, with availability imminent. This sounds like a bit of a winner from the spec.

Completely new on the synth front is the N5 music workstation. Korg's AI2 synthesis system, as seen on Korg's other synths, is used, and the instrument has 12Mb of waveform ROM (containing 528 multisamples and 286 drum samples), 1169 Programs, 302 Combinations and 37 drum kits. A user area offers space for 100 Programs, 100 Combis and two drum kits of your own. The front panel provides analogue-style controls, with instant access to filter attack and release time, filter cut-off and "effect dynamic modulation". You can assign 12 other parameters to these knobs, for control of 16 parameters in all. The front panel also has dedicated switches for portamento and layer/split assignment, plus an external sequencer start/stop switch. Also immediately accessible from the front panel is the arpeggiator, which offers 20 preset patterns. Another nice touch for an affordable synth — the N5 only costs £725 — is that the keyboard is aftertouch as well as velocity sensitive. Last of all, the GM, GS and XG-compatible N5 also has a built-in computer interface.

A module version of the SG ProX Stage Piano (reviewed in *SOS* November 1997) has also been announced. The SG Rack (£699) offers 64-note polyphony, 24Mb of waveform ROM, 64 Programs (including 16 pianos and a selection of electric pianos, clavinets, organs and more); attack, decay, release and effect settings are user-editable, and edits can be stored in user memory slots. A Performance mode allows two sounds to be split.

And while we're talking racks, Korg's forthcoming TR-Rack (a 1U version of the Trinity workstation) will actually be equipped with a full 32Mb PCM ROM, not 24Mb with an 8Mb option, as reported in November's news.

Other Korg news comes in the shape of the AX300G guitar multi-effects processor, priced at £219 (100 preset Programs, 32 user Programs, 28 different types of effect, and 24 types of effects chain, plenty of foot controls and a built-in tuner), the pocket-sized GA10 guitar tuner (£16.99) and the equally compact CA10 chromatic tuner (£19.99).

A Korg Ltd, 9 Newmarket Court, Kingston, Milton Keynes MK10 0AU.
T Brochure line 01908 857150.
F 01908 857199.
E info@korg.co.uk
W www.korg.com

Above: The new D8 digital multitrack.
Below: How do you get a stage piano in a 19-inch rack? With the SG Rack, of course...

Korg N5 workstation.

ReBirth Born Again

Steinberg's Nuendo, running on a Silicon Graphics computer.

ReBirth 338 v1.5.

Steinberg's *ReBirth 338* software TR808/TB303 simulation, developed in conjunction with Propellerhead, has just reached v1.5, for both Mac and PC. The most notable enhancement for the software (see review in *SOS* August 1997) is that every one of *ReBirth*'s controls can be accessed via MIDI instead of solely by mouse. A Learn function helps to automatically assign the most important controls. The Pattern Controlled Filter (PCF) is a new resonant filter; applied to the 808, PCF produces especially "spaced-out" results, apparently. New LED graphics show MIDI activity and the presence of sync pulses, and a new tap recording option supports real-time programming with the Tab key on the computer keyboard. *ReBirth* v1.5 is available from Steinberg dealers now, or registered users can download the software free from www.steinberg.net or www.propellerheads.se.

The family of plug-ins for *Cubase VST* continues to grow with two new additions from Prosoniq; *VoxCiter* (£299), for the Mac only at present, aims to add "natural brilliance" to vocal recordings, and restore the quality and fidelity of any kind of instrumental or vocal material. *Ambisone* (£149) is a 3D audio engine, again currently for Mac only at the moment. This plug-in lets you mix *VST* audio tracks in full 3D stereo, placing sound sources outside or above the speakers. The 'Virtual Scenery Modelling' approach used by the software allows the 3D effect to work in headphones as well as through monitors. Another new plug-in is due from Waldorf: the Mac *VST*-only *d-pole* is a multi-mode filter offering low-pass, band-pass and high-pass modes, with resonance and 12dB or 24dB operation. An envelope follower is included, along with an LFO for cutoff frequency and the curiously named Panorama Modulation.

New software, and a new platform: with *Nuendo* Steinberg are producing an audio tool for film, video and multimedia designers, running on the Silicon Graphics platform favoured by visual special effects engineers and computer animators. *Nuendo* combines the real-time effects and plug-in architecture of Steinberg's Virtual Studio Technology with virtually unlimited digital audio tracks. Actually, Steinberg are amongst the first wave of audio software developers to move to Silicon Graphics machines; SGI recently announced that software and plug-ins are also being developed by Arboretum Systems, Daikin Comtec, DUY, Grey Matter Response, LiquidAudio, Spectral Designs and TC Electronics. Silicon Graphics offers a professional digital audio board with eight channels of 24-bit ADAT optical and two channels of AES digital audio I/O. These capabilities are a basic part of their Octane and Onyx2 systems, with multiple boards adding more ins and outs.

A Arbiter Pro Audio, Borehamwood Industrial Park, Rowley Lane, Borehamwood, Hertfordshire WD6 5PZ.
T 0181 207 5050.
F 0181 207 4572.
W www.steinberg.net
W www-europe.sgi.com/

Bob bounces back!

Bob Moog's company, Big Briar, is introducing a new line of Moog products. First up is the Moog Signature Series Etherwave Theremin and TB15 Theremin Amplifier. The Signature Series Etherwave (a version of which we reviewed in November 1996) is a compact instrument that mounts on a mic stand; each instrument is personally autographed by Bob Moog. The matching TB15 amp is a portable 15W device, with an 8W speaker, sealed black enclosure, headphone socket and 3-band EQ. The Moog LMC (Lintronics MIDI Convertor) for the classic Minimoog monosynth is also now available, and plans are afoot for other Moog products, including new versions of classic Moog analogue synths. We can't wait...

A Big Briar, 554-C Riverside Drive, Asheville, NC 28801, USA.
T 001 704 251 0090.
F 001 704 254 6233.
E info@bigbriar.com
W www.bigbriar.com

Orange aid

Repackage a Waldorf Microwave II in a 5U rack package, and give it a total of 44 editing knobs — more than almost any other contemporary synth — and an orange finish, and you'll have the Microwave XT. Add expanded DSP RAM for even more effects (such as flanger, overdrive, phaser, ring modulator and delay) and a new operating system (v1.5) which features new filter types and modulatable FM, and you've got the makings of a powerful new instrument — you can even have optional wooden end-cheeks if you like. We've reviewed the various flavours of Microwave in these pages before (the Microwave in December 1989, the v2.0 operating system in August 1995, and the Microwave II in July 1997), and the new machine's basic spec looks pretty much the same as the Microwave II: 8-part multitimbrality, 10-note polyphony, 256 sounds, 128 multis, 64 ROM wavetables, 32 RAM wavetables, 64 waves per wavetable and MIDI-sync'able arpeggiator. Each voice is made up of two oscillators and two wave generators, noise, ring modulator, mixer, two multi-mode filters, wave envelope with loop function, ADSR filter envelope, ADSR amplifier envelope (each phase modulatable separately), two MIDI-sync'able LFOs, and a modulation matrix.

A Arbiter Pro Audio, Wilberforce Road, London NW9 6AX.
T 0181 202 1199.
F 0181 202 7076.
E arbiter@compuserve.com
W www.demon.co.uk/arbiter

shape of things to come

The South of England Battle of the Bands has been running annually since 1993, and is happening once again this year. Any bands from London and the South East can enter, with all heats taking place at Twenties nightclub in Worthing. Any style of music is welcome, with heats being split into four categories (rock, indie, MOR and covers). Any band wishing to enter should send an SSAE to ASP Entertainment for details.

A ASP Entertainments,
22 Southfield Road, Broadwater,
Worthing, Sussex BN14 9EH.

Gremlins with a particular appetite for picture captions broke into last month's *SOS* and feasted well; photographer credits were consequently missed off several articles. Apologies (and thanks for the use of their excellent photos) should therefore go to: Piers Allardyce for the pictures of Morcheeba's studio, Pete Norris and Paul Godfrey in the Morcheeba article, Stephen Lovell-Davis for the pictures of Tchad Blake recording at Real World, and The Museum Of Synthesizer Technology for their pictures of the ARP Odyssey.

January 15 and 16 are the dates for a showcase of unsigned Welsh bands. There are two sessions each day (2pm-6pm and 7.30pm-11pm), and it takes place at The Legendary TJ's nightclub in Newport, Gwent. A total of 18 bands from all over Wales will be playing to a potential audience of 500. Organisers Fever Promotions are still looking for demo tapes, publicity and sponsorship.

T Fever Promotions 01495 248351.

Robbie Williams, ex-Take That, has taken a couple of Tascam DA88s on his first solo tour. The machines will provide additional backing, edited from original studio multitracks by Guy Chambers (the tour's musical director), for the five-piece band.

T 01923 819630.

Roland's V-Drums system, reviewed by *Sound On Sound* last month, has been given the award for Most Innovative Product at a recent industry awards ceremony at London's Café Royal. The award was sponsored jointly by the Musical Industries Association and *Music Business* magazine, and was presented by Mark Fisher, Minister for the Arts.

T 01792 515020.

SOS can be reached at sos.feedback@sospubs.co.uk

or visit www.sospubs.co.uk

Werking at home

Sound Technology, in conjunction with Emagic, have announced the availability of the Audiowerk8 Home Studio Kit bundle for MacOS and Windows 95. The £499 bundle packages the Audiowerk8 PCI digital audio card with *Logic Audio Discovery* v3.0 MIDI sequencing, audio editing and DSP software; PC users also get a copy of Syntrillium's *Cool Edit ProLE* whilst Mac users get Emagic's *ZAP* (Zero-loss Audio Packer) audio file compression software. As with all Emagic software, an upgrade is available to the full *Logic Audio* package at any stage. The bundle is available for a limited period only.

A Sound Technology, Letchworth Point, Letchworth, Hertfordshire SG6 1ND.
T 01462 480000.
F 01462 480800.
E info@soundtech.co.uk
W www.soundtech.co.uk

play it again Sans!

Tech 21's new SansAmp Acoustic DI (£199) has been designed specifically for acoustic guitar players. The unit removes unwanted feedback and aims to provide the natural warmth and presence of a properly miked acoustic guitar for both live and studio musicians. Controls include active bass and treble controls, sweepable semi-parametric EQ with mid-shift, and effects loop. It can be powered by a 9V PSU or phantom power, and may also be used as a DI box, with or without EQ.

A Exclusive Distribution, Unit 10,
Furnston Court, Icknield Way, Letchworth,
Herts SG6 1UJ.
T 01462 481148.
F 01462 481149.

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shape of things to come

The desired FX

Pierre-Olivier Margerand at Ridge Farm with his new Absolute Zero monitors.

Spirit's new FX16.

If you buy Spirit's new FX16 4-buss mixer, you'll get a Lexicon effects processor built in. The fully editable 16-program effects system (with dual effect capability) joins a host of other features on this £849 desk. All 16 of the mic/line inputs feature Spirit's UltraMic preamp (with global 48V phantom power), 3-band EQ (with swept mid), four auxiliary sends (including a dedicated Lexicon effects send), and 100mm faders. The master section offers four stereo auxiliary returns, a mono sum output and two subgroup outputs (in addition to the main stereo out). Add the optional rack kit, and the whole package will happily fit into 10U of rack space.

Elsewhere in the established Spirit range, we hear that production team Brothers in Rhythm have taken delivery of a pair of Spirit Absolute 4P active nearfield monitors. Brother Steve Anderson notes: "Before the 4Ps were launched, we had several companies here demonstrating their speakers to us, but we couldn't find any that we really liked. But as soon as the 4Ps came along, we fell in love with them... they seem to have an extended low and high frequency range, which is ideal for our work." The duo wrote and produced six tracks for Kylie Minogue's current album, and the 4Ps will be used to remix these tracks.

Ridge Farm, the Surrey residential studio that has hosted Oasis, Portishead and more, has installed a pair of Absolute Zero nearfields. House engineer Pierre-Olivier Margerand (otherwise known as POM), is happy with the new monitors: "I really like them. The bass is good, and they are less tiring on the ears than a lot of other monitors I could mention. When you've been sitting in the studio for hours, you don't want to be blasted by your monitors and end up taking off loads of top end. That's why the less aggressive sound of the Absolutes is so useful."

A Spirit by Soundcraft, Cranborne House, Cranborne Industrial Estate, Cranborne Road, Potters Bar, Hertfordshire EN6 3JN.
T 01707 665000.
F 01707 665461.
W www.spirit-by-soundcraft.co.uk

polyphonic aftertouch

The Creative Musicians' Collective, an organisation of more than 500 independent recording artists and record labels from 22 countries, have added a new touch to their regular catalogue/magazine. The latest issue (number 11) of *Aftertouch* includes a CD sampler, showing off examples of 60 tracks from albums available inside *Aftertouch*. The new issue runs to 330 pages, and not only includes listings of music for you to buy, but interviews and features on many of the artists inside. *Aftertouch* 11 costs $5 in the US, $6 in Canada or $7 for the rest of the world. You can pay by cheque or money order, Visa, Mastercard or American Express. If you'd like to get your music into *Aftertouch*, you can become a member. This does cost money, but you get access to full exposure in *Aftertouch*. Contact CMC for details, or have a look at their web site.

A Creative Musicians Coalition, 1024 W Willcox Avenue, Peoria, UK 61604, USA.
E aimcmc@pan.com
W www.aimcmc.com

Finalizer Plus: New addition

TC Electronic are replacing their Finalizer studio mastering processor... with the Finalizer Plus. New features include 24-bit A/D and D/A converters, real-time sample-rate conversion, word clock input for post-production users, stable digital clock for rock-solid, jitter-free digital input and output, an ADAT port, TOS-Link optical I/O, MS encode/decode, stereo adjust and external device insert, plus precise L/R balance in the input menu.

TC have also announced an upgrade program for current Finalizer users, which will add all of the new hardware and software features of the Plus to the original processor.

A Raper & Wayman, Unit 3, Crusader Estate, 167 Hermitage Road, Manor House, London N4 1LZ.
T 0181 800 8288.
F 0181 809 1515.

Keyfax Software, the company behind the Twiddly Bits collection of building block MIDI File disks, now has a brand new web site. Check it out for full details of the company's products as well as reviews, news and discussions of MIDI topics. The latest release from Keyfax is *Dangerous Drums*, a collection of MIDI drum loops created by The Prodigy's Paul Kodish, using a Roland TD7 MIDI Drum kit. The performances are completely unquantised, and compatible with any Mac, PC or Atari sequencer.
T 01734 471382.
W www.keyfax.com

Deltron Components have produced a new catalogue (shown above) which highlights a number of recent developments, including the MIDI Brighteye tester, high-quality leads and the 'revolutionary' TS connector range. The catalogue also offers a wide range of hi-fi connectors, stage boxes and more.
T 0181 965 4222.

Session drummer Steve Holland has been using an Allen & Heath MixWizard WZ16:2 live and in the studio. The desk was initially chosen for use as a drum submixer on a UK tour with rock band Bad Caesar. Steve comments: "I found the WZ16:2 very straightforward to use... it's very compact and robust. Without doubt, it would stand up to a lot of bashing about in the back of a van."
T Allen & Heath 01326 372070.

Techno will be one of the highlighted musical genres at MIDEM 98 (January 18-22); the focus on dance and electronic music will be reinforced by the MIDEM Techno Club, which has been specifically devised to help smaller labels to attend MIDEM for the first time. The conference program will also feature sessions aimed at the dance music sector.
T Reed MIDEM Organisation Ltd 0171 528 0086.

An LA Audio 4x4 dual compressor/gate was used on a recent recording of *Later with Jools Holland*, for BBC2. Visiting American freelance engineer Scooter Scott specified the 4x4 because of its "unique frequency-selective gating and compression features."
T 0171 923 1892.

Our customers' comments

"Ghost is Killer! Classic fat British EQ like you've always dreamed of. And the faders are awesome...the taper on them is as smooth as anything I've ever used. Incredible. Ghost has just about everything I look for in a quality console; great tone....great feel...looks...even the name! I'd swear you custom made this for me. I could not have picked a better console for sound, features and feel."

Geno Porfido, Boulevard Recording Co. New Milford, NJ

"Other consoles I've worked with in the past just couldn't deliver the levels of punch and clarity I felt the music deserved. I never have this problem with my Soundcraft Ghost. The Ghost gives me the flexibility I need over a wide range of frequencies and has the body and warmth to really bring my music to life."

Johnathan Moffett, Drummer with Michael Jackson and Madonna

"After the first mix I did, I realised I was in a whole new league. This thing sounds beautiful. Very silky in the high end and full in the lows. The EQ is totally cool and the board has a quality feel to it. I know of nothing that touches it in its price range and I have been recommending Ghost for months to anybody who's looking for a console."

Garth Webber, Red Rooster Studio, Berkeley CA

"I've worked on many competing 8 bus consoles and none can compare to the Ghost in features, ergonomics and, most importantly, sound. The Ghost, simply put, sounds warm and musical - you don't have to work hard to get great sounding mixes on this board. The EQ is very flexible and we compared the mic preamps (using a Neumann U-47) to the Neve 1066s in our studio. We were very surprised at how favourably they compared to these megabuck classics."

Peter Thorn, What If? Productions.

Just about the only sound as sweet as our EQ!

Let us know what you think about the Soundcraft Ghost by visiting our web site at http://www.soundcraft.com or via e-mail to info@soundcraft.co.uk

Ghost

Soundcraft

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SOUNDCRAFT US, HARMAN PRO NORTH AMERICA, INC., AIR PARK BUSINESS CENTER 12, 1449 DONELSON PIKE, NASHVILLE, TN 37217, USA. TEL: 1-615-399-2199 FAX: 1-615-367-9046

All trademarks acknowledged

shape of things to come

Gate expectations

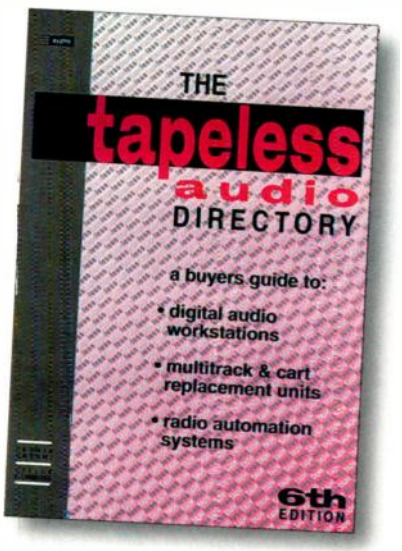
To celebrate the launch of the new second year of their higher diploma in Sound Recording, Music Technology and Music Business Studies, Gateway have recently awarded a scholarship to student Keith Wilson, who successfully completed the first year of the course last July. Keith joins 28 other students also taking the second year, which includes modules in live sound, broadcast sound, post- production for film and TV, digital editing and mastering, and multimedia. To accommodate the new modules, Gateway have purchased a collection of new equipment, including a full Digidesign Pro Tools 4 system, a Yamaha 03D digital mixer, a Yamaha CDR machine, two Tascam DA38s and a Soundcraft 24-channel Ghost console. With the help of Soundcraft and Dolby, Gateway's commercial studio, one of a total of nine studios at the school, now houses a 40-channel DC2020 automated mixer equipped for surround.

A Gateway, The School of Music, Kingston Hill Centre, Surrey KT2 7LD.
T 0181 549 0014.
F 0181 547 7337.
E gatewayeducation@xing.ac.uk

Keith Wilson.

wot, no Tape?

The latest edition of Sypha's *The Tapeless Audio Directory*, by Yasmin Hashmi and Stella Plumbridge, is now available. The format for this sixth edition has been revised, offering even more descriptive information, as well as the now-familiar comprehensive technical specifications. Everything from low-cost card-and-software packages to high-end turnkey systems, from domestic and international manufacturers, is covered, using the same terminology throughout. *The Tapeless Audio Directory* runs to 104 pages, costs £19.95, and is available from *SOS*; contact us for ordering and postage details.



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F 01954 789895.
W www.sospubs.co.uk

A3000: out now on video

Yamaha's A3000 sampler, reviewed in July 1997, is receiving a welcome level of support. First up, an 'overview' video has been released. With a running time of 20 minutes, the video takes the viewer through the modes and applications of the A3000, and best of all, it's free. It's available from all Yamaha Hi-Tech Main Dealer stores, or from the Yamaha information line while stocks last.

The A3000 also benefits from the latest update of BIAS *Peak* (reviewed September 1996), the Mac-based sample editing software. With v1.62, full support for the A3000 is provided, allowing samples to be moved between sampler and computer via SCSI and edited fully on the computer.

A Yamaha-Kemble Music (UK), Sherbourne Drive, Tilbrook, Milton Keynes MK7 8BL.
T Brochure Line 01908 369269.
F 01908 368872.

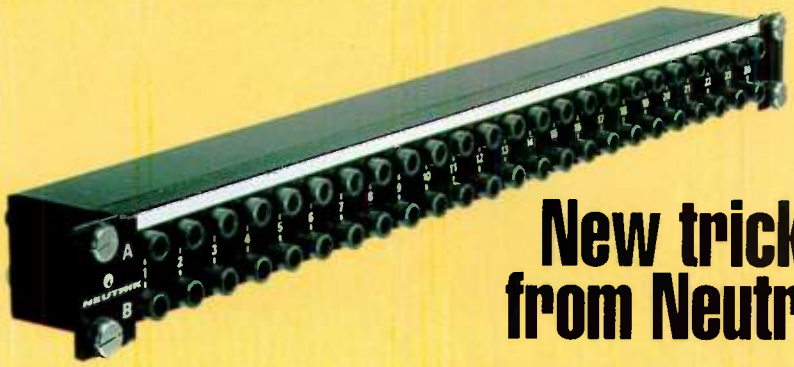
Status Pro

Songwriter/producer Nigel Wright, who has worked with Barbra Streisand and Madonna and recently produced the title track to Disney's *Hercules*, has installed an Otari Status console at his private studio, Skratch, in Surrey. He'll use the 48-channel in-line desk, which also features Otari's Eagle automation system, alongside his 48-track Otari Radar hard disk recorder.

Nigel's engineer, Robin Sellars, says: "Status saves us the expense and inconvenience of hiring mixing studios. It 's perfect for the way we work: I have 40 channels of keyboards hard-wired into the small faders on the Status, leaving the large faders free for the 48-track Radar."

A Stirling Audio, Kimberley Road, London NW6 7SF.
T 0171 624 6000.
F 0171 372 6370.
E sales@stirlingaudio.com
W www.stirlingaudio.com

Left-right: Robin Sellars, engineer, Lee Matt, and Nigel Wright (seated).



New trick from Neutrik

Neutrik are introducing a new quarter-inch stereo phone-plug patchbay, the NYS-SPP, featuring 48 front and 48 rear connectors. The printed circuit boards connecting front and rear connectors are held in place and can't be pulled out by pressure of the rear cable, and jacks are colour-coded (grey and black) to give a clear visual indication of normalled or non-normalled selection; rotation of the PCB, which changes from normalled to non-normalled operation, is achieved by simply opening the two bottom screws on the front cover and turning the PCB by 180 degrees. Two large white designation strips and a sheet of pre-printed labels are supplied, and channel numbering is ready-printed on front and rear panels.

A Neutrik UK Ltd, Columbia Business Park, Sherbourne Avenue, Ryde, Isle of Wight PO33 3QD.
T 01983 811441.
F 01983 811439

M people

The M Corporation has recently supplied and installed equipment for music and technology courses at South Nottingham College. The new facility is based around a Behringer MX8000 mixer and a Fostex D80 digital recorder, linked to a Power Mac 9500 running Steinberg's *Cubase VST*. Also installed was a wide range of outboard equipment, synths and samplers. The college will be running seven 10-week courses ranging from an introduction to MIDI through to mixing down and production.

The M Corporation has also recently supplied Duran Duran with equipment for their forthcoming American tour, and for use on their new album. A fully loaded PC is at the heart of the system, which also includes a Kurzweil K2000, Alesis QSR and a variety of audio and video hardware and software. Lastly, the M Corporation have launched their new web site; product news is joined by a range of Shockwave games and a staff hall of fame "with a twist". Hmm...

A The M Corporation, The Market Place, Ringwood, Hants BH24 1AP.
T 01425 470007.
F 01425 480569.
W www.m-corp.com

A South Nottingham College, Charnwood Centre, Farnborough Road, Clifton, Nottingham NG1 8LU.
T 0115 921 2347.

'Temp here to stay?

Miditemp are a German company who produce a range of sophisticated MIDI file players. Features common across the range include:

- 64-track MIDI playback and record
- GM compatibility
- MIDI File 0 and 1 compatibility
- The ability to play back 8- or 16-bit stereo WAV files
- Up to 16Mb RAM
- SCSI interface for internal or external hard drives (and CD-ROM drives)
- WaveBlaster option for add-on sound daughterboards
- 1000 patches and 8192 songs
- Floppy drive
- Two stereo outs

The range consists of two models, but each has two variants; the MP22W and MP22CDW both offer a 2X2 MIDI matrix, while the MP88W and MP88CDW offer an 8X8 MIDI matrix; the larger CDW models include an internal CD-ROM drive. The supplied MIOC (MIDI Input Output Controller) remote works with all three machines, and provides control over all functions, with the benefit of a large display. While there is no UK distribution at the moment, Miditemp are happy to supply customers throughout Europe. Contact them for pricing and shipping details.

A Miditemp GmbH, Am Pfanderling 62, D-85778 Haimhausen, Germany.
T 0049 8133 2488.
E miditemp@miditemp.com
W www.miditemp

Inspect their gadgets

Music specialists BCK continue to round up useful gadgets for the studio and live musician. In their latest newsletter we found a mention of the Forefront Technology range of MIDI gadgets, which now includes a little MIDI velocity filter box (£59.99). Of course, BCK still sell the rest of the Forefront range, including the FT5 MIDI Thru box (2 Ins and 8 Thrus), the simpler FT9 MIDI Thru box (1 In and 3 Thrus), the FT7 MIDI switch box and the FT8 MIDI Merge (2 Ins to a single Out).

BCK have also discovered a new stand-alone GM MIDI file playing box made by Bontempi (hands up who used to have a Bontempi organ!). The M86 Leonardo MIDI file player is Karaoke-equipped (if you go in for that kind of thing) and comes with a SCART cable to link to a TV set and display MIDI file lyrics; it also has its own sounds, built-in styles and, more interestingly, a vocoder mode. If you don't have a use for these exotic features, naturally you can ignore them and just use the M86 to play back your own MIDI files in a live situation. Tempo can be changed and transposition undertaken while a file is playing, and the unit costs a reasonable £299.

Last up on the BCK front is a MIDI vocal harmony generator from Tune 1000 (manufactured by Canadian company IVL, the chaps responsible for much of the technology behind the excellent Digitech Vocalist range). The MIDI Harmony box has been optimised for use with MIDI files featuring harmony tracks — the Tune 1000 range, for example! There's a minimum of controls, but the box is capable of generating up to four-part harmony with little brain-ache on the part of the user. The price is £299.99.

A BCK Products, Stationbridge House, Blake Hall Road, near Ongar, Essex CM5 9LN.
T 01992 534442.
F 01992 524004.

shape of things to come

Track 'em up

Scottish MIDI file specialists Comtracks have recently become UK distributor for the Tran Tracks range of MIDI files from the States. Tran Tracks have recently purchased the library of Real Tracks, from Canada, and these files are now available through Comtracks. And to keep up with the international flavour, Australian-produced files from Powertrax are also be distributed by Comtracks.

On the software front, the Scottish company are now distributing *Autoscore 2.0* and *Internet Music Kit* from Wildcat Canyon Software. *Autoscore* lets you sing or play an acoustic instrument into your PC and have the result converted into printed music; it's available in Deluxe (£79.95) and Pro (£154.75) versions. The Pro version adds facilities such as full pitch-bend tracking and direct connection to popular sequencing programs. *Internet Music Kit* lets you create music (from preset phrases and styles), convert it into something usable on a web page, and then embed the data into a web page, without needing to write a line of HTML. Your finished work can be previewed in Netscape's *Navigator* or Microsoft's *Internet Explorer*.

A Comtracks UK Ltd, 1 Straiton Place, Portobello, Edinburgh EH15 2BA.
T 0131 468 1150.
F 0131 468 1149.
E sales@comtracks.com

Sabine's magnificent 7

Sabine's latest entry into the signal-processing market is the Power Q ADF4000 workstation, which combines the functions of seven digital processors in one 2U rackmounting package. Power Q offers:

- Up to 12 bands of parametric EQ, with high- and low-pass filters.
- 31-band graphic EQ with adjustable filter widths.
- Up to 12 bands of feedback extermination.
- Real-time analyser.
- Compressor/limiter.
- Digital delay (for speaker alignment).
- Noise gate.

In addition, Power Q features Sabine's ClipGuard clip level-control technology and an automatic room equalisation process.

A Fuzion plc, 2 Lyon Road, Walton-on-Thames, Surrey KT12 3PU.
T 01932 882222.
F 01932 882244.
E 100527.254@compuserve.com

price cut corner

Tascam have cut the prices of a range of digital recorders, including DTRS, DAT and MD formats, as well as two of its pro CD players. First of all, the DA98 DTRS format digital 8-track has been released at £3999 including VAT, about £400 less than the previous list price of the DA88. The DA88 itself has been cut by a massive £1600 to £2799; the lower-cost DA38 loses £900, to retail for £2099. Two DAT machines have also been reduced; the DAP1 portable, with phantom-powered XLR mic ins and built-in limiter, is now £1199, while the fully pro DA50 timecode DAT is now £479.99. The MD801R MiniDisc recorder and MD801P MD player have dropped to £1499 and £1199 respectively, a cut of £300 in both cases. Lastly, the CD301 CD player loses £40, to retail for £459, while the CD401 is now £699, a drop of £70.

Arbiter Pro Audio, the UK distributor for AKG mics, have announced a range of price reductions. The popular C1000S condenser is now £88 lighter, now weighing in at £199, while the C3000 drops £79 to list for £299. Nearly £200 has been sliced from the WMS300 UHF wireless system, down to £763, and the WMS300PT pocket transmitter system now costs £880, down from £1115.

Cimple Solutions have also cut the prices of some of their distributed lines. The Oberheim GM1000 guitar effects processor is now £799, down from £899, the Viscount EFX10 is £199.95, from £239, the Viscount EFX100 is £189.95, from £204.99 (check out the review in this issue), and the new Viscount Gammaverb is £95.95, from £139.99. Another effects processor is due from Viscount: the forthcoming EFX200M will have the option of a digital I/O interface.

A TEAC UK Ltd, 5 Marlin House, The Croxley Centre, Watford, Herts WD1 8YA.
T 01923 819630.
F 01908 236290.
W www.tascam.com

A Arbiter Pro Audio, Borehamwood Industrial Park, Rowley Lane, Borehamwood, Hertfordshire WD6 5PZ.
T 0181 207 5050.
F 0181 207 4572.

A Cimple Solutions, Unit 2/17 Wembley Commercial Centre, 80 East Lane, North Wembley, Middx HA9 7UR.
T 0181 904 4141.
F 0181 904 1200.
E service@cimplesolutions.demon.co.uk

Bandit shake their booty

The Bandit A&R Newsletter recently celebrated its 10th anniversary. The newsletter, which will soon reach its 120th issue, is aimed at singers, bands and songwriters looking for their first deal in the music business; to that end, 20 labels, management companies, publishers, production companies and so on are profiled every month, along with what sort of songs and artists they're looking for. This feature gives you a point of contact, and lets you choose companies who may be sympathetic to your work.

Normally the annual subscription is £69, but if you book before January 31, requesting an anniversary subscription, you can have 12 issues for £40. If you want a taste, take advantage of Bandit's free issue offer — send them an SAE — and if you pay by quarterly standing order, your first three issues are half price.

A Bandit Publications, PO Box 22, Newport, Isle of Wight, PO30 1LZ.
T 01983 524110.
E bandit@wightweb.demon.co.uk
W www.wightweb.demon.co.uk/bandit/

Essential Dance Tools

Loops, bass lines and beat boxes - indispensable elements in electronic music.
Now Propellorheads joins forces with Steinberg to put a whole new spin on the theme.

ReBirth
Virtual Synthesizer

Two 303 synths, one 808 drum machine, pattern based sequencing, delay and distortion.

ReBirth is a self-contained program capable of generating sweeping synths, dubby bass lines and stonking drum patterns entirely in the software domain. Just like the real thing, the filters are programmable in real-time and drum sounds can be tweaked with decay and tone parameters.

Every parameter can me controlled via MIDI and the program can sync to any midi sequencer. Available for PC and Mac.

ReBirth - rrp £149.00 inc.vat.

ReCycle!
Groove Analysis

Matching audio loops to sequences can be time consuming and tiresome. ReCycle has been designed to make this task easy.

ReCycle can match one loop with that of another within seconds. Simply play back a ReCycle midi file from your sequencer to trigger your sampler and change the tempo to whatever you want. No TimeStretching required. The automatic mapping facilities also make ReCycle ideal for transferring sample libraries fast. Analyse an audio file with a selection of samples and send it to your sampler. Instant key mapping and perfect truncating. PC and Mac.

ReCycle is compatible with the following samplers:
Akai S1000/2000/3000, Roland S760, Kurzweil K2000/K2500, Emu ESI-32, E-64, E4, Ensoniq EPS/EPS16+, ASR10/88, Digidesign Samplecell & Cubase VST 3.5 Mac.

ReCycle - rrp £199.00 inc.vat.

NEW in version 1.5

A new filter module has been added to the ReBirth arsenal of sonic tools. Switchable between low and band pass, this filter further enhances the sound capabilities of ReBirth and can be routed to any of the two synths or the drum machine.

Visualize your Mix X<>POSE

Promotional Videos, Live Performance or Multi-media Production for MIDI musicians.

X<>Pose uses midi for triggering and control of images and QuickTime video footage. Just activate the visual material by playing on a midi instrument. A wide range of effects are also included to allow real-time processing and most of them can be controlled via midi controllers. So even basic images can be processed to create exciting abstract, futuristic, ambient results. X<>Pose is available for Mac, PC version scheduled for the new year.

X<>Pose - rrp £399.00 inc.vat.

System Requirements
Macintosh: Power Macintosh 603e processor or better. 66 Mhz or faster, 16 Mb or Ram, System 7.5.3 or later.

PC: Intel Pentium 75 Mhz or faster, 16 Mb Ram, Windows 95, Direct X compatible sound card

Steinberg

Distributed Exclusively by **Arbiter Pro Audio**
Unit 2 Borehamwood Industrial Park Rowley Lane, Borehamwood, Herts WD6 5PZ. Tel: 0181 207 5050 Fax: 0181 207 4572

www.steinberg.net

shape of things to come

Kyma chameleon

Symbolic Sound Corporation's *Kyma*, the professional synthesis software/hardware package for Mac or PC platforms, has now reached v4.5. A general overview of the package, was given in part two of our computer synthesis mini-series, back in May 1997, and the new version now offers:

- Real-time spectral analysis and resynthesis.
- Granular synthesis and processing, with 56-224 simultaneous grains.
- Vocoders with 22-88 channels.
- Graphical spectrum editor.
- Alternate tuning tool with 0.0026Hz accuracy.
- Analogue synthesis and sequencer emulation.
- Streamlined interface.
- Easy mapping of MIDI faders to sound parameters.

In addition, a new PCMCIA interface card allows *Kyma* to be run on Mac Power Books and PC laptop computers. The card takes up one slot in the computer, and allows users to move their computer between studios equipped with the Capybara external DSP hardware, or use *Kyma* on stage without having to cope with a full-sized computer, and by simply racking the Capybara.

A Symbolic Sound Corporation, PO Box 2530, Champaign, IL 61825-2530, USA.
T 001 217 355 6273.
F 001 217 355 6562.
W www.symbolicsound.com
E info-kyma@symbolicsound.com

Integrator comes together

Analogue Systems, home of the FB3 Filter Bank (reviewed *SOS* July 1995) and TH48 sequencer (reviewed *SOS* April 1995), are launching an analogue modular synth. The system will be housed in a 3U 19-inch rack case, with voltage-switching for use anywhere on the planet. All modules will be 6, 12 or 18HP (horizontal pitch) wide, with the exception of the 84HP-wide analogue sequencer, which fills the whole rack width. The RS Integrator, as the system will be called, will offer a wide range of modules, featuring unusual or non-standard functions. The initial collection of modules will include the following:

- RS10 3U case and power supply
- RS20 ring modulator
- RS30 frequency-to-voltage convertor and envelope follower
- RS40 sample & hold, noise generator and clock unit
- RS50 trigger converter, trigger divider and DC level shifter
- RS60 voltage-controlled envelope generator with auto repeat
- RS70 high-gain preamp, inverter amp and attenuator
- RS80 voltage-controlled LFO with sync reset
- RS90 voltage-controlled oscillators with sync, low-frequency switch, voltage control of two waveshapes simultaneously, pulse-wave modulation
- RS110 multi-mode filter
- RS180 voltage-controlled amplifier with linear/exponential capabilities
- RS210 8-octave fixed filter bank
- RS230 DC buffer

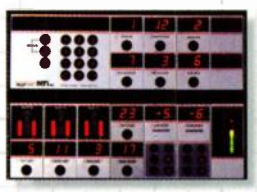
A long list of additional modules is due for release later in 1998.

A Analogue Systems, 17 Cannis Road, St Austell, Cornwall PL25 4EB.
T 01726 67836.
F 01726 67836.

dynaudio lexicon dbx

turnkey

If you want to look at equipment we'll send you some brochures...



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

Turnkey's revamped and enlarged demo facilities feature what we believe to be the world's largest digital comparator systems for pro audio* and the only one of its type in the U.K.

One side of the switcher-equipped recording room.

Over 70 effects processors are available for instantaneous A/B via relay switching, eliminating the repatching time which makes good comparisons so difficult. 16 pairs of studio monitors, 10 power amps, 16 mixing consoles and around 30 sources and recorders from DATs, CDs, HDRs and Multitracks are on the same matrix so you can instantly configure complete systems.

Compare 6 mics. by recording simultaneously to ADAT.

Take 8 bus consoles - hundreds are bought each year on recommendation. Bearing in mind the sums involved it's hard to believe that the opportunity to properly compare the various brands for EQ and noise has not previously been offered.

Waldorf Wave, Pro-Tools IV and Big by Langley in Studio 1.

We've taken the same innovative approach to demonstrating all our products from CD Rom samples to analog synthesisers.

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

Huge range across Mac, PC and Acorn platforms.

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13 Mics, PA/DJ, Mixers & Monitors

* The leading manufacturer of this equipment tells us that the Turnkey systems are the largest ever supplied worldwide.

turnkey 0171 379 5148
Fax: 0171 379 0093 114 Charing Cross Road London WC2H 0DT

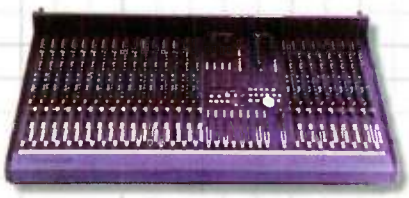
DREAM RECORDING PACKAGES AT DREAM PRICES

Soundcraft & ALESIS

GHOST CONSOLE

- Pristine Audio Quality Throughout
- 4 Band EQ & Fully Parametric Mids
- Up to 12 Auxiliaries
- MMC, Jog/Shuttle, Track Arming, MIDI Muting & Synchronisation Built-In (not LE)

The project studio has changed how professional musicians make and record music. Record advances used to pay for studio time, but now its for an artist's home studio utilising digital 8 track and a compact high quality console.



The Ghost, though, is more than a project console, you only have to look at the features to see this. Soundcraft continues to break new ground in analogue console manufacture bringing fully professional facilities: Ultra low noise inputs, 4 band EQ with 2 fully parametric mids, up to 12 auxiliary sends, MIDI mute automation and MTR transport control (not LE) are a few of the features that put other project consoles to shame. In fact the only comparison with a project console you could make is the price.

RRP £6729	RRP £7469	RRP £7575	RRP £8327
£4299	£4699	£4799	£5299
GHOST 24 LE + ADAT XT	GHOST 24 + ADAT XT	GHOST 32 LE + ADAT XT	GHOST 32 + ADAT XT
ALL PACKAGES INC FREE LOOMS	ADD £399 FOR 24ch METER BRIDGE	ADD £499 FOR 32ch METER BRIDGE	ADD £1499 FOR 2nd ADAT XT

ADAT XT DIGITAL MULTITRACK RECORDER

- Industry Standard Digital Tape Format
- Ultra High Speed Transport
- Digital Dubbing Between Two Machines
- Fluorescent Bargraph Metering

Alesis pioneered low cost digital multitrack recording with the introduction of the ADAT, and changed the face of home and professional recording. The new XT version is totally compatible with the old machines, but has numerous improvements.

The design features a die-cast chassis and has a completely redesigned transport, which rewinds and fast-forwards four times as quickly as the old machines. Also BRC style editing can be performed from the front panel with two machines, and an all new display further simplifies operation.

digidesign

PRO TOOLS 24

NEW Digidesign have added a high performance 24 bit system to their ProTools range of products. The new D24 PCI-bus audio card is based on the Motorola 56301 processor, and increases the audio tracks from 16 to 24 per card. There is also an updated 888 interface with 24bit A/D & 20bit D/As, multiple 888s enabling up to 72 channels of discrete analog or digital I/O. They have also reduced the price of the standard ProTools from £7,131 to £4,465 and ProTools Project from £2,137 to £1,879.

DSP FARM REDUCTIONS & FREE PLUG INS WHEN PURCHASING PT24

ProTools 24 & G3 Pack

- G3/266 32/4096SD, ZIP & Keyboard
- Apple Multiplescan 720 Display
- ProTools24 Core System
- 888/24 Interface
- PCI SCSI Accelerator
- 4Gb External Barracuda Hard Drive

NEW G3 PACKAGE **£9999** INCLUDING INSTALLATION £11,749 INC VAT

ProTools 24 & 9600 Pack

- 9600/200 32/4096CD & Keyboard
- Apple Multiplescan 720 Display
- ProTools24 Core System
- 888/24 Interface
- PCI SCSI Accelerator
- 4Gb External Barracuda Hard Drive

9600 PACKAGE **£9999** INCLUDING INSTALLATION £11,749 INC VAT

ProTools Project

PROJECT **£2195** £2,579 INC VAT

- ProTools Project
- 882 Interface

ProTools III

PROTOOLS III **£5495** £6,457 INC VAT

- ProTools III Core
- 888 Interface

ProTools Plug-ins

t.c. tools £775

Arguably the best reverb plug-in available, TC Tools uses algorithms developed from the M5000 mainframe reverb. Great user interface allows you to visualise the effects via the graphics, making it intuitive and easy to use.

Dolby Surround Tools £1339

ProDolby Surround mixes entirely within the ProTools environment. Both Encoder & Decoder Plugins are available as a bundle providing digital implementation of encoding/decoding process.

Focusrite D2 £880

Based on the famed Focusrite Red 2 Dual EQ designed by Rupert Neve, the D2 plug-in matches the high-quality expected from the company, even down to the brushed aluminium front panel.

Antares Auto-Tune £580

The plug-in that many professionals have but none will admit to it! AutoTune identifies the pitch of a signal and corrects it to a defined scale, retaining original quality, making intonation problems a thing of the past. Available as a TDM or VST plug-in.

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

QUESTED

Ask anyone in the know in the audio industry about who are the foremost acoustic designers in the business, and the chances are that the name of Roger Quested will be top of the list. He has built an unrivaled reputation for himself in a notoriously difficult process which is half science, half art.

Whilst his initial designs were all large bespoke projects for his studio installations, the last few years have seen the emergence of a very carefully thought out, high quality range of monitor speakers, to cater for the demands of the modern speaker market, from the innovative new F11, to the incredible HQ410.

The Quested range is probably the most comprehensive available, covering active, passive and self powered designs, as well as amplifiers and active crossovers, from subwoofers through nearfields to custom built soffit mounting units.

Call Turnkey Professional to arrange a demonstration, a free trial in your own studio, or to enquire about our generous part exchange facilities.

F11 SELF POWERED MONITOR

The F11's cabinet design is another Quested first, being made from a new mineral loaded material which offers excellent acoustic properties using a considerably smaller box than would be possible using conventional materials. The design is a self powered two way bi-amplified one, with 165mm bass driver, and 28mm soft dome HF unit. Months of fine tuning have resulted in a speaker which produces a superb sound, totally belying its size. Custom colours can be specified for bulk orders.

NEW PRODUCT **£1149**

VS2205 SELF POWERED MONITOR

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

NEW PRODUCT **£1699**

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

*We will beat any genuine quote from a UK or European dealer at the time of... We must be able to substantiate the quote and the goods must be available and in stock. Prices ... 17.5% VAT ... bundles. UK mainland ... from £9.99. Please allow 10 working days for cheque clearance. Errors & omissions excepted.

KORG ensoniq ALESIS Steinberg Technics Vestax KURZWEIL FATAR

EUROPE'S LOWEST

dbx DYNAMICS PROCESSORS FOR EVERY APPLICATION

DBX is one of the oldest and most respected names in the audio industry. Classics like the 160 and 165 have given them a reputation for producing no compromise audiophile equipment. Fortunately, modern manufacturing techniques now mean the rest of us can own DBX quality at affordable prices.

1066 DUAL COMPRESSOR LIMITER GATE

DBX build on the success of their highly acclaimed dynamics processing range with the flexible new 1066.
In addition to all the professional features expected from this respected brand, the 1066 offers switching between their patented "Overeasy" soft-knee and hard-knee modes, sidechain switching, ultra-low distortion "Peak Stop Plus" limiting and meticulous US hand-built quality.
A/B this product at Turnkey to hear why DBX remains an industry standard in signal processing.

RRP £479

286A 'CHANNEL STRIP'

These days, in the age of MIDI and hard disc recording, most people tend to only record one audio track at a time, and have seen the value in investing in a good quality microphone. However, a mic is only as good as the circuitry you pass it through afterwards, and for some time, high end manufacturers have produced 'channel strip' style boxes which include all the essential acoustic recording processes in one device. Now the DBX 286A brings you a high quality mic pre amp, Over Easy compressor / de-esser, enhancer and expander / gate all in one device, offering you a premium quality signal path at a budget price. The ideal enhancement to any project studio!

RRP £229 **£199**

266 DUAL COMPRESSOR GATE

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

RRP £229 **£199**

163A COMPRESSOR/LIMITER

Compressors and de-essers are an essential part of the recording process, but the plethora of controls that many of them are fitted with can often lead to confusion and ending up with a worse result than you started with. The DBX 163A and 263A are designed to give you high quality results with total simplicity - a single control gives you 'more' or 'less', and the rest is all taken care of for you. The units are also ideal for portastudio and budget mixer owners, as they sport a front panel mic input, so no insert points are required. Buy one of each and get a free universal rack tray. Limited stocks only - order now to avoid disappointment!

RRP £189 **£99**

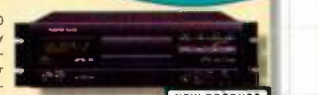
263A DE-ESSER/COMPRESSOR

RRP £189 **£99**

BUY THE 163A & 263A AND GET A FREE UNIVERSAL RACK TRAY

DA20MkII DAT MACHINE

TASCAM



The new Mk II version of the DA20 builds on what is already a quality machine: reliable tray-loading mechanism, SCMS is switchable in or out, both analog and digital recording at all 3 sample rates and coaxial SPDIF in and out. High sound quality is guaranteed by 1-bit DAC playback, and there is a special 'Table-of-Contents' feature. New features include error counting & adjustable ID encoding.

NEW PRODUCT **£699**

DA30MkII DAT RECORDER

Professional machines start here! Tascam's DA30 and it's current Mark II equivalent are probably the most commonly found machines in professional studios, and with good reason: they combine a range of pro features such as 44.1kHz recording, AES/EBU digi I/O, balanced analogue connections, and now a jog / shuttle wheel, with sturdy build quality and excellent reliability. Incredible new low price makes pro quality affordable!

RRP £1299 **£975**

102MkII & 202MkIII TAPE DECKS

Fantastic deals on Tascam's superb professional quality mastering cassette decks. Both are full 19" rackmount units, the 102 MkII is a single deck unit, the 202 MkII is a double deck, which records on both decks. Limited stocks only at these prices, ideal for mastering and duplication.

RRP £249 **£199**

RRP £349 **£269**

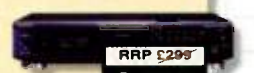
DTC-A6 DAT RECORDER

SONY

Turnkey have done it again! A pro, full spec DAT machine at a bargain price! Just look at the list of features. SPDIF coaxial and optical ins and outs, digital and analog recording at all three sampling rates (32 kHz, 44.1 kHz, 48 kHz), full 19" rackmount, as well as all the usual ID functions and a full function infra red remote control. Sony's exclusive Super Bit Mapping process can also be switched in, cramming the sound of 20 bits into 16! Stocks at this incredible price are limited - get your order in now!

RRP £799 **£499**

MDS-JE510 MINIDISC RECORDER



Although DCC looks to have died as a format, MiniDisc is thriving, and rapidly becoming a standard in radio stations and other institutions around the world. With sound quality almost as good as DAT, and a range of editing features like Combine, Move, and Auto Cut, it makes an ideal choice for mastering on a budget. If MiniDisc is for you, there's no better value on the market than the MDS-JE510, with digital input, jog dial and full function remote control as standard.

RRP £299 **£199**

MZ-R30 PORTABLE MINIDISC RECORDER

Now available is this compact portable version of the MDS-JE510 as featured above. This must be the neatest walkman you've ever seen! Price does not include AC adaptor, priced £24.99

RRP £399 **£199**

- *Excellent Sound & Build Quality Throughout the Range*
- *Full Feature Sets for Detailed Sound Control*
- *Automatic Settings for Ease of Use When Required*
- *Turnkey Pricing Means Even Better Value for Money*

SV3800 INDUSTRY STANDARD DAT RECORDER

Panasonic

The Panasonic SV3700 has been the industry standard mastering DAT recorder, and is now superseded by the SV3800. Using 1 bit, 64x oversampled (equivalent to 20 bit), you can be sure of the highest possible sound quality. Records and plays back at all 3 sample rates via analog and digital inputs. Highly useable jog/shuttle wheel. AES/EBU and SPDIF digital connections, error counting and many other software features. In stock now!

RRP £1291 **£895**

THE UK 4 TRACK CENTRE

Our famous 4 track pack includes everything you need to start making music: Maxell headphones, a dynamic microphone, a chrome tape, cables, head cleaning kit and the best book we've yet seen on multitrack recording, taking you through basic track laying, mixdown etc... with sections on everything from mic placement to synchronisation and MIDI. We've obtained some great 4 track pricing and for a limited period, we will give you the 4 track pack (normal price £59.95) absolutely free when you purchase any of these multitrack recorders.

PORTASTUDIOS

TASCAM

PORTA 03 MkII

New version of a classic portastudio. Improved styling and metering.

RRP £229 **£149**

ALL MULTITRACKS INC '4 TRACK PACK' ADD £10 FOR PORTA 03 MkII

414

All new Portastudio from Tascam! Records to all 4 tracks at once using DBX noise reduction. Double speed recording for better bandwidth, 2 band EQ, 4 mic inputs and full LED metering make it great value for money. Includes free four track pack!

RRP £349 **£329**

424 MkII

A brand new version of the best selling 424 from Tascam, inventors of the portastudio. Features include 3 band EQ with a mid sweep, records to all 4 tracks at once, 2 independent auxiliary sends (1 switchable pre/post fade). Logic controlled 2 speed transport with built-in memory location points, DBX noise reduction, initial supplies limited.

RRP £499 **£429**

ALL MULTITRACKS INC '4 TRACK PACK' ADD £10 FOR X-14

X-14

Fostex

The neatest introduction to multitrack recording ever! Built in mic for instant recording and straightforward operation means almost anyone can make a track without reference to the manual. Buy with our complete four track pack for only £10 extra!

NEW PRODUCT **£149**

XR SERIES MULTITRACKS

XR3

High speed machine at £249! New auto-bounce facility and built in mic - ideal for 4 track recording on the move.

RRP £249 **£219**

XR5

Stunning new double speed Fostex machine with individual EQ, up to 3 aux sends and 2 stereo returns, 2 inserts & 4 separate tape outs allowing use with an external mixer.

RRP £420 **£289**

XR7

The XR7 breaks new ground in price and performance - 6 inputs (2 mics), 2 separate aux sends, low/hi plus sweep mid EQ. Records up to 4 tracks at once - double speed transport, Dolby C.

RRP £499 **£369**

D5 DAT RECORDER

Exclusive scoop purchase on a genuine professional machine brings quality within reach of the rest of us. Now that Sony's dominant machines are discontinued, this is one of the cheapest DATs around, but just look at the spec list: 19" rackmount, 44.1 kHz analog recording SCMS-free operation, error detection indicators, balanced ins and outs on XLRs, AES/EBU professional digital connections as well as all the usual DAT features from the makers of the industry standard D208 timecode machine. Huge reduction.

RRP £1299 **£739**

DMT-8 VL DIGITAL MULTITRACKER

INC '4 TRACK' PACK & SM58 — Fostex

The personal digital multitrack is here at last, and at a price you won't believe! 8 separate tracks of CD quality audio recording to hard-disk (up to 12 minutes). Record 2 tracks simultaneously (eg shuttle audio and sync to MIDI sequencer) leaving 6 tracks. The 8 channel mixer accepts 2 mics, with a 2 band EQ and 2 aux sends, separate outputs and S/PDIF optical output. Why buy 4 tracks when you can have 8!!

INCLUDES FREE SM58 mic. ONLY AT TURNKEY

RRP £1208 **£879**

MT50 MULTI-TRACKER

BOTH INC '4 TRACK PACK — YAMAHA

The MT50 can record on all four tracks simultaneously, and works at double the normal speed for improved frequency response and reduced wow and flutter. Each channel has it's own two band EQ, an auxiliary send for use with effects units, and DBX noise reduction is incorporated to keep background noise to a minimum. A special 'sync' output bypasses this so as not to interfere with timecode.

RRP £389 **£279**

MT4X MULTI-TRACKER

The MT4X is Yamaha's top of the line machine and has a specification to go with it! It's logic controlled transport means that as well as two autolocate points and 'return to zero' function, you also get a special 'rehearsal' mode, so that you can practice dropping in and out as many times as you like, without risking erasing your precious 'recording'. Other great features include three band EQ on each channel, two auxiliary sends, LCD metering, double or single speed operation, and individual track outputs for use with an external mixer.

RRP £559 **£339**

We will beat any genuine quote from a UK or European dealer at the time of order. We must be able to substantiate the quote and the goods must be available and in stock. Prices include 17.5% VAT. Uk mainland carriage from £9.99. Please allow 10 working days for cheque clearance. Errors & omissions excepted.

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PRICES GUARANTEED*

Roland

JUPITER STRIKES BACK!

JP8000
ANALOG MODELLING SYNTH

So far, modelling technology has been used to recreate acoustic timbres, but Roland are the first to specifically model true analog synthesis with their new Analog Modelling technology, and believe us, the results are spectacular!

Analog Modelling not only produces superb emulations of the great synths of the 60's and 70's, but also totally unique timbres never before heard. Realtime control is excellent, and all knobs, sliders, buttons and the ribbon controller send out Continuous Controller messages. For instant creativity, a powerful arpeggiator and real time phrase synthesiser are included, which can be easily synchronised to an external MIDI clock. This is very likely to be the hottest synth of '97 - order now!

- *Superb New Analog Modelling Synthesis*
- *Unrivalled Realtime Control*
- *Highest knob Count Around for Easy Programming*
- *Built in Arpeggiator and Realtime Phrase Synth*

~~RRP £1499~~
£1049

D80
HD RECORDER

FOSTEX

INC 850 MEG HD

The D80 is a 3U rackmount unit, with 8 individual in/outs and outputs, a removable front panel doubles as a remote and meterbridge, and a removable cannister drive slot. Slaves to MMC as well as being able to act as a master, all with no track loss, and has SPDIF digital ins and outs to allow backup to a standard DAT machine and direct digital recording. Easy to use editing allows cut, copy and repeat pasting across multiple tracks. Comes with 850 meg HD as standard.

~~RRP £1499~~
£1099

D90 HD RECORDER

INC 1.3 GIG HD

The D90 has all the features of the D80, but also has ADAT digi i/o as standard, and optional kits for connecting SCSI drives & balanced analog i/o's for interfacing with pro level equipment. Our price includes a 1.3 gig HD fitted free!

~~RRP £1798~~
£1295

D160 HD RECORDER

INC 2.5 GIG HD

Latest in the family from Fostex is the superb D160, giving you a full 16 tracks of hard disk recording for well under £3000 - less than the price of a second-hand analogue machine! D/A conversion is 20 bit delta-sigma 128x oversampling, so sound quality is superb. An amazing amount of machine for your money - call us for more details. Price includes 2.5 gig HD

RRP
£2932

SOUNDLINK 168RC
DIGITAL MIXING CONSOLE

KORG

OVER 45% OFF !

The 168RC features 16 digi i/o in the ADAT optical format, as well as eight analogue mic/line inputs, two of which have phantom power, master outs are also available as SPDIF. Also available from Korg are high quality external 8 channel A/D and D/A convertors in ADAT format for more analogue connections, and you can cascade multiple 168RC's together for unlimited channels!

Internally, the 168RC has 8 subgroups, 3 band parametric EQ, 2 external and 2 internal aux sends. The internal sends go to 2 high quality effects processors with some of the finest algorithms around, including reverb, delay, distortion, pitch shift, dynamics processing and even speaker simulation. For automation, up to 100 'scenes' can be stored internally, taking a snapshot of every single parameter of the desk, which can then be recalled at the touch of the button, and in addition to this all parameters can be dynamically controlled in real time via MIDI. All in all, a tour de force product with far too many features to detail here.

Call now for a demo!

~~RRP £1899~~
£999

MDMX4
DIGITAL MULTITRACKER

SONY

OVER 40% OFF!

The MDMX4 offers 37 minutes of high quality four track digital recording on an MD data disk. It also features the exclusive Track Edit system and a host of other functions that will revolutionise your concept of personal recording, and Sony's second generation data compression algorithms give it a significant sound advantage over similar machines. The 10 input mixer (2 XLR's) has 4 busses, individual track outputs, 2 aux sends and 3 band EQ. Random access transport includes 11 point locator, jog-shuttle wheel as well as rehearsal and auto-punch modes. There's no need to leave a track spare for bouncing, and whole songs can be digitally copied forward for a 'safety' version. MMC and MTC compatibility for use with MIDI sequencers - you can even control it from your sequencer! MIDI Clocks are also supported for use with keyboard workstations and drum machines. Stocks are very limited on this exclusive deal - order now!

~~RRP £999~~
£599

HD-S200
PORTABLE DAT RECORDER

aiwa

OVER ONE THIRD OFF!

Turnkey's incredible buying team bring you the DAT exclusive of the year!

This beautifully manufactured machine from AIWA, records at 32kHz (long play), 44.1kHz or 48kHz through either the analog or digital inputs. Digital input and output via optional optical cables (£29 each), backlit LCD display, full complement of ID buttons. Comes with lithium ion rechargable battery (no memory effect), additional dry cell battery case for extra battery life, mains adaptor, phono cables and headphones included in the price. Very limited stocks - grab your once in a lifetime bargain now!

~~RRP £599~~
£399

PDR-04 CD RECORDER

PIONEER

Why master to DAT when you can master to CD for the same price! DAT, CD or Mini Disc ID codes are automatically transferred onto the disc, and recording can be stopped and started at the end of a track. CD's are more durable and have a longer shelf life than DAT, and you get all the advantages of instant access, and impressing your mates with your very own CD! *These will sell out quickly - order now!*

~~RRP £699~~
£499

PDR-05 ALSO AVAILABLE with sample rate conversion ONLY £599

CDR870
CD WRITER

PHILIPS

Brand new CD recorder from Philips that is the first on the market to be able to use re-recordable CDs (watch out though, these will not play back in an ordinary CD player). Price includes remote control and one 5-inch CD.

NEW PRODUCT
£499

DD8
HD MULTI-TRACK RECORDER

NEW PRODUCT

AKAI

Akai's new DD8, Records and/or plays back 8 tracks at a time directly onto hard drive, or crucially, 2.6 gig magneto optical carts. There is finally no lengthy backup at the end of a session, or reload at the beginning (of course you can still make a safety copy if you wish to). Sync multiple machines together, use it with the DL1500 remote for DD1500 style SuperView operation and editing, choose from a myriad of expansion options TDIF, ADAT, AES/EBU and analog I/O, digital EQ, Ethernet, SMPTE, MIDI, 9 PIN and Biphase synchronisation - the list is endless!

Call for a Turnkey Professional Brochure and a free trial.

PRICES FROM
£3199

MULTITRACKS NEW, USED & EX DEMO

Akai DR4VR	£700	Fostex XR5	£250	Tascam DAP1	£999
Akai DR8	£1795	Fostex XR7	£330	Tascam DA30	£1999
Alesis ADAT	£1179	Pioneer PDR04	£499	Tascam 414	£345
Alesis ADATXT	£1650	Roland VS880	£999	Tascam 424MK2	£799
Fostex D5	£699	Roland VS880 Expanded	£1699	Tascam 564	£1099
Fostex D16	£2931	Sony DTC45	£480	Tascam Porta03 MK2	£119
Fostex D80	£999	Sony MDMX4	£599	Yamaha MD4	£599
Fostex D90	£1299	Tascam DA20	£496	Yamaha MT4X	£349
Fostex D4/T8VL	£879	Tascam DA30MKII	£796	Yamaha MT50	£249
Fostex XR3	£169	Tascam DA88	£2380		

DR-16 HD MULTI-TRACK RECORDER

First there was the DR4, then the DR8, and now Akai bring you 16 tracks of non-sensence hard disk recording in a single box! 8 inputs and 16 individual outputs are provided making it perfectly suited for full blown multitrack recording. Amongst the options available is a video output board to give a full colour display of all the tracks, which makes editing a breeze. Buy now from Turnkey and we will include a free 2 gig hard drive!

~~RRP £4199~~
£3599

INC FREE 2GIG HD

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

*We will beat any genuine quote from a UK or European dealer at the time of order. We may be able to subsequently match the quote and the goods must be available and in stock. Prices include 17.5% VAT. UK mainland carriage from £9.99. Prices E&OE. 10 working days for cheque clearance. Errors & omissions excepted.

Authorised Dealer Soundcraft DRAWMER MACKIE Roland SONY TASCAM FOSTEX digitech

EUROPE'S LOWEST

ZOOM

A JOURNEY TO THE MOON!

Zoom is a Japanese company that was set up a few years ago by disgruntled staff from some of the major Japanese manufacturers. Their sole aim was to produce innovative new effects processors, that represent the best value for money on the market. Have they achieved that aim? We certainly think so!

1201 TRUE STEREO FX PROCESSOR

The 1201 is a full 19" rack unit, featuring true stereo 16 bit processing at 44.1kHz, with 64x oversampling convertors. The quality of the reverb alone would make it worth the price, but there's lots more: two simultaneous effects are offered, from a choice of 33 including delay, chorus, flanging, tremolo and pitch shifting, 'vocoder', karaoke, 'lo-fi' and vocal distortion effects as well as various reverb types including reverse. If one of the 363 presets doesn't suit exactly then using the two parameter knobs will allow you to tweak the program until it does, and the addition of 2 band EQ will further tailor the sound to your mix.

NEW PRODUCT
£99

- *16 Bit 44.1kHz True Stereo FX Units*
- *Great Quality Reverb & Multi FX*
- *Vocoder and Mic Input on 1204*
- *Up to 512 Different Presets*

1204 TRUE STEREO FX PROCESSOR

The 1204 builds on the success of the 1202 by adding MIDI control, 100 extra user presets for storing your own edits, and a two digit LED display. On top of this, there is also a rotary speaker effect, and a vocoder - a front panel mic input is even provided for quick and easy setup.

Nothing else touches these units at the price - check one out today!

RRP
£199

INC FREE 10u DESKTOP RACK & 4x 3m JACK LEADS

XR300 SYNCHRONISER

TURNKEY EXCLUSIVE

XRI Systems

Long the synchroniser of choice in professional studios, we now exclusively bring you this industry standard unit at an unheard-of price. Features include true SMPTE at all standard sample rates, MIDI clocks / Song Pointers or MTC for compatibility with all MIDI sequencers. Large LED time-code display. Merged MIDI input. Straightforward operating system. Full 19" rack unit.

RRP £299
£169

PROGRAMMER FOR MATRIX 1000 OR MICROWAVE

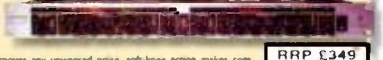
access

There's no doubt that the Oberheim Matrix 1000 and Waldorf MicroWave deliver powerful analog sounds. However, when it comes to programming your own sounds, top producers have tended to go for older synths like the Minimoog and Super Jupiter, because their knobs and sliders make for easy creation of new sounds. The Access programmer gives you the best of both worlds - now you can freely experiment with your modern analog synth using the same intuitive front panel, and better still, record every tweak of a parameter into your sequencer.

EXCLUSIVE
£329

COMPOSER WORKHORSE COMPRESSOR

BEHRINGER



A natural sounding and fully featured compressor at a give away price! Built-in gate removes any unwanted noise, soft-knee action makes compression much less obtrusive, "auto" mode makes quick setup a doddle and side-chain access means it can also be used for de-essing etc.

RRP £349
£169

STUDIO TWIN 2 CH. STUDIO FX PROCESSOR

DigiTech

Two effects units for the price of one! The Studio Twin can be used as both a single true stereo, or two independent mono FX units, with each signal being treated seperately. S-DISC processing means that typical Digitech sound quality can be taken for granted - crystal clear reverbs, spot on delays and fat modulation effects (Sound On Sound said - "studio effects to a very high standard"). Editing is done via front panel knobs, there's a parametric EQ on board, and the built in transformer means there's no fiddly external PSU. MIDI patch change, +4dB balanced connectors and LED level meters complete a thoroughly professional package at this bargain basement price! *Buy now to avoid disappointment.*

RRP £250
£149

MIDIVERB 4 PRO QUALITY FX UNIT

ALESIS

The MidiVerb 4's excellent Alesis effects algorithms produce dense, natural Reverberation, rich Chorus and Flange, Delay and Pitch effects that are designed for professional use. There are thirty-two effects algorithms, and 128 Preset and 128 User Programs to choose from. Large backlit LCD, online help, MIDI controller routing and programmable footswitch give you complete creative control.

RRP £329
£249

STUDIO QUAD 4 CH. STUDIO FX PROCESSOR

DigiTech

NEW LOW PRICE!

At last - Multi effects as they should be! The new Digitech Studio Quad features not only their custom designed and ultra-powerful 'S-DISC' chip, but also 4 independent inputs and outputs, which using the built-in sub-mixer, can be configured as 4 mono line feeding 4 effects processors, feeding 4 stereo outputs. Huge screen, and new intuitive operating system make editing a breeze. 20 bit convertors give greater than 90 dB signal to noise ratio. Effects include reverbs, delays, detuning, chorus, flanging etc. Hundreds of other features too numerous to mention.

RRP £529
£349

THC-00 RESINATOR

FAT

Freeform Analog Technologies FreeBass is already one of the most successful sound modules of the year, and now following hot on the heals of the Freebass and PCP330 Procoder is the new THC-00 Resinator.

Not one, not two, but three band pass filters with resonance! And we mean resonance! Feed any mono signal into this unit and get out some of the most wacky and groovy sounds you've ever heard in glorious auto panning stereo. Each of the filters has it's own cutoff point which is modulated in a selection of ways, by a combination of the built in LFO, the polarity reversable envelope follower and even an external control voltage. Ideal for processing loops, vocals or indeed any another signal, for results ranging from the sublime to the extreme! Must be heard! More fresh thinking from FAT.

NEW PRODUCT
£199

PCP330 VOCODER

One of the most asked questions in the industry must be "Why doesn't anyone make a vocoder anymore?" - well here it is, with a fantastic feature list, great sound quality and a down to earth price. The carrier can be either an internal VCO or external line input, whilst both line and mic inputs are given for the modulator signal. Eleven filter bands each have their own level knob on the front panel giving true hands on control of your sound, and the sibilance (unvoiced) control also has an external input if required. The final output can contain any mix of modulator, carrier, vocoded signal and a special filtered version of the signal. Remember, this doesn't only create robot voices, there are thousands of creative uses, and it's also ideal for processing drum loops.

Order now and own an instant classic!

NEW PRODUCT
£299

DIGITAL PROBLEM SOLVERS

FRIEND-CHIP

In today's increasingly digital world, many people are still using their equipment's analogue ins and outs, because of the difficulty of interconnection and synchronisation. Friend Chip's new sensibly priced digital patchbays and 'black box' problem solvers end the misery and make the digital studio a reality! The DigiMax digital patchbay (£299) has 8 inputs and outputs (2 each on optical), can accept both AES/EBU and SPDIF signals, and is MIDI controllable. An XLR version (£499) is also available for greater AES/EBU reliability. The Audio Time Base (£499) is a 1u 19" rack which acts as a master clock source for your studio, outputting word clock, Digidesign Super Clock and SPDIF. The master clock can be internally generated, or a reference taken from mains, SPDIF word clock, Super Clock, video or LTC (SMPTE). Lockup from timecode is in around 1 second!

Also in the range:

OP-CON: optical to co-axial and vice versa	£69
PRO-CON: SPDIF to AES/EBU and vice versa with SCMS stripping	£129
D 4-2 COPY CON: switcher with 1 optical & 3 co-ax ins, 2 co-ax outs and SCMS stripping	£99
SR44.1: converts almost any incoming sample rate to 44.1kHz (ideal for ProMax01 and non 44.1 DATS)	£149
SRC/W: sample rate convertion to 32, 44.1, 48kHz, with lock to external word clock	£249
Super Clock Driver: converts DigiDesign superclock to word clock and vice versa, 3 outputs	£129
Silent Audio Clock: converts Super Clock to word clock and vice versa with synchronous SPDIF signal	£129
ADAT Audio Clock: ADAT 9 Pin to word clock, Super Clock and SPDIF clock convertor	£129
ADAT Word Clock Synchroniser: ADAT 9 Pin to word clock and Super Clock convertor, also sends MTC (synchronise your sequencer) with MIDI merg	£199
ADAT SPDIF Synchroniser: as above but with converts only to SPDIF	£199
ADAT MIDI Machine Control: MIDI to ADAT 9 Pin convertor with MIDI thru (add to either of the above for full remote ADAT control from your sequencer)	£69
Rack Kit: holds up to three 'black boxes'	£49

FROM
£69

VTP-1 DIGITAL MIC PRE

DigiTech

The all new 2 channel VTP1 tube mic amp / EQ looks set to take the market by storm. It combines four bands of semi parametric EQ with a high definition mic amp based around a proprietary valve design. Phase reverse, high pass filter, 20dB pad (line inputs also available) and 48v phantom power are provided, together with high quality balanced analog outputs, and AES/EBU and SPDIF outputs at 44.1 or 48 kHz. Ideal front end for any digital system.

NEW BOXED
£999

VCS1 COMPRESSOR

The VCS1 is brimming with innovation and quality, and brings you a sensibly priced dual channel valve dynamics processor with plenty of useful features. The compressor has the usual envelope, threshold and ratio controls, but is also switchable between hard and soft knee compression and has an auto mode for ease of use. There are also separate gate and limiter sections, to give highly detailed signal control. Valve gain is variable to give a range of sound from subtle colouring through to controlled distortion. Call for more info.

NEW PRODUCT
£799

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

* We will beat any genuine quote from a UK or European dealer at the time of order. We must be able to substantiate the quote and the goods must be available and in stock. Prices include 17.5% VAT. UK mainland carriage £5.00 - £9.99. Faxes, offers, E.O.E. Errors and omissions excepted.

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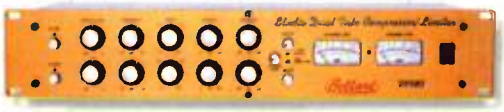
PRICES GUARANTEED*

Bellari

PREMIUM QUALITY VALVE OUTBOARD EQUIPMENT

If you've previously used valve equipment, you'll be well aware of the magical quality that tube circuitry produces, and if you haven't used it - try it now! Many manufacturers use the word valve as an excuse to charge exorbitant prices for their product, but not Bellari, and our factory direct exclusive makes the range unbelievable value for money!



The RP583 Studio Tube Compressor / Limiter has become an instant hit, offering as it does two channels (stereo linkable) of some of the finest sounding compression money can buy, with a smooth and natural compression characteristic. Ratio is continuously variable from 2:1 to infinity, and there are separate controls for attack, release, threshold and make-up gain. Dual VU metering is provided, as well as jack and balanced XLR ins and outs, and sidechain access is fully catered for. Ideal for a variety of instruments, vocals and complete mixes.

NEW PRODUCT **£499** FACTORY DIRECT

RP533 Studio Tube Multi-Processor

Whilst mixers these days are of a better quality than they used to be, to get the best possible signal to tape or disk, you can't beat a dedicated unit - and for value for money, you can't beat the Bellari RP533 Studio Tube Multi-Processor. The all tube 2u box, features a premium quality transformer balanced mic pre amp with switchable 30dB pad, phase reverse and true 48V phantom power. The compressor has all the features of the RP583, and the exciter section adds a wonderful sheen to virtually any sound, as well as beefing up the bottom end. Each stage has it's own bypass switch, sidechain access is provided, and the large VU meter can monitor input, output, or gain reduction. No serious recordist should be without one!

NEW PRODUCT **£499** FACTORY DIRECT

RP520 Studio Mic Pre Amp

A true dual tube mic pre amp at a bargain price, with tubes used at all the crucial gain stages, not just strapped across the outputs. Features include phase reverse, input and output pads, separate gain and output level controls, true 48v phantom power, jack and XLR ouputs and dual VU meters. Bypass you desks mic amps and feel the quality!

NEW PRODUCT **£399** FACTORY DIRECT

RP562 Stereo Exciter

Traditional exciters usually do a good job of brightening up the extreme top end, but can often leave you with a rather harsh signal lower down. The incredible warmth of the Bellari Sonic Exciter ends all that, providing a sparkling top end with no harshness, and a huge bottom end to boot. The stereo unit has both Jack and XLR connectors, dual VU meters, and even a separate subwoofer output with it's own cutoff and level controls. Superb sound quality at a fraction of the price of similar devices.

NEW PRODUCT **£299** FACTORY DIRECT

ADB3 Stereo Direct Box

Stand alone 2 channel tube DI box

NEW PRODUCT **£129**

MP110 Direct Drive Mic Pre Amp

Stand alone single channel tube mic pre amp

NEW PRODUCT **£169**

Focusrite

FOCUS EQ
PARAMETRIC EQUALISER

Focusrite have long represented the pinnacle of audio achievement, but sadly their products have always been out of reach for most of us. Now, specifically with the high quality project studio in mind, they have designed the Green range of processors.

Turnkey are well known for bringing you clearance deals at bargain prices, but not often does the chance come to own something as prestigious as Focusrite outboard, at a fraction of the original cost. The Focus EQ features an ultra high quality mic pre-amp complete with phantom power and phase reverse, as well as line and instrument level inputs, making it an excellent recording channel, or even a top quality preamp for bass or acoustic guitar. In addition to the four parametric EQ bands, there are also variable high and low pass filters, and the EQ and filters each have their own bypass switches. Typical Focusrite build quality can be taken for granted, as can some of the best sounding EQ you've ever heard. Very limited quantities available for this exclusive deal - order now or regret forever!

RRP ~~£939~~ **£499**

The Dual Mic Pre - an audiophile quality dual channel mic preamp. **£819**

The Voicebox - this combines a mic/instrument preamp, compressor, de-esser and parametric EQ in a single unit - the ultimate signal path for digital recording! **£989**

The Compressor - highly versatile compressor with hard & soft knee types, separate limiter and gate and built-in sidechain filters. **£1049**

The Channel Strip - similar to the Voicebox, but also featuring line level inputs and extra EQ. **£1129**

All 5 are on permanent demo at Turnkey.

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

lexicon

REFLEX UNDER HALF PRICE!
EFFECTS PROCESSOR

Once the preserve of only the world's top studios, Lexicon reverb has become more affordable in recent years, but this incredible exclusive deal means anyone can own one!

The Reflex packs stunning reverb quality together with other effects such as delay and Resonator, and some of the most comprehensive MIDI control available into a 1U rack unit. Reverse, gated and plate reverbs are included along with more traditional algorithms, and up to 10 editable parameters are available for each program. Lexicon's famous Dynamic MIDI allows for any four of these to be controlled in realtime via virtually any MIDI information - imagine varying decay time via note number, or feedback from your modulation wheel - the possibilities are endless! The best sounding reverb this side of an MPX1.

RRP ~~£469~~ **£199**

Limited stocks only - first come, first served!

t.c. electronic

FINALIZER 2
MASTERING PROCESSOR

Brings the professional quality mastering tools of the private studio. 5 band stereo EQ. De-esser. Digital Reference Generator™. Normalizer, and Dynamics, all with highly flexible editing, plus the option to let TC's Wizards do the work for you by analysing your own material automatically. Analog and digital I/O, call us for a demo and we'll send to improve your masters!! New Finalizer 2 has ADAT I/O and is fully 24 bit.

RRP **£1899**

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

362
SONIC MAXIMIZER

The 362 series delivers the sound improving benefits of "Sonic Maximizer" technology with the convenience of ganged-stereo operation.

RRP ~~£189~~ **£149**

362NR SONIC MAXIMIZER & NOISE REDUCTION only £179
362SW SONIC MAXIMIZER & SUB WOOFER CONTROL only £169

waldorf

4 POLE
FILTER

The 4 Pole is the legendary Microwave / Wave 24 dB lowpass filter. You are free to apply this filter to any audio signal that you patch into the Filter. So if your favourite sampler or sample player lacks this special quality, you can give it a sonic boost with the 4 Pole Filter.
It is the most powerful (and quite possibly the only) analog filter available today!

NEW BOXED **£269**

X POLE FILTER

What do you get if you take two of Waldorf's 4 pole filters, put them in a rack and spice it up? The all new X-Pole! Harnessing all of the 4 Pole's great sound, MIDI and tactile controllability, the X Pole allows you to treat two mono signals independently, or the two channels can be linked together for a stereo signal. 2u rack design makes for easy integration into your setup. Fatten up your sound today - your lungs need never be the same again!

NEW PRODUCT **£439**

spark electronics

MODEL 316
SEMI-PARAMETRIC EQ

This incredible unit from Spark Electronics are perhaps better known for their ultra high quality broadcast mixers. The Model 316 is a 3U rack offering 16 channels of 3 band semi-parametric EQ and was originally designed for their high end sub mixer the Xtramic CX. Each band provides up to 15dBs of boost or cut and frequencies of 50Hz-500Hz (low), 500Hz-5kHz (mid), and 5kH-15kHz (high). This is a unique opportunity to upgrade the EQ on your mixer to a standard that is not found on many professional consoles, or add EQ to monitor sections of live desks.

RRP ~~£789~~ **£349**

Roland

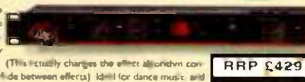
SRV-330 UNDER HALF PRICE!
REVERB UNIT

This incredible unit from Roland uses the technology developed for their £24,000 R-8 system. As well as being an ultra high quality reverb unit (32bit processing is employed), the 3D technology allows each reflections to be realistically placed and surrounded in a 360 degree circle. Full MIDI control, true stereo processing, +4/-20 dB I/O & dials, a wealth of editing facilities and exceptionally quiet performance make this an unmissable buy. *Very limited quantities at this bargain price!*

RRP ~~£869~~ **£429**

lexicon

VORTEX UNDER HALF PRICE!
MULTI EFFECTS PROCESSOR



The Lexicon Vortex brings the effects found in allowing effects to be morphed between in real time and in the process creating new and previously unheard of effects. (This actually changes the effect algorithm continuously - it's not a simple cross-fade between effects). Ideal for dance music and its real time nature makes it an excellent choice for live performers. Input dynamics can control effect parameters, tap tempo to control delay times etc. Typical quality can of course be taken for granted. First come first served!

RRP ~~£429~~ **£199**

OUTBOARD NEW, USED & EX DEMO

Alesis 3630	£195	Behringer Duotec	£119
Alesis MICROVERB4	£199	Behringer Ultrafex	£188
Alesis MIDIVERB4	£249	BOSS SX700	£369
Alesis Nanocomp	£90	Drawmer MX30	£225
Alesis Nanoverb	£145	Joe Meek VC3	£169
Alesis Quadraverb	£249	Joe Meek VC4	£379
Alesis QUAD2	£499	LA 4C2	£229
Behringer 104	£99	LA 4G2	£229
Behringer 107	£249	LA 4X4	£199
BBE 362	£219	LA G8	£379
Behringer Composer	£169	LA GX2	£149
Lexicon MX2	£249		
Lexicon ALEX	£199		
Lexicon LXP15II	£699		
Lexicon MPX1	£888		
Lexicon REFLEX	£229		
SPL Vitalizer Stereo	£299		
Yamaha PROJR	£999		
Yamaha REV100	£159		
Yamaha REV500	£299		
Yamaha SPX1000	£1199		
Yamaha SPX990	£729		

To be sold best any genuine quote from a UK or European dealer at the time of order. We reserve the right to withdraw the quote and the goods must be available and in stock. Prices include 17.5% VAT. UK mainland carriage: Mini £9.99. Please allow 10 working days for cheque clearance. Terms & conditions apply.

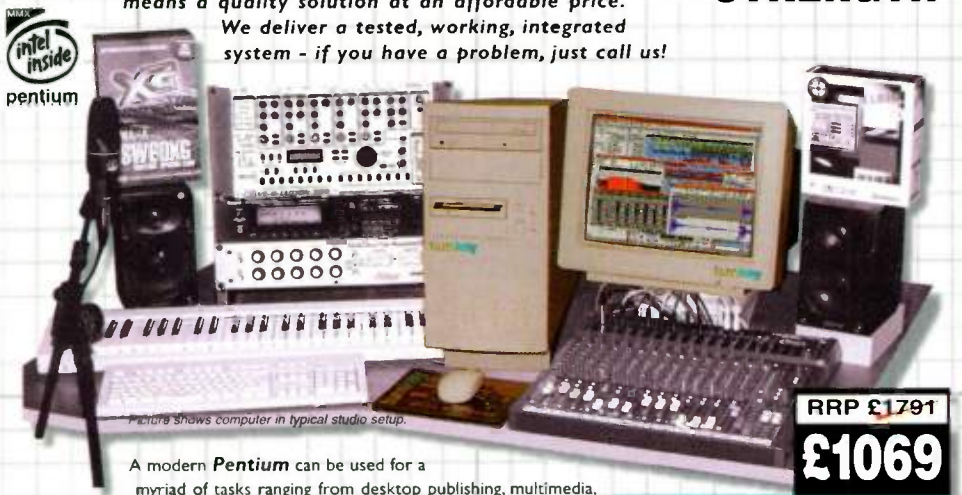
KORG ensoniq ALESIS Steinberg Technics Vestax KURZWEIL FATAR

EUROPE'S LOWEST

turnkey

THE TURNKEY PRO TECH PENTIUM: A TOWER OF STRENGTH

Ringing round for the cheapest Pentium?
We sell audio equipment - not office software and games! The computer is the heart of any studio setup, and a Turnkey Pro Tech audio-ready PC, built with carefully selected components, means a quality solution at an affordable price. We deliver a tested, working, integrated system - if you have a problem, just call us!



Picture shows computer in typical studio setup.

RRP ~~£1791~~
£1069

A modern ***Pentium*** can be used for a myriad of tasks ranging from desktop publishing, multimedia, games, and office work. However, few applications are as demanding as digital audio recording. Criteria which are irrelevant to most PC shoppers (such as the level of radio frequency interference within the casing), become very important, and sound cards which are otherwise considered "best buy" in the press often lack the essential "***full duplex***" ability which permits monitoring of audio during recording.

By supplying a pre-installed computer which we build from carefully selected components, we ensure that you get up and running immediately, you won't need to delve into DMA channels and P'n'P BIOS conflicts, and you won't get any nasty surprises like "insufficient system resources" warnings, when you try to run your software. Call us to discuss your requirements - ***satisfaction guaranteed!***

PACKAGE PRICE TABLE	16 bit full duplex & SW60	Fiji & DB50	Digi. Fiji & DB50	Pinnacle & DB50	Digi. Pinnacle & DB50
Digital Orchestrator Plus	£1,039	£1,299	£1,349	£1,349	£1,269
Steinberg Cubase VST	£1,069	£1,399	£1,449	£1,499	£1,569
E-magic Logic Discovery	£1,069	£1,329	£1,369	£1,399	£1,489
E-magic Logic Audio	£1,249	£1,529	£1,559	£1,599	£1,689

•Add £229 for deluxe 17" monitor •Add £129 for PC200 keyboard
•Add £129 for Sony powered speaker system with subwoofer
•Add £69 for MIDI interface with 2 separate MIDI outs.

CUBASE VST STARTER PACK

- Intel Pentium 166mmx (opt. 200, 233)
- 512k L2 cache RAM
- 32 Mb RAM (optional 48Mb, 64 Mb)
- 1Gb HD (optional 2 Gb, 4 Gb, 9 Gb)
- 24x speed CD-ROM drive
- 15" SVGA display (optional 17")
- Windows95 CD, keyboard & mouse
- Cubase VST PC 3.5
- 16 bit full duplex audio system
- Yamaha SW60XG synthesiser card
- 1x1 MIDI interface adaptor

P200mmx package with 2 gig HD only ***£1299!***

RRP ~~£1661~~
£899

P166 PC PACKAGE AS ABOVE BUT WITH CAKEWALK V5.0

MU10 GM SOUND MODULE

YAMAHA

OUT OF THIS WORLD MEGADEAL!

Turnkey's incredible buying team have done it again! Yamaha's MU10 was already great value for money, but this exclusive offer makes it unbeatable! The "XG" range of products (including the famous DB50XG) has long been highly regarded for its 676 excellent sounds, 3 built in effects processors and superb integration with computers.

The MU10 comes in a handy module format which means there's no need to open up your computer, no IRQ conflicts or DMA problems, you just connect it to the serial port of your Mac or PC (cable included). What's more its MIDI in and out ports means it also acts as a MIDI interface, and it can be used as a stand alone module without a computer!
The 34 built-in effects can be used not only with the built in sounds, but also with any external signal (eg your voice, guitar etc) via the stereo audio input. The MU10 comes with the CD-ROM version of Steinberg's famous Cubasis MIDI sequencing software, and this incredible offer includes Yamaha's XgEdit editor free for detailed editing of the onboard sounds.
A complete starter kit for anyone looking to get into making music.
This exclusive offer is only available whilst stocks last - get your order in now!

Package available with *new Models of MIDI keyboard (full size touch sensitive keys), microphones, headphones and cables only

£169

RRP £199
£115

CAKEWALK PRO

CAKEWALK

OVER 60% OFF PRICE

Cakewalk has been the US #1 sequencer for ever. For a limited period, we are offering Cakewalk Pro v5.0, with 4 discrete audio tracks and 256 MIDI tracks for £79.00. That's less than the price of Cakewalk Home Studio! Upgrade option to Pro 6 (£49) or Pro 6 Audio (£109).
(Comes on CD-ROM. Also includes v4.5 for Win3.1)

Cakewalk Pro 5 + MIDIMan Dman	£ 229
Cakewalk Pro 5, MIDIMan Dman + DB50	£ 335
Cakewalk Pro 5 + laptop MIDI Interface	£ 149
Cakewalk Pro 5 + Pentium package	£ 999

RRP £199
£79

SIBELIUS-7 TOP-END NOTATION V3.5

Sibelius

Why do so many music academies use a program which doesn't work on the PC or Mac!! Because for professional notation type-setting, nothing else comes close: "In a totally different league from anything else" - Paul Patterson, Royal Academy of Music, Future Music Platinum award.
We are now an Acorn Authorised Dealer, we stock and demonstrate the exciting new RiscPC computer, running RiscOS/3 powered by the 200 MHz ARM Processor, and with optional 486 or 586 board for running Microsoft Windows software.

Acorn

Call Geoff for a DEMO. One to one tuition also available upon request.

FROM ONLY
£499

CODA FINALE 97

NEW VERSION NOW AVAILABLE

Finale has long been considered the "Rolls-Royce" of score programs, but at a price of £699, few people could stretch as far as buying it, and with its extremely powerful but complex user interface, many beginners were put off. Well, Finale 3.7 now retails for just £499 (£249 for Academic Users), and now sports a radically redesigned user interface and rewritten manuals. If you're looking to notate Holst's "Planets" or Stockhausen's "Gruppen", Finale contains all the features you'll need!

~~WAS £699~~
£499

MUSIC AT PASSPORT NOTATION / COMPOSITION

PASSPORT

Musictime has been our best selling piece of music software since its introduction in 1992. The latest upgrade is called "Music At Passport" and includes a new "PitchWrite" facility which allows notes to be sung or played into the program using a microphone. A "pure score program" such as this offers the cleanest and most intuitive user interface, since the program revolves around the score, which is always displayed on the screen. Advanced facilities such as part extraction are included, and the program handles transposing instruments with ease. Includes Internet Explorer free!

RRP £129
£89

BAND-IN-A-BOX INTELLIGENT ARRANGER V7.0

PG music

Tired of starting each song with a 'Blank Slate'? Band-in-a-Box is the worlds leading intelligent arrangement software. Combine your chord list with built in styles, or create your own. NEW VERSION now includes full GS / XG compatibility, as well as 'Auto Soloing' which has to be heard to be believed. Notation / Lyrics display during playback. Can export music into Cubase.

•FOR PC, MAC (v6.0) or ATARI (v5.0)

#1 SELLER
£89

MIDI INTERFACES FOR PC COMPATIBLES

INTERFACES

Genesport Cable	fits any SoundBlaster™ type card	£25
JRDI Link	1 in, 1 out serial interface for notebooks	£50
JPDI-401-II	1 in, 1 out MIDI card with Wavetable	£50
Wanton 1e1	Works easily with your existing sound card	£50
Wanton 2e2	2 in, 2 out MIDI card for Windows only	£75
Pinnion 2e2	2 in, 2 out parallel interface for notebooks	£120
MIDI Edge 1x4	1 in 4 out MIDI card with Wavetable	£100
Wanton 4x4e	4 in 4 out MIDI / SMPTE card for Windows	£210
Pinnion 4x4e	as Wanton4x4e except for Parallel port	£210

16 BIT DUPLEX DIGITAL AUDIO RECORDING

midiman

This 16bit card has much lower noise levels than similarly priced cards, and allows full duplex record/play on fast 486 or Pentium computers. Ideal with Cubase 3.0, Digital Orchestrator, Sound Studio Gold etc... Built-in MIDI interface (cable included in the price), and connector for optional synthesiser daughterboard.
Really really easy installation with Win95 (Plug 'n' Play). After putting the card in, switch the PC on, and insert the disk when prompted. Takes about 90 seconds! (a bit longer if you already have a sound card). Buy with Cubase - £399, with Digital Orchestr. - £275

RRP ~~£249~~
£149

CUBASE VST FOR PC!

CUBASE Steinberg

The industry standard MIDI sequencer is now even better value than ever! Version 3 now includes full hard disk recording facilities as on the Mac that work with virtually any soundcard!
Get £50 off Score version at only £449

RRP £329
£279

CUBASE VST MAC

As well as all the great sequencing and audio recording facilities you've come to expect from Cubase, Power PC owners can now take advantage of up to 32 audio tracks, complete with built in digital EQ, DSP, reverb and FX! ***Get £50 off Score version at only £449***

MIDIQUEST 6.0 UNIVERSAL PC EDITOR LIBRARIAN

Sound Quest

MIDIQuest is the most powerful, flexible and comprehensive editor librarian around, with support for the widest range of MIDI devices including XP50, JV1080 series, Morpheus / UltraProteus, MU50, MU80, Quadraverb Plus / GT, Cassic Keys, TD-7, KT76 / KT88, Korg X5, DPM3 and many others. Driver upgrades are generally free of charge, so MIDIQuest will last for as long as MIDI is around! It's a really good investment. New version comes on CD-ROM and is fully Windows 95 native (ie 32 bit)

RRP £235
£199

SOUND FORGE 4 PC SOUND EDITOR

ALSO SOUND FORGE XP - £119

Sound Forge 4 (now with AVI support) is a full-featured sound editor intended for musicians, sound designers, and multimedia developers using the Windows platform (16-bit or 32-bit Windows). Allows sound file editing, effects, loops and regions, playlists. External samplers and sync to MIDI and SMPTE Time Code. Multiple window environments allows more than 50 sound files to be open at one time. Supports WAV, AIFF, Creative VOC, VOX, and Sound Designer SD1 files. Drag-and-drop glitch-free editing. Sound Forge is perfect for authoring audio CDs on the PC.

RRP £499
£349

REBIRTH RB-338 SOFTWARE SYNTHESISER

If you're into techno, trance, ambient, hardcore... you simply must have the sound of a 303 in your arsenal of sonic weapons. As it's been out of production for well over a decade, those still in existence are collector's items. They'll cost you an arm and a leg which has opened a market for clone products. The ReBirth RB-338 is a CD-ROM which gives you two 303s and one 808 - a software recreation of these two classic pieces of analog hardware. All the quirks and subtle qualities of the real thing are there, with full MIDI and sync capabilities. No cables, no boxes... all you need is a Mac or a PC.

RRP £149
£139

We will beat any genuine quote from a UK or European dealer at the time of order. We must be able to substantiate the quote and the goods must be available and in stock. Prices include 17.5% VAT. UK mainland carriage from £9.99. Please allow 10 working days for cheque clearance. Errors & omissions excepted.

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PRICES GUARANTEED*

turtle beach

A DIGITAL HURRICANE IN YOUR PC?

99% of available sound cards use the old-fashioned "DMA" system of recording audio in order to be compatible with Soundblaster games. With the Pinnacle and Fiji, Turtle Beach abandoned this system in favour of their proprietory Hurricane architecture. Basically, it gives you more tracks than DMA on the same PC hardware, and leads to less driver conflicts.

FREE DIGITAL ORCHESTRATOR PLUS WITH PINNACLE (WORTH £129)

The Turtle Beach Multisound series has long been considered the "Rolls Royce" of sound cards, from the very first Multisound in 1993, through to the highly respected Tahiti card, and now - the Multisound Pinnacle.

The audio quality of the Pinnacle is beyond reproach, based around a Motorola DSP with 20bit convertors on both record and playback, 64x oversampling, and Delta/Sigma convertors. An on-board Kurzweil chip provides a top-quality set of synth sounds, which can be augmented with your own samples which can be mapped to a MIDI keyboard via the SampleStore™ control panel. (Up to 48 Meg of samples can be loaded, depending on the size of SIMMs fitted). Create your own drum-kits, mix in breakbeats sampled from CD etc... etc...

Other upgrade options include a synth daughter-board (eg DB50XG), cable for MIDI interface, and S/PDIF daughter board allowing direct digital transfer to/from DAT, CD player, MiniDisk etc... (£99 for either card). The Pinnacle is bundled with Voyetra's D.O.P. sequencer which gives up to 16 audio tracks with digital effects (eg reverb, delay....) depending on hardware specification.

- 20 BIT DAC / ADC
- Enhanced or Std Duplex
- Sample Store (up to 48 Meg)
- Kurzweil Wavetable Synth
- WaveBlaster™ Connector (for DB50)
- Optional S/PDIF Daughterboard

PINNACLE
£449
INC. FREE DIGITAL ORCHESTRATOR PLUS

FIJI
£349
A PINNACLE BUT WITHOUT SYNTH & SAMPLESTORE

CUBASE VST £599 PACKAGE WITH FIJI

LOGIC AUDIO £699 PACKAGE WITH FIJI

CWALK PRO AUDIO 6 £649 PACKAGE WITH FIJI

ADD £100 FOR PINNACLE INSTEAD OF FIGI
ADD £100 FOR S/PDIF DIGITAL I/O

S3000XL WORKHORSE SAMPLER

INC FREE ZIP DRIVE & 32 MEG — AKAI

Akai continues it's tradition of supplying workhorse samplers to the studio market with this sturdy offering. The compact 2U rackmount machine features 32 note polyphony, 10 outputs, 2 meg expandable to 32 with SIMMS, SCSI as standard, MESA editing software, and a whole range of expansion abilities including digital i/o and an extra filter board. Buy from us and get 16 meg and a ZIP drive free!

RRP ~~£1789~~
£1399

S2000 SAMPLER

Akai's entry level studio sampler, the S2000 doesn't skimp on features: 32 note polyphony, low pass resonant filters, 2 meg RAM expandable to 32 meg, optional 8 output board and quad FX board. Comes bundled free with MESA software to allow full graphic editing from your computer.

Now bundled with SCSI interface, 12 speed CD-ROM drive, ZIP drive (inc 100 of RAM) at the incredible price of only:
£999

RRP ~~£999~~
£799

S20 SAMPLER

All new sampler from the makers of the industry standard, the S20 brings quality sampling to a new affordable level. 16 bit sampling gives great quality, and the standard 1 meg memory is expandable to 17 meg, giving up to 18 minutes sampling time depending on the sample rate used. Built in sequencer means you can build up grooves without the use of a computer, and the special auto loop tempo mode makes BPM calculation a doddle. The 1.44 meg disk drive reads floppies from virtually all Akai samplers giving you instant access to a huge library of sounds. Initial stocks are very limited - get your order in now.

RRP ~~£499~~
£479

MPC 2000 SAMPLING DRUM MACHINE

Ever since the launch of the Roger Linn MPC60, Akai have led the way in sampling drum machines. It's latest evolution, the MPC2000, is a lot more than a glorified drum machine however - the 64 track sequencer is a development of what most people consider to be the only real alternative to computer based setups (32 MIDI channels are available), the sampling section is virtually identical to the best selling S2000, SCSI is standard, and the outputs can be expanded from 2 to 10 and digi i/o for only £249! There are far too many other features to mention here - on demo now at Turnkey.

RRP ~~£1199~~
£1149

INC FREE 8 MB RAM

ESI32 + SCSI SAMPLER WITH V2.0 SOFTWARE

EMU

STOP PRESS
END OF LINE EXCLUSIVE DEAL
OVER 40% OFF!

The ESI32 features 32 note polyphony, 4 polyphonic outputs (expandable to 10), G-chip resonant filters, a huge top quality library (also Akai and Emaxll compatible), and DSP processes like time-stretch, doppler FX, parametric EQ, exciter etc. All E-mu samplers come with free access to our enormous sample library (we have all the EIII library on CD-ROM) and of course, our excellent technical support. The best sounding sampler this side of an E6400, order yours now before it's too late!

RRP ~~£1199~~
£699

Also available bundled with 12x speed CD-ROM drive, ZIP drive and 8Mb of RAM plus 2 CD's for the incredible price of only:
£999

CALAMARI ESI-32 TURBO EXPANSION BOARD

The upgrade all ESI-32 owners have been waiting for! For only £299, you get SIX extra outputs giving a total of ten, two simultaneous FX processors, and a plethora of new filter types taken from the E4x. Unbelievable value for money - every ESI owner should have one!

RRP ~~£369~~
£299*

*When purchased with the ESI32 or the ESI-4000

E6400 ALSO AVAILABLE only £1999 INC.16 MEG FREE

ZIP REMOVABLE DRIVE

INC DISK & 25 PIN SCSI CABLE — iomega

There was a time when hard disks were a luxury for sampler owners, but with the advent of the ultra cheap Iomega Zip Drive, this has become a thing of the past. For under £150 the Zip drive stores 100Mb (94Mb formatted) on each cartridge. A must for anyone with more than 2 meg of RAM!

RRP ~~£219~~
£149

SP202 SAMPLING UNIT

BOSS

More functionality than the original Fairlight for under £300! The SP202 offers 16 bit sampling with sample rates up to 32 kHz, giving a maximum of 4 20" sampling time, or 31" using optional PCMCIA memory cards. Features like timestretch, filter, delay and ring modulation mean this machine has to be taken seriously, and the built in automatic BPM calculator, together with tap tempo function, is a godsend for loop merchants. The built in mic and battery operation (optional PSU available) make it great for sampling on the move. Ideal for DJ's or anyone needing sampling on a budget, initial stocks will be very limited - get your order in early!

RRP
£299

PROTECH 12x CD-ROM DRIVE

turnkey

If you want access to large amounts of sample library in a hurry, then there's no better way to do it than via CD-ROM. Hundreds of discs are now available full of everything from orchestral instruments to hip hop loops, all ready prepared to load into your sampler. In theory SCSI is SCSI, but in practice it's just not the case, particularly when it comes to samplers. Drives that work perfectly with one machine will often flatly refuse to work with another. So we've taken the guesswork out, and come up with a bargain priced CD-ROM drive that works with all current Akai, Emu and Roland machines, and what's more, it runs at 12x normal speed, for ultra quick loading (actual speed depends on SCSI spec of sampler). Guaranteed to work! (Supplied with connector for 25 pin SCSI port, specify sampler when ordering - may require additional cable)

NEW PRODUCT
£169

SU10 SAMPLING UNIT

INC 2 FREE TIME & SPACE CDs — YAMAHA

Yamaha's SU10 is a ground breaking unit, making professional quality stereo sampling available to everyone. Up to 54 seconds of sampling is available and 48 samples can be held in memory at any one time. Samples can be filtered, reversed, scaled, crossfaded, pitchshifted and even scratched using the ribbon controller. The built in sequencer means you can produce your own tunes using just this unit! The SU10 comes bundled with 2 free Time & Space CDs containing almost 800 samples.

RRP ~~£289~~
£249

ALSO AVAILABLE WITH 3 OCTAVE MIDI KEYBOARD only £339

ESI4000 NEW SAMPLER

EMU

The ESI4000 has all the features of the ESI32 we have come to know and love, but now has 64 voice polyphony, memory capacity of up to 128 meg, and an operating system upgrade giving you E4 style multi mode filters. All E-mu samplers come with free access to our enormous sample library (we have all the EIII library on CD-ROM) and of course, excellent technical support. Also available with the fantastic Calaman Turbo board pre fitted for only £1499! Initial stocks are very limited - call to reserve yours now!

NEW PRODUCT
£1199

COMPUTER NEW USED & EX DEMO

Cakewalk Audio	£199	Turtle Beach TROPEZ+	£199
MOTU MTPAV	£349	Yamaha DB50XG	£99
Turtle Beach Fiji	£329	Yamaha MDF2	£249
Yamaha SW60	£129		

SAMPLING NEW, USED & EX DEMO

Akai CD3000 XL	£1799	Akai S3200XL	£2399
Akai MPC 2000	£999	Emu E6400	£1999
Akai S2000	£759	Emu ESI32	£599
Akai S3000XL	£1499	Emu ESI4000	£799
Kurzweil K2500	£2199		
yamaha SU10	£175		

SAMPLE LIBRARIES

Time+Space

We have two 100 CD jukeboxes in store holding the complete Time & Space range of sample CDs. Whether you want drum loops for techno, drum & bass or deep house, ethnic instruments & textures or a sound FX library - there's sure to be something to suit your needs. These discs make ideal fodder for all kinds of sampler, from those built into mixers to full blown stand alone units.

Check one out today!

PRICES FROM
£19

A3000 SAMPLER

YAMAHA

Arriving any time now, Yamaha's A3000 is their first entry into the sampling market for almost ten years, but this break has allowed them to take a good look at the market and come up with a highly competitive product. 64 note polyphony, four outputs (expandable to twelve plus digi i/o). WAV file compatibility and memory expandable up to 128 meg, means that the A3000 must be taken seriously at this price. Call for full details or a demo.

NEW PRODUCT
£1299

*We will beat any genuine price from a UK or European dealer at the time of order. We must be able to substantiate the quote and the goods must be available and in stock. Prices exclude 17.5% VAT. Uk mainland carriage from £9.99. Please allow 10 working days for cheque clearance. Errors & omissions excepted.

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EUROPE'S LOWEST

IMPROVE YOUR PERSONAL SPACE!

Ask just about any recording engineer for their opinion on who makes the finest reverb and effects processors, and you will get just one answer - Lexicon. Their 224 was the first digital reverb made, and even now twenty years on, is still much sought after.
The current mid-priced range of the MPX1, PCM80 and 90, make the famous Lexicon sound more affordable than ever, and represent some of the best value for money signal processing around.

MPX1 MULTI EFFECTS PROCESSOR

For those of us who need top quality reverb & multi FX but cannot stretch to the expense of the PCM80 & PCM90, Lexicon have released the MPX-1. Featuring the famous 'Lex' chip for reverb and separate DSP processor for multi FX, the MPX-1 brings you all that is good in signal processing for an incredibly low price. Up to 5 simultaneous effects are available including pristine quality stereo pitch shifting, and effects can be "morphed" from one algorithm to another, as pioneered in the Vortex. All new operating system includes on-line help and database for sorting presets - achieving quality results is as stress free as possible.

~~RRP £1199~~
£749

PCM80 MULTI EFFECTS PROCESSOR

The PCM80 effects processor has state of the art audio quality with true stereo processing, amazingly detailed editing including MIDI clock control and a card slot. Cards include Dual FX, Pitch FX and the Martin Gershin card.

~~RRP £2199~~
£1899

PCM90 REVERB PROCESSOR

The PCM90 is dedicated to reverb and features two of the the famous proprietary Lexi2 chips (the PCM80 has one Lexi2 chip and one Motorola DSP). The dual layer programming architecture makes it a breeze for day to day use, but allows ultra detailed editing for those who want to get right 'under the hood'. Optional cards mean obsolescence is built out!

~~RRP £2589~~
£POA

- *Unrivalled Reverb Quality from the First Name in Digital Effects*
- *Excellent Realtime Control via MIDI & other Modulators*
- *True Stereo Processing with Dual Mono Possibilities*
- *Wide Range of Extra Program Cards for PCM80 & 90*

SYNTH MODULES

ORBIT
PLANET PHATT
CARNAVAL

Emu have taken their wealth of experience in making modules such as the Proteus, Vintage Keys and Morpheus, combined it with the filters from the incredible Emulator 4, and with their usual innovation, come up with the Orbit, Planet Phatt and Carnaval.
The Orbit is stacked full of classic drum sounds, pulsating basses, ambient pads, as well as a huge variety of hits and effects. Planet Phatt brings a new definition to swing, and the Carnaval is ideal for dance grooves as well as Latin specialists.
The inclusion of the E4's 16 different types of 6 pole filters mean that these modules have some powerful filtering than any other synth. Finally the 'BEATS MODE' includes a wide selection of loops and grooves, which can have their pitch changed without tempo change and vice-versa, and even their sounds too!
V2 software now gives improved beats mode and other enhancements.
Orbit upgrade available for only £69.

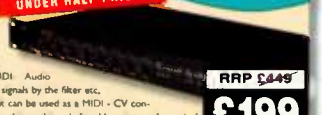
~~RRP £869~~
£699

SC88-VL SOUND MODULE

Based on the original Sound Canvas module, but with much more of everything, the SC88 is 32 part multi-timbral with two independent MIDI ins, also 64 note polyphony for handling virtually any MIDI thrown at it. Having twice as much sample ROM too, the SC88 is really like two SC55s, except with 18 bit D/A convertors, delivering the same audio quality as the JV-1080 synth. Choose from a GS / GM compatible sound palette of 654 individual sounds, and 24 drum kits. The built in interface for Mac or fast PC makes it even better!

~~RRP £649~~
£369

DEEP BASS 9 TB303 CLONE



UNDER HALF PRICE!

A great sounding TB303 clone. 1u rack with 1 knob per function, all the sound controls of the 303 are duplicated, filter cutoff, accent and glide all controllable over MIDI. Audio input allows treatment of external signals by the filter etc, and CV / gate in / out also means it can be used as a MIDI - CV convertor. An excellent analog bass machine - this unbelievable price on the end of the line means they will sell out very quickly!

~~RRP £449~~
£199

VIRUS VIRTUAL ANALOGUE SYNTH

Control specialists Access have used all their considerable expertise in the design of their new 'virtual analogue' synth, the Virus. All major parameters have their own dedicated knob or switch, and an 'expert' mode allows super detailed editing via the LCD display and parameter controls. Of course, all edits send out controllers in realtime. Synthesis facilities are unparalleled - 64 oscillator waveforms (2 per voice), 3 LFO's, 2 multi-mode filters per voice, oscillator sync, filter overdrive, built in FX - you name it, it's got it!
12 note polyphony, 16 part multitimbrality, 6 outputs and 2 filter inputs mean you're not just limited to one sound at a time. We're so confident that you'll love this synth that we're offering a seven day money back guarantee (ask for conditions).
The most flexible and best sounding virtual analog on the market.

NEW PRODUCT
£899

QUASIMIDI RAVE-O-LUTION 309 DANCE WORKSTATION

The Rave-O-Lution 309 is undoubtedly Quasimidi's best and most innovative product to date. Imagine the raw powerful sound quality of Roland's TR909 and TB303, give them 50 times as many sounds, add resonant filters to the drums, and you've still only got half the instrument that is the Quasimidi 309! Knobs for all functions all send out MIDI controllers, built in real-time and step-time sequencer, 2 on board effects processors & EQ, optional rack ears, typical German build quality - far too many features to mention here! The ultimate dance production workstation, must be heard to be believed. "superb bass synth ... excellent drum sounds ... one of the most immediately useable products on the market" - Sound On Sound.
Call for a free demo CD. Money back within 7 days if not satisfied (ask for conditions).

FACTORY DIRECT
£549

RACK EARS ALSO AVAILABLE only £25

309 AUDIO-EXPANSION

Input / output expansion board now available only £149! 2 extra outputs, 2 inputs allowing you to route any 2 external signals through the AES synthesis. Also comes with new operating system with many new features.

FACTORY DIRECT
£149

POLYMORPH SYNTHESISER

Coming soon, the Polymorph is a four part analogue style synthesiser, with 8 note polyphony, 4 outputs and superb 309 style realtime editing facilities and sequencer & FX.
Call for more details.

FACTORY DIRECT
£769

ATC-1 ANALOGUE MONOSYNTH

Studio Electronics started out life as a company that serviced and modified old Moogs, moved on to producing remanufactured Mini Moogs in 19" rack form, and then developed the SE1 - a modern Mini Moog whose components were painstakingly researched to provide an instrument that was according to the reviewers indistinguishable from the real thing.

Most recently has come the ATC-1 Tone Chameleon - hand crafted in the USA in the same way as their previous products, but with reduced cost due to less knobs but a vastly increased sound palette thanks to the ingenious use of filter cartridges to emulate the best sounding instruments of yesteryear. Editing is a breeze thanks to an individual button for each function, and a large central parameter dial.

Circuitry is analog throughout - right down to the oscillators, and the sound is needless to say, superb. There are 2 LFO's (one syncs to MIDI), three envelopes, and virtually all parameters can be controlled over MIDI. The ATC-1 is supplied with the Mini Moog filter, and can also be fitted your choice of a TB303, ARP 2600 or Oberheim Xpander filter (only £69 each), and for the filter fetishists amongst you, the filter Selector (only £199) taken all 4 filters simultaneously, and the filter type is automatically stored with each patch, avoiding the need for switching. The rear panel sports an audio input, and CV & gate ins and outs as well as the usual MIDI connections.
Incredible reduction on another Turnkey exclusive - quality doesn't have to break the bank!

~~RRP £899~~
£569

JV1080 SYNTH MODULE

In the same way as the S1000 became the industry standard sampler, Roland's JV1080 has become the industry standard synth module. It's not hard to see the reason why - straightforward operation combined with top flight sound quality and a huge range of useable sounds. But expandability of the machine is where it really comes into it's own. There are over 10 different expansion boards which can be fitted (up to 4 at once), each one with as much ROM as the original machine, covering sounds from Vintage to Orchestral and Dance to World. At Turnkey we have the full range in stock, as well as an unbeatable price on the machine itself. Buy with any four expansion boards for only £499 extra!

~~RRP £1199~~
£849

JV2080 SYNTH MODULE

The Roland JV1080 has been become the industry standard sound source for home studios and professionals alike. It's superb sound quality, 64 note polyphony and expandability were a winning combination.
Now the new JV2080 builds on that success by offering a giant editing screen, three independent effects processors as well as reverb / delay and chorus and room for 8 of Roland's renowned expantion boards - the potential is virtually limitless! Judging by the success of the JV1080, these will be in strong demand - call us now! Buy with any four expansion boards for only £499 extra!

~~RRP £1399~~
£POA

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PRICES GUARANTEED*

YAMAHA STAY IN THE MIX WITH YAMAHA

PROMIX 01 Digital Mixer

This is the digital mixer that shattered the price/performance barrier. You get 1 stereo and 16 mono inputs (8 are mic/line), all with 3 band parametric EQ, 2 external aux sends, 2 internal sends to the built in SPX990 based FX processors, 3 assignable dynamics processors, motorised faders and total automation. The SPDIF digital output means you can connect the ProMix01 directly to your DAT, CDR or MiniDisc with absolutely no loss of quality. This was incredible value at the original price, but this new low price makes it probably the best value for money mixer on the market.

- Up to 20 Inputs in Total
- Moving Fader Automation
- 2 Built in Effects Processors
- 3 Assignable Dynamics Processors

RRP ~~£1999~~ **£1499**

03D Digital Console

INCLUDES FREE SONY DTC-A6 (RRP £799!)

Like the 02R, the 03D is a fully-automated digital mixing console set to have a large impact on the mixing market. With 26-inputs & 18-outputs the console features fast 32-bit internal digital audio processing, versatile analog and digital I/O configuration, new 32-bit onboard multi-effects processors with freeze (sampling) and guitar amp simulation effects, motorised faders, fader and mute grouping, surround sound mixing, onboard automation, MIDI remote capabilities and much more.

- Ultra Compact Format
- Moving Fader Automation
- Surround Sound Capabilities
- Takes ADAT, TDIF or AESEBU Digital Board

Call now for a Turnkey Professional brochure and a free trial!

RRP **£2999**

02R Digital Console

INCLUDES FREE SONY DTC-A6 (RRP £799!)

The fully digital 40 input 8 bus console with total automation and moving faders. 4 band parametric EQ and dynamics for every input and 2 comprehensive on-board fx processors with a range of reverbs, delays and other standard fx. Optional interface cards allow full digital connection of ADAT, T-DIF and AES/EBU formats for integration of MTR and hard disk systems.

- Up to 40 Inputs in Total
- Moving Fader Automation
- Dynamics Processors on Every Channel
- Takes 4x ADAT, TDIF or AESEBU Digital Boards

RRP ~~£6999~~ **£5999**

M-BD1 SOUND MODULE

UNDER HALF PRICE!

Over 50% off on this top quality bass & drum module. Packed full of superb acoustic and electronic sounds of typical Roland quality, the M-BD1 is 28 note polyphonic and 8 part multitimbral, and has 2 built in FX processors. Makes an ideal addition to any MIDI setup, providing the bread and butter sounds for a wide variety of tracks.

Very limited quantities - order now to avoid disappointment.

RRP ~~£469~~ **£229**

BASS STATION BUDGET MONO SYNTH

END OF LINE CLEARANCE EXCLUSIVE TO TURNKEY

Digitally taped to get into analog circuits on a budget, then the Bass Station keyboard is for you. But this is no mere toy! Two oscillators, pulse width modulation, two LFO's and knobs that send out MIDI information, makes this a versatile sound creation tool capable of a wide range of bizz sounds and effects. An ideal addition to any MIDI setup!

RRP ~~£349~~ **£219**

SD-35 MIDI PLAYER

OVER 60 % OFF

The SD35 is a Standard MIDI File player / recorder, and so much more. As well as simple playback of both Type 0 and Type 1 MIDI files direct from floppy disc, they can be transposed, parts can be soloed or muted (an incoming MIDI signal is automatically routed to this channel in this case), tempos can be changed, and CD style controls are available to enable programming of whole sets, complete with repeats!

As if all this wasn't enough, you don't even need another sound source! The SD35 comes with Roland's acclaimed GS sound engine built in (which most MIDI files are programmed on), giving you 223 top quality General MIDI sounds, plus reverb and chorus and all the GS editing features. For ultimate convenience, tracks can be stopped and started via an optional footswitch, and you don't even need a separate mixer to sing or play along - the SD35 can accept mic, instrument or line level signals, which are balanced and mixed with its own sounds.

Another Turnkey exclusive bringing you incredible value for money on this end of line exclusive! Order now while stocks last!

RRP ~~£785~~ **£299**

DR-660 Dr. RHYTHM DRUM MACHINE

BOSS have been making Dr. Rhythm drum machines since the early eighties, combining value for money and ease-of-use with the latest drum and percussion sounds. The DR-660 builds on the success of the DR-550 Mk2, but offers 16 full velocity and aftertouch sensitive pads, 4 separate outs (unheard of at this price), and 255 drum sounds including the best of TR808 / 909. The 660 also boasts the 'human feel' control first introduced on the R8 which allows velocity to control a real-time crossfade between several waveforms. Process your sounds with on-board digital reverb and chorus - fully editable, with individual effect send control for each drum sound.

RRP ~~£469~~ **£299**

PULSE MONO SYNTH

Waldorf quality at a previously unheard of price! Their first release was the long awaited Microwave, which has been universally acclaimed, and rightfully so. The Pulse's three oscillators provide some of the fattest sounds around, and it's modulation matrix allows a far higher degree of programming complexity than anything else in its range. Add to that the fact that editing any parameter sends out a MIDI controller and you have a fantastic all round performer.

PULSE PLUS ALSO AVAILABLE only £599

RRP **£499**

SOUND MODULES NEW, USED & EX DEMO

Yamaha RY8	£119	Kurzweil K2000R	£1499
Alesis DM5	£269	Kurzweil KMP1	£359
Alesis QSR	£599	Novation Drumstation	£399
Alesis SR16	£125	Novation Super BStation	£399
Boss DR5	£249	Roland JV1080	£699
Emu MORPHEUS	£500	Roland MC303	£399
Emu UltraProteus	£929	WALDORF MICROWAVE 2	£849
Korg X5DR	£389	Waldorf PULSE	£349
Waldorf PULSE +	£429		
Yamaha MU5	£179		
Yamaha MU50	£299		
Yamaha MU90	£799		
Yamaha P50	£239		
Yamaha QY700	£699		
Yamaha RY20	£199		

SR-16 DRUM MACHINE

The SR-16™ Soiree Drum Machine is an emotive tool for songwriting and performance. It features a great selection of 233 sounds, offered both in dry form and with reverb. Alesis's exclusive Dynamic Articulation™ feature enables a drum sound to change its tonal content as it's played harder for truly realistic performances. The SR-16 features 200 preset patterns that were actually played in by top studio drummers - not just programmed and quantized. Of course, the SR-16 also provides complete MIDI implementation, a finger-tight user interface, flexible programming and editing features, velocity-sensitive pad buttons.

RRP ~~£299~~ **£189**

MICRO PIANO PIANO MODULE

The MicroPiano is the most highly regarded piano module on the market. Featuring Kurzweil's breathtakingly realistic true stereo samples - 32 note polyphony means you won't suffer from note-stealing and the wide range of other keyboard sounds and strings make it useful in many other situations. Built in effects including very high quality reverb mean there's no need to tie up another effects unit. Strictly limited quantities at this price. Hurry as this won't last long. Order today - you won't be disappointed!

RRP ~~£599~~ **£349**

FREEBASS TB303 CLONE

MEGADEAL ALERT NEW LOW PRICE!

If you need the unique sound of an original Bass Line™, but can't afford the inflated prices that go with it, then Freeform Analog Technologies' Freebass is the product for you!

It's the only authentic sounding TB303™ clone on the market, and it's got MIDI! 1U rack with 1 knob per function, all the sound controls of the 303 are duplicated, Cutoff, Resonance, Envelope Mod, Accent, Tune and Decay. Waveform is continuously variable from square wave to sawtooth, and an auto tune button is included to retune the oscillator - no more continual drifting!

On top of this, there's an audio input to the filter stage, allowing you to process any external signal with the FB383's powerful synthesis. The ultimate analog bass machine - this incredible price means these will fly out of the door! Another Turnkey exclusive.

- Superb Sounding TB303™ Clone
- Fraction of the Price of an Original
- External Input to the Filter
- Exclusively Available at Turnkey

RRP ~~£199~~ **£129** FACTORY DIRECT

MC-303 GROOVEBOX DANCE WORKSTATION

The enduring popularity of the TB303, MC202 and TR909 has just refused to go away but increasing rarity has meant that secondhand prices have been driven up to ridiculous levels. Roland, the creators of these machines, now bring you the MC303 Groovebox which combines all their classic drum machine sounds, a step time / real time sequencer, 303 'acid' bass sounds complete with front panel filter controls and a whole host of other useable sounds (it's 16 part multi-timbral!). This box is an all in one dance music solution, and believe us, it sounds the business! Initial supplies will be very limited, order now to avoid disappointment.

RRP ~~£569~~ **£469**

ALSO AVAILABLE WITH MK149 MIDI KEYBOARD only £559

MICROWAVE II WAVETABLE SYNTHESISER

The Microwave II combines all the famous features of the original Microwave together with today's requirements for user interface, signal to noise ratio and sonic purity. It's simplicity of use is obvious with the use of just 5 rotary dials and a 2x40 character back lit LCD. On the back the Microwave II has 2 fully modulatable stereo outputs (configurable as 4 monos with panning). Tone generation comes from a powerful DSP generating wavetables, the 10 voices each feature two oscillators, 2 wave generators, a mixer, two filters in series, a stereo amplifier, four envelopes, 2 LFOs, a modulation matrix with 16 slots and several 'modifiers', more than enough to keep even the most demanding programmer satisfied!

NEW PRODUCT **£999**

*We will beat any genuine quote from a UK or European dealer at the time of order. We must be able to ... the quote and the goods must be available and in stock. Prices include 17.5% VAT ... carriage from £9.99 Please allow 10 working days for cheque clearance. Errors & omissions excepted

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

EUROPE'S LOWEST

Wave Synthesiser

TURNKEY EXCLUSIVE! waldorf

We now offer a new custom range of Wave synthesisers with 76-note keyboards in four colour options - standard blue, red (as shown), Sahara and black. Totally unique sound.

PRICES FROM £6299

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

THE RAVEN

KEYBOARD DANCE WORKSTATION — QUASIMIDI

Dance experts Quasimidi have done it again with this incredible new product. Stacked full of hundreds of the finest dance sounds, from fat analog synths through retro drums and special effects. On board sequencer with special loop motif mode makes it a cinch to create instant hits! Typically superb sound quality from this top German manufacturer. Also available, Raven Max expansion board giving over a thousand new sounds. Call in for a demo, we guarantee you'll be impressed. Free demo CD available, please call to receive one. Money back within 7 days if not completely satisfied - please ask for conditions.

NEW PRODUCT £849

K5000s ADDITIVE SYNTH

KAWAI

In this age of many 'soundalike' synth keyboards, it's not often you get something coming along with a completely fresh approach. Kawai have dared to be different though with the K5000S, and reintroduced additive synthesis. This has been tried in the past, but the limited DSP power has severely curtailed the possible results. The only method of synthesis that can theoretically produce any possible sound, additive has a palette which ranges from superb acoustic simulation, to timbres quite unlike those offered by any other synth. The inclusion of a traditional synthesis section complete with an incredibly powerful filter means it's also a cinch to create fantastic analogue style sounds, and a generous complement of knobs which all send MIDI controllers add to the ease of use. Far too many features to mention here - call for more information or for a demo.

RACK VERSION ALSO AVAILABLE only £999

NEW PRODUCT £1199

X5D

KEYBOARD SYNTHESISER — KORG — OVER 40% OFF PRICE!

Another unbelievable end of line clearance special from Turnkey! Top quality General MIDI compatible keyboard from Korg was a best seller at the original price but with this deal stocks won't last long! The X5D features 64 note polyphony, 16 part multitimbrality, 47 effect types for its 2 built in processors, a free octave touch sensitive keyboard with pitch bend on modulation wheels, and there's a special 'Combi' mode which stacks up presets for some truly huge sounds! There are over 500 sounds of renowned Korg quality, covering the full range of acoustic sounds through drums and percussion to huge synth textures. The clear 2 line backlit LCD display makes for easy parameter editing, right down uneven tempered tuning. An ideal beginners instrument or for anyone wanting more sounds, its light weight also makes it great for gigging. *Very limited quantities only on this one.*

RRP ~~£699~~ £399

PROPHECY

VIRTUAL MONOSYNTH — KORG — UNDER HALF PRICE!

The Prophecy is already a legend in its own lifetime, and this incredible new low price makes it better value for money than ever. Virtual synthesis not only gives some great acoustic simulations, but also superb analog sounds, from Moogs through ARP's to some of the classic Rolands. The keyboard that revived the arpeggiator still has one of the best around today, and the ribbon controller and knobs galore make for a highly expressive instrument.

Limited stocks only at this price - buy now or forever hold your peace!

RRP ~~£899~~ £429

N264

KEYBOARD WORKSTATION — KORG — UNDER HALF PRICE!

A brand new quality 76 note keyboard workstation for under £700! It may sound unbelievable, but at Turnkey, it's true! What's more, Korg's N264 is 64 note polyphonic, has a 32,000 note memory, a built in disk drive and four individual outputs. There are 400 program and 400 combi sounds, together with a complete set of General MIDI sounds for MIDI file playback. The sequencer features up to 100 patterns which can be assigned to the keyboard for instant dance music style composition, as well as continuous recording, and a fully featured arpeggiator which outputs MIDI data. From the inventors of the original workstation, the M1, usability is naturally excellent, and Korg's sound sets are legendary. *Very limited quantities only on this exclusive end of line deal from Turnkey. Hurry, hurry, hurry!*

RRP ~~£1499~~ £699

XP-50

WORKSTATION KEYBOARD — Roland

All the power and flexibility of the JV1080 in a keyboard, together with what has to be the best onboard sequencer around, and a built in disk drive. The XP50 has a 5 octave keyboard and 2 outputs also available is it's big brother the XP80 with a 7 octave keyboard, 4 outputs and the king size display as featured in the new JV2080. We have limited stocks only at staggering prices - don't delay - order today!

RRP £1499 £999

XP-80

WORKSTATION KEYBOARD

RRP ~~£1799~~ £1199

TRINITY

KEYBOARD WORKSTATION — KORG

When it comes to workstation keyboards, the Korg name is legendary. Their current flagship product, the Trinity not only features the customary range of exemplary sounds, but also touchscreen technology to make it one of the most intuitive instruments on the market, and a range of options to turn it into a fully fledged recording studio: sample playback (Akai compatible), Prophecy expansion board, and even hard disk recording!

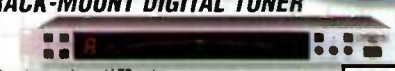
TRINITY PLUS £1799
TRINITY PRO . . £1999
TRINITY PROX. . £2499

RRP ~~£2345~~ £1499

CALL SOHO SOUNDHOUSE ON 0171 379 6766 FOR DETAILS

DTR-1

RACK-MOUNT DIGITAL TUNER — KORG



- Oversize easy to read LED meter.
- Auto tuning with 3 selectable modes; Strobe, Cent, Hz.
- Two tuning inputs to handle tuning of 2 instruments.
- Built-in microphone is perfect for tuning acoustic instruments.
- 3-Octave reference tone. • Cable check function.

RRP ~~£249~~ £169

DTR-2 RACK-MOUNT DIGITAL TUNER

- Rack-mount auto chromatic tuner with large LED meter.
- Full 7 octave tuning range.
- Auto reference calibration function can automatically calibrate the tuner to instruments that are not easily tuned.

RRP ~~£149~~ £99

PC-200 MkII

MIDI CONTROLLER KEYBOARD — Roland

Compact touch sensitive master keyboard offering full control over pitch bend and mod, data slider assignable to reverb, pan or any controller, sustain pedal input, transpose over 2 octave range, send patch & bank change messages.

Check out our unique package prices with these modules:

SH32 + PC200	£249
MOD1 + PC200	£349
MU10 + PC200	£249
SC88VL + PC200	£499

RRP ~~£199~~ £149

CTK-601

GENERAL MIDI KEYBOARD — CASIO

A 61 key, touch sensitive, General MIDI keyboard at an unbelievable price. This is an ideal instrument for professionals and beginners alike as it is extremely easy to use, but don't think that means it's not powerful. The sound quality is excellent and the auto-accompaniments, which can be transmitted via MIDI, are superb.

Add to all this 10 digital effects, four sound/control pads, layered or split keyboard modes, recording and four registration memories and you've got the best value for money keyboard on the market. And we've got an unbeatable deal - Turnkey price includes free power supply and headphones!

RRP £199

PS2

ELECTRIC GUITAR — Jackson

The PS2 is equipped with 1 high output Jackson humbucker and 2 Jackson single coil pickups and full locking trem system. We have managed to acquire a limited quantity of these quality guitars at an incredible price!

Hurry - as always first come first served - choice of colours available.

RRP ~~£399~~ £POA

AN1x

VIRTUAL ANALOGUE SYNTH — YAMAHA

The analogue emulation market is hotting with this exciting new release from Yamaha. Building on the incredible success of the CS1X, the AN1X is built on the same design principles, but uses technology from the groundbreaking VL range to produce stunning virtual analogue sounds. With a 5 octave aftertouch sensitive keyboard, 10 note polyphony, 8 knobs and a ribbon controller, and built in effects, the AN1X is sure to be an instant hit.

Demand will far outstrip supply - get your order in early!

RRP ~~£899~~ £725

WK-1500

76 NOTE MIDI WORKSTATION KEYBOARD — INC FREE STAND, HEADPHONES & PSU

This TOP OF THE RANGE Casio has 128 sounds, 100 auto accompaniments and a 76 note keyboard. It is also fully General MIDI compatible and all 16 MIDI channels can be controlled from the keyboard.

With an onboard six track sequencer all your songs can even be recorded on the instrument itself. This is unbelievably good value for such a great instrument.

RRP ~~£549~~ £299

SANSAMP RANGE

TECH 21 • NYC

The Tech 21 range of hand built American products emulates every tube amplifier sound ever desired, giving you the classic Fender, Marshall, Boogie, HiWatt, Vox sounds etc - an all in one versatile unit at a fraction of the cost of the originals!

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YAMAHA

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RRP ~~£119~~ £99

GI-10P

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The Roland GI-10 opens the world of MIDI and computer sequencing to the guitarist. With fast and accurate pitch to MIDI conversion the GI-10 offers total access to sounds and possibilities (via an external sound source) previously unavailable. The GI-10 also has a microphone input jack enabling voice to MIDI conversion. Included in the package is the Roland GK-2A controller pickup which fits neatly and effortlessly onto virtually any guitar which connects to the GI-10 via the included cable. *As ever, these will be sold on a first come, first severed basis, as stocks are extremely limited.*

RRP ~~£577~~ £299

KX88

MASTER KEYBOARD — YAMAHA

The KX88 has been the luxury master keyboard of choice in top studios, and with the death of the Synthesizer has probably the best action available. 88 note wooden weighted keyboard, inputs for 2 sustain pedals, 2 continuous controller pedals (one of each is included), breath controller, 2 wheels, 4 sliders, 6 momentary switches, 2 toggle switches and aftertouch. Apart from taking pride of place in your studio, the KX88 can be considered a collector's item, and with no sounds to go out of date, it will last your whole musical career.

RRP ~~£1649~~ £849

KEYBOARDS NEW, USED & EX DEMO

Alesis QS6	£549	Korg Trinity PLUS	£1795
Alesis QS7	£779	Korg X5D	£399
Alesis QS8	£1299	Korg Z1	£1699
Korg N364	£799	Roland A33	£335
Korg PROPHECY	£549	Roland A90	£1099
Korg SGPROX	£1799	Roland A90EX	£1399
Korg Trinity	£999	Roland AX1	£249
Roland RD500	£1249		
Roland VK7	£1099		
Roland XP10	£299		
Roland XP50	£849		
Roland XP80	£1199		
Yamaha AN1x	£849		
Yamaha P150	£1099		

GX-700

GUITAR EFFECTS PROCESSOR — BOSS — OVER 40% OFF PRICE

INC FC-200 MIDI FLOOR CONTROLLER

The GX-700 features a huge array of digital and analogue effects enabling you to use up to 13 simultaneously with 100 preset and 100 programmable patches as well as a sophisticated speaker simulator making the GX-700 the perfect studio or live processor. Included in the price is the Roland FC-200 (RRP £319) MIDI floor controller giving you total access to the GX-700 from it's designated floor switch. *Hurry, limited stocks available.*

ROLAND FC-200

RRP ~~£769~~ £449

*We will beat any genuine quote from a UK or European dealer at the time of order. We may be able to [illegible] the price and it may not be available and in stock. Prices include 17.5% VAT. UK mainland carriage from £9.99. Please allow 10 working days for cheque clearance. Errors & omissions excepted.

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MONITOR 2
MID FIELD STUDIO MONITOR

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Flat bass response down to 40Hz assisted by the substantial ported cabinets which come in a mirror image pair. The three way design with 10" woofer offers superior transparency with excellent quality reproduction across the whole frequency range. Power handling is up to 150w per speaker. We cannot hold this offer forever - buy now before it's too late!

~~RRP £699~~ **£349**

BUNDLE WITH SERVO 550 only £699

SPIRIT STUDIO
CONSOLES BY SPIRIT

Soundcraft's Spirit Studio desks revolutionised the project studio market when they were introduced over 5 years ago offering sound quality and features only previously found on desks several times the price. Even then they were great value for money, but because Soundcraft have recouped their R&D costs, and because of our substantial buying power, they are now available at an unbelievable price. No other desks represents such fantastic value for money, just check out the feature list:

'In line' layout means 40, 56 and 72 inputs respectively for the 16, 24 and 32 channel desks, 4 band EQ with 2 mid sweeps, 6 aux. sends, 8 true subgroups direct outs on every channel, LED metering, fader reverse - the list is endless!

~~RRP £1537~~ **£899** 16 ch

~~RRP £2063~~ **£1465** 24 ch

~~RRP £2894~~ **£1999** 32 ch

GHOST CONSOLES

INC FREE METER BRIDGE

Ultra low noise inputs, 4 band EQ with 2 fully parametric mids, up to 12 auxiliary sends, MIDI mute automation and MTR transport control are a few of the features that put other project consoles to shame (no MIDI on LE versions).

~~RRP £6607~~ **£3399** 32 ch LE

~~RRP £4617~~ **£2849** 24 ch LE

SERVO 170
AMPLIFIER

Samson's Servo 170 is specifically designed for use with nearfield monitors, and does an excellent and unobtrusive job sticking as close as possible to the "more with gain" ideal for an amplifier. It offers a power rating of 85 Watts per channel RMS, making it an ideal partner for most of today's nearfield studio monitors. The standard 2u design means it fits neatly into your rack system, independent left and right volume controls are given, and there are built in signal and clip indicators, together with protection circuitry to help prevent blowing your speakers.

At this price stocks won't last long - another Turnkey exclusive!

~~RRP £289~~ **£179**

ABSOLUTE ZERO
by SPIRIT
NEW NEARFIELDS

The latest addition to Soundcraft Spirit's monitor range are the Absolute Zero's. For those of us with slightly less demanding monitoring applications, they make the ideal choice.

RRP **£199**

ABSOLUTE 2
by SPIRIT
STUDIO MONITORS

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~~RRP £250~~ **£POA**

CONTROL 5
STUDIO MONITORS

These classic monitors from JBL have been a standard in studios for several years and still stand up very well against more recent competition. The solid build quality you can expect from JBL comes as standard and the ported design gives fantastic bass response. Internal fuses help to prevent blown tweeters and a compatible Timbersound sub-woofer is also available for only £199. Exclusive to Turnkey.

~~RRP £439~~ **£249**

CONTROL 1 COMPACT MONITORS

These superb compact monitors (RRP £199) are ideal for accurate monitoring on a budget. Sturdy impact resistant casing makes them the only choice for location work.

~~RRP £199~~ **£99**

BUNDLE WITH DENON PMA250 only £269

MONITORS
FROM HARBETH ACOUSTICS

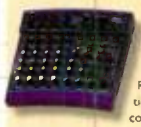
Many of today's popular budget monitors sound impressive in the store, with tremendous bottom end and sparkling treble. But mixes made on these monitors can still sound wrong when played on other systems. The problem? Lack of clarity and detail in the mid-range, particularly vital when working with vocals and lead instruments. Harbech manufacturers of monitors for the BBC and others for many years, now address this problem with their new expression near-field [illegible] offering [illegible] response and excellent mid-range [illegible]

NEW PRODUCT **£369** PER PAIR

MONITORING NEW, USED & EX DEMO

Behringer Autocom £159	Soundcraft Absolute 4P . £799
Samson SERVO170 .... £195	Tannoy PBM 6.5 MkII ... £289
Samson SERVO260 .... £265	

SPIRIT FOLIO NOTEPAD PORTABLE MIXER



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

~~RRP £199~~ **£149**

RACPAC MIXER

This excellent member of the Folio range is a sure-fire winner combining superb sound quality with a fantastic list of features: 3 Band EQ with Mid sweep, 6 auxiliary sends, high-pass filters, rack-mountable (includes swivelling connector field) up to 28 inputs on mixdown, 4 true sub-groups plus separate mix bus, insert points and direct outs on every channel.

Mega deal only at Turnkey!

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MIXERS NEW, USED & EX DEMO

Mackie 16 ..... £1500	Mackie LM3204 ..... £499	Sndcrft RACPAC £399	
Mackie 24 ..... £2350	Sndcrft Folio F1 14 ..... £269	Sndcrft SPIRIT24 ..... £1250	
Mackie CR1202VLZ £279	Sndcrft Folio F1 16 ..... £319	Tascam M2600 ..... £1495	
Mackie CR1402VLZ £399	Sndcrft Folio Powerpad ... £269	Yamaha 02R £5999	
Mackie CR1604 ..... £450	Sndcrft Ghost24LE £2499	Yamaha 03D £2999	
Mackie CR1604VLZ £725	Sndcrft Powerstation £869	Yamaha Promix 01 ..... £950	

C1000 CONDENSOR MIC

The C1000 has become an industry standard amongst project studio owners and live performers alike, offering as it does a great frequency response, and extraordinarily rugged construction for a condensor mic. It can be phantom powered or used with a 9v battery, and even comes with a polar response adapter to change from cardioid to hyper-cardioid.

~~RRP £286~~ **£169**

WMS51 WIRELESS MIC SYSTEM

High quality diversity radio mic systems have always been the preserve of the professional due to the high costs often associated with them. The WMS51 system breaks that tradition, offering an unbeatable price/performance ratio. The system consists of either the HT51 hand-held transmitter featuring AKG's well known and respected d3700 dynamic capsule, or the BT version can accept any of the Micro Mic II series or guitar, whilst reception is handled by the SR51, a half rack receiver featuring balanced and un-balanced outputs, a control for squelch (RF interference rejection) and an auto mute facility.

~~RRP £316~~ **£219**

AT4033
LARGE DIAPHRAGM MIC

For years the Neumann U87 dominated the large diaphragm condensor mic market, but at a price. That was until the advent of the Audio Technica ATM4033. For about one third of the price, it offered superb sound quality - sparkling vocals and acoustic guitars and all the kind of qualities you would expect from this kind of mic. Now Turnkey have secured a quantity at a new unbelievable price. If you're in the market for a serious mic/phone, you can't afford to miss this one by! This price available on current stocks only.

~~RRP £599~~ **£319**

C3000 LARGE DIAPHRAGM MIC

INC FREE BOOM STAND

The C3000 uses all of AKG's experience in building large diaphragm mics such as the C12 and C414, but by using modern manufacturing techniques, and only offering two patterns (cardioid and hyper cardioid), the price has been kept to a minimum. Its open sound and superb frequency response make it ideal for vocals, as well as sounding great on a variety of other instruments.

~~RRP £389~~ **£239**

SM58
INDUSTRY STANDARD DYNAMIC MIC

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

~~RRP £169~~ **£99**

NT1
LARGE DIAPHRAGM MIC

Rode have quickly made a great name for themselves with the NT2, now the NT1 cuts out the frills at an incredible price. The gold plated large diaphragm capsule gives a superb full frequency response, and is great for all round use and particularly good on vocals. If you only have one mic, this has got to be a strong contender!

NT2 ALSO AVAILABLE only £499

~~RRP £329~~ **£299**

IMPACT SERIES
IMPACT180

IMPACT120

Turbosound is a legendary name in the PA business, but until recently many of us could only dream of owning a Turbo rig. Now with the introduction of the Impact series, you can stop dreaming! Turbosound quality at a previously unheard of price - for example we can offer the superb Impact 120's at only £999 a pair - incredible value for money! Come down for a demo now - they're sure to make an impact!

~~RRP £1285~~ **£999**

IMPACT110

~~RRP £282~~ **£199**

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MICS NEW, USED & EX DEMO

AKG C1000S £159	Soundcraft DM01 ... £199
AKG C3000 ..... £229	
Beyer MC740 ..... £1199	

AMPS NEW, USED & EX DEMO

Bose 802 ..... £599	JBL TR225 ..... £789	Yamaha P3500 ..... £499
C Audio ST400 ..... £449	Yamaha P1500 ..... £375	
C Audio ST600 ..... £549	Yamaha P2500 ..... £449	

SOUNDLAB DLP3Rs & KAM GMX7

INC FREE CABLES

A fantastic start-up direct drive bedroom package by the most respected names in DJ equipment. The outstanding DLP3R and the versatility of the GMX7 swinging mixer is sure to be a winner!

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POWERSTATION 600
PA MIXER BY SPIRIT

The Powerstation has been [illegible] and this is the first of a 3 model range. Primarily it is up to 750W per channel, there are 6 mono and 2 stereo inputs. Lexicon effects get 2 effects parameters, there's 3 band mid sweep [illegible] series. Clean/Drive [illegible] switching package deals.

Powerstation - 2 x Turbosound Impact 180	£1599
Powerstation - 2 x Peavey Pvbass	£1599
Powerstation - 2 x Electrovoice SB 124	£1599
Powerstation - 2 x JBL MS28	£1599
Powerstation - 2 x Bose 802 + MS28	£1599
Add 4 SM58s + stands, mixer stands and mains kit	£199

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SL 1210 MkII
TURNTABLE

After more than 10 years at the top, Technics SL 1210s are still holding their own.

Solid build quality, near instant start & stop and a stick steadily pitch control make them a safe buy.

Package prices also available with various mixers - please enquire.

~~RRP £489~~ **£POA**

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*We will beat any genuine quote from a UK or European [illegible] at the time of order. We must be able to [illegible] and it must be available and [illegible]. Prices include 17.5% VAT. UK mainland carriage from £8.99. Orders above £10 [illegible] days (by [illegible]). Errors & omissions excepted.

Digidesign Pro Tools

Digital Recording & Editing Environment

Pro Tools moves up a bit (or eight) and Mackie's dedicated hardware controller for the system finally arrives. MIKE COLLINS gets an advance viewing.

PT24 hardware and software, with Mackie's HUI in the foreground.

I bought my Pro Tools PCI system just about 12 months ago, at the same time as a Yamaha 02R. These were paid for with a 3-year loan from my bank, and now, just a year later, it looks as though it's time to go back to the bank manager, as the latest version of Pro Tools (called PT24), plus Mackie's HUI (Human User Interface) for Pro Tools, are on the verge of being released.

To find out more, I recently went along to Digidesign's offices at Pinewood Film Studios to spend an afternoon looking around the new PT24, followed by a visit to London-based audio suppliers Syco the same evening, for a demonstration of the Mackie HUI rigged up with a PT24 system.

PT24 SYSTEM

The *Pro Tools* software has been updated to version 4.1, and a new 24-bit interface, the 888/24, has been developed, along with a new 24-bit processor card, the d24. This last item is a half-length PCI card based on the Motorola 56301 processor, and currently it can handle 24 tracks of 24-bit audio, although a software update will enable it to handle 32 tracks by the end of 1997. A Mac serial port is provided on the d24 card to connect a SMPTE Slave Driver or Universal Slave Driver synchroniser for quicker lock-up, or to act as a third serial port for the Mac. Currently this port is non-functional, but it is expected to be in use by the end of the first quarter of 1998.

The DSP Farm in PT24 systems is the same card as the one supplied with PTIII systems, although there have been some recent tweaks to make it work with the latest expansion chassis. As far as expansion chassis are concerned, you can use the [*third-party manufactured*] Bit 3 7-slot and 13-slot models with the d24 card, although the 13-slot model only lets you use 10 of its slots. (With PTIII systems you can use both the Magma and Bit 3 7-slot units, but not the 13-slot model).

SOFTWARE

Although the *Pro Tools* software has been updated to version 4.1, it looks just about identical to the previous release. So what's different? Well, there's support for the Bit 3 13-slot chassis, as mentioned above, and for the Mackie HUI on PowerPC systems, and you get bundled EQ in both AudioSuite and TDM versions. The 4.1 software update also fixes a problem with destructive record, where it would fill the drive or corrupt the file if you stopped recording in the middle of a song. You can use the 4.1 software with PTIII PCI systems if you like — to allow you to use a HUI, for instance.

The new software now features full MIDI Machine Control support, so you can lock a sequencer such as *Logic Audio* to Pro Tools, making the sequencer the master if desired. There's full support for the Universal Slave Driver (USD) synchroniser (also reviewed on page 81 of this issue), and the 4.1 software can now send MIDI Time Code back to Pro Tools with positional info. Digidesign's Video Slave Driver (VSD) and SMPTE Slave Driver (SSD) synchroniser units will lock via MTC, but only to quarter-frame accuracy, whereas the USD talks directly to the card, to bit accuracy (1/80th of a frame).

There are a number of changes to the standard plug-ins — the 4-band and 1-band EQ and the dynamics processors — whose algorithms have been improved to sound more like those on high-end analogue consoles. *D-Verb*, *DPP1*, *DINR* and the Focusrite *D2* have all been updated with a new graphic look, and TC Works' *TC Tools* 2.0 now has a 5-band real-time EQ module, as well as the chorus and reverb modules. The 4.1 CD-ROM also contains updates for all Digidesign-distributed plug-ins, if they need updating for 4.1 (which some don't).

OTHER CONSIDERATIONS

So do I need to go back to the bank manager for this 24-bit upgrade? It certainly would give me a better signal-to-noise ratio, with increased dynamic range and headroom, on my recordings, and would let me prepare better audio for DVD and other future formats. Yet more cash would have to be

24 & Mackie HUI

found if I wanted to be able to record analogue sounds at 24-bit: I would need appropriate A/D converters for this job, and the new Digidesign 888/24 interface has eight of these. It will only let me monitor at 20-bit resolution, but this is an improvement on the 16 bits available previously. As far as the digital inputs and outputs are concerned, both AES/EBU and S/PDIF interfaces can handle 24-bit digital audio signals anyway, so you can use the digital inputs and outputs on the older 888 and 882 interfaces to bring 24-bit signals in and out of PT24. Interestingly, the 888/24 will also work in stand-alone mode so I could, conceivably, use it with other digital equipment on occasion. Currently you need to use jumpers inside to set the sample rate and digital format for stand-alone use, but a software utility will be available soon. The 888/24 can also be used for 16-bit recording with PCI-based PTIII systems, although it requires Pro Tools 4.1 software and won't work with the ADAT interface or with NuBus-based Pro Tools systems.

The 888/24 uses Crystal 5394 A/D converters and Crystal 4329 D/A converters, and Digidesign claim a dynamic range of 110dB for the A/D and 102dB for the D/A. At the A/D converter the analogue signal is encoded while referenced to an extremely low-jitter clocking mechanism, to ensure the highest quality conversion. Indeed, Digidesign claim that their unit surpasses the performance of both the Apogee AD1000 and AD8000 converters. On the other hand, the new Apogee AD8000 box also looks pretty tempting, with eight channels of 24-bit A/D and two or eight channels of D-A featuring Apogee's proprietary SoftLimit circuitry, plus UV22 encoding for 20-bit or 16-bit audio. The Apogee interface will connect directly to Pro Tools, and various format-conversion cards are also available for expansion with ADAT or TASCAM interfaces. Tough choices!

One very significant change is that the d24 card no longer uses the Digidesign SCSI buss. Today's Macs are more powerful, hard drives are cheaper and faster, and SCSI accelerator cards are widely available and increasingly affordable. So now you can play back audio off any drive connected to your Mac, using DAE's new host-based disk engine. This uses system RAM in the computer to buffer the audio data coming off the hard drives. It is a claimed advantage that the card uses the computer's RAM rather than its own on-board RAM for this purpose, but bear in mind that 64Mb is required! Fortunately, RAM prices are at an all-time low.

Using an appropriate drive on the external Mac SCSI buss, you can be sure of getting 16 16-bit tracks from the drives you used for Pro Tools III systems. However, to get 24 tracks of 24-bit audio you will very likely need to use a SCSI accelerator card with the latest, fastest drives. The data rate required for 24 tracks of 24-bit audio is around 150K/sec per track, which adds up to about 3.6Mb/sec of sustained throughput. This can only be achieved using very high-performance drives. Your hard disk space requirements are also likely to increase fairly substantially compared with PTIII systems.

HUI

This is a professional hardware control surface jointly designed by Digidesign and Mackie, which provides tactile control over the recording, editing and mixing features of Pro Tools. Physically it resembles a small digital mixing console, with mix buss and hardware I/O assignment switches at the far left, eight assignable channel strips more or less in the centre, and various other controls to the right. At the top there are controls for plug-ins, with a switching matrix for the automation functions below this. In the middle of this section there are control room monitoring controls, a built-in talkback mic, and a keypad to let you enter data. Below is a set of transport controls and a jog wheel with associated navigational switches. In the upper right-hand corner there's an alphanumeric display for controlling the parameters of DAE-compatible plug-ins, with eight stereo meters to the left of this.

On the back you get a pair of MIDI ports to connect to the digital audio workstation, and two pairs of general-purpose input/output jacks for triggering Stop/Play/Punch, On-Air, external console solo, and suchlike. There are three pairs of jacks for control room audio input and output, along with a headphone jack which shares the Output 3 signal. The HUI's talkback mic preamp can be used to hook up a remote talkback mic, rather than using the built-in mic, and two balanced high-quality mic preamp inputs with switchable phantom power are also provided. These have stereo jack inserts to let you strap a compressor or EQ across the inputs, along with balanced/unbalanced line-level jack outputs.

I'll come clean right away: if you're using Pro Tools as your recording and mixing environment rather than just for editing, I feel the HUI has features to die for. I particularly liked its electronic scribble strips and the way in which various plug-in parameters come up on the screen. Then there's the analogue control room section, with switches for three sets of monitors which can be configured as six discrete signal paths for surround sound. Actually, there's so much stuff on the HUI that it could take you quite some time to become totally familiar with it.

The question on many people's lips is going to be "Do I need an external mixer if I buy a HUI?" This depends very much on what you're going to use your system for, and how many audio signals you need to be able to plug into it at any one time. You might need a second, or even a third interface. You can connect a Y-cable to the d24 card to go to two 888 interfaces, but you can only connect one 888 or 882 to the DSP Farm. And don't forget that you only have line-level inputs on the Pro Tools interface, so you may well need one or more microphone preamps. Of course, by the time you've bought extra 888 or 882 interfaces and enough microphone preamps, you might just as well have bought a fully-fledged mixer. Watch this space for more as soon as review systems are available. SOS

info

£ Pro Tools 24 core system (software, d24 card, DSP farm card) £7131; 888/24 interface £3124. Prices include VAT. Contact Digidesign for upgrade prices.
A Digidesign UK, Avid Technology Ltd, Westside Complex, Pinewood Studios, Iver Heath, Pinewood, Bucks SL0 0NH.
T 01753 653322.
F 01753 654999.

£ Mackie HUI £3171.33 including VAT.
A Key Audio Systems Ltd, Robjohns Road, Chelmsford, Essex CM1 3AG.
T 01245 344001.
F 01245 344002.

Yamaha MDF3

Hardware MIDI Data Filer

There are still plenty of people who just won't have a computer in the studio, but nevertheless need some way of saving MIDI data. NICHOLAS ROWLAND checks out the successor to the venerable MDF2.

Just like it says on the tin, a MIDI Data Filer provides a means of filing MIDI data — in other words, it records, stores and transmits MIDI files and System Exclusive patch data. While doing nothing that can't be done by any software sequencer, MIDI data filers can prove useful little beasts. They're great for live sequencing if you don't want to risk gigging your computer. They can also greatly expand the potential of diskless keyboard workstations, offering both access to pre-recorded MIDI files and a convenient way of recording performances using internal backing tracks. And they're a godsend for anyone still relying on hardware sequencers without disk drives, such as the Alesis MMT8.

FILER FACTS

Enter the Yamaha MDF3, successor to the MDF2 (reviewed June 1992). Improvements over the previous model include an upgraded disk drive able to read high-density as well as double-density floppies, the ability to read both format 0 and format 1 MIDI files (the MDF2 could only manage the former), and a footswitch input for remote-controlled starts and stops. Otherwise, its physical appearance and functionality is the same. Like the MDF2, it's very easy to get along with, thanks to its combination of dedicated and multi-function buttons and associated LEDs.

At the back you'll find a MIDI In, MIDI Out and a footswitch socket, plus the power switch and connection for an 11.5V DC power supply. For the musician on the move, the MDF3 can also run on six AA batteries (not supplied) which yield around three hours of continuous use. The LCD will flash up a battery low message as time begins to run out.

MODE WATCH

First stop is MDR mode — MDF3 shorthand for storing and transmitting bulk data files. Note that the MDF3 is fully compatible with any MDR files created using the MDF2, as well as Yamaha's QX3 sequencer.

In SEQ mode the MDF3 will automatically change sequence data into type 0 standard MIDI files. As mentioned above, it will happily play back both type 0 and type 1, along with ESEQ files — a custom Yamaha format used by the likes of the QX3 and Clavinova CVP series. However, due to the way the MDF3 reads and writes its file names, it's not wise to keep SEQ files with MIDI files created by other means on the same disk. That's unless you use a computer to change the file names and fool the MDF3 into thinking they're all SEQ files. (More on this below.) While in SEQ mode, the MDF3 faithfully records and re-transmits note on and off, polyphonic aftertouch, control change, pitch bend, program change, channel aftertouch and system exclusive messages. In other words, you'll get out what you put in — but obviously there's no way of editing it using the MDF3 itself.

Under Job mode, you can program the MDF3 to play back a number of SEQ data files in a pre-determined order, or program one or more SEQ files to play in a continuous loop. The Record Tempo option allows you to change a MIDI file's recorded playback tempo, and you can also alter tempos on the fly during playback, using the file data buttons.

The MDF3 will happily sync or swim with other MIDI devices, acting as a slave or master. You can also choose whether it will transmit or respond to MIDI real-time control messages, for co-ordination of starts and stops with other devices.

Once files are recorded, you can use the utility menu to rename, delete or append them. One handy utility is the one which details all the files on disk and tells you how much room they occupy. Disks formatted for the MDF3 are compatible with MS-DOS or PC-DOS, so they can be read and edited using a PC. Mac and Atari users can also get in on the action via utility software such as *PC Exchange* and *DOS Mounter*. As well as allowing you to swap disks of MIDI files between computer and MDF3 with the minimum of fuss, this also allows you to carry out functions which would be somewhat tedious on the MDF3. For example, by renaming the file extensions used by the MDF3 you can change the order of sequencer files played under the Repeat Play function. And if you need to change the setup of your synth during your set, you can change the appropriate MIDI data file to a sequencer file and then transmit it automatically under the Program Play function.

VERDICT

And that's all there is to it — the MDF3 functioned just as it was meant to and didn't give me any problems. I have to admit that the prospect of reviewing such a workaday piece of kit didn't exactly set my pulse racing (respect due, Yamaha). Yet after my computer crashed for the third time while in the process of loading some bulk dumps back into my CS1x, I decided that maybe there was a place for the MDF3 on my studio wish list after all. If this review strikes a chord, you'll know you're a potential user too. SOS

pros & cons

YAMAHA MDF3 £329

pros
- Neat, chunky design.
- Takes the headache out of MIDI dumps.
- Battery power makes it eminently giggable.

cons
- LCD not backlit.
- Wouldn't suit sophisticated MIDI setups.

summary
At this price, probably a luxury for most people, but for the computerless musician, a luxury well worth considering.

SOUND ON SOUND

info

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Korg DL8000R

Digital Multitap Delay

The world of multi-effects might be generally interdisciplinary, but DEREK JOHNSON finds that there'll always be room for a specialist.

I'll admit it: I love dedicated effects processors. The average '90s multi-effects unit might offer tremendous value, but there's a real kick to having a box that says 'reverb' or 'delay' on it, and knowing that's pretty much all it'll do — and do well. A few years ago Boss's RV70 reverb looked like the start of a trend, but this was not to be, and these days there's not a lot of choice when it comes to editable dedicated processors.

Until now: Korg have released two 1U rackmounting processors, the DL8000R digital multitap delay, reviewed here, and the AM8000R ambience multi-effects processor, to be reviewed soon. Both come from the company's Toneworks division, although that label is missing from both units and their manuals. This division is responsible for Korg's guitar/gigging processors, which should give a few clues about the DL8000R. Indeed, while it's a perfectly capable and creative studio tool, this new processor is going to find many fans on stage too.

BRIGHTEN UP

The DL8000R's most striking feature — its fluorescent 12-character display (the characters are 14mm high by the QVC tape measure test) — will endear it to gigging musicians. A 2-line LCD wouldn't be anywhere near as visible as this homing beacon on a darkened stage. One side-effect of *not* using an LCD is that Korg had to find another way to keep the user fully informed. Their answer? A scrolling display. Though it's rather disconcerting at first, you do get used to it. Basically, when you select a program or editing parameter, its full name scrolls across the display, with the most relevant part remaining when scrolling has ceased. Another worthwhile feature for the hassled on-stage musician is the big, chunky knobs. The package as a whole has an un-Korg-like feel, although it is very sturdy.

Let's look at the rest of the control surface. Within the display area you'll find the level meters, and a collection of icons which light up depending on what you're doing. For example, a MIDI icon flashes when MIDI messages are received, an Edit icon lights in edit mode, and so on. Either side of the display are the chunky knobs: stereo input and output level controls each have a double pot, for independent control of left and right signal, and the remaining edit knobs double as switches. Turn the Function knob clockwise and it scrolls through the list of editable parameters; pressing it takes you to sub-menus, where available. The Value knob changes programs and parameter values, and confirms the writing of an edited program (it also functions as an edit compare switch). Lastly, the intriguingly named Warp! knob provides instant control over assignable parameters in the current program (press to restore the altered parameters).

Four buttons remain: Time/Tempo selects between a time-based delay mode, where you set absolute values for all taps, and a tempo-based mode where you work with various delay patterns; Hold freezes the current delay; Trigger lets you 'tap' delay times; Bypass does what it says on the panel!

Rearward, there's a four-pin socket for the external PSU, and a full complement of MIDI sockets and quarter-inch audio connectors (two in, two out). There are also four control sockets, for a control pedal and trigger, hold and bypass footswitches.

pros & cons

KORG DL8000R £469

pros
- Easy to use.
- Bags of delay time.
- MIDI control.
- True stereo.

cons
- Knobs a bit un-pro.
- External PSU.

summary

If your first reaction is that the best part of £500 could buy a multi-effects processor, the DL8000R isn't for you. If, however, you're looking for a new tool to assist in the definition of your sound, start saving.

SOUND ON SOUND

DELAYS ON TAP

Essentially, the DL8000R offers two independent, programmable delay lines (left and right), each with 3-band pre-EQ, 400ms pre-delay, three delay taps and a feedback tap. The maximum delay for each tap is 4800ms, and low- and high-frequency damping for the feedback tap are available. This would be a useful tool without anything more, but Korg have added quite a bit of icing. Each of the three main taps can also be modulated by the on-board LFO or a variety of controllers (MIDI, Warp! knob or foot controller). Up to eight controllers can be defined in Utility mode. The LFO is simple, yet allows you to create a wide range of effects. Any delay-based effect can be replicated on the DL8000R, so as well as surrounding yourself with a mad halo of ping-ponging delays, you can easily create straight — or wild — phasing, flanging and chorus effects, often in conjunction with sundry delays. It's even possible to simulate reverb-type effects with careful editing.

Aside from control over three taps (and feedback) per delay line, you have the option of using patterns in Tempo mode; in this way, rhythmic sequences can be generated. And you're not restricted to straight sub-divisions of quarter notes, either: a 'resolution' parameter lets you base delays and patterns on values of between a quarter note and a whole note, including triplets. MIDI sync is eminently possible, though the tempo range seems limited to 50-200bpm. Without a MIDI device connected, you can define your own tempi, for achieving approximate sync in a non-MIDI situation.

While the taps each offer a maximum of 4800ms of delay, they can't be placed serially; the longest delay is 10 seconds — the total of 400ms of pre-delay, 4800ms of main delay and 4800ms of feedback, which isn't too shabby! This should be enough for the closet Fripp enthusiast. Samplists might like to jam a loop of some kind, hit the Hold button and sample at their leisure. Extreme feedback values don't always end up in distortion, either, and can be left to happily rumble on in the background.

When you're done editing, save your work to one of the 128 user memories. These are initially filled with duplicates of the 128 factory presets.

IN USE

In use, the DL8000R is a doddle, with a logical heriarchy, though some may find scrolling though the parameters a bit of a drag. Actually, bar the odd run-in with the manual, I found Korg's new delay to be very easy to use. You might not get as much information as you're used to on the display at one time, but at least you're not straining your eyes by peering at the average LCD.

Low points are few. It can be hard to monitor the various taps while editing, and making the large parameter changes involved with 4800ms of delay can be a bit wearing; values change very quickly when the knob is twirled fast, but some other way of taking care of big parameter jumps would be kinder to thumb and forefinger. On the subject of knobs, I'm sure they're fine, but they look like leftovers from a home-brew electronics kit. Lastly, the DL8000R seems to run hot, which is surprising considering the external power supply.

VERDICT

My negative comments do not detract from my enjoyment of this fun and creative tool. It's so immediate and musical. The basic delays are clear and faithful, with noise kept to a minimum, but the EQ and low- and high-damp parameters should let you knock any shine off, if dark and grungy is what you're after. Guitarists who are serious about delay, and studio musicians who want an edge that their multi-effects processor can't hope to provide, should check this one out. SOS

info

- **£** £469 including VAT.
- **A** Korg UK Ltd, 9 Newmarket Court, Kingston, Milton Keynes MK10 0AU.
- **T** Brochure line 01908 857150.
- **F** 01908 857199.
- **E** info@korg.co.uk
- **W** www.korg.com

Roland VS880 S2

CD-Writing Upgrade for the VS880

If you own a VS880, you can already record, edit and produce a stereo mix of your masterworks, all without leaving the 880's tape-like hard disk recording environment, but now Roland have added the ability to make a CD master in the same way. PAUL NAGLE goes for the burn.

Is it my imagination, or does most gear have a shorter shelf life these days? It seems to be only a matter of months before a new model appears and the manufacturers begin their quest to persuade us to sell up and make the change. And computers? Obsolete as soon as you buy 'em mate! With this in mind, I was heartened to see Roland continuing to cram new functionality into their VS880 hard disk recorder with their second major update, providing the facilities to record, mix, master, and now create CDs in a single self-contained environment. The S2 upgrade (as it is known) is a hardware and software package consisting of a SCSI CD writer, Zip disk, manual, cable, and a CD containing software for PC and Mac — a thoughtful addition for those who wish to connect the CD drive to their computer.

PERFORMING THE UPGRADE

Roland state that the S2 upgrade must be preceded by the S1 (V-Expanded) update, although I did not personally verify whether this was actually the case. The update needs the VS880 to have an internal IDE drive, and if you intend to burn entire CDs in one pass this should be at least 1.2Gb in capacity, preferably greater. The supplied CD writer looks substantial enough (I'm told it's JVC-manufactured) and has an internal power supply, two SCSI connectors (a terminator is supplied) and SCSI ID selector. It's 2x write, 6x read multi-session capable.

Since I don't own a Zip drive, one was loaned to me for the purposes of this review. Upgrading was then a matter of powering up with the system upgrade disk in the Zip drive and replying 'Yes' to the prompt.

CUTTING A CD

If you want to create a CD, the VS880 songs in question must be recorded at 44.1kHz, and the copy operation requires you to mix your finished master down to two tracks first. This may involve some track bouncing, or even mastering to DAT if you have no spare tracks free. The manual provides some helpful hints in this direction. None of the VS880's effects or auto-mixing can be applied during CD writing. The manual warns that this version of the software overwrites all user effects patches, although they *are* re-loaded as and when any songs requiring them are called up.

I dug out one of my many 'not-good-enough-for-release' DATs and copied it to the VS880. Following the simple instructions, I then set the CD track start points using a modified version of the VS880's markers. From the song menu, I took the option to Write+Finalize. In this mode the data is written to the CD, then a final Table Of Contents (TOC) is automatically created. I then told the machine which two tracks contained my masterpiece and the display switched to indicate the size of the recording in Mb, the amount of free space on the internal IDE drive, and the amount of free space on the CD. Having prepared the master, the CD recording process requires a second copy of this data to be created (also on the internal drive). This is the Image file, and to make space for it I first archived a large-ish song I'd been working on to my external SCSI hard disk.

The next stage required me to confirm that I wanted to write the CD, and this was followed by a reminder to set my CD track numbers. Finally, I was asked if I wanted to Obey Copyrights? Naturally, I answered yes. Now began the creation of the Image file, which would later be transferred over the SCSI link to the CD writer. I say "later", but "much later" would be closer to the mark. After an hour, the conversion process was only halfway through. I took this opportunity to read the documentation more thoroughly and discovered that the conversion process takes roughly double the time of the recorded data. I settled down for a wait. After just over two hours, the Image file had been created and the write phase began. Fortunately, writing takes place at double speed, so I only had another half an hour to go. At the end of this process there is an option to use the Image file to make further copies, but if you

pros & cons

ROLAND VS880 S2 UPGRADE

pros

- Can use cheaper CD-R media.
- CD writer can be connected to PC or Mac for data backup or can function as a normal CD-ROM drive.
- No SCMS (whoopee!).
- Self-contained production system.

cons

- Conversion process very slow.
- Ties up the VS880.
- Currently no means of saving the Image file.

summary

It does what it says on the tin — eventually! This upgrade extends the considerable power of the VS880 still further, but I hope Roland can find a way to speed up the data-conversion process, or at least provide the facility to secure that oh-so-important Image file.

SOUND ON SOUND

YO HO HO AND A BOTTLE OF COPY PROTECTION MEASURES...

Roland treat the SCMS virus with the respect it deserves — they ignore it! Quoting from the manual: "The VS880 does not implement SCMS. This design decision was made with the intent that SCMS should not restrict the creation of original compositions which do not violate copyright law." This attitude should be applauded — and I, for one, can live with the slightly clumsy "Obey Copyright?" dialogue which is Roland's way of asking you not to be a filthy pirate.

decline, the file is deleted. This means that if you wish to make a second copy at a later date, you must endure the lengthy conversion process again. If you choose to, you can write tracks to CD one at a time — useful if hard disk space is at a premium or if you prefer to master to CD rather than DAT. When the CD is finished, a Finalise operation must be done before you can hear the results on a normal CD player, although you can listen to pre-finalised tracks via the VS880 at any time. After finalisation, no further tracks can be added.

THE RESULTS

My internal 1.3Gb IDE drive was able to cope with about 73 minutes of song data, plus the Image file, with a few Meg to spare, and I achieved good results using the cheapest (unbranded) blank CD-Rs I could find (less than £1 each). Since this is a hard disk system, you have all the usual cut, copy, insert and erase tools at your disposal to help with

> "I hope Roland can find a way to speed up the data-conversion process."

setting out the order and duration of your finished CD perfectly. The Roland CD-R drive burns CDs with the PQ subcodes that are required for CDs intended for use as masters by a CD duplication factory.

I'm sure nobody enjoys backing up their VS880 to DAT, but with blank CDs so cheap, I'd love to see an option to archive and restore raw song data implemented in a future upgrade.

CONCLUSION

The CD-writing procedure added in the S2 upgrade works smoothly and produces excellent results, but while writing CDs the VS880 is tied up, unable to perform its normal duties. It seems unbelievably short-sighted to spend so long creating an Image file and then have no means of backing it up, and I can only ask that this is changed as soon as possible in the next (minor) upgrade. However, by continuing to support the VS880, Roland show that there can be plenty of mileage left in existing equipment, providing it's designed properly in the first place. This CD-writing system gives you the means to avoid both computer and DAT recorder, and despite my reservations over the time my VS880 would be occupied, the quality of the results, even with the cheapest recordable CDs, was everything I'd hoped for. With only a few tweaks in the software, this system would take some beating. SOS

info

- **£** VS880 (basic model, without supplied hard drive or effects) £1529; with hard drive and effects £1899; S2 CD-writing upgrade £599; S1 upgrade (which is required for installing the S2 upgrade) £49. All VS880s being shipped now already have the S1 upgrade.
- **A** Roland UK Ltd, Atlantic Close, Swansea Enterprise Park, Swansea, West Glamorgan SA7 9FJ.
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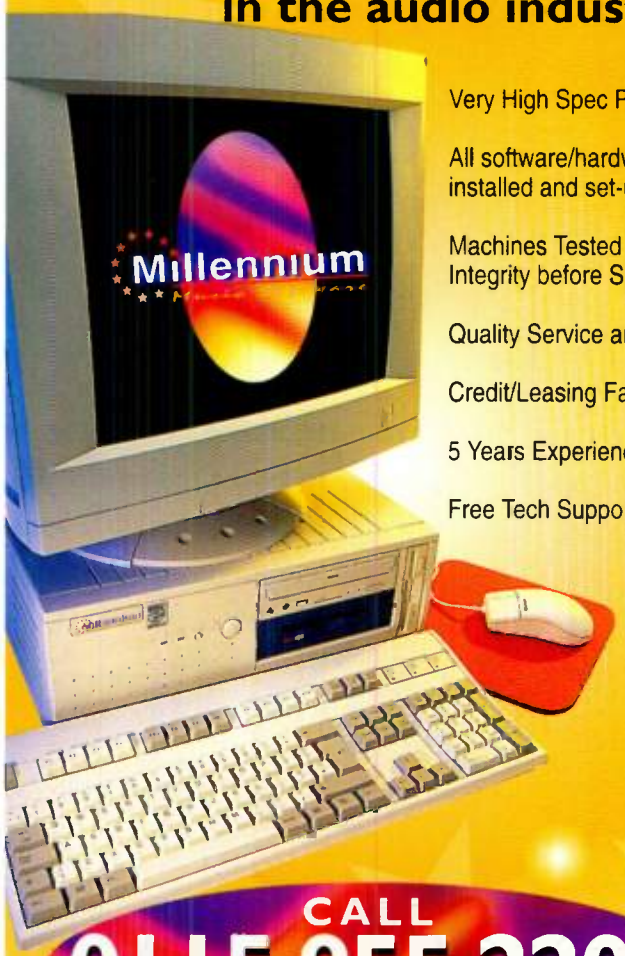

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PROMOTING YOUR ACT

Your recording's complete, packaged and ready to shake the world. So what do you do about it? BIG GEORGE looks at step one in the promotion merry-go-round.

The best advice anyone will ever give you on how to promote your act is "Don't bother. You haven't got a chance". The road to international stardom is paved with broken promises, missed opportunities and never-had-a-hope-in-hell-to-begin-with's. But if you let that sort of thing stop you trying, you didn't have the right stuff to begin with.

Promoting your act's latest (and most likely first) release is a major uphill struggle. Whether you're promoting yourself or paying for a professional plugger to do it for you, it's an expensive business. If you think you can do it with a couple of phone calls and one chance meeting with Chris Evans you might be right — but don't bank on it.

You see, promoting your act isn't a matter of playing your track and sending your photos and biog to the right person and then everything taking care of itself. To 'make it' (snigger — I'm sorry to laugh, but the concept of 'making it' is so alien to real life inside the music industry. Do you know, some people think that one play on the radio is 'making it'; others think that getting into the pop charts means you've 'made it'; I'm told that people actually still believe that getting signed to major label is 'making it', and an appearance on *Top Of The Pops* is the definition of 'having made it'. How wrong they all are) is rather more difficult, and it takes many forces working in tandem to even scratch the surface of success.

Once you've got a foothold with the media (whatever aspect and however it comes off), you have to push even harder and keep on pushing, otherwise you'll be trodden on by the next act right behind you — and there are thousands of them, all vying for that elusive top spot.

Don't neglect your local paper when it comes to promoting yourself or your band — it'll often have a page dedicated to the local music scene, like SOS's local paper, the Cambridge Evening News.

GLIMMER OF HOPE

Before Alan (Fluff) Freeman had even started as a DJ, a wise old man called Lao-Tse said a journey of a thousand miles starts with a single step. So, step one on the road to 'making it' (ha ha ha, sorry) is being bloody sure that your product (get used to that word) isn't a half-baked piece of self-indulgent nonsense which only you and your Mum think is any good. It doesn't matter how small the recording budget was, if it's not in the same Poptastic ball park as the kind of records you want to push aside, you'll trip on your first step. A lot of people never get up from the horrendousness of that kind of fall.

But let's assume your music will be massive as soon as the general public get to hear it. There are many directions you can go in, but before you even start you need, at the very least, a biog or a one-page write up on the band, its aims or philosophy, which should be short (and entertaining to read), and four really good photographs: two black and white and two colour. The photos should all be very similar in content and approach (you want people to make the connection between them when they see one in a local paper and another one in a magazine like *Sound On Sound*. Talking of which, how would you get a feature about your act in *SOS*?

INFILTRATING THE RANKS

Sound On Sound, as every reader knows, is the very best magazine in the world with regard to Hi-tech Music Recording, so they're not going to be interested in a piece about how you choose ▶

BAD NEWS
(..FOR FLIGHTCASE MANUFACTURERS)
MU100R
Sorry guys. We're only going to need 1U. Crammed into the MU100R's 19 inches are (deep breath): 20Mbytes of AWM2 wave ROM containing 1,500 instrumental voices - yes one thousand five hundred! - and more than 45 drum kits. 65 notes of polyphony, each with individual EQ - Invincible. 256 preset, but fully editable VL voices. (using Physical Modeling - the world's most advanced and realistic form of synthesis.)
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"Rome wasn't built in a day, and Bono didn't buy a castle until his fifth album."

your stage gear. Similarly, a fashion magazine would not be the slightest bit concerned with how you revolutionised the process of vocal sampling using time-stretch parameters. So tailor your approach to suit whoever you're sending your stuff to, then call them two days after you've sent it and see if they're interested. But remember, every month every magazine has got three times as much copy as it can print, so if you haven't got exactly the right spin on the story you're offering them, it won't get in.

A much easier place to start your media blitz is your local newspaper — come to think of it, anyone's local newspaper. As everybody knows, the local press excels at profiling flower shows and highlighting the lack of community policing, but is it any good at helping to kick-start a global music career? The answer is Yes! Not because of the in-depth reporting it gives or its pioneering efforts to discover new musical talent, but purely because it gives positive press coverage, with a photo. Whatever you do, though, don't let the local paper take the picture, unless you want to look like a local counsellor opening up a new child-care centre. Give them one of the four fabulous pictures from your press pack. Building a press portfolio is very important, as it helps you get ready for step one of the process of promoting yourself. So at this stage of your career, whatever you do, don't make enemies of the press; wait until your third album is number one.

IT'S ALL ABOUT THE MUSIC

Let's talk about your product. You will need copies on CD or, if your product is on vinyl only, at the very least a dozen CD-Rs. You will need at least 200 promotional copies to send in the post; the CD-Rs you would give to radio stations personally. Cassettes are a good thing to have as well, but they do not — and I repeat, DO NOT — constitute a front-line assault weapon in the promotions war. They are good to give people to play in their cars, and that's the only place they'll be played.

Promoting yourself is a giving thing, and that doesn't just mean the product — it takes a lot of time, effort and money. Think about how much you've spent on equipment over the years. If you're serious about getting somewhere in this business, what percentage of that cost do you think should be invested into getting you there?

OLD BANDS FOR NEW

You have to remember that the last thing the record industry wants to do is break a new act — they're too busy collecting the sheer profit they make on selling back catalogue. If you don't believe me, go into your local record megastore and count how many old records are for sale compared to new releases. By my unscientific reckoning (which took three hours counting on my fingers) it's 250 records recorded before the '90s to every one recorded in the '90s. Or, to put it another way, which will perhaps make you see sense and take the advice given at the beginning of this article: there are at least 2000 different back-catalogue titles to every debut album on sale. And whatever theory you want to use to counter that conservative estimate, the fact remains that retail is everything. No amount of stories in magazines and local newspapers counts diddly squat compared to a punter paying hard cash (or plastic) for your music.

But enough of this defeatist talk: Rome wasn't built in a day, and Bono didn't buy a castle until his fifth album. As a matter of interest, probably as much money was spent on promoting U2's latest album as it cost to build the big stage with the lemon on top.

Let's see if we can get as far as step one of the process. You have got an excellent product (which isn't a lemon) and you want to promote it. That isn't just repeating what's already been said, it's trying to get a handle on what you want to achieve (although you'd better get used to repeating yourself over and over again, in meetings and when you do interviews). Ask yourself some serious questions:

- What do you want to achieve (apart from world musical domination) in the short term?
- Have you got more product in the can?
- Do you release it commercially under your own steam first? (For a detailed look at how to go about that, see the May '97 issue of *SOS*).
- Are you prepared to work hard on making the first step work?

JUST PLUG IN

Whilst researching this article I spoke to half a dozen different promotions agencies and individual pluggers. Apart from one freelance plugger, all of them wished to remain anonymous, not because they said anything contentious, but because they didn't want loads of unsigned acts ringing up them up in order to get promoted. They all said that they have to believe in something very strongly before they'll hawk it all over town, and that their reputations were worth more than the money they might make.

As for the one plugger who didn't mind their details being given out, although their rates were the lowest they are dodgy and untrustworthy and haven't got access to any of the right people — in short, they would f*** up you and your career.

So if you want to get in touch with a professional promotions company, you'll have to find them yourself. The best way to do this is to pal up with a radio producer and get hold of the list of all the reputable pluggers in the business. And before you say anything, pal-ing up with a radio producer is the sort of thing you will *have* to do at some point — the sooner the better.

As for rates, it seems that the average rate for a professional operation to promote a single for a month nationally (which means Radio 1FM and some of the London-based pop stations) is between £1500 and £4000. For this, you will have someone enthuse about your track to the right people at the right time. Every relevant DJ and producer will get a copy of your record (which you will have supplied free of charge).

For regional promotion, the cost goes up to between £3000 and £5000, and for that around 400 DJs across the country will receive your record and a phone call asking what they thought of it. But very few promotions companies deal with stations based outside London, the reason being that most local FM stations are run by advertising-hungry corporate companies who only play established artists, chart records and occasionally songs which are being played by London-based stations. In other words, of the 600+ singles released every week, regional stations will only play the Spice Girls, Oasis, etc, and not yours at all. Sad, but a fact!

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Promoting your act

The late, great — well, the late, anyway — Frankie Goes To Hollywood. TV worked a treat for them...

There is never too much you can do beforehand — even going to the right places to be seen by the right people doing the right things. If you can create a buzz in the scene you plan to dominate, promoting yourself will be a whole lot easier.

JUST TURN THAT DIAL

The best way of selling your record by the lorry-load is to get masses of TV and radio air time. To take TV first of all, if you're no-one then there's no chance, unless you want to go on a sad talent show. TV producers have major labels courting them on a routine basis and these days the old pals act is more than just a nod and a wink, it's a shareholding. As for MTV and VH1, they play videos by Nirvana, Sheryl Crow and Wet Wet Wet. If you can find a way to get on TV, go for it: it worked for Frankie Goes To Hollywood 14 years ago, and look what happened to them (as shown above).

With regard to radio play, there are two areas to look at

- BBC
- All the others

I don't include pirate stations, as they cover a very small area and have an even smaller (zero, in fact) impact on the general record-buying public. Oh, for the days of pirate stations broadcasting from a rust-bucket ship in the North Sea, playing music which wasn't corporate-sponsored bland nonsense! (See Sounding Off, January '97).

Radio 1FM has a fantastic policy with regard to new music and embraces specialist shows where presenters can play their own personal choice, whereas local commercial stations have a playlist of 200 records (all safe, established artists) and DJs are allowed no personal choice — which, although disgusting, won't change at all in this century. Apart from Tina Turner's latest record, they play one or two Hot Oldies per hour. Hot Oldies mean the same old records coming round and around again, like Thin Lizzy's 'The Boys Are Back In Town' (you'd think it was the only song Phil Lynott ever wrote, which is another sick thing about local radio — no sense of musical history or quality). So, unless you can find a way of blackmailing the owner of a local radio-station chain, you have *no chance* of getting local FM radio play, period!

> "Just remember: it will take longer than a year of solid hard slog promoting yourself before you can even consider being a failure."

THE BEST OF BRITISH

Luckily, Radio 1FM does not exist to please advertisers by aligning them to established hit music which supposedly reflects well on their companies. The BBC radio has a forward-thinking policy that plays more new music than any other station in the world. But a lot of it is still playlisted. Records on the Radio 1FM 'A-list' will be played between 20 and 30 times every week; on local FM stations the A-list will be a lot more conservative and be played as many as 60 times a week. To get onto the A-list of any station you have to be part of the establishment or be flying up the pop charts at a turbo-charged rate. And that doesn't mean entering the chart at number 79 and then dropping out the next week, as is the case with so many records these days. Entering the lower end of the chart might, just might, propel a record into the 'B-list', which will get you between eight and 20 plays a week. But records that go onto the B-list and are dropped the next week tend never to get heard of again.

DOING IT THE EASY WAY

One sure-fire way of being seen by the entire tabloid-reading nation, which includes the producers of daytime TV programmes, music-press assassins and media whores from every nook and cranny, is to have a film star, soap opera star (preferably a female character who is going through a torrid storyline) or a premier-league footballer in the band. For maximum media-bility someone from the band should be going out with them. A Max Clifford-type approach would be: they should have a fight outside Stringfellows night club on Saturday night so the story (with pictures) could hit a tabloid on Monday. One of the couple should book into a clinic early evening on Monday and issue a statement saying they are too upset to talk. That would be Tuesday morning's headline. Next, the other one should punch a foreign photographer: this would make a top story and get the entire British press on their side. On Wednesday, one photographer should get a zoom lens picture of a kiss-and-cuddle, making up-type scene, which would give you the rest of the week to sell the exclusive story to at least five Sunday newspapers: her side, his side, a couple of parents (one saying they're great together and the other saying they should never have met), and someone else from the band dishing out the shock-horror studio exploits. It would get the record (remember that part of the deal — your music) played across the airwaves for at least a week.

That sort of coverage is orchestrated on a regular basis. This doesn't mean that it works, but it's the staple diet of most of the tabloid gossip columns. Of course, it would make the entire music press your enemies for ever, and what better way is there of selling platinum amounts of albums than by being slagged off by the weekly music press?

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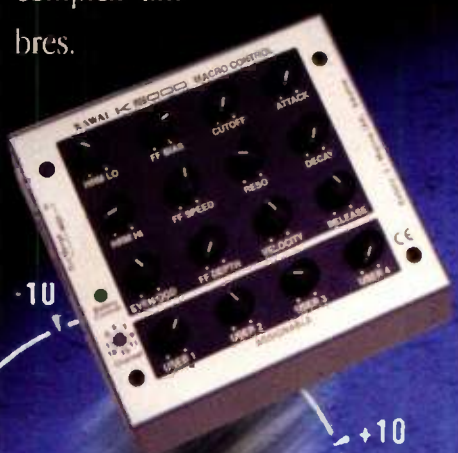

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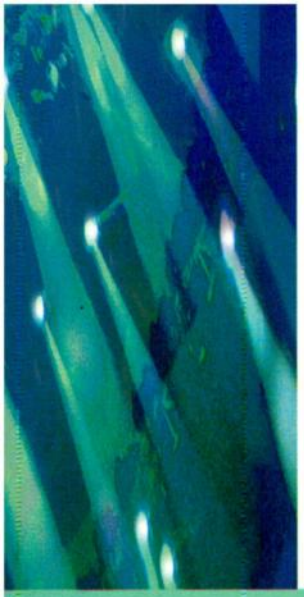


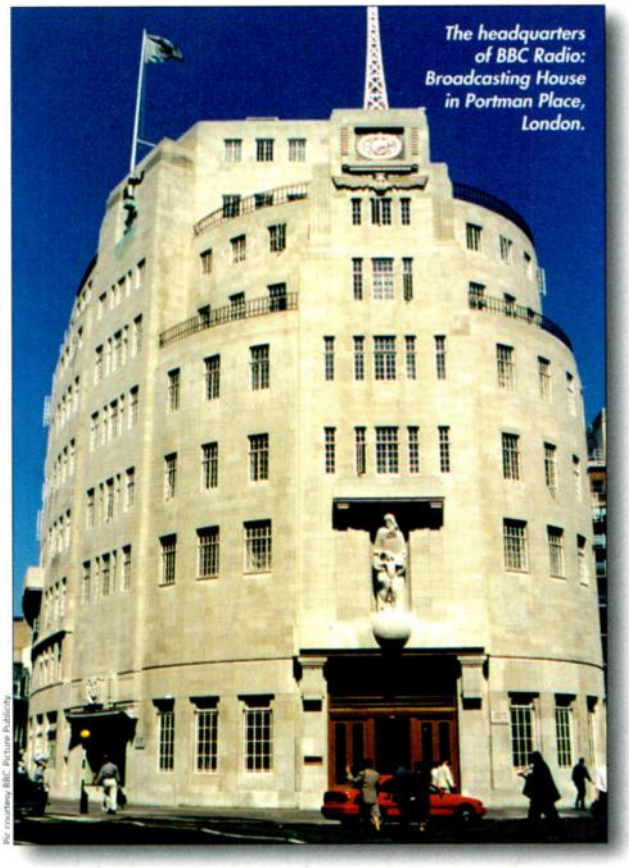
"This is a hard business, and the hardest part of it to crack is step one of the promotion treadmill."

The most you can hope for, to start with, is an appearance on the 'C-list', which will give you between four and 10 plays per week (depending on whether the DJ broadcasting likes your record, as C-list plays are the only list mainstream Radio 1FM DJs have as personal choice). But, unless you can back this up with a positive shift in record sales and/or mainstream press, you'll be off the nation's airwaves in a week.

To get onto the Radio 1FM playlist there's one man you have to get to: Jeff Smith. Every week he will see around 20 different professional pluggers for 10-20 minutes. They will play him their latest offerings and then he'll take the records to a playlist meeting with various programme producers to finalise the week's lists. Apparently, if you try hard enough there's the chance he will give you five minutes of his time, although he didn't return any of the 10 friendly calls I left on his voice mail.

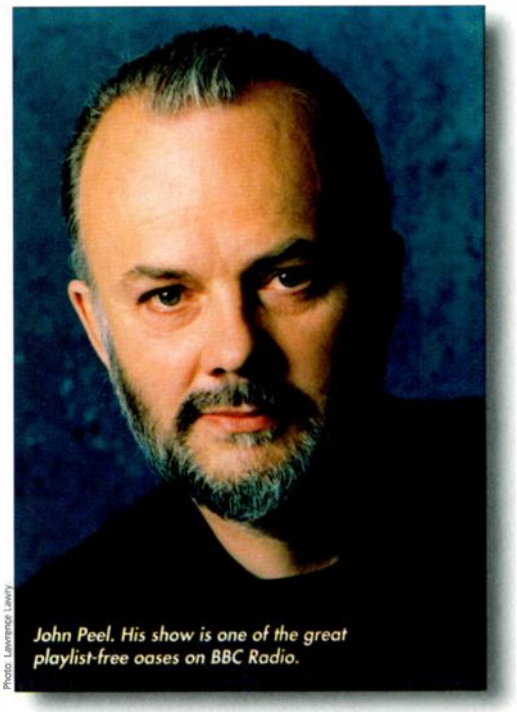
THE SPECIALISTS

This is not the case with the many and varied specialist shows on Radio 1FM. These are not dictated by playlists at all. Which is one very good reason we should be very proud of the BBC. Shows like *One In The Jungle*, *The Essential Mix*, and *Westward's Rap Show*, and DJs such as Pete Tong, Andy Kershaw, Danny Rampling and (the greatest human being in the entire music industry, who ought to rule the planet, not just because of his eclectic musical taste but because he is the toppest bloke on the planet) John Peel are able to programme their own shows. And that means playing your track!



The headquarters of BBC Radio: Broadcasting House in Portman Place, London.

Photo courtesy BBC Picture Publicity



John Peel. His show is one of the great playlist-free oases on BBC Radio.

Photo: Lawrence Lawry

Getting a few radio plays on a specialist show might not mean your record going platinum, but it can lead to other things. Major record companies might not be forthcoming in signing and developing new acts from scratch, but they're always picking up new records with a bit of profile in their quest to own as many small labels as possible. A couple of plays on Radio 1FM can often be the impetus for your record to be picked up by a major for a label administration deal or for distribution. It can also help to get your track licensed for a compilation or loads of compilations, which can be quite a nice earner and can greatly assist in further releases.

But before you ring the BBC and ask to speak to one of the DJs in person and demand they play your record, STOP! Don't blow it by being a pain in the butt with a pile of crap and the wrong attitude. Do some detective work. Find out who the producer of the show is. Don't just think you can call Tim Westward up and he'll agree to play your track every Saturday for the rest of the year.

Know what to send: some people only play CDs, whereas John Peel has a passion for vinyl. Some like to know a lot about who you are and what you do, others just want the record. Professional pluggers know these things — it's their job. If you're doing this yourself you will have to find out for yourself. That alone will take time and effort.

JUST HANGING AROUND

Hanging round BBC Broadcasting House in Portman Place is definitely a wise move. If you keep your ears open and your mind alert you will find out who's who. You will see people taking boxes of records in: these are either record company reps, producers or DJs. Now's your chance to impress — *without* seeming like a mental axe murderer. Knowledge is power, and outside the most famous and revered broadcast building in history is a good place to go about gaining some.

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Promoting your act

Most (but not all) of the current breed of stars have never needed to hang around outside the BBC with the autograph-hunting anoraks. They use professional pluggers, but that costs serious money — or does it? The Spice Girls allegedly didn't pay a penny to the company that plugged them. They, or the muscle behind them, made a percentage deal from their record royalties. I tried to get this rumour confirmed or denied by the relevant parties, but the response was a series of "no comment"s and non-returned calls. Funny, that — but from what I could gather everyone was blissfully happy to have been involved in the arrangement.

This is a hard business, and the hardest part of it to crack is step one of the promotion treadmill. As well as getting radio play you have to generate record sales, press, public interest, foreign interest and TV coverage. When no-one seems the slightest bit interested in you and your music, it will hurt, bad. But that's not to say all is lost: you may be going about it the wrong way, on the wrong day. Keep trying. It took the Pet Shop Boys 18 months to break their first record, 'West End Girls', and look at them now — financially secure for life, doing what they want to do, adored by millions of people across the world... that can't be bad.

Just remember: it will take longer than a year of solid hard slog promoting yourself before you can even consider being a failure. This article has only looked at how you go about taking step one: the next thousand miles can be the most exhilarating or heart-breaking you will ever endure, but if you're not prepared to start on the journey, you will never get to the destination. In the words of another wise old man, Dr John: "Quitters Never Win & Winners Never Quit"! SOS

GEORGE PROMOTES HIMSELF ONTO RADIO 2

I've been made spokesman for the BBC's 75th anniversary CD, which I feel is one of the high spots of my career — although I can't help wondering whether they chose me because all the other composers appearing on the CD are either dead or tax exiles. My first publicity appearance in this capacity was the Richard Allinson show on Radio 2.

We started by talking about the greatness of dead composers like Eric Coates, and very much alive ones like the delightfully 'Wilde' Debbie Wiseman (whose latest high-profile job was the score for the Stephen Fry Oscar Wilde biopic) — then the phone went. It was the top brass saying that we weren't allowed to plug BBC products on the Beeb. So we spent the next 25 minutes talking about my favourite subject: ME.

George promotes himself to Richard Allison of Radio 2.

When this version of 'West End Girls' was released it was a hit worldwide — but it had, by then, taken the Pet Shop Boys 18 months of relentless promotion to break the song.

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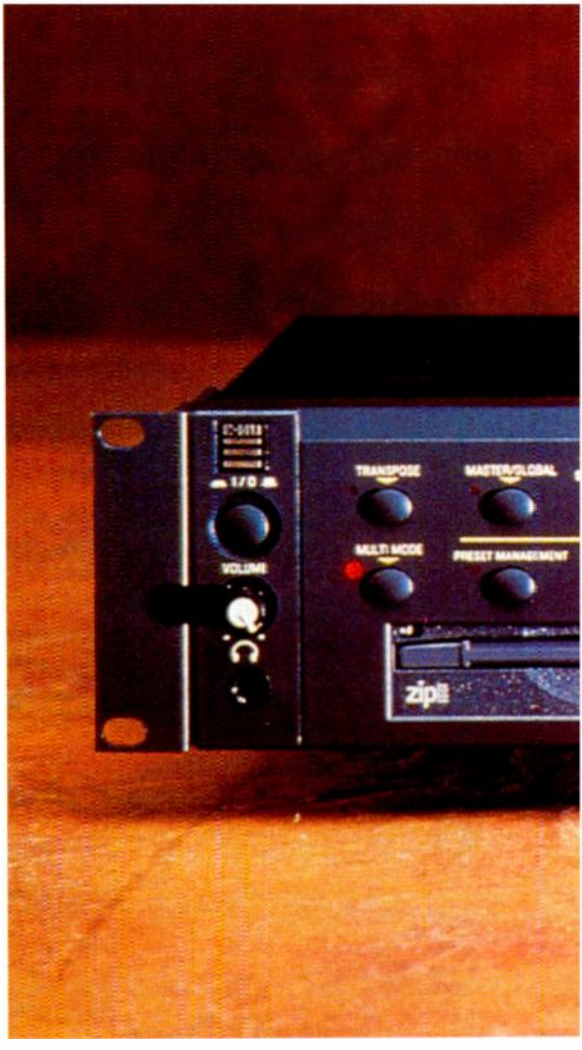


EMU ESI4000 64-NOTE POLYPHONIC SAMPLER

Emu's latest sampler release is a new budget module to replace the ESI32. But with recent price drops from Akai, and Yamaha's return to the sampling fold, have the company done enough to fend off the competition? SIMON TRASK spends some quality time with the ESI4000 and finds out...

Emu's first sampler, the Emulator, represented the affordable face of sampling on its release in 1980 — despite the fact that it cost around £8000. Then again, when the only alternatives were the megabuck Fairlight CMI and NED Synclavier computer music systems, £8000 didn't seem so bad. The follow-up EII, released in 1984, wasn't much cheaper, but a year later 'affordable sampling' took on a whole new meaning when Akai and Ensoniq broke the £2000 price barrier with their S612 and Mirage samplers respectively. Suddenly, the EII became the expensive face of sampling. Although Emu responded in early 1987 with the Emax, at around £2500 it was still significantly more expensive than offerings from the likes of Akai, Ensoniq and Roland. The following year's EIII, starting at almost £8000, cemented the company's reputation for producing high-end, high-quality samplers aimed at pro musicians and studios with deep pockets, and it's only in the past few years that they've made a serious effort to tackle the budget sampler market, with the ESI32. This end of the market is particularly dynamic at the moment, what with Akai's recent price cuts, Yamaha's return to sampling with the A3000, and 'desktop workstation'-styled releases from Ensoniq (ASRX) and Akai (MPC2000) offering an alternative to the traditional rackmount module approach. With all this bustling activity, have Emu done enough to make their new ESI4000 stand out from the crowd?

OVERVIEW

Like its predecessor, the ESI4000 is a 2U-high, 19-inch rackmountable unit with a modestly-sized central LCD window; in fact, the front-panel layout and labelling is the same as on the 32, the only visible difference between the two panels being the name! Surprisingly, given that one of the key advances of the new sampler over its predecessor is a doubling of polyphony (64 as opposed to 32 voices), it doesn't follow the ESI32 in emblazoning the amount of polyphony above the LCD — a missed opportunity, surely.

In familiar vein, the new module supports mono and stereo 16-bit sampling at 22.05 or 44.1kHz via Left and Right analogue audio inputs on the rear panel (mic to line level, with gain amount controlled from the sampling setup page in the ESI4000's software). With the Turbo option card fitted, you can also sample via an S/PDIF digital audio input, in this case at the usual digital rates of 32, 44.1 or 48kHz. You get 4Mb of sample RAM as standard, upgradable to a maximum of 128Mb (the spec in the manual wrongly says 32Mb, which is the maximum on the ESI32). The 4000's predecessor came factory-fitted with 2Mb of RAM, which has long been the standard default at the budget level, so 4Mb marks an improvement — but it still seems a bit mean, especially as there are many Banks on the supplied dual CD-ROM set which require more than 4Mb.

I couldn't find any details on upgrading the sample RAM in the accompanying manual. However, it appears that you can upgrade the ESI4000's RAM with SIMM chips, via two internal slots, as on the ESI32 before it and the more expensive E-series instruments, but check with your dealer on what sizes you can use and mix, and what access time the chips must have. Typically, upgrading the RAM will involve removing the existing 4Mb if you want anything substantial. Budgeting for having additional RAM fitted when you buy the sampler is

always a good idea; 4Mb is certainly usable, but to make the most of the instrument you should think about putting in more if you can afford it.

The ESI4000 is 16-part multitimbral, of course, with dynamically allocated polyphony and one Preset per part in Multi mode. You can create up to 256 Presets (combinations of samples, zones and synthesis settings), drawing on a pool of up to 999 samples. Multiple zones can be freely split and layered across the keyboard within each Preset, with each zone having its own synthesis parameter settings (resonant, multimode filter with Z-plane morphing, plus filter, amplifier and assignable AHDSR envelopes and an LFO). You can assign samples to primary and secondary layers within a Preset, and crossfade and switch between them using velocity ranges and keyboard position. Emu's long-standing Preset Linking feature is also included, allowing you to link additional Presets to the main one for additional layering and switching.

The ESI4000 has Left and Right main analogue audio out jacks and a Sub Out/Mix In Left and Right pair which can be used for external effects processing on selected sounds, with the option to route the externally effected signal back into the main onboard mix (the tip of an inserted stereo jack plug acts as the effect send and the ring as the return). With the addition of the Turbo option card, you get two more Sub outs (this time on stereo jack sockets), making a total of four separate output routings (Main, Sub 1, Sub 2, Sub 3) available for each individual zone within a Preset. In Multi mode, you can override these zone settings for each part, by assigning the part globally to one of the outs. You'll also need the Turbo card if you want to use onboard effect processing (see the 'Turbo Option' box for more details on the Turbo card's capabilities).

Emu are making the ESI4000 available in three configurations. The base-level configuration (£1199) comes with a built-in floppy drive and no Turbo option card (though it can be fitted at a later date). The next configuration (£1499) adds the Turbo card as standard, while the most expensive (£1699) includes the Turbo card and also replaces the floppy drive with a built-in Iomega Zip removable hard drive. Zips have become the *de facto* standard budget removable, winning out over the technically superior Syquest EZ135; you can now get individual 100Mb Zip cartridges for 10 quid (less if you order several at a time), making them a convenient and cheap storage and transfer medium for sample data. There's certainly a convenience factor in having a Zip drive built in, but whether it's a good idea to junk the humble floppy in the process is open to debate. With SCSI fitted as standard on all configurations, it might be a better move to get one of the two cheaper configurations and hook up an external Zip drive (which would also let you shop around for bargains — prices are falling steadily). Heavy-duty users might also want to think about getting an Iomega Jaz or a Syquest Syjet drive for 1Gb+ removable storage; again, prices on these are falling.

The ESI4000 comes with a dual CD-ROM set, the *ESI32 150Mb Production Soundset*, containing around 60 Banks (complete memory sets of Presets and their associated samples). These cover a wide variety of instruments and effect sounds, together with an assortment of 'groove loops', making the disc a great starter set. Also included is a mixed-mode CD-ROM containing samples, audio demos, ▶

pros & cons

EMU ESI4000 £1199

pros

- Professional sound quality.
- Versatile filtering.
- Front-panel trigger buttons.
- Sub outs & digital I/O.
- Sample memory expandable to 128Mb.

cons

- User interface could be more a bit more streamlined and consistent.
- No graphical sample editing or monitor output.

summary

A well specified budget sampler providing a capable if uninspired updating of the ESI32.

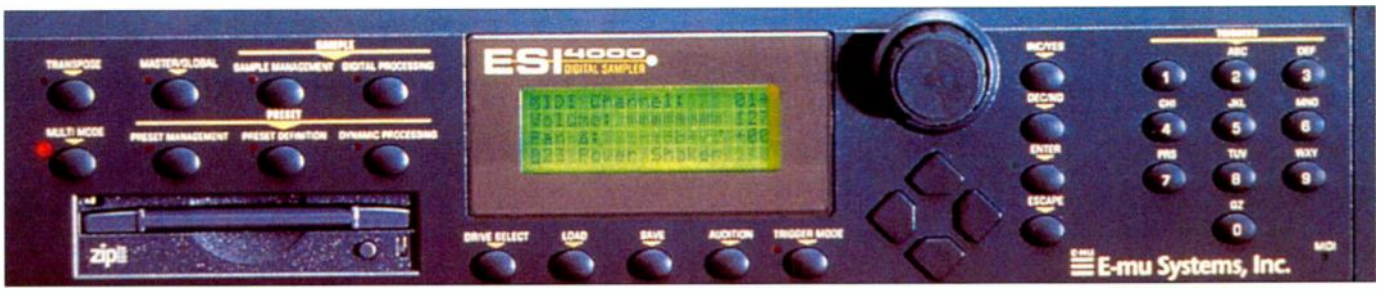
SOUND ON SOUND

▶ samples to user-specified keyboard ranges during sampling (for example, to consecutive white keys or consecutive octaves, beginning with C1). The ESI4000 has a generous assortment of sample-editing capabilities for a budget sampler, including time-stretching, pitch-shifting, doppler/pan, transform multiplication (accentuates common frequencies of two samples) and parametric equalisation, as well as the usual looping, truncating, reversing, cutting and pasting. These are effectively implemented features with their origins in the company's more expensive E-series samplers.

Also well implemented are the synthesis capabilities of the ESI4000, which, as you might remember, are specific to each zone, not to the whole keyboard, as is typically the case on synthesizers. The ESI4000's sample-based subtractive synthesis architecture isn't the most sophisticated available, but its powerful multimode filter deserves special mention for its 19 different filter types, which include comb, parametric and vocal formant ('morphing') filters, as well as a more familiar collection of low-pass, high-pass and band-pass types. The delicately named 'Bottom Feeder' is a distortion filter which provides an effective way to add more 'oomph' to the bass end; also included is the original ESI32 low-pass filter, which, according to Emu has been included "to maintain backward compatibility". The ESI4000's filter has its origins not in the company's more expensive samplers but in their Morpheus module of a few years back (though the upper-range samplers also have Morpheus-based filters, with more morphing options).

CONCLUSION

While Emu seem to be making the upper end of the sampler market their own at the moment, competition at the lower end is plentiful and tough. Yamaha, for instance, set a new standard for budget samplers earlier this year with the 64-voice polyphony and 128Mb maximum sample RAM of the A3000, and the ESI4000 can be seen in part as a response to that. In fact, the 4000 overall seems to be a 'keeping up with the Joneses' exercise on Emu's part. As such it's effective, if not inspiring: the 4000 is a capable enough sampler, and also fairly straightforward to use, while its plentiful polyphony and memory capacity shouldn't leave you feeling constrained. Sample quality is, of course, top class, and the filters are a strong point; however, the effects section is competent sonically but otherwise a bit lacklustre by today's standards, and it's a shame there's no internal resample-with-effects capability. Yamaha's A3000 is worth looking at as a similarly-priced alternative, while if £1200+ is pushing your budget Akai's S2000, at £799, is well worth considering — though you should also consider whether the 2000's 32-voice polyphony and maximum 32Mb sample RAM will be limiting for your intended applications. Akai offer several upgrade boards, and you could add boards giving digital multi-effects as well as S/PDIF digital I/O and eight individual outs for around £100 less than the mid-range ESI4000 — plus you can fit up to 32Mb of Flash ROM, which isn't an option on the ESI4000 (though it is on the more expensive E-Synth and E4X). The ESI4000 certainly keeps Emu in the game, then, but it's not a standout player. SOS



SPECIFICATION

Polyphony:	64-note (mono), 32-note (stereo)
Memory:	4Mb standard, upgradable to 128Mb
Sampling:	Stereo 16-bit, 44.1kHz or 22.05kHz
Frequency response:	20Hz-20kHz at 44.1kHz sample rate
Total Harmonic Distortion:	Less than 0.03%
Signal/Quiescent Noise:	Better than 100dB
Stereo phase:	Phase coherent +/- 1% at 1kHz
Samples:	999
Presets:	256
Filter types:	19
Connections:	L & R main analogue audio outs; L & R analogue sub outs/mix ins; L & R analogue sample inputs; stereo headphone output; MIDI (In, Out, Thru); SCSI port (50-pin Centronics type). With Turbo option fitted: S/PDIF digital audio in and out; FX analogue audio out; Sub 1 & Sub 2 analogue audio out
Weight:	4.5kg/10lbs
Dimensions:	Width 43.5cm x depth 23.7cm x height 8.9cm (2U-high 19-inch rackmount)

info

E ESI4000 basic with floppy drive, £1199; with floppy drive and Turbo option card, £1499; with Zip drive and Turbo option card, £1699; Turbo option card as add-on, £349. Prices include VAT.

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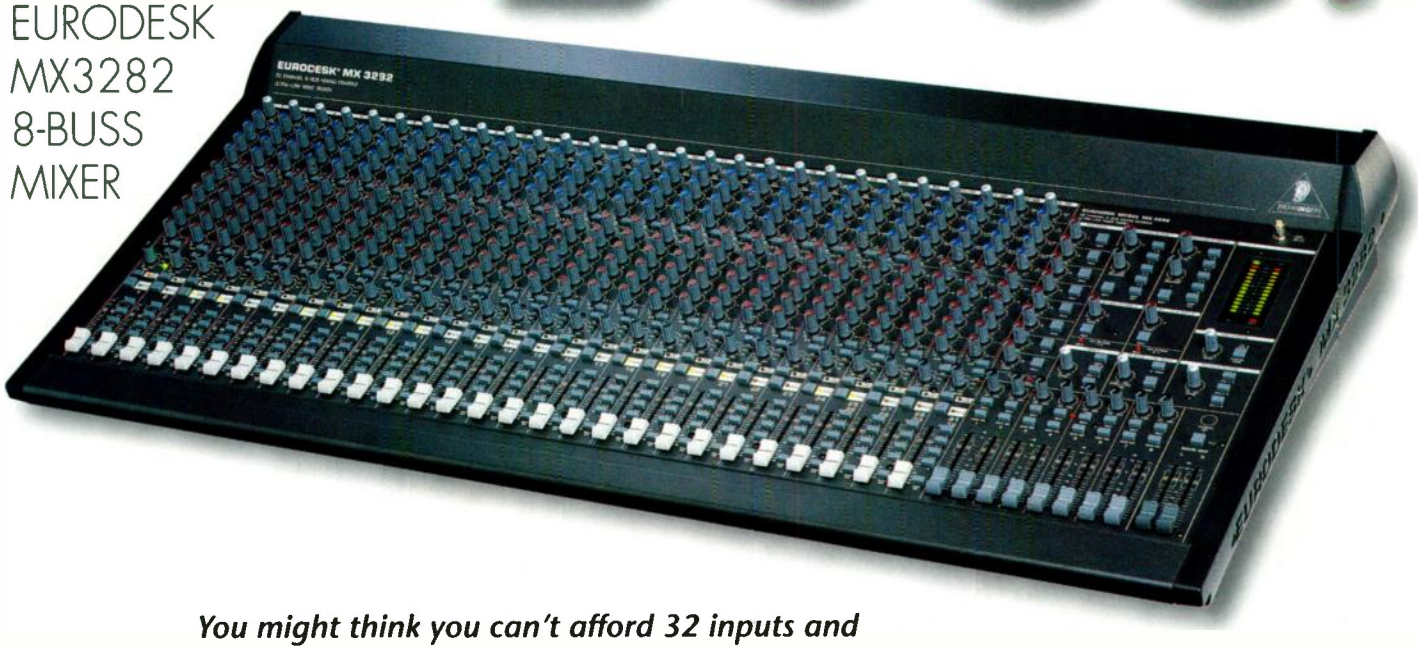

You might think you can't afford 32 inputs and eight busses — but a look at this cost-effective console might just change your mind. DEREK JOHNSON goes on the busses...

There are many candidates for "most important component" in your studio: it could be the mic, that first point of contact between real-world sound and your recording medium, or it could be the monitor speakers, which have such an effect on how you perceive your finished work. You could also choose the mixing desk, which sits firmly in the middle of everything, routing your sounds to tape or hard disk and back again to the real world, as you mix. (Many might vote for the recorder itself, but that would spoil the flow of my intro!)

In any case, few could disagree that the mixing desk is central to the modern multitrack studio, whether bijou back-bedroom or multi-room complex. The suitability, or otherwise, of your mixer to your circumstances can make the difference between a smooth-running session and a disastrous waste of time; a desk's audio quality is also critical to the finished result. This is one case (to paraphrase part one of our 'Into Gear' series last month) where you really should buy the best you can afford.

Luckily, you may now be able to afford rather more than you at first thought. How does a 32 input, 8-buss desk with a wealth of features, for under £1600, grab you? Read on...

WHAT IT IS

What we're discussing is Behringer's Eurodesk MX3282, a straight-ahead, no-nonsense, 32-input desk with a clear and stylish layout. Not only is the desk capable of 8-track recording — or more, given a flexible patchbay — but it's also pretty compact for the facilities on offer. Behringer are aiming the MX3282 at both live and studio markets, and although there are only a few dedicated live features — up to four pre-fade aux sends are available, and a handy 75Hz low-cut filter can help cut out stage rumble, for example — the desk should prove suitable for a wide range of applications. It might also be just about compact enough for a group to use both in the studio and on the road, especially if said band is interested in getting flexible multitrack recordings of their live work. In the studio, you'll welcome the low-noise balanced mic preamps (with a claimed bandwidth of 5-100Hz), the flexible solo system (Pre-Fade Listen or Solo-In-Place are available), the built-in talkback and the generous eight auxiliary sends.

When it comes to giving compact mixers the maximum number of inputs, the in-line design rules; channel strips provide both input and

pros & cons

BEHRINGER MX3282 £1599

pros
- Compact and very affordable.
- Comprehensive feature set.
- Good sound.
- Flexible routing.

cons
- Auxiliaries 1 and 2 fixed pre-fade.
- No scribble strip.
- PSU a bit noisy.

summary

What can I say? Anyone in the market for a cost-effective 8-buss mixer ignores the MX3282 at their peril.

SOUND ON SOUND

monitor signal paths, with the monitor section magically providing extra inputs at mixdown, effectively doubling the total. Surprisingly, the MX3282 doesn't take this approach, being more of a traditional split console, with the inputs and outputs (subgroups, monitor and master fader) fully separate. And though an in-line console design wins out in the number of inputs at mixdown, the split MX3282 still manages a creditable 32 inputs (plus four stereo aux returns). Where in-line desks often compromise by sharing EQ and aux sends between input and monitor signal paths, each input on a split desk such as the MX3282 has the advantage of access to all EQ and aux sends.

A split desk also offers simplicity of monitoring, since the signal path is easily followed: input signals are routed to multitrack tape (or hard disk) via the subgroups, and the returns from your recorder are routed to input channels. I evaluated the MX3282 with an analogue 8-track recorder, and routed the eight tape outs (or seven, when using track 8 for a sync code) to mixer inputs 1-8. During the course of a session, what was my monitor mix almost seamlessly became the final mix, with no repatching.

MONO INPUTS

The lack of bulk may be a surprise, but otherwise this new Eurodesk is pretty traditional: it's a greyish slab of metal covered in knobs, switches and sliders. The exact layout consists of 24 mono channels, four stereo channels (that's eight inputs, folks, making a total of 32), and a master section offering the subgroups, auxiliary send/return controls, monitoring options and master faders. It's customary in reviews such as this to provide a rundown of what each channel offers — and we're not about to disappoint. Let's check out the mono channels first:

- Gain control — offering 10dB to 60dB for a mic input or matching any line-level input of between10db and -40dB.
- Equalisation — 3-band, with 12kHz high and 80Hz low, and a swept mid with a range of 100Hz-8kHz; 15dB of cut or boost is available in each case, with the swept mid gain control obviously on its own pot. A 75Hz low-cut filter switch is also available — useful for cutting out stage rumble picked up by mics on stage, or for getting rid of unruly low frequencies in the studio.
- Auxiliary sends — there are six knobs addressing eight send busses. Aux sends 1 and 2 are fixed pre-fader (for monitoring), 3 and 4 are fixed post-fader (for effects processing), while the last two pots feed aux sends 5 and 6 or 7 and 8, via a switch; these last sends are also switchable for post- or pre-fader operation, giving you the choice of more monitor sends.
- Pan pot — for placing your sound in the stereo field, or, in combination with the subgroup switches and faders, routing the input signal to the subgroups.
- Activity LEDS — next to the pan pot; the green LED glows when there is signal present, and the red one flashes when you're overloading the channel.
- Solo/PFL — switch and LED. Depending on the state of the Solo switch in the main master section, this routes either a Solo-In-Place or Pre-Fade Listen; for the record, the former solos a channel with its pan position intact, whereas PFL simply solos the channel in mono for gain checking.
- Mute — switch and LED.
- Routing buttons — four for subgroup pairs (1-2, 3-4, 5-6, 7-8) and one for the main stereo mix.
- 60mm fader.

STEREO INPUTS

The stereo channels, which are ideal for connecting stereo sources to your desk (synths, samplers, radios or whatever) are also pretty comprehensively specified, echoing many of the features and routing possibilities provided by the mono channels. The auxiliary sends, subgroup and mix routing switches, solo and mute switches, activity LEDs and 60mm fader are identical. ▶

THE MX2442

Also in the Eurodesk family is the MX2442 4-buss desk, priced at £999. As you might guess, this is equipped with 24 inputs (16 mono and four stereo) and four subgroups. In most respects, the specification is identical to the MX3242 discussed in the main review; the principal difference, apart from fewer inputs and sub-groups, is that there are only six aux sends, on four pots, with two stereo returns. The EQ is identical, there are high-quality mic preamps on all mono channels, and inserts where you need them. So if space is even more tight, or you could do with saving a bit more cash and can get by with the reduced feature set (although 8-track recording shouldn't be terribly difficult to arrange), you might want to have a look at the MX2442.

> "The suitability, or otherwise, of your mixer to your circumstances can make the difference between a smooth-running session and a disastrous waste of time; a desk's audio quality is also critical to the finished result."

The connector-stuffed rear panel (also featuring the name of the desk, in case you've forgotten what it's called).

One of the MX3282's mono input channels (see page 55 for a rundown of the features).

▶ Controls that differ include the -20dB to +20dB gain control, balance pot and 4-band EQ. The balance pot, not surprisingly, takes the place of the pan pot found on the mono channels; should you connect a mono source to a stereo input, this knob will behave as a pan pot. The EQ offers 15dB cut or boost at 12kHz (high), 3kHz (high mid), 500Hz (low mid) and 80Hz (low).

MASTER SECTION

The master section looks busy at first glance, but is actually straightforward:

- Auxiliary send masters — a strip of eight, next to the last stereo input channel; each knob has a Solo button for level checking, with a single red Solo indicator LED for all eight switches.
- Auxiliary returns — there are four altogether, and all have a Solo switch; auxiliaries 1 and 2 also have a full set of routing switches, allowing two sets of effects returns to be easily submixed with the main audio mix, for recording direct to multitrack tape, for example.
- Monitoring — both headphone and control room options are provided. The control room monitor out can monitor the 2-track return or the main mix, and has a mono switch; with the headphones, you have a choice of monitoring the main control room/monitor mix, or the signal from auxiliary sends 1/2 or 5/6.
- Bargraph level meter — doubles as main stereo mix meter and PFL/Solo indicator. LEDs indicate whether you've selected Solo or PFL operation.
- Solo section — with a knob for monitoring the level of solo'd channels, and a switch for selecting Solo or PFL operation.
- Talkback section — the in-built talkback mic, activated by a momentary switch just above the master faders, can be routed to aux 1/2, aux 5/6 or aux 7/8.
- Subgroup faders — across the bottom of the master section, each with solo switch, main mix routing switches and pan pot.
- Main mix faders.

And I mustn't forget to mention the BNC connector provided for an optional gooseneck lamp. If you're still with me, let's look at the connectors, laid out neatly at the rear. Each mono channel offers a balanced XLR mic, balanced quarter-inch jack, and a quarter-inch insert connector. The stereo inputs are simply pairs of balanced quarter-inch jacks. The eight aux sends and eight subgroup outs are all balanced quarter-inch jacks, as is the monitor/control room output pair; there are also eight subgroup insert points. Two pairs of phono sockets are provided for 2-track record and playback, and the main stereo outs offers a choice of XLRs or balanced jacks, with insert points. Thoughtfully, Behringer have provided two headphone sockets, although the back panel may not have been the best place for them. The last connector is the 7-pin power socket for the external 2U rackmounting power supply (the main power switch is on the external PSU), and the last switch is that for the global 48V microphone phantom power supply.

OPINIONS

Sonically, the MX3282 is more than satisfactory, with quiet mic preamps, musical EQ, and no audible crosstalk. Operationally, it's a breeze to use. Sessions during the review period went especially smoothly, and I encountered no visibility problems, with knobs and switches, for the most part, perfectly accessible. The controls and faders themselves are good quality, and smooth in use, though the faders are perhaps a little sticky. I found that it required a certain knack to get a completely smooth fade with both master faders. The routing switches are also perhaps a bit too close to the main channel faders. Some might find the front panel to be a bit dark and lacking in contrast, especially when used in the low-light conditions of mixing or recording a live concert. But you could always add a gooseneck lamp — the connector's there! — and there is just about enough in the way of colour caps on pots to help you if lighting's a problem.

There are a few other features that are missing or strangely implemented, but keep in mind that this is a £1600 desk with an otherwise generous feature set, that does its job brilliantly. One of the desk's most notable omissions is a scribble strip, the plastic strip used for identifying the various signals going through a mixer, which is found at the bottom of the channels of many desks. Curiously, though, there *is* sort of a recessed half-inch-wide channel across the bottom of the mixer, which looks as if it should have a scribble strip stuck in it. In fact, I improvised by cutting thin strips of paper and Blu Tacking them into this channel; even Behringer's brochure shows the desk with a long piece of masking tape stuck in place! (I didn't use tape because we at *SOS* take care of our review stock.)

There is also no internal option for adding MIDI control; a MIDI-controlled fader system could, of course, be added via the desk's insert points, but this isn't as tidy as the fully integrated approach. Another feature that can't be added is a full meter

MANUAL WORK

If you've used virtually any mixer before, you may find that the MX3282's manual remains in the box, since the desk is so easy to use. This is just as well, since the manual is not terribly good; all the facts are included (just about), but the organisation is confusing, with no attempt to introduce and explain the desk's features in a logical and thorough manner. Needless to say, there's no index. Beginners will welcome the fold-out front panel and rear-panel connector layout diagrams, and keep them folded out during their early days with the desk. Some mixer manufacturers provide practical examples (Mackie are very good at this), but those provided here are not entirely useful, although they might help the complete newcomer to figure out how to wire in a patchbay or start a session from scratch.

A side view, revealing the MX3282's wedge design (and the name again, in case you've forgotten what it's called since you last looked at the back panel).

> "At the end of the review, it all comes down to price and facilities, and on both fronts the MX3282 scores highly. The feature set is virtually unbeatable for the price."

bridge; the metering is adequate for such an affordable desk, but it'd be nice to be able to add to the few flashing LEDS and the main stereo bargraph meter. And while I'm whingeing, some users may have preferred an EQ bypass switch to a 75Hz cut option. I was about to disparage the 60mm faders, but I realise the desk wouldn't have been quite so shallow with full-sized 100mm faders. In any case, 60mm is quite long enough

While acknowledging the need for a reliable power source in order to maintain the desk's headroom and operating efficiency in all situations, I feel that more could have been done to minimise the noise produced by the 2U rackmounting power supply. Size constraints may have made an internal power supply an impossibility, but I feel a little more attention could have been paid to the noise question. A desk of this size — and price — is going to be very attractive to the bedroom musician, and users such as these need one more fan (and another resonant case housing) sitting in the room where they record everything about as much as they need a hole in the head.

On the auxiliary send front, it would have been nice if sends 1 and 2 could have been switched to post-fade operation. Not all users of this desk are going to need *any* pre-fade (monitor) sends, and even with six effects sends to choose from, only four per channel are available. Of course, the pre-fade sends *could* be used for effects, but remember that when you move the channel's fader, the send will still be feeding your effects unit. One mod that you can make, internally, switches the aux sends from post-EQ to pre-EQ; this requires the cutting of one and the soldering of another link for each send on each channel. Perhaps a similar mod could have been provided for post/pre-fader operation of auxiliaries 1 and 2.

CONCLUSION

At the end of the review, it all comes down to price and facilities, and on both fronts the MX3282 scores highly. There are tons of inputs, loads of aux sends, and plenty of flexibility; the sound is also very good. The desk's size would suit the project or bedroom MIDI studio perfectly, especially one equipped with the new breed of digital 8-track, yet the feature set is perfect for semi-pro full multitrack performance.

There is no shortage of mixers on the market at the moment, and you'd be forgiven for a certain *ennui* at the thought of yet another one. However, Behringer's new Eurodesk really is worth a look. Essentially, it's hard to seriously fault this desk; the feature set is virtually unbeatable for the price. SOS

info

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soul keeper

OLA ONABULE — RECORDING SOUL AT HOME

Sometimes it's easy to forget that home studios packed with synths and samplers aren't solely the preserve of the dance fraternity. British soul artist Ola Onabule does all his recording and the managing of his own label from his Brixton home. CHRISTOPHER HOLDER finds himself at the end of the (Victoria) line.

Hearing a homespun dance number storming the charts barely raises an eyebrow these days. The plummeting prices of quality MIDI equipment and studio gear has broken down many of the barriers in accessing a wider audience for your music than your mum and Larry your long-suffering goldfish. But that's dance music. Meanwhile, most other genres remain the preserve of 'real' studios and real flesh-and-blood musicians. By necessity, Ola Onabule has gone about trying to emulate the major studio sound, the feel of musicians jamming in a studio and the polish of a professional mastering room — all in the comfort of his Brixton-based maisonette. His first album, *More Soul Than Sense*, did just that and enjoyed considerable commercial and critical success, selling close to 6000 copies, while the single 'You'd Better Believe' was playlisted on Jazz and Kiss FM. This year sees the release of Ola's second release, *From Meaning, Beyond Definition*, on his own Rugged Ram label.

Ola explains his working ethos particularly eloquently: "There's enough music made from the A&R man's point of view, or from the accountant's point of view. There's a legitimate space that should be reserved for music that sounds the way the artist intended it to sound. I'm doing my best to defend that space."

DI WHY?

This DIY approach may have made for some hard work, but it has afforded Ola the sort of creative freedom he wasn't enjoying during a tenure at Warner Bros' Elektra Records.

"In 1991 I got signed to Warner Brothers but it all fell apart about a year later. I had one notion of how soul music was supposed to sound, they had another — and they weren't compatible. So when that relationship ended I spent a year or so looking around for another deal and found myself in so many situations where people began saying the same kind of things that I heard at the beginning of the last relationship. I read the warning signs and I knew my future wasn't going to be with a major record label."

So what is wrong with the soul and R&B scene in the UK that we can't give our artists some freedom to express themselves?

"Soul music is in a weird place in Britain at the moment. A lot of people think it's doing well because they see the likes of Mark Morrison or Damage, but really they're pop acts, they're not R&B soul acts. Soul music is defined by its practitioners, like Earth Wind & Fire, Stevie Wonder and Take 6. As a style it is lost amongst the blues, gospel and jazz end of black music. This is different from black people singing pop, which I think is what a lot of people, including record people in Britain and Europe, think of as soul music.

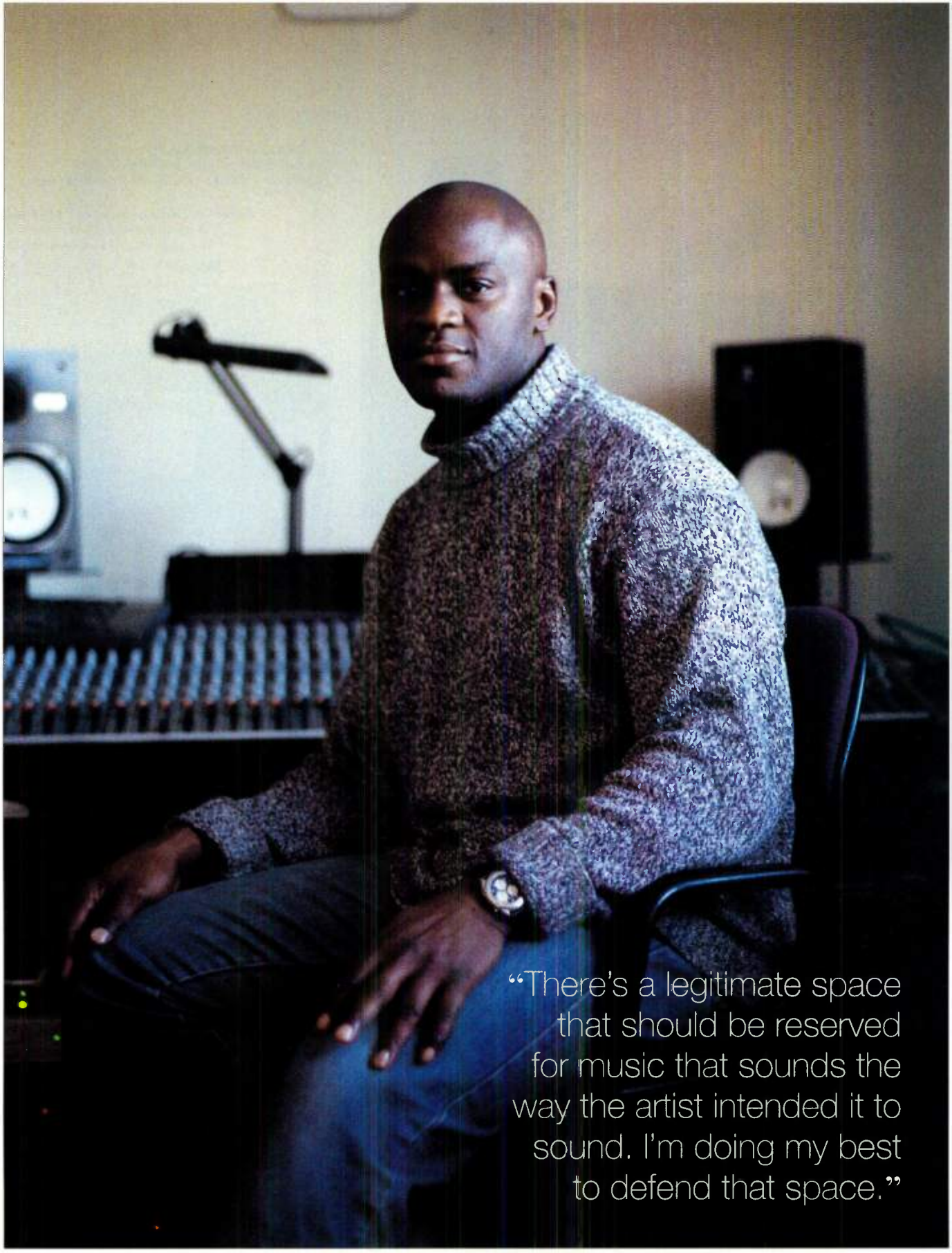
"For now, most of the soul acts I know and identify with in the UK are running their own labels. Sure, there are parallels between the space that I occupy and that people in the underground dance scene occupy; it's born out of the same need to produce music in the absence of any other assistance — it's the spirit of getting on with it."

QUIET AND STUDIOUS

Ola has taken the design and layout of his studio very seriously. Most people pick their house because of the suburb, because of the stonking conservatory, because junior can go over the road to The Ridings school for the best in education... Ola needed his real estate to be above a shop. Finding the right property solved some of the studio's volume constraints, but Ola didn't stop there: windows have been double-glazed, a second ceiling has been installed and rockwool stuffed into the recess, the false ceiling has been treated with acoustic tiles, while rugs and a sofa finish off the sound treatment.

"I have to suppress any worries about my recordings not being able to effectively compete with the major studios. I have to make the best with what I've got, and be all the more careful about keeping noise levels low. Noise is probably the most important concern, since there's a lot of vocal stacking, a lot of live mic work. As you can hear, we're on the main road out of Brixton, with all the traffic and the buses going by. I have to make sure that I record in the dead of the night. I pile things up against the window, and use various other techniques here and there, so I get as close as I can to that quality studio sound.

"The characteristics of the room are now pretty good. I was a bit worried when I was putting the room together because I knew I couldn't afford the best treatments around, but the advice I got was that once you put all your gear in here, and you've



got bookshelves up, your CDs and records, and your sofa, all of those things will do what a bass trap and expensive treatments would do."

If you take a look at one of Ola's CD releases you'll notice from the credits that the DIY approach carries on all the way to the point of mixdown. Virtually all the instrumentation and production is done solo in his long hours spent in the studio.

"I'm musically literate and I can play enough drums, guitar and keyboards to put most of the record together, but the technology allows you to get away with so much. For instance, at the times where I haven't the proficiency to play at the correct speed, I can often slow the sequencer down and take my time. But whenever I find myself confronted by something I can't do, I know, thanks ▶

ola onabule

Left: Ola's Allen & Heath Spectrum desk, and Yamaha NS10M monitors. The Roland PG800 programmer is sitting on the top left corner of the desk.

Below: Ola's main keyboard and sequencing A-frame, containing a Yamaha DX7, Atari ST, and Korg Wavestation.

"I think the world is becoming a 'get on and do it yourself world', and as far as I'm concerned, having your own studio is the first step."

▶ to my session work, that I can contact some of the best musicians in London. They're always very understanding, they're always willing to come and lay a track down for much less than they would if they were doing a session for a major."

MIXING WITH THE RIGHT CROWD

It's at the mixdown stage that Ola finally relinquishes command. Not to say that his half-inch tapes are sent out of house to be mixed — oh no. Ola brings in a freelance engineer to mix for him.

"When I was going to mix the first album, I spoke to a number of engineers. One guy came in, looked at my effects units and mumbled, 'I never work with anything less than a Lexicon 350L', made another disparaging comment about the speakers and left in a huff. 'How on earth could I be expected to soil my hands on such budget gear?', that sort of thing. Then Tufty [*Mark Evans, who has engineered for Jennifer Rush, Elton John and Let Loose, amongst other notables*] came along, and by this time I was a bit nervous, I started to get an inferiority complex. But he was completely OK, he walked into the room and seemed more impressed than anything else. Knowing his reputation, I was pretty relieved."

Martin Rex (responsible for mixing The Shamen's 'Ebenezer Goode', amongst other hits) mixed Ola's most recent CD. I asked what sort of preparations Ola made for his arrival.

"I just zero'd the desk before he came in and left him to it. Because I work almost entirely alone, when it comes to the mix I'm just relieved to leave it to someone else. I trust what he does, he really understands the idiom. But the words Martin bandied around a lot were 'less gear, more talent'. By the end of the first few sessions together, I was really locked into the idea that it's how you use what you've got. If you've got the most expensive gear in the world and it's just sitting there looking at you, and you're not finding out what it can do creatively for you, then it's a waste of money."

OBSESS IS MORE

Ola loves his studio and his gear with a passion, and it's obvious that everything in it is lovingly tended.

"I think the first thing I bought was a Kawai R100 drum machine. It only had about 12 sounds, and they all went 'klunk'. The kick would go klunk, the snare would go klunk, but I still thought it was the definition of sex itself at the time. Ever ▶

GEAR LIST

- Akai S1000 sampler
- Akai S1000PB playback sampler
- AKG C3000 condenser mic
- Alesis Quadraverb multi-effects (x2)
- Allen & Heath Spectrum console
- Audio & Design compressor
- BBE 462 Sonic Maximizer
- Behringer Multifex
- Beyerdynamic MC740 condenser mic
- BSS DPR902 dynamic equaliser
- Digitech Studio 400 multi-effects
- Drawmer gate
- Drawmer compressor
- Korg Wavestation synth
- Lexicon PCM70 reverb unit
- Pioneer 4-speed CD-ROM drive
- Roland JV1080 synth module
- Roland MKS20 digital piano
- Roland MKS70 analogue module with PG800 programmer
- Roland Octapad 2 MIDI drum pads
- Symetrix 528E Voice Processor
- Tascam DA20 DAT machine
- Tascam MSR16 multitrack
- TL Audio 2011 parametric EQ
- Waldorf Pulse monosynth
- Yamaha DX7 synth
- Yamaha NS10M nearfield monitors
- Yamaha SPX900 multi-effects

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WRH

since then I've just been putting all my money into gear.

"I run *Notator* on the Atari. Just about everybody I know has moved onto either a Mac or PC-based system, and the pressure is on me to change, but I know this system so well. Once or twice the monitor has conked out and has gone out for repairs, but I can still do some rudimentary work without the monitor. I know all the key commands and I can just guess what it will be doing at any one time. I'm very wary about changing this system.

"The [Korg] Wavestation is my master keyboard. Up until a very short time ago it was a Roland D70, but I sold it because I was desperate for that monophonic beast over there [*pointing at the Waldorf Pulse*], which has fulfilled my dreams and made my life complete [*said with a worrying lack of a tongue in his cheek*!]. Ever since it's come into my life I've been a very happy man. It's just a beautiful sounding monophonic synth. I've worked with other monophonic synths, but I have to say that even the Minimoog has moved to second place in the list of monophonic synths in my estimation. It's just all there, and MIDI-wise it just so sexy, everything sends out a controller message.

"The [Roland] MKS20 is my synth for keyboard sounds. It's not known for a good acoustic piano, but its organ sounds and its Rhodes pianos are very pleasing. The MKS20 is a keyboard player's passion, almost all keyboard players get all moist when they start to talk about the MKS20.

"This is my workhorse multi-effects unit, the [Digitech] Studio 400. It's great, I just stick a sound through there and tweak until I'm satisfied. I think it was a *Sound On Sound* review that spoke very highly of it, the reviewer said 'If you're thinking of buying a Lexicon, why not get two of these, you won't regret it'. I haven't.

"My desk is an Allen & Heath Spectrum. It's not brilliant but it's got loads of channels, MIDI muting and it does the job. It's a little bit noisy and is also prone to exacerbate any earthing problems. I haven't got any earth problems at the moment, but when I get a new piece of gear it's a bit of a tricky period. I iron out noise through trial and error, really. I found that I couldn't have both earths out or in on the two [Akai] S1000s — one of them had to be earthed and the other unearthed.

VOX BOX

One of the outstanding features of Ola's sound is the lead vocals and the rich layering of the backing vocals. Once again Ola is himself responsible, demonstrating the tonal versatility of his voice and the ingenuity of his recording techniques.

"My lead vocal is recorded straight to tape using the Beyer MC740. I route the signal through the TLA valve EQ as the mic preamp, adding compression at 2:1 with my Drawmer gate. I'm really partial to heavily stacked backing vocals, especially on the *acapella* tracks. I get the dense sound by tracking each harmony three to five times on my Tascam multitrack, using the pitch variation knob to add a bit more harmonic interest. Sometimes I'll add more harmonies by sub-mixing the first 15 vocal tracks and sampling them off to a stereo pair, freeing up the tape so I can track up the remaining harmonies. Finally, I mix all the tracks to a stereo pair, sample them off and pass them through a pitch-shifter set to detune between +2 and -2 cents at the mixdown stage."

SOME EQS ARE MORE EQUAL THAN OTHERS

"The TL Audio EQ is terrific. I'm into EQ in a big way; I like the flexibility that it offers. This one goes across the entire mix, along with the compressor. But I also use it to doctor specific sounds, not in a correctional way, but creatively. I hardly ever touch the desk's EQ. When I'm working on a tune I'll use its EQ almost as a sketch-pad EQ. So, for instance, when I'm working and find a kick I like but it hasn't got enough of what I want, I'll get an approximation using the desk's EQ, and doctor it later with the TLA parametrics when it comes to committing it to tape.

Good EQ is certainly a staple on the signal-processing side of recording; it's up there with a good compressor in importance. This stuff is getting cheaper as well. I got my TL Audio EQ for £500 and I know it's dropped in price since then [*you should be able to pick one up for around £350 — Ed*]. I only found out about the quality differences between EQs in the last couple of years. I used to have some cheap parametrics, but the difference between good EQ and crap EQ is phenomenal, and good parametric EQ is truly a creative tool, while bad EQ is a liability."

Above: (top-bottom): Yamaha SPX900, two Alesis Quadraverbs, Lexicon PCM70, and Digitech Studio 400 effects, Oberheim Matrix 1000 synth, Roland MKS70 and MKS20 synth modules, Akai S1000PB and S1000 samplers, and Roland JV1080 synth.

Above: Ola's beloved Waldorf Pulse monosynth and TL Audio parametric EQ.

The same principle seems to apply to the two [Alesis] Quadraverbs. It's an on-going battle.

"Of my processors, my pride and joy is the Audio and Design compressor which I picked up fairly cheaply from Tony Larking Audio. I was going to splash out on a valve compressor but didn't have the money, and an engineer friend suggested that I should take a look at this. Everyone who has come here to work has fallen in love with it.

"The Tascam 16-track reel-to-reel I can heartily recommend, especially now that I've seen quite a few of these in classified ad pages. They're going for about £1500. They really do the job, especially for someone such as myself who really likes to stack vocals. Even if I went for the hard disk recording option I'd do it in addition to what I've already got. I like the look of the Akai DR8 or DR16."

RUGGED EDGE

Someone who's made such a success of his musical life so far might be expected to have some useful advice for other fellow musicians. Any parting words for those who want to strike out on their own?

"Musicians can get too dependent; it's like they need a manager to wipe their nose. I find that in any given situation, if I hang around too long without

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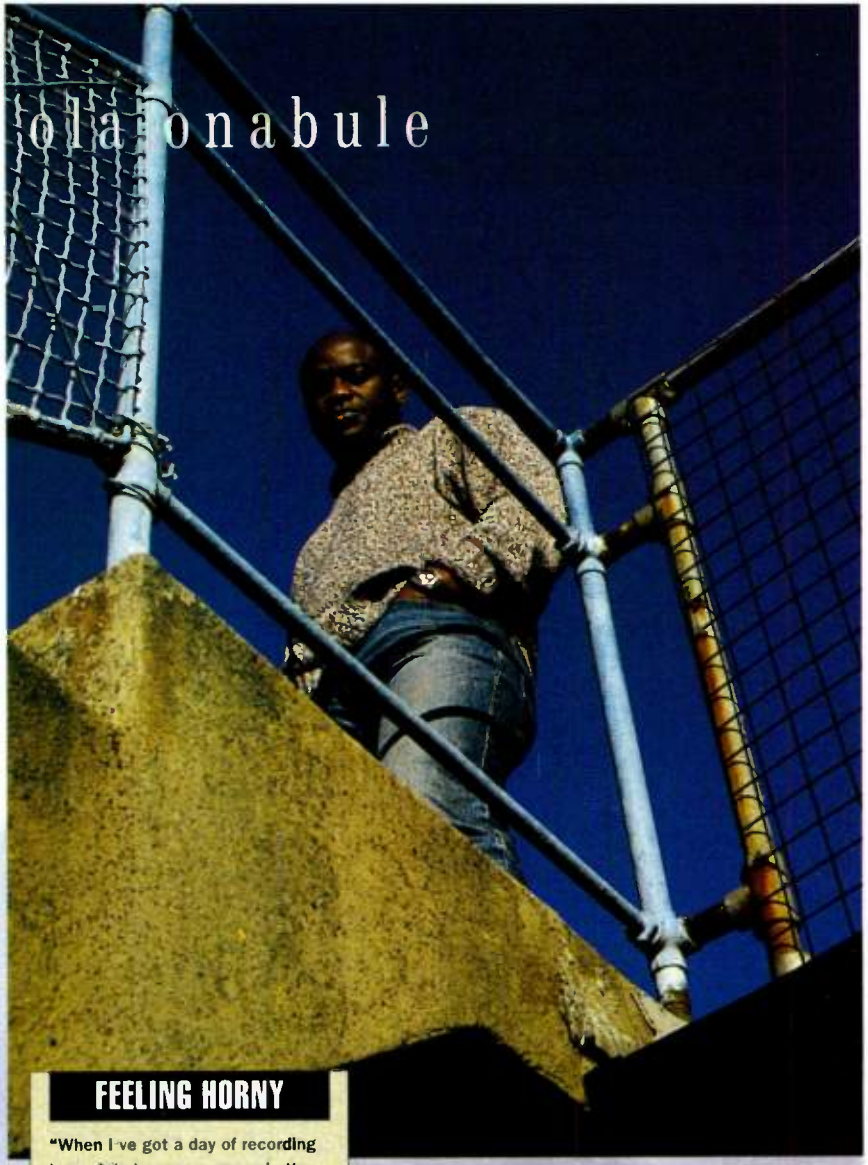

FEELING HORNY

"When I've got a day of recording horns I'll clear more space in the studio. I'll have trumpet, trombone, alto and tenor sax in for the session and have two mics between them. I've got an AKG C3000 and a Beyer MC740. The Beyer's top end is brighter than the AKG, while the AKG's mid is more pronounced, so I'll tend to use the AKG on the trombone and tenor, leaving the Beyer for the trumpet and alto sax. It's not the best sound in the world in here, but it's not too bad either. I listen a lot to my Earth, Wind & Fire recordings and the brass section on those, and I still haven't quite got the sort of sound they have. I don't know what it would take, I've been told it's down to the size of room. Size *does* matter apparently".

▶ anything happening I'll do it myself. If I had a song that needed a brass band recorded, I wouldn't worry about whether or not I could record a brass band in this room or not. I think I'm more likely to just book them and find ways around it. Financially, our Rugged Ram label breaks even and makes enough profit to keep our interest, but ultimately it's about not hanging around waiting to get signed, or about being signed and making some very heavy compromises. Getting the music done now with more or less no artistic compromises is very satisfying, and I've got the technology to thank for that. It would be fantastic to be given a blank cheque, but in the absence of that cheque what I'm doing now is very satisfying.

"I'd say that even if you are going to get a major-label deal, the first thing to do on your way to world domination is to set yourself up in a studio with the intention of releasing stuff yourself. What you'll learn will be invaluable: how to work the equipment, how to arrange your songs, things like that. As a result of my work here in my studio I've gone on to write music for film, do jingles, produce other singers — all because I do a lot of work myself. Also, when you release records yourself you find out about distribution companies, manufacturing, and how much it all costs. I think the world is becoming a 'get on and do it yourself world', and as far as I'm concerned, having your own studio is the first step."

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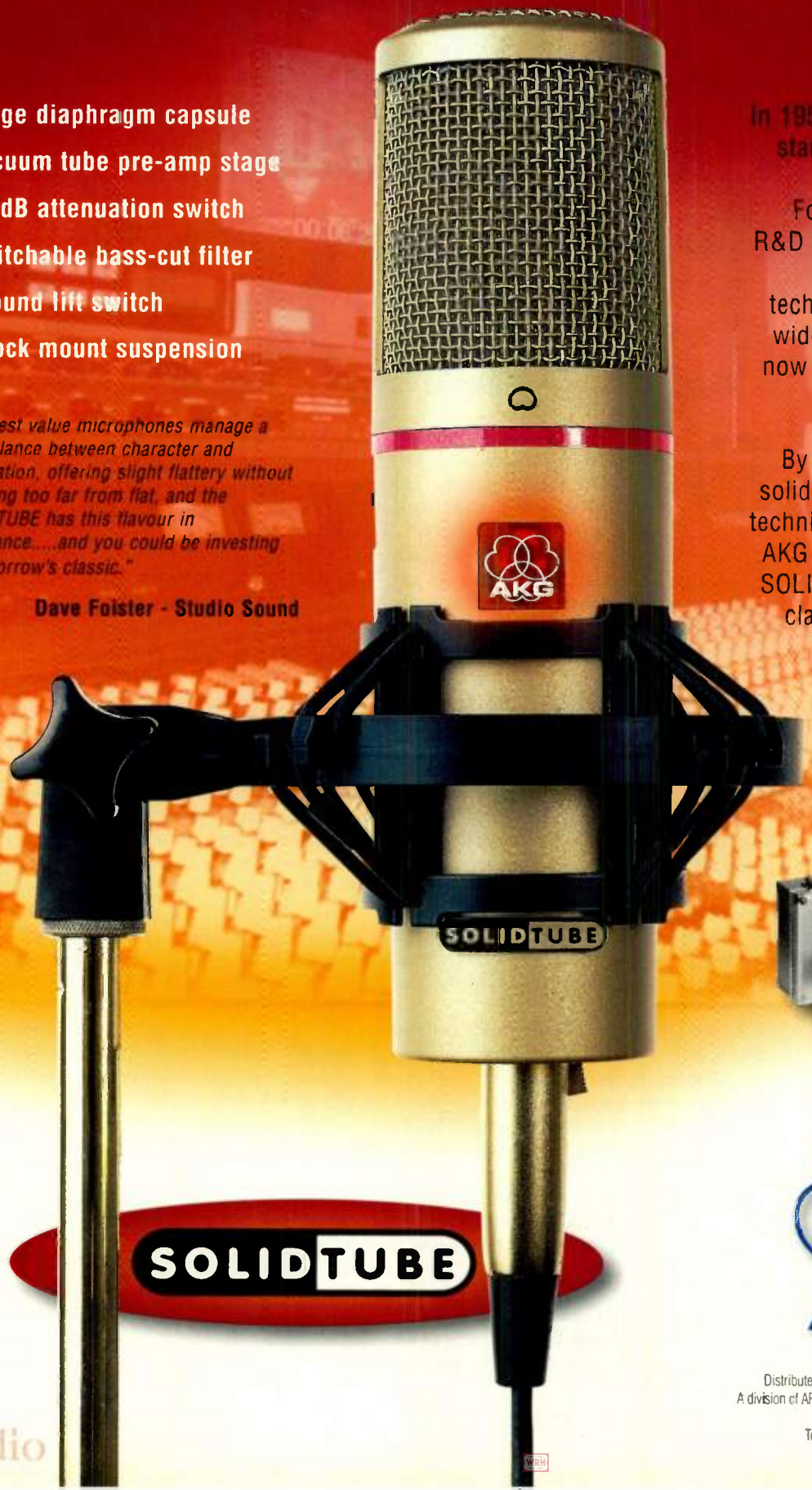
Dave Foister - Studio Sound



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better by tube?

DEMETER HM1 TUBE MIC PREAMP

Can an expensive valve microphone preamp like this one really make that much difference to the quality of your recordings? DAVID MELLOR finds out.

Demeter, as you all know, is the ancient Greek goddess of valve amplification, and as such it is her responsibility to bring warmth and life to recordings that would otherwise be made with transistors, ICs and especially anything cursed with a cold digital soul. Personally, I'm not a believer. I think you can make great recordings with any equipment that has a good enough frequency response, low enough noise, and is otherwise working properly. Music is in the artistry, not the equipment. (Am I giving the game away?) But I'm happy to keep an open mind, and if I find valve (or tube, as they say in the USA) recording equipment that really is better, then I'll use it alongside all my cooler-running gear — if I can afford it!

Demeter the company have a long history in valve equipment, since 1980 apparently, when many people believed that valves had become extinct at around the same time as the dinosaurs. But the company persisted and, thanks to Demeter in some part, the valve is now seen by designers as another eminently usable option in the choice of active circuit devices. Valves are no longer old-fashioned — they just have a long history behind them.

As well as the HM1 reviewed here, Demeter make the EQ1 2-channel parametric equaliser and the HC1 mono optical compressor in the same range. Another range of Demeter products includes the VTMP2b mic preamp, VTCL2a compressor/limiter, VTBP201 bass preamp (sounds interesting), VT275 tube DI box, and even the VT275HF valve power amplifier. I think you can see that Demeter are certainly no me-too first timers — these people are serious about their valves!

DESIGN

The HM1 is a straightforward 2-channel mic preamp with no frills such as compression or EQ. Every mixing console has mic preamps built in, so there has to be a good reason for spending money on something very similar to what you already own — and you probably already have many more than you need. Either the HM1 should sound better than your console's mic amps, or it should sound different in an interesting way. (The only other main reason for owning a separate mic preamp would be that you move from studio to studio and having your own preamp gives you the confidence of consistency.) Before I give my opinion on whether it is indeed better or different, let's take a look at what it does.

Both channels of the HM1 are identical and have both mic and line inputs. The mic inputs are on the back panel, on normal 3-pin XLRs and on balanced tip-ring-sleeve jacks. On the front there's an unbalanced line input. Outputs are on balanced XLRs, and jacks too. The input impedance of the line input is a desirable 1MΩ, which means that it is such a trivial load that even an electric guitar retains the brightness that is lost when a lower impedance is used. The mic input has switchable +48V phantom power (which isn't applied to the line input, so don't worry about your pickups smoking). The other switches are for phase, -20dB pad and low-frequency cut — all perfectly normal, and standard provision.

Gain is calibrated from 30dB to 60dB, meaning that the lowest gain setting, with the pad taken into account, is 10dB. A volume control sets the output level, which can be as high as a specified +28dB into 600Ω (I presume they mean dBu), high enough for any purpose I can imagine. Not all mic preamps have sufficient output to drive pro equipment properly, so this is a point worth checking. An LED bargraph which describes itself as a VU meter shows the output level in 10 stages,

pros & cons

DEMETER HM1 £1169

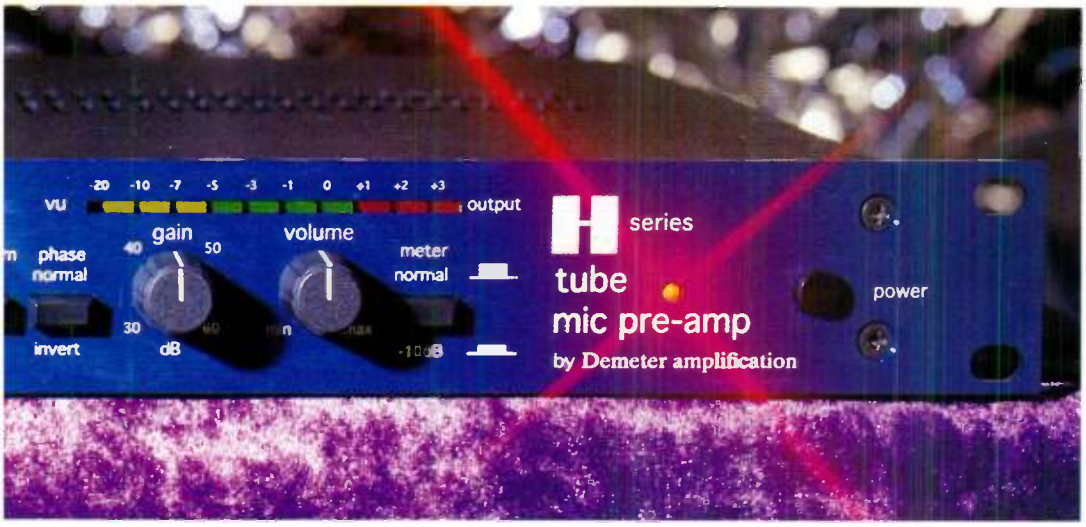
pros
- Makes your mics sound more expensive.
- Transformer-balanced inputs.
- High maximum output level.

cons
- Expensive (like most similar units).
- Internal build quality is good, but should be outstanding at the price.
- Fuse holder likely to be damaged.

summary

Definitely good, definitely different (to a transistor preamp) and definitely worth having — if you can afford it.

SOUND ON SOUND



from -20dB to +3dB, with a switchable extra 10dB of sensitivity if necessary. Subjectively, the ballistics seem faster than a mechanical VU meter, but it does, according to my tests, take a full 250ms to come within 1dB of full level. Fast ballistics are great for checking peaks, but some engineers prefer meters which show the effective loudness of the signal, as a traditional VU meter does quite well. In addition to the meter there is a overload LED which indicates when the gain control is set too high for the level of the input signal — that is to say, when you're risking clipping. This does, of course, register even very short peaks.

BUILD

That's it for the controls. Now let's open it up and see what the build quality is like. Bearing in mind that the valves run on 200V supplies, I'll make doubly sure to isolate it from the mains first! (Don't forget that this is something that will eventually have to be done to replace the valves.) The casing has a reasonably solid feel and opens up easily. Inside, the build quality is good rather than exemplary. The heat-shrunk shroud around the mains switch terminals seemed a little unprofessional to me, and I noticed in comparison ▶

"Having pronounced myself a non-believer at the beginning of the review, have I been converted? Yes, I like it."

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> "Valves are no longer old-fashioned — they just have a long history behind them."

that the mains inlet, voltage selector and fuse holder have their terminals exposed, as do the valve base terminals. To remove the valves (specially selected 12AX7As) involves placing some stress on the solder joints of the daughterboards upon which they are mounted. In the review model, one of the pins of one valve base was touching a capacitor, when there is ample room on the board for such overcrowding to be unnecessary. Overall, although the HM1 bears a CE seal of approval sticker I'm only satisfied with the build quality when, considering the price, I had expected to be amazed.

One further point to consider is that, unless this unit is permanently bolted into a rack, sooner or later the protruding plastic fuse holder is going to take a knock and be damaged. Demeter should use a recessed fuse holder, for which there is ample room. By the way, full marks for transformer-balanced inputs. Transformers are bulky, heavy and expensive, which is why we don't see them so often these days, but transformer-balanced equipment is not nearly so prone to hum and to do strange things as the cheaper electronically balanced alternative. Since there is room, maybe Demeter could offer transformer-balanced outputs as an option?

When mounting the HM1 it would be advisable to leave 1U of rack space above the unit. Valves obviously generate a fair amount of heat, and in this case they radiate through slots in the top panel. Leaving space above the HM1 is for the protection of any other equipment mounted higher in the rack, as well as for the HM1 itself. The cool-running valve has not yet been invented.

SOUND

And now the real meat and potatoes. What does the HM1 sound like? Does it blow away every transistor mic preamp you have ever heard? Starting with the line inputs (a nice little extra on a unit that is advertised as a mic preamp) you may be inclined to connect your keyboards, sampler or electric guitar to obtain a little valve warmth that would otherwise be lacking, but don't think that this is any kind of overdrive or distortion box. When the overload LED comes on, it really is telling you it's time to back off the gain. Up to that point, however, it's very easy to be convinced that the sound is just a little bit better in an undefinable way, and driving the unit close to the edge can enhance the flavour. Actually this would be a very good preamp for a Fender Rhodes electric piano, since a Rhodes really does need a high-impedance input if the sound is not to be made rather dull and unexciting (which is the way you normally hear it!). The HM1 doesn't suit an electric guitar at all, since you need the distortion and hiss of a real guitar amp (some cabinet rattles and an authentic tear in the speaker cone too) to feel you're getting the real thing. An electro-acoustic guitar with a built-in preamp is a different matter. My Martin guitar, which has an internal Martin preamp, sounded fine.

And what about the mic inputs? For over £500 apiece, they had better be good. Let me put it this way: when you record vocals straight into the desk with a good large-diaphragm mic they sound pretty much the same as they do with a basic cooking-quality capacitor mic — until you mix, that is. Suddenly, the large-diaphragm mic is clearer, fuller, and the sound is incredibly more responsive to compression and EQ. That's the difference I found with the HM1. It turned a standard AKG C451/CK22 (which I wouldn't normally recommend for vocals, but it suits my own particular brand of mournful wailing) into more than a match for a mic costing three or four times as much. To see whether I could take this any further, I tried a classic Neumann U87 through the HM1. Of course, much depends on the vocalist, since you can easily come across a really great singer whose voice, for reasons that are difficult to define, just doesn't suit your favourite mic/preamp combination at all, but it seemed to me that the U87 had been taken backwards through a timewarp and had acquired something of the nature of a valve U67 or even a '47. I'm not going to promise that you will hear all of this, since it is subjective and subtle, but you wouldn't buy a unit costing over £1000 without testing it very carefully, so you will indeed be able to judge for yourself. Technically, the distortion is low (I measured it myself at less than 0.03%), which shows that valves and distortion do not necessarily go hand in hand. The noise is certainly higher than can be achieved with transistors at -95dB EIN (Equivalent Input Noise). A transistor preamp can achieve something like -127dB at its optimum gain setting.

But you don't buy a valve preamp and complain about the technical specs. If warmth could be rated objectively, the Demeter HM1 would be up with the front-runners. If you want a mic preamp with character, in the same league as the top transistor models but with a slightly different sound, the Demeter HM1 is definitely a contender.

CONCLUSION

Having pronounced myself a non-believer at the beginning of the review, have I been converted? Yes, I like it. The HM1 is good and it's different, so it would justify a space in my rack. In terms of value it compares with other top mic preamps, which in my opinion are all over-priced, but if you have a spare thou or so, it's well worth a listen. You may be converted too. SOS

info

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In addition KORG are the proud manufacturers of the renowned Z1, a "next generation" DSP synthesizer, with advanced synthesis techniques that provide realism, limitless creativity and expressiveness at an unsurpasssed level.
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- An optional ADAT optical digital interface for single cable integration into digital recording systems.

NEW TR-RACK

And the latest addition to KORG's range is the TR-RACK, pictured below this rack has all the features of the famous Trinity, but in rack format. This rack is sure to be a hit with those of you who want powerful synthesizer effects but don't have the room for the full keyboard. Try it today.

ENSONIQ

MR RACK £789

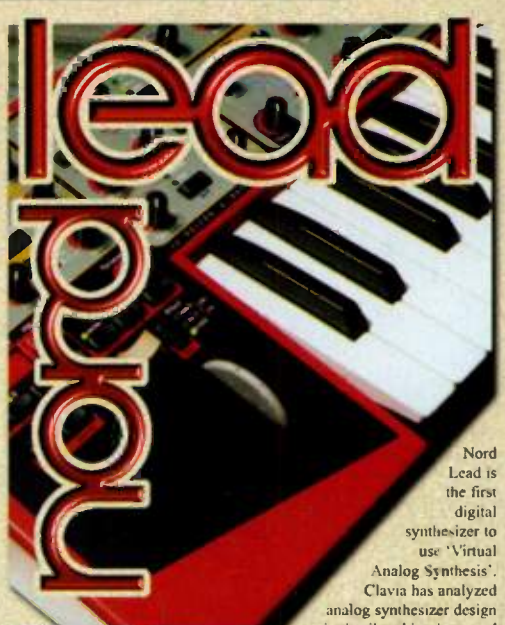
Want to sound different? These days very few synths can make you sound unique. However one manufacturer namely Ensoniq can. At Music Connections we realise that Ensoniq is a wonderful niche synthesizer manufacturer. Very few synthesizers sound as distinctive as an Ensoniq. That's why many top artists around the world don't want you to use Ensoniq. Otherwise they won't sound as unique anymore. If you haven't tried one of Ensoniq's new synths or their stunning new groove machine the ASR-X, you really don't what yuor missing.

MR-61 £1399
MR-76 £1595

E-MU

As probably the country's largest offering in our stores first. We believe EMU equipment to be second to none and we are proud to have their equipment on show & on demo in our stores. Great deals available on all EMU equipment. if you would like an example just check out the great offer on Darwin on our hard Disk Recording page. And try out the superb Carnaval, Planet Phatt and Orbit V2.

nordlead



Nord Lead is the first digital synthesizer to use 'Virtual Analog Synthesis'. Clavia has analyzed analog synthesizer design in detail and implemented the research in a digital model. Nord Lead employs mathematical simulations of the electronic signal generated by analog oscillators, instead of using waveform tables. This makes it possible for example, to sweep the pitch smoothly over a very wide range and allow for true pulse width modulation.

NORD 2	CLASSIC
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novation

Super BassStation
An exciting evolutionary development of the BassStation rack, the new Super BassStation adds a plethora of must-have features: a sub oscillator white noise, ring modulation, LFO2, independent external MIDI sync of both LFO's, arpeggiator, analogue chorus and distortion effects and stereo outputs with assignable autopanning. The MIDI to cv gate converter can now be run on a seperate channel, and can even derive an analog trigger output from MIDI clock. Phew!
This unit can now be seen as a serious tool for the serious synthesist.

NOVATION £CALL

Spectral Audio's Syntrack is an amazing analogue/digital hybrid synth rack. Audio is generated from a wave table oscillator before passing through a -24dB/oct analog MOOG filter and an analog VCA with distortion control. An external audio input allows anything to be passed through the filter and distortion sections. All parameters are controllable in real time over MIDI.
It sounds absolutely unique. Amazing DX-like basses, jungle dope-basses, squeaking leads, and all manner of bleeps and thwaps can effortlessly be wa[illegible] thi[illegible] little baby. It really hits the sweet spot!

SYNTRACK £299

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TANNOY

We are still finding Tannoy's 600 series monitors to be one of the most popular selling pairs on the market and it's not surprising when you hear the sound quality they produce. Test them for yourselves at all of our stores and we'll give you an unbelievable price!

Event speakers have built themselves an image to be proud of and considering how young this company is they must be something special for people to take these in preference to a known brand name. And with the new low price you must check these and Events other products out for youself, you won't be disappointed! Check out the new amazing EVENT cards on page 8 of this advert.

20/20: £349
20/20bas: £749

YAMAHA

Has this company woken up from a deep sleep or what. I mean, this is the company that bought us DX synths, TX Synths and VL synthesis. And now this little wonder called the AN1X. This synth really must be heard. No advert can ever convey just how good this little gem really is. Don't forget there's still the CS1X & VL70 as well. Also hot on the heels of the AN1X is Yamaha's A3000, this sampler is so packed full of features, that it has most of the established sampler manufacturers hurriedly rushing back to the drawing board. Once again you must come in and sample the delights of this unit for yourselves (no pun intended) The A3000 Sampler features on page 5 of this advert.

As manufacturers of some of the finest Hi-tech music equipment ever made, it is only fitting that a company , of the calibre of Music Connections holds a very comprehensive range of their equipment in stock, for you to try & purchase.
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ENSONIQ

ASR-X TURBO

Ensoniq's ASR-X is a hybrid machine dedicated to making it easy to sample, resample and loop. In addition it holds a built-in synth, incredible effects, resonant filters and an easy to use sequencer. The best parts have been taken from Ensoniq's famous ASR-10, MR family and all their other ideas they have never had the chance to include. The ASR-X TURBO is expandable to 26Mb ROM and 34Mb RAM not forgeting the Expansion boards and 10 output expansion options. And now your luck is really in because we are now including SCSI as standard at £1199. However, as an even bigger bonus we are now including the Dance Board & SCSI in a model called the ASR-X TURBO at just £1495.

Just come in and try this awesome groove machine for yourself, we can't begin to describe the power of this machine in words, hear what you've never heard before!

E-MU

Just arrived from EMU, the stunning new E-SYNTH. Just study the specification below to realise what this new combination can do for you.
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ESI-4000

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Easy to use - the ESI-4000 provides you with an intuitive user interface that is easy to learn and a pleasure to use-you'll spend more time making music less time readin manuals.
Powerful DSP and sample editing - The ESI-4000 gives you incredibly powerful digit signal processing that lets you massage and manipulate samples to create your ow unique sounds. Built-in sample editing tools such as automatic truncation, normalizatio and cross-fade looping allow you to edit samples quickly and easily.
Unmatched filter technology - the ESI-4000 has 64 digital 6-pole filters with 19 differe types available that make your sounds come alive as never before.
Highly expandable - Your ESI-4000 can hold up to 128Mb of RAM using 72-pin SIMM and you can easily upgrade the number of outputs, add dual 24-bit effects and digital I/ with the ESI turbo kit.
Unbeatable value - the ESI-4000 starts at only £1199 with 4Mb RAM, making it the bi value sampler in it's class. Shift dimensions and see the ESI-4000 at Music Connection

E-SYNTH

E6400

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AKAI

The new AKAI samplers have all the capabilities that made the S3000 series the world standard for professional sampling, the new range add features like a powerful multi-mode for ease of layering and multitimbral sequencing, multi-effects card that provides four independent channels of effects, RAM expansion with readily available SIMM memory. flash RAM, MESA graphical Macintosh based front-end etc...

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MPC2000

CD3000XL

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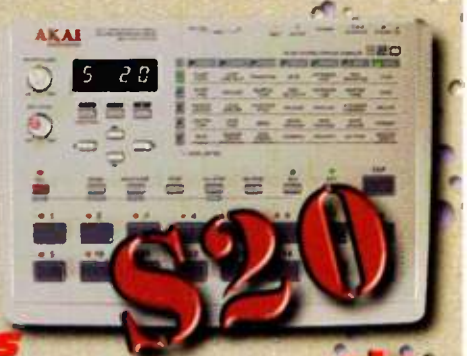

S20

A3000

The A3000 is an affordably priced 64-poly, 128 MB professional sampler that's as accessible to techno/hip-hop/dance DJ's and seasoned electronic musicians as it is to those in the market for their first sampling unit. With it's unique control knobs and easy to edit sound architecture, the A3000 takes the mystery and frustration out of the sampling process, while providing a powerful performance and composing tool ideal for stage and studio alike. Memory can be expanded to a maximum of 128MB via four 72-pin SIMM sockets. The internal DSP provides three effect blocks including high quality effects plus special types (for phrases and loops) such as real-time stretch (beat change), Lo-Fi effects, and others which can be configured specifically for each program.

All of these are available for analog input audio recording and external audio mixing. Dynamic filters (Lo Pass, Hi Pass, Band Pass, Band Eliminate) and parametric EQ can be applied to each sample, which can be freely mapped to key and velocity ranges with layers and/or splits.

Other features include a 4-band total EQ, an easy MIDI record/playback function for making quick song sketches, plus sound file compatibility across multiple platforms (including WAV, AIFF). All this, and more, make the A3000 the one sampler that professional musicians everywhere will want to take a serious look at.

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then you're ready for the 03D Digital Mixing Console. Nestled between the popular ProMix 01 - famed for bringing affordable digital mixing to the masses - and the award winning, industry standard 02R Digital Recording Console.

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KORG

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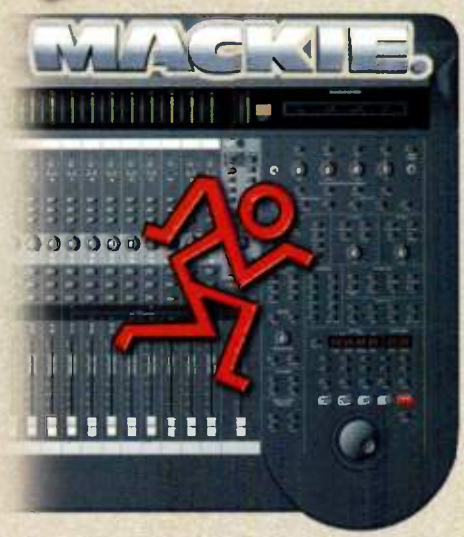

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DCP-8 Now £599

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SX-700 £CALL

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GREEN £CALL

TLA £CALL

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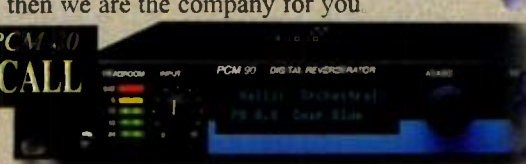
PCM 80 £CALL



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E-300 £699

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New CAD Valve Mic £1495

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DARWIN Exclusive

E-MU

Introducing the DARWIN 8- Track Digital Hard Disk Recorder from Emu Systems. DARWIN is a stand-alone random access recorder that features screen-based digital audio workstation (DAW) style recording editing capabilities, tape based system ease-of-use, and a price point competitive with ADAT and DA-88 modular multitrack digital recorders. What does that mean to you? Plenty. DARWIN is much more than a simple recording device. DARWIN is a creativity tool unto itself which will stimulate your imagination and allow your recordings to evolve as quickly as your ideas. Forget the limitations of traditional tape-based recording. DARWIN delivers the mindbending power of non destructive random access and recording editing. Consider being able to cut and paste that riff you could only get right once, over and over throughout a song, seamlessly and effortlessly. Or, completely change the structure of a song - dozens of different ways with just a few keystrokes - without affecting your first take. Or, instantly resurrect that once-in-a-lifetime vocal track you accidently punched-in on and wiped out. DARWIN will do it all.

Advanced DAW features?
Absolutely. Try on DARWIN's high resolution graphic display, or nondestructive playlist-style editing, or multiple levels of undo. And those are just the tip of the iceberg.
Want more than 8 tracks?
No problem. Up to four DARWIN units can be slaved together for 32 instantly accessible tracks. Of course DARWIN can also be used as an expander to a tape-based multitrack. But most amazing of all is the unlimited track capability of a single DARWIN through it's Virtual Slave Reel (VSR) feature. Using VSR, you can instantly create new versions of a project that can then be used for recording additional tracks. The number of additional tracks that can be created with VSR is limited only by your available disk space.
In addition to the already proven expansion cards including ADAT sync Option card, ADAT Digital I/O card and 4 input expander card EMU are dedicated to improving an already outstanding machine. Recently released is the new DSP card with a 32-bit floating processor for timestretch, pitchshift, gain and compression and soon to be released is the SMPTE time code card allowing 16 Darwins to be linked together and features the best interaction with ADAT seen to date.

Just when you thought you had made up your mind on what hard disk recording package to buy, EMU arrive to spoil your plans. Do you remember the **DARWIN???** this wonderful piece of equipment developed by EMU but unaffordable by you. Well EMU thank god have had a change of heart. Exclusive to Music Connections we bring you that exact piece of equipment for the amazing sum of **£1495** Inc vat.
Yes that's right just **£1495**. Now when we heard this news we had to stop and think? Is there anything that's comparable at anywhere near the price to this amazing piece of equipment. To tell you the truth, we don't think so. And could this now, really be the end of tape based recorders as we know them?
This machine is so capable that it is impossible to tell you everything about it in an advert, and really you should see it in the flesh to see just what amazing value this represents. So if you were thinking of a tape based machine, maybe you should think again. Give us a call, come and try it, or forever stay in the dark ages. This offer is limited to first come, first served.

ENSONIQ PARIS™

20-bit Multitrack Recording system

PARIS is the most advanced digital audio recording system ever developed. PARIS seamlessly intergrates digital audio recording, object-orientated editing, digital mixing with automation, real-time effects processing and MIDI sequencing into an intuitive and flexible environment. PARIS grows to meet your needs with a dedicated control surface and a family of expandable input/output modules. Powered by ENSONIQ DSP technology on a cross platform PCI card, PARIS delivers a total audio recording solution at a revolutionary price.

ENSONIQ

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digidesign

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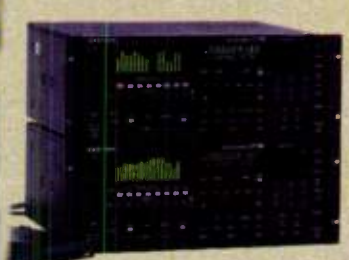

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ACP-22
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Slave to the Rhythm

DIGIDESIGN UNIVERSAL SLAVE DRIVER DIGITAL SYNCHRONISER

Digital devices need synchronisation just as much as analogue ones, and this new offering from Digidesign aims to be a one-box solution for most audio and visual sync requirements. MIKE COLLINS says it's about time...

All digital audio systems, whether workstations like Digidesign's Pro Tools, mixers like the Yamaha 02R, or outboard like the Lexicon PCM90, have internal quartz crystal oscillators which control the speed of the digital audio playback or recording — just as the motors in analogue tape machines control the speed of the tapes. If you want to link two or more analogue tape machines together and have them play back or record in sync with each other, you need a machine synchroniser which will control the speeds of the motors on the analogue machines to keep them in step. The machine synchroniser typically reads SMPTE timecode and 'tach' pulses coming from each machine, compares these with the synchroniser's internal clock or with an external clock feeding the synchroniser, and speeds up or slows down the motors of the analogue machines accordingly. SMPTE timecode is also used to provide location information, so that locate points can be entered into the synchroniser and the machines will wind forward or backwards to the correct points. Some of you may have come across 48-track recording systems in professional studios, where two 24-track tape machines are linked and controlled in this way, while others may be more familiar with linking a Sony U-Matic VCR with a Fostex B16 multitrack tape recorder to put music to picture.

What you may not have fully realised is that when you connect digital audio systems together, their clocks need to be synchronised too — even if they are mixers or other outboard devices. Digital audio signals are similar in some respects to video signals, in that they carry sync information within the signal. So, whether you connect your digital devices using S/PDIF, AES/EBU or ADAT optical connectors, sync information will be available which the receiving device can 'lock' to. Most professional digital devices will also have a separate sync connection, which would be a so-called 'wordclock' signal via BNC connectors for most equipment, a Digidesign 'Super Clock' (wordclock x 256) in the case of Digidesign equipment, or possibly an AES/EBU sync signal via XLR. Another option is to use a video sync signal via BNC connectors and lock each device's internal clock to a video sync pulse, or 'house sync' signal. This video sync signal is often called a video 'black burst' signal, as it carries no picture information and would appear black if you tried to view it on screen. By analogy, the AES/EBU sync signal, which carries no audible information, is sometimes referred to as a digital 'black' signal.

There are various ways in which you can hook up all your digital devices, and which one you choose depends on the task at hand. If you want to achieve the highest quality at all times, combined with the greatest flexibility, ideally you need to use the most accurate house sync generator you can afford, as your ultimate timing 'master', and feed all your other devices from this. The other devices are said to be 'slaves' to the timing master, and synchronisation is achieved by adjusting the speed of the slave clocks — that is, the playback sample rates of the slave devices — to match that of the master clock. Varying the speed of the clock varies the playback sample rate and causes the pitch of the audio to go up and down — and if you varispeed the master clock, the slaves will all follow.

A NEW MASTER

Previously, Digidesign sold two different sync boxes: the SMPTE Slave Driver and the Video Slave Driver. The SMPTE Slave Driver would lock Pro Tools positionally to external LTC (Longitudinal Time Code) and resolve the digital audio timing to ▶

Digidesign Universal Slave Driver

pros & cons

DIGIDESIGN UNIVERSAL SLAVE DRIVER £1785

pros

- Features a varispeed control for digital audio systems.
- Auto-switches between LTC and VITC.
- Works with Pilot Tone and Bi-phase/Tach.

cons

- Although a PC Serial port is provided, no PC software is available to control the USD as yet.
- No ADAT or Tascam sync connections are provided.

summary

The USD is a well-designed synchroniser for Pro Tools/AudioVision, which will also work with various other digital systems. It is aimed especially at users working to picture, whether film or video. Music project studios will need additional synchronisers for ADAT and Tascam recorders, and a high-quality video house sync or AES/EBU clock generator is also recommended.

SOUND ON SOUND

a clock reference derived from the incoming LTC, so the Digidesign audio system would know where it should be and how long each frame should last. The Video Slave Driver would lock Pro Tools' digital audio timing clock to an external video or black burst signal, so Pro Tools would run at the same speed as a VCR or other devices resolving to this same master clock source. The Universal Slave Driver integrates the functions of both these units and adds many other functions, such as the ability to read and write VITC (Vertical Interval Time Code) and to 'burn' SMPTE into a window within a video signal.

The USD has its own internal clock so that you can operate it in stand-alone mode, using its internal clock as the master for all the devices in your system, and it can produce most of the sync signals you're likely to need in a digital audio project studio. It can generate LTC, VITC and MIDI Time Code, Word Clock, Digidesign Super Clock, and AES/EBU 'Null Clock'. It also has six General Purpose Interface (GPI) outputs and four GPI inputs. GPI is often featured on radio broadcast equipment for powering studio record lights or controlling audio cart machines. GPI features have been announced for future versions of the Pro Tools software — so Digidesign are clearly aiming their products at radio studios and for other broadcast work.

CONTROL ZONE

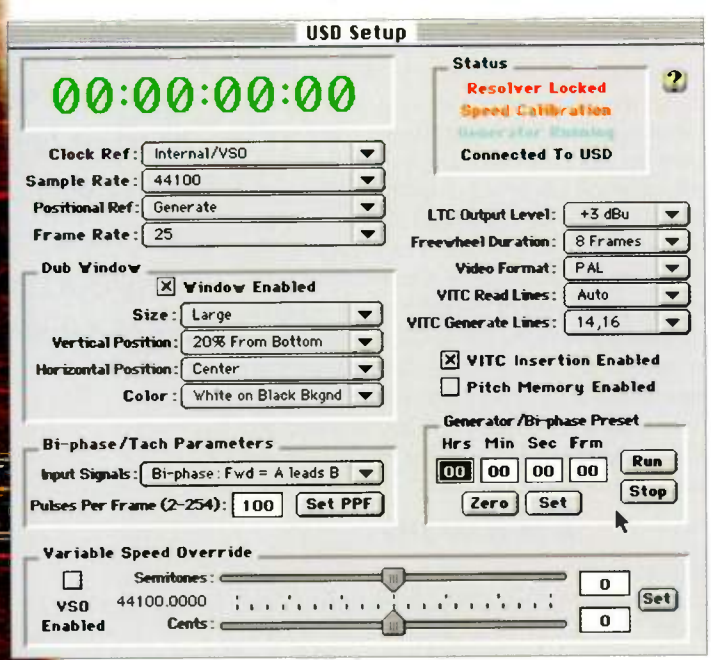
The USD's front panel features one button to switch between the clock reference sources (video sync, wordclock or whatever) and another to let you select the positional reference (internally generated timecode or externally-generated LTC, VITC or Bi-phase). A third button lets you set the frame rate, with six choices available (30, 30 drop-frame, 29.97, 29.97 drop-frame, 25 and 24 frames per second). In the centre of the front panel there's an LED display which normally shows timecode, with four associated buttons to let you program the various functions from the front panel, in which case the timecode display shows the parameters being adjusted. You can choose between 44.1 and 48kHz sample rates, and both pull-up and pull-down rates are supported.

A better way to control the unit is using the supplied *USD Setup* software for the Macintosh. In this case you can disable or 'lock' the front-panel controls on the USD if you wish, which can be useful if you want to prevent anyone from altering the controls by accident. Using the Variable Speed Override (VSO) feature, you can vary the speed of the USD's internal clock, and consequently the pitch of Pro Tools and any other device receiving its clock reference from the USD. You raise or lower the pitch of your audio material using two faders (one each for semitones and cents) provided in the software's Setup window, and these let you vary the sample rate between 35 and 50kHz (this gives you a range of approximately -4 to + 3 semitones at 44.1 kHz, for instance).

By the way, don't forget that if you're controlling the USD from a Mac using the *USD Setup* software, you're occupying one of the Mac's serial ports. The other port will almost certainly be connected to your MIDI interface — so where can you connect your Sony 9-pin machine control? This normally connects to a Mac serial port, but now you're using both. Fortunately, the USD can pass machine control and other RS422 serial information to and from the 9-pin sockets on the back of the USD. The USD does not offer any 9-pin control itself — the 9-pin sockets simply pass the information through the USD to and from the Mac's serial port, so to use 9-pin control you will need the optional Machine Control software for Pro Tools.

VIDEO & FILM FEATURES

If you're working to picture, you will normally want to sync both the USD and your VCR to a common video sync source. The USD has a video reference input to allow it to slave to house sync, and it even goes one better by providing a standard video input. This means that you can lock to the timing signals within a standard video signal coming from a VCR — which you can use if you don't have house sync, or if you need to synchronise Pro Tools to a consumer-grade VCR or to an inexpensive PC-based video editing system that does not have a video sync input. And the timecode features are particularly well-implemented. You can use both LTC and VITC, and there is an 'Auto-Switch' mode which lets you automatically switch between these depending on which is the better choice at the time. VITC can be read while the tape is crawling or paused, so you can Auto-spot regions in Pro Tools (which you cannot do using LTC, as the timecode disappears when the tape is paused). But VITC cannot be read at fast winding speeds,



The supplied USD setup software for the Macintosh.

inspired

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while LTC is OK with this, so Auto-Switch uses LTC when winding fast, and reads VITC when moving slowly. By the way, the USD's VITC features are far superior to those in the MOTU Digital Time Piece. For instance, you can specifically select which pair of lines in the incoming video signal to read, or you can use the 'Auto' setting, which will search for the valid line pair automatically. You can also select which pair of outgoing video lines you want to generate VITC onto.

The USD also has great features for people working in film. For instance, you can synchronise to Pilot Tone, which is used on location film shoots to provide sync between a film or video camera and a portable quarter-inch analogue tape machine such as a Nagra. Pilot Tone is derived by clock-referencing the camera to the local 50Hz or 60Hz AC line frequency and using this same frequency to clock-reference the tape machine, so that both the camera and the audio tape will run at the same speed. Pilot Tone is falling out of use because it contains no positional information, unlike LTC, which is far more popular today. Nevertheless, Pilot Tone is still used and it is good to see that Digidesign have provided for this.

Film soundtracks are frequently recorded and mixed using special magnetic film recorders, or edited using flatbed editing systems, which typically use Bi-phase or Tach pulses for synchronisation purposes. These timing pulses encode both speed and direction, though in slightly different ways. The Universal Slave Driver can 'count' both the speed and direction of a stream of these pulses, so it can use a bi-phase/tach source to deduce positional information from a starting 'address point'. Again, Digidesign are to be applauded for providing a sync solution for film sound.

SUMMARY

If you need a synchroniser for your Digidesign Pro Tools or Avid AudioVision system, and particularly if you are working to picture with video or film, or working in broadcast, this unit has the features you need. I was particularly impressed with the control provided for the VITC facilities, and this is the only unit I am aware of which provides a varispeed function for Pro Tools. It is not as versatile as the MOTU Digital Timepiece and it costs half as much again, so is it worth it? If you're working in film or broadcast, the answer is probably yes. If you work in music recording, however, the DTP is possibly a better choice. SOS

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THANKS FOR THE MEMORY...

There's a button on the front panel of the USD that fascinated me when I first saw it. It's marked Pitch Memory and comes in very handy if you are synchronising to audio coming from an analogue tape machine, using LTC (Longitudinal Time Code) as a clock and positional source, and the analogue machine is being varispeeded. The USD will vary the sample rate to match while it is receiving LTC, but what about when you want to stop the tape running and still hear your digital audio? Normally the pitch would go back to its normal 44.1 or 48kHz setting, so the pitch would change — frustratingly! But if Pitch Memory is enabled, you can take Pro Tools 'off-line' and still have your audio play back at the varispeeded pitch — what a neat feature!

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Definition

passive /ˈpæsiv/ adjective **1** submissive. **2** inert

active /æktiv/ adjective **1** given to action; working, effective. **2** practical; diligent.

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A WINTER'S TALE

RECORDING THE MUSIC FOR *FATHER CHRISTMAS AND THE MISSING REINDEER*

A job helping to provide the sounds and recording the music for an animated Christmas special had SOS contributor PAUL WARD hastily upgrading his studio and exploring the deepest recesses of his synth collection, in search of sleigh bells and singing reindeer patches...

When I was first approached to record the music for a forthcoming feature animation my immediate reaction was "Great! When do we start?". It's not every day you get the chance to record music that will be heard on prime-time Christmas Day television! And just how did I manage to get involved in such an exciting job? Well, it was all down to my brother-in-law, Richard Taylor Gmus PPRNCM (to give him his full professional title!). Richard is a highly talented, professional, classically trained musician and writer of such successful musicals as *Once Upon a War* and *Whistle Down the Wind*. With such a reputation, Richard (amongst others) had been approached by production company Cosgrove Hall [*you may know the company especially from such perennial animated favourites as Dangermouse — Production Ed*] to submit a piece of test music based on storyboard drawings of the opening title sequence for *Father Christmas and the Missing Reindeer*.

This animated feature is a roller-coaster ride of mystery, comedy, action and adventure as jolly Mr Claus (given a voice by David Jason) attempts to find his absentee antlered chums in time to meet his December deadline. I won't give away too much of the plot here, but Santa has all kinds of help, from robins, talking books, magic trumpets and a small boy called Simon — in fact, even the sleigh manages to help by... Well, I suppose that would be telling. Check the ITV listings at Christmas and see for yourself!

Richard's music won out over the other submissions and he was asked to go ahead with the project. Not having a studio of his own (the test submission had been done on his Korg O1W/FD, using the internal sequencer), it was only a small logical step to his decision to 'keep it in the family' and use my facilities. Since we had never worked together before — musically or otherwise — it was in many ways a leap of faith on Richard's part to ask me to get involved, but I can happily report that we're still talking!

My first task was to determine whether my studio was actually up to Richard's requirements. After a preliminary chat with him I began to hear the distant (750ms pre-delayed large hall reverb) alarm bells ringing. It was clear that a great deal of instrumentation was required for some of the more complex musical sections, which would undoubtedly leave my sound modules struggling for polyphony — particularly as most of my synths are analogue, and 'electronic' sounds would not be featuring heavily in the production.

Normally I'd get around polyphony problems by committing the most note-hungry parts to my analogue 8-track, but as soon as synchronisation to video was brought into the frame, it became clear that my usual working methods would not suffice. There was no way to synchronise video with the analogue 8-track (at least not without a great deal of hassle) and I was not at all convinced that working with a traditional linear recording system would be the best way to get the job done in any case — waiting for tape rewinds has never been one of my favourite occupations.

I began to look at various methods of increasing my studio's available polyphony, perhaps by buying/hiring extra sound modules, or by using my Akai S1100 to sample some of the more complex musical parts. Eventually I decided that, rather than potentially compromising the smooth running of the recording sessions by resorting to any Heath-Robinson tactics, I would be wisest to look at upgrading my system to do the job properly and make it better able to cope with similar projects (hopefully) in the future.

HARD TIMES

Hard disk recording appeared to offer a very efficient solution, but I didn't particularly want more boxes cluttering up my studio, and a hardware approach seemed quite inflexible. Since much of my usual material involves very little 'real' instrumentation, a dedicated hard-disk recorder would spend much of its time gathering dust. This

approach would also fail to address my need for more MIDI outputs to handle the growing number of multitimbral sound modules in my collection. After taking a look at my gallant little Atari STe and staring glumly at my overworked/underpowered 386 PC, I came to the conclusion that the time was right to make the move to a full-blown integrated MIDI and digital audio PC-based system. At least I would be utilising the same machine for word-processing, accounting, Internet access and all the other odds and sods that make a computer earn its keep. Playing the odd game of *Formula One Grand Prix* wouldn't go amiss either...

Before anyone starts writing to me and waxing lyrical about the delights of the Macintosh, let me state here and now that, although I did consider the possibility, the Mac was never an option I was very likely to take up. It was important to me that I was familiar with the new system in as little time as possible. I also have a great deal of time and money tied up in the PC, in terms of both software and experience. To begin the project by coming to terms with a new operating system was something I just could not justify. Most of my immediate colleagues and contacts are also PC users, giving me a ready supply of knowledge and support in an emergency — a Mac would have left me most conspicuously out on my own! A further problem is one of space. Given that I need to keep a PC around, a Mac would have to share studio space with it — and space in my studio is very much at a premium!

Carefully-calculated budget in hand, I approached several PC suppliers with a view to buying the best-specified machine I could afford. I was keen to get a machine which had at least a fighting chance of not becoming obsolete within two days of leaving of the shop. For this reason I thought it prudent to opt for an MMX processor — though it has subsequently been suggested that, for serious audio use, the software houses are highly unlikely to make use of the MMX's extra instruction capabilities, although the slight improvement due to caching differences is probably worth the minimal extra cost.

MAKING THE CHOICES

After what seemed an eternity of comparing prices and specifications I opted for a Silica Shop Hurricane P200MMX. This machine appeared to exhibit all of the current improvements, including 512K pipeline cache and even a 16x speed CD-ROM drive. I first upgraded the memory to 48Mb so that the PC would be better able to cope with the stresses of hard disk recording and running multiple applications. Steinberg's *Cubase*, my sequencer of choice, was duly ordered, installed and checked out with the existing soundcard to ensure that everything was working as it should. I would really have liked to try the new *VST* version, but I discovered that it would not be ready by the time we needed to start recording. ▶

Paul Ward (left) and Richard Taylor (right) working on the score in Paul's studio.

RUDOLPH THE SINGING REINDEER

Our first major production challenge came when we were required to simulate the sound of singing reindeer. Richard wanted to make the sound musical, whilst avoiding an overly 'angelic' voice effect. I thought long and hard about a meaningful way to represent this sound and spent a lot of time juggling vocal samples and white noise to give a kind of gritty 'oo' sound that seemed appropriate. In the end we went for a combination of a JX8P filtered square wave and a K2000 vocal sample, pitch-swept by envelope generators to give a 'howling' effect with a pitched sustain phase. At mixdown it would be necessary to ride the volume, EQ and reverb levels to give the impression of the reindeer being at various distances from the listener, depending on the camera's viewpoint.

I had to download a 'full-duplex' driver for the 'cheap and nasty' soundcard that came as standard with the PC, and I also installed my old MIDIQuest ISA MIDI interface, which happily worked without a hitch. Once all this was running as it should, it was time to begin looking at the upgrades necessary to give me my full 'studio in a PC'.

Taking a look at the system interrupt usage gave me something of a shock: I only had one spare interrupt left. The soundcard was actually taking up three interrupts — one for the synth section and one each for the audio in and out! Removing the old card and plugging in a Turtle Beach Fiji certainly made a big difference to both the quality of sound coming from the PC and the interrupt resources available on the system! However, installing the Fiji was not without its problems. Initially, *Cubase* would only run for 10 or 20 seconds before the whole machine hung, requiring a hard reset to recover. Experiments with other audio playback programs achieved similar results, though for some reason the standard Windows 95 MediaPlayer seemed to work fine. Despite all indications to the contrary, the problem turned out to be a faulty Fiji card. The replacement worked perfectly first time, and (but for a problem with the joystick port which meant I had to install the Fiji in non-Plug and Play mode) has given no other trouble since.

I bought a digital I/O option with the Fiji to enable me to transfer audio directly to DAT, and this also proved traumatic. For some reason, my Yamaha DTR2 DAT recorder refused point-blank to recognise the digital output of the soundcard. My Akai S1100 sampler had similar problems, seemingly unable to lock onto the clock signal from the Fiji. My Kurzweil K2000 synth/sampler had no such difficulties, nor (fortunately) did a borrowed Tascam DA30 DAT recorder... I hadn't planned on buying a new DAT, but it now seemed unavoidable, and since I had proved a Tascam machine would work with my other equipment I went for a shiny new DA30 Mk2.

The Fiji digital I/O and the DA30 Mk2 also give me the capability to apply processing to previously recorded material by dumping to and from DAT without having to go through an analogue conversion process. This was to prove invaluable almost immediately when a close friend found that he needed a very old cassette cleaning up for inclusion on a CD compilation. A couple of passes through Steinberg's *WaveLab* and off went the recording, sounding as good as if it had been made yesterday.

I couldn't resist buying a Yamaha DB50XG daughterboard to provide sound for multimedia applications — not doing so would have seemed like an insolent waste of the Fiji's Waveblaster header socket! I was very impressed by the sounds of the DB50XG and would heartily recommend it to anyone. The depth and quality of the sounds are beyond reproach at the price, and it was far from being merely the add-on for gaming that I had expected, clearly being capable of augmenting my studio's capabilities.

I added an Adaptec 2940 SCSI card and attached an Iomega Jaz drive to provide backup facilities. The 2940 interface is particularly suited to audio recording by virtue of its inherent high speed and use of 'buss-mastering' technology, which ties up less of the main PC processor's time. The Jaz provides 1Gb of removable storage space, which would allow me plenty of room to shuffle an hour's worth of stereo audio around at the mastering stage. The advantage of the SCSI buss is that I can add on several storage options, such as CD-R or a larger, faster AV drive, giving me some degree of future-proofing. I can also share the Jaz simultaneously with my S1100 or K2000 for sample storage.

Windows did have one or two problems understanding that I didn't really have eight K2000s plugged in at the other end, but this never really posed much of a problem in normal use. The reason for the anomaly is apparently something to do with the way Windows interfaces with the SCSI network, and the K2000's internal hard drive being assigned device number zero. I was pointed in the direction of some new drivers, but they made little difference, so I decided to live with it.

As far as the odd game of *F1GP* goes... I hadn't realised that DOS-based games wouldn't be able to

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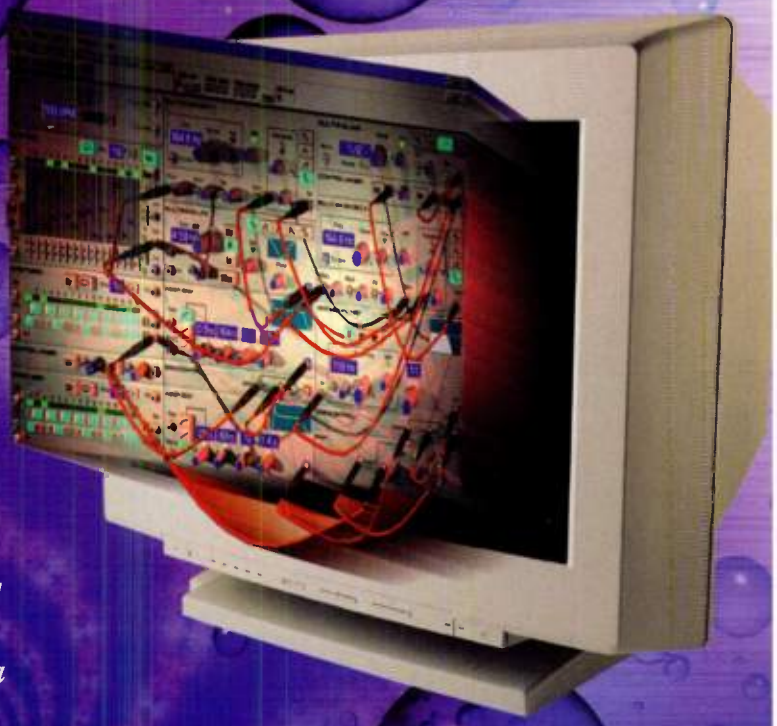

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make use of the Fiji or DB50XG cards, being incompatible with the usual Soundblaster standard. So I just plugged the old soundcard back in and all the DOS-based games seemed to find it with no problem (or drivers), despite Windows appearing to know nothing of its existence! After several problems with a new set of Fiji drivers and the Fiji's joystick port I found that the old soundcard's joystick port was found by Windows too — more by luck than judgement. PCs are strange beasts indeed...

I'll spare everyone the story of the 'interesting times' I had setting up other hardware and software, such as my modem and Internet applications. Suffice it to say that I managed to muddle my way through with a little help from my friends (*SOS* contributors Janet Harniman Cook and Martin Walker, take a bow). I consider myself reasonably conversant with PC technology, but I was quite unprepared for the scale and scope of problems I had to deal with to get my new machine into an ideal state for proper use. On more than one occasion a Mac certainly seemed a very tempting alternative! I had every intention of adding a multi-port MIDI interface, but as soon as I learned of the Windows 95 limit of 11 MIDI devices I decided to hold off for a while. As an alternative, I pressed all the available MIDI outputs from my current setup into service instead — including the COM1 serial port. For the moment this is adequate.

Were the results worth all this effort and expense? On the whole, yes. I overspent my budget (largely as a result of having to buy a new DAT machine), but I'll still turn in a profit, and I've invested in a very flexible recording system, with full backup facilities, that is eminently capable of the work I require of it — at least for the foreseeable future.

KEY QUESTIONS

With the gear situation well and truly sorted out, it was time to make a start on the project. It began gently enough, with Richard and myself going through the sound sources in my studio and looking for a collection of sounds that would form the backbone of the cartoon arrangements. The K2000 was favoured for its bells, strings, brass and a particularly stunning oboe sample found on a distant corner of the Internet, whilst the S1100 was loaded up with harp, piano, acoustic guitar and percussion sounds, including the obvious sleigh bells! The Yamaha TX802 doubled most of the harp parts, to add extra 'bite' to the sound, and also supplied many of the twangy/tinkly patches that it does so well. Extra 'breathy' bell patches came from the beautifully gritty Kawai K1R. The Roland D550 played many of the horn parts, as well as some of the occasional synth-type sounds, along with the Korg Wavestation SR. The Wavestation also provided ansuperbly realistic clarinet. Due to the nature of the project, my old analogue synths took a back seat, although my JX8P produced some of the string pads and basses to fill out the bottom end. Richard's Korg O1W/FD was drafted in during mixing to add sounds that we felt could not be improved upon with my own equipment, including harp and vibes.

After searching around for an age for the best pizzicato string patch, it occurred to me to check out some of the sounds available on the Yamaha DB50XG, and we were both very pleasantly suprised by the result! A couple of tweaks to the reverb settings, and the pizzicato strings were in place. The DB50XG's bassoon patch also put in an early and very welcome appearance.

Having compiled an extensive set of basic sounds, I ensured that all of the patch information was backed up into *Cubase*'s Studio Module as a global system exclusive dump. As work progressed and further sounds were brought into play, I updated this dump so that all sounds were available by name in the Studio Module at all times. This allowed us to change between *Cubase* songs without having to fiddle around finding patches specific to a certain piece of music. The S1100 samples were stored in a single volume on the internal hard drive, which was loaded up at the start of each session by a program change command from *Cubase*. I similarly defined a boot macro on the K2000's hard drive to get the K2000 into a state of readiness at the start of each session. I always think it's important to let the machines do as much of the work as possible, leaving the humans free to deal with the creative process, relatively unhindered by technical considerations. If I had to hold Richard up for five minutes while I hunted for "that cello sound we used on the chase scene", I felt I wouldn't be doing my job properly.

SCORING SANTA

Once all the basic sounds were accommodated, we began by recording the title music. At this stage no timecoded video tape was available to us, so we worked to the storyboard and the supplied frame counts. It was accepted that there would probably be a lot of trimming and tweaking required when we were finally working to picture, but this was as good a starting point as any — the more material we had in place when the video cassette arrived, the better.

The title scene was to begin with a single snowflake making its way towards the ground,

SELECTED EQUIPMENT LIST

COMPUTER/SOFTWARE

- Silica Shop Hurricane P200MMX PC, with 512K pipeline cache, 16x speed CD-ROM drive and 48Mb RAM.
- Steinberg *Cubase* PC v3.05 sequencing software.
- Adaptec 2940 SCSI interface card.
- Turtle Beach Fiji soundcard with digital I/O option.
- Yamaha DB50XG daughterboard.
- Iomega Jaz drive.
- MIDIQuest ISA MIDI interface.

SYNTHS/SAMPLERS/MISC

- Akai S1100 sampler.
- Alesis Quadraverb multi-effects.
- Drawmer noise gate.
- Kawai K1R synth module.
- Korg O1W/FD keyboard.
- Korg Wavestation SR synth module.
- Kurzweil K2000 synth/sampler.
- Roland D550 synth module.
- Roland JX8P analogue synth.
- Tascam DA30 Mk2 DAT machine.
- XRI XR300 timecode generator/synchroniser.
- Yamaha TX802 synth module.
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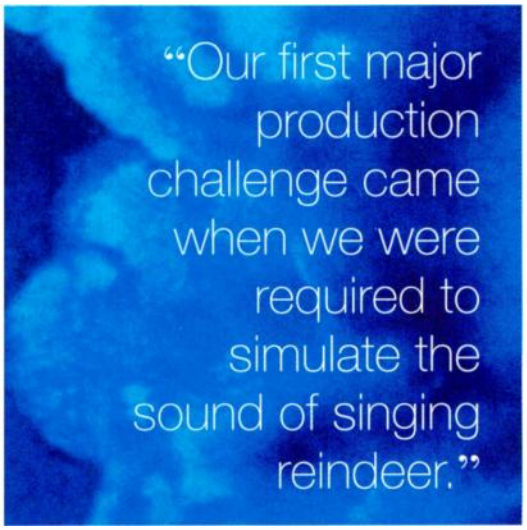

opening on the cartoon's title and then spiralling down towards Santa's house. The point at which the title appeared seemed to warrant a significant musical punctuation mark, and Richard had prepared a piece which took this into account. The section of music opened with a single string note, gradually building into the main theme and then coming to a climax before having a 'musical box' theme crossfading as the viewpoint floated through Santa's window. The significant timing points, such as the appearance of the titles, were marked in *Cubase* by cowbells, and time-locked to enable us to change tempos without moving these reference markers.

Richard had recorded rough versions of the main themes into the sequencer of his Korg O1W/FD. We transferred these a track at a time (at half speed, to ensure timing accuracy) into *Cubase*, with *Cubase* taking its timing reference from the O1W's internal clock. On playback from the PC it was clear that something was awry. Strangely, *Cubase* was found to be quantising the notes as they came in, despite the fact that Auto-quantise was switched off! The answer was to switch the quantise *value* to 'off', at which point everything began to transfer correctly. I had never encountered this problem with my Atari, so was quite unprepared for it.

For simplicity's sake, we recorded all the music in 1/4 time, leaving us to concentrate on tempos alone. Richard, being something of a 'traditional' musician, and an accomplished piano player to boot, was quite prepared to re-play any parts we considered suspect. I was happy to go along with this, since it was often much quicker than using *Cubase*'s editors and kept the creative juices flowing. When the time came for some serious editing and quantising sessions, Richard became quite fond of the new options afforded him by the technology! Some of the faster harp arpeggios benefited greatly from subtle quantisation and general tidying. The harp sound itself was found to be lacking in definition once it was blended into the mix, so the Yamaha TX802 was called upon to add an extra transient 'twang' to the sampled harp and this worked very well indeed. Richard had to do some fairly substantial trimming to fit into the time window before the appearance of the cartoon titles. This is part of the cruelty of working to video — as a stand-alone piece of music, the original, unedited version was superior to that which will ultimately accompany the visuals!

As work progressed, I kept a cycle of backups between the PC and a couple of Jaz cartridges, so that in the event of a disk crash we would never lose everything. This proved to be very important as, on occasions, Richard would require me to return to previous versions to see how things had changed, and maybe restore elements that had been rejected in one piece for use in another.

Partly due to the nature of the project, but also due to the way in which both of us wanted to work, I made it a point to leave all the mixer channels set to a nominal 0dB level and set volumes from *Cubase* for all the instruments that could make use of MIDI volume commands. This meant that we could switch between pieces of music at a moment's notice without having to completely reset the mixer each time. The only problem with this approach occurs when MIDI-controlled fades are brought into play, since any preset volume commands for the instrument are overridden as soon as the first volume command from the fader information is received. The K2000 is the exception to this rule, since it allows MIDI volume commands to define the maximum volume of the part, and then uses MIDI expression commands to fade between the maximum and fully off — brilliant! Some day all instruments will behave this way. For the S1100 I created loud and soft versions of each program, to allow some flexibility in setting basic levels.

Inevitably, there were times when 'loudest' just wasn't loud enough. On these occasions, I resorted to lifting the odd desk channel before recording the sound to hard disk in Richard's absence and setting a higher level from there. Any instruments that were beginning to show the strains of the demands on their polyphony were also recorded to hard disk during these breaks, freeing them up for further parts on the next session. This usually involved the K2000 string and S1100 stereo piano parts. I recorded these as cleanly as possible, from the digital outputs and including effects, in the hope that these recordings would make it to the final mix. For the MIDI-driven sounds I deliberately avoided adding effects, other than those on the instruments themselves, which could be recalled by patch change messages. External effects would be added at mixdown.

The system generally worked well. There were one or two moments when program change messages were lost or ignored, but these were few and far between. Such problems were usually down to 'operator error', but a few just seemed to go away after a re-boot and a coffee! One very annoying 'feature' of *Cubase* 3.05 manifested itself each time I deleted a track that had a patch change assigned to it, because the non-existent track would continue to send its patch change regardless! Fortunately, nipping out and back into *Cubase* always cured this fault.

IN THE PICTURE

After a few days we were sent a 'line test' video tape. This is a rough copy of the cartoon done entirely from basic line drawings, and is created to allow the director to confirm that the overall pace and timings work properly. This tape did not have any timecode added, but did include the dialogue, so we only had to hit the play button along with the relevant scenes to get a feel for whether the music was in the right ballpark. It was important that the music did not cover any of the dialogue, so although the music could be faded down at the dubbing stage, we tried to avoid using anything excessive over any of the important lines. Apart from the title

EFFECTIVE TREATMENT

As work on the score progressed, it became clear that I would have to keep instrument assignments tidy to avoid everything becoming totally unmanageable. Since the K2000 was being used quite extensively, I designated MIDI channel 1 of the machine as the channel for selecting its effects. If the K2000 has a weak spot it is the handling of effects. There is no capability to apply varying amounts of effect to the sound played on a specific MIDI channel, and there are only two pairs of audio outputs, so choosing an appropriate effect is very important. Most of the sounds we were using were attempting to recreate realistic orchestral timbres, so it was usually quite easy to apply a general reverb patch through which all of the instruments were passed, much as would happen in a real environment. Any sounds necessitating special treatment were passed out of the secondary audio outputs and through the Alesis Quadraverb or Yamaha REV7 effects. The S1100 presented no such problems, having the ability to specify varying internal effects amounts for each program, and eight audio outputs.

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"I can honestly say that this project has been amongst the most satisfying I've undertaken."

scene, which required a fair amount of re-working, we only had to make a few tempo tweaks and everything seemed to run pretty much as expected.

I considered it important to establish that my system would be able to cope with the timecoded tape we would eventually receive, so I asked the studio to send me a test tape containing the same format of timecode. If there was to be any problem I wanted to know about it earlier rather than later! A tape of one of the studio's previous cartoons was duly sent, complete with dialogue on one of the stereo tracks and timecode on the other. In the event, there proved to be no problem at all. My XRI XR300 read the timecode and duly poured MIDI Time Code into *Cubase* without any complaints. My confidence was considerably boosted.

GETTING IT TAPED

Our work pattern was now well established, with Richard putting pen to paper during the day, while I was taking care of the day job, and both of us working to get the parts recorded into the computer at night. This regime worked very well, pausing only to accommodate my holiday halfway through!

On my return from holiday, the timecoded video tape was available and we could now start running our music in sync with the action on screen. To our dismay, the opening title sequence had once again been trimmed, forcing us to make yet more painful cuts to the musical accompaniment. Nevertheless, our work prior to receiving the timecoded tape really paid dividends, since in most cases very little needed to be done other than setting a start point.

We carefully edited starting points and tempos to hit crucial pieces of action, and I added a reference 'clapperboard' click at the start of each section of music, noting the timecode position of this click on the DAT label, so that the music could be accurately synchronised by the engineer at the dubbing stage. Some of the reference clicks unfortunately overlapped into the music preceding the cue, but the dubbing engineer assured us that he could use a second pair of tracks to alleviate the problem.

Work progressed well, and with a week and a half to go we had just over half of the soundtrack scored and recorded into *Cubase*. The circus scenes in particular were great fun to work on, with manic organs and crazy calliope sounds really defining the mood. When it came to specific musical effects, such as the singing reindeer (see 'Rudolph the Singing Reindeer' box), Santa's trumpet and the twinkly magic spells, I decided to record the musical backing and the effect separately, to give the dubbing engineer a chance to balance the relative levels. After all, it was possible that the producer would want the music considerably quieter than we might anticipate, while the effect was arguably more important to the storyline.

MERRY MIXING

When the time came to mix the music, our job was made considerably easier by the fact that we had used MIDI volume and expression commands to do much of the work as we went along. Very little EQ-ing was necessary, since Richard's skills as an orchestral arranger had ensured that few parts were fighting for space. The main job was to boost those parts that had run out of steam despite being set to a maximum MIDI volume of 127. Effects were generally used sparingly, to keep a strong sense of 'realism' to the sounds. I decided not to compress the overall mix, as this could be done at the dubbing stage, if necessary, although I did patch a Drawmer noise gate across the masters (and individually across the noisiest channels) to keep everything as clean as possible.

I can honestly say that this project has been amongst the most satisfying I've undertaken, and there was a real sense of achievement when it all came together as a coherent piece of work at the end. It's something of a cliché to say that the best soundtracks are those which are not consciously heard during a film, but complement the action in such a way as to blend into the background. I agree with this wholeheartedly, but I still harbour a secret wish that someone, somewhere notices the sounds accompanying the film and believes it's a real orchestra!

So how would I do things differently next time? I think I would firstly record the whole piece as a single *Cubase* song. I had believed that splitting the soundtrack into sections would simplify the process, but it just led to extra confusion, with some MIDI channels being assigned different sounds in different sections, and various anomalous 'hang-overs' from one section to the next. I would also like to invest in a video recorder with more advanced jog and shuttle features, to make searching for hit points less of a drag. An automated mixer, such as Yamaha's O2R, would have made it easier to mix as we went along, saving both time and trouble. An investment of this amount and nature would have to be justified by a steady flow of similar work. But judging by the last few calls we received from the director of *Father Christmas and the Missing Reindeer*, and the dubbing engineer, you never know!

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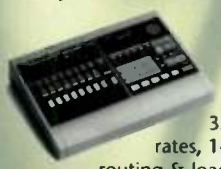

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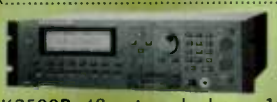

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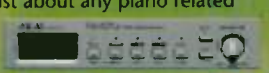

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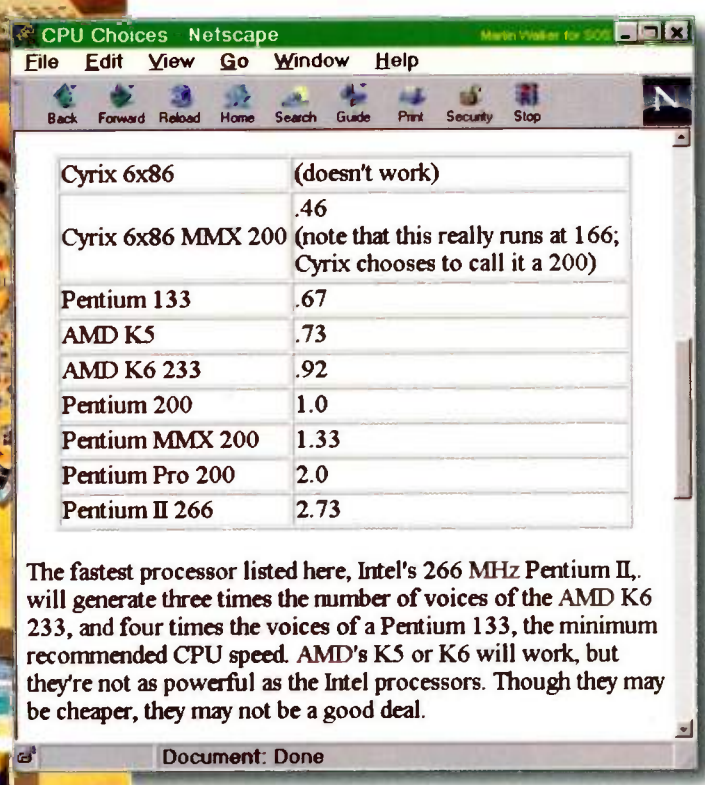
PC MUSICIAN HARDWARE UPDATE

If you thought the MMX processor was still the last word in new technology, prepare to boldly go where your PC has never gone before. MARTIN WALKER looks at the many new families of PC chips, and explains their relevance to the musician.

So many new PC processor chips have been released during the last year that it's not surprising if many people are a bit confused. Almost everyone has heard about the Pentium MMX processor, particularly due to the controversy that followed its inauspicious launch directly after Christmas 1996. However, despite the promises of huge potential increases in performance, little software uses its powers directly even now, and still less of this software is relevant to PC musicians. Fortunately, most applications that are not specifically written to take advantage of the special facilities of MMX still show a typical 10% system speed improvement when run on an MMX system, compared to a system using a non-MMX chip of the same clock speed, largely due to the MMX's larger on-board cache size and design. For this reason, although *Cubase VST* does not require an MMX processor, its designers claim a 10-15% increase in performance if you have one installed. One application that does use MMX directly is Seer Systems' *Reality* software synth (which I reviewed in the November issue), and this shows a 30-40% improvement with MMX, over the same speed of non-MMX processor.

With the launches of other processors to rival the Pentium range, Intel have now removed the non-MMX ones from the current line-up. This leaves the Pentium 166MHz MMX as the entry-level model, with a new low price of about £100, so if you still haven't got one in your PC, it's well worth upgrading. Check first with your supplier that your motherboard supports the MMX processors directly (they need a 2.8V supply, rather than the 3.3V supply used by their predecessors). Most bought in the last 18 months should do so, and in this case you can just use a standard MMX processor. If not, you'll need an MMX Overdrive upgrade, which is a bit more expensive (see June's PC Notes for full details).

Since the Pentium 166MHz and 200MHz MMX models were released, they have been joined by a 233MHz model. Although many motherboards can run this one too, the faster the processor, the more current it takes, and some motherboard power supplies have insufficient 'welly' to cope — check your motherboard manual before purchase. Current prices are around £200 for the 200MHz chip and £300 for the 233MHz version. Don't buy a faster processor thinking that upgrading from a 166 to a 200MHz version will immediately give you a 20% improvement in overall system performance (200/166), because it doesn't work like that. Although the processor will be running 20% faster — and I have certainly measured this improvement when running DMSS plug-ins — the processor is only one link in a long chain of components inside your PC. Expect a real-world ▶



A screen grab from the Seer Systems web site (www.seersystems.com), showing the relative performance of a range of processors compared with a non-MMX Pentium 200MHz when running the Reality software synth.

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system improvement of more like 5% when upgrading from 166 to 200, and another 3-4% when moving from 200 to 233.

The other big processor launch from Intel this year was their Pentium II range, which is designed to succeed the Pentium Pro. The Pro traditionally had a 'professional' image, with support for multiple processors on the same motherboard for more power. It is generally acknowledged that the 233MHz Pentium MMX is probably about as fast as standard Pentiums are likely to go (although there is an AMD K6 model running at 300MHz), but the Pentium II range starts at 233MHz (around £400), with faster models at 266MHz (£500) and 300MHz (£650). They all incorporate the benefits of MMX technology but, in a complete departure from all previous designs, the 'II' is not just a plug-in chip, but a complete sub-assembly with cache memory and a huge attached heatsink, which is known as the 'Slot 1' format. This requires a completely new design of motherboard, leaving existing Pro owners with no plug-in upgrade path.

When it comes to other processing contenders, such as the K6 range from AMD, and the MX range from IBM/Cyrix, despite their MMX features (licensed from Intel in the case of AMD, and 'reverse engineered' with Cyrix) these are best avoided by musicians. When measuring audio performance with the majority of musical applications, my experience to date suggests that, despite their lower prices, the supposedly faster performance with most mainstream applications simply does not translate to the rarefied world of HD audio and real-time plug-ins. Seer Systems measured the performance of their *Reality* software synthesizer: compared with their benchmark Pentium 200 (non-MMX), the Pentium 200 MMX came in at 133%, the AMD K6 233 at 92%, and the Cyrix MX200 (166MHz) at less than half the speed (46%). Incidentally, the Pentium Pro 200 measured 200%, and the Pentium II 266 came in at a staggering 273% — nearly three times the speed. When it comes to music applications, it pays to have Intel Inside.

> "Most people agree that, of all upgrades, installing a new motherboard is the most fiddly."

THE MOTHER OF ALL UPGRADES

Although many people have no idea what sort of motherboard they have inside their PC, anyone buying a new machine (or those DIY-ers who are happy to upgrade the more complicated bits) will need to know the options. Each motherboard is designed around one of several chipsets, consisting of between two and four Integrated Circuit chips, and most often designed by Intel (although there are several other manufacturers). The chipset used by your motherboard will determine the range of processors that you can plug in, the types of memory that can be used, and the hard disk performance.

The most significant choice is the processor, and for the majority of musicians at the moment this will normally be one designated as 'Socket 7'. Many processors will plug into a Socket 7, including all Pentiums, the AMD K5 and K6 ranges, and the IBM/Cyrix 6x86 and 6x86MX ranges. The 'Socket 8' standard is for plugging in Pentium Pro chips, but these have already been superseded by the Pentium II range, using the new 'Slot 1' format. These are the basic three choices for a motherboard, and each processor socket standard is supported by one or more chipsets. The chipset controls the flow of data to and from the components in your PC, such as the CPU, memory, hard drive, and any devices connected to either the ISA or PCI busses. Although a few motherboard manufacturers use chipsets from SIS, VIA and Opti, the majority rely on Intel's Triton series of chips.

The first chipset released by Intel for the Pentium was the 430FX (commonly known as the ▶

GETTING BOARD

There are several choices when it comes to the physical dimensions and layout (form factor) of a PC motherboard. The most common boards, up to now, have been based on the 'Baby AT' layout, which has caused some problems for musicians. I have one in my current PC, and since the main CPU is in line with the card slots, its heatsink and fan prevent me from plugging in more than one full-length ISA expansion card (which is about 13 inches long). The mass of wiring attaching peripherals such as the I/O ports and floppy and hard drives to the motherboard also obscures the memory sockets, which makes it far more difficult to add more memory without unplugging everything.

To make things easier, a new design known as ATX has been available for about a year: this relocates the processor from the front of the motherboard to the rear and to the side, beneath the power supply. This allows full-length cards to be plugged into every available slot and, even more usefully for musicians, improves the cooling system. Rather than sucking in air from the front of the case by using an extractor fan in the power supply (which means that most processors still need an extra heatsink-mounted fan to blow air directly onto the processor, to keep it sufficiently cool), the ATX design reverses the process: air is pulled into the case by the power supply fan, then blown directly towards the adjacent processor. This means that many processors need no dedicated fan of their own, which removes a major noise-producing component from the studio environment.

From the manufacturer's point of view, ATX assembly costs are reduced, because the I/O sockets are an integral part of the motherboard. The only thing to watch out for is that ATX motherboards require a special case equipped with a different power supply from that of the more common Baby AT board, but these are relatively inexpensive — see the 'Buying the Bare Bones' box.

This side view shows a PC with a Baby AT motherboard, and while it looks as though there is plenty of room for expansion cards, the processor will sit on top of that white four-sided socket (bottom centre). You may then have problems fitting a full-length soundcard, although, as usual, most non-musician PC owners will still experience no problems.

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'FX' or Triton). This has been superseded, first by the double launch of the 430HX and 430VX chipsets, and more recently by the 430TX. Most people probably have either HX or VX chipsets in existing PCs. The HX was also known as 'Triton II' (the 'H' is often referred to as High quality), and it offered increased support for up to 512Mb of RAM, as well as for dual processors. The 430VX (aka 'Triton III', and also referred to as the 'Value' model) has one advantage over the HX chipset: it supports up to 64Mb of SDRAM (Synchronous Dynamic RAM — see 'Thanks for the Memory' section, later, for more detail). Both HX and VX series perform about 10% faster than the previous FX chips.

The latest TX chipset, which appeared in mid-1997, is supplied with most Socket 7 PCs sold today, and includes support for SDRAM (like the VX). More significantly, it also supports Ultra DMA/33 hard drives, which have a significantly better performance than their forbears. Finally, the TX chipset is often quoted as being optimised for MMX processors, although this is untrue — only software using the extra MMX processor instructions will show a major benefit, and this does not rely on any component on the motherboard.

If you are using a Pentium Pro or Pentium II, the relevant chipsets are the 440FX (Natoma) and the 440LX. The more recent LX is the only one of the two to support SDRAM and Ultra DMA/33, along with the latest feature — AGP (Accelerated Graphics Port). This allows users of heavy-duty 3D graphics to move vast quantities of graphic data at a much faster rate than the normal PCI buss allows (33MHz). AGP runs at 66MHz in its basic 1x mode, and links the main memory to that of the graphics card for faster throughput. The 2x mode achieves an effective clock speed of 133MHz, but both modes need a special AGP video card which fits in a new design of card slot. Frankly, few musicians are likely to benefit from AGP.

Although good motherboard design is vital for top performance, you are unlikely to see more than a 5% variation in overall performance between different models. This is not to be scoffed at, but expandability is far more important. Your choice of PC motherboard will determine the number of available slots for expansion cards and memory upgrades, and for a musician this is just as important as the final few percent of overall speed.

GETTING ON THE BUSS

One of the decisions facing manufacturers of expansion cards is whether to use the ISA or PCI buss. ISA (Industry Standard Architecture) has been around for a long time now — IBM expanded it from an 8-bit to its current 16-bit width in 1984, when it introduced the 80286 processor. Nowadays the buss is still being used a great deal, even by recently introduced expansion cards (both DAL's V8 and Digital Wings' soundcards are ISA-based), but many believe its days are numbered. This is partly because of its lower maximum data rate. Most modern Pentium processors operate with a system speed of 66MHz, with the other computer busses synchronised to this. The processor itself works at a fixed multiple of the system speed — so, for instance, a 133MHz device works at 2x the system speed, a 166MHz at 2.5x, a 200MHz model at 3x, and so on.

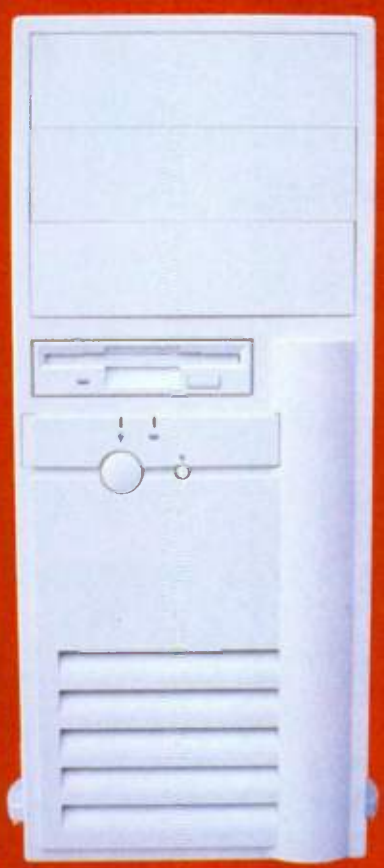
The 16-bit ISA buss, which runs at a usual speed of about 8.25MHz, has a maximum data rate of 16.5Mb/second. This might sound huge, but PCI runs at 33MHz (half the speed of the motherboard) and has a 32-bit width, which equates to 132Mb/second! Another major benefit of the PCI specification is that it can operate concurrently with the main PC processor — the CPU can be processing data while the PCI buss is busy transferring data between other parts of the system. One of the attractions of the PCI buss to manufacturers is that it is cross-compatible with the Apple Mac; any PCI card should (theoretically) work on both platforms, as long as it has driver software available for each.

Although both busses can move loads of audio channels about (each mono 44.1kHz channel only requires 88.2Kb/second for a 16-bit audio signal), the faster the data can be shifted, the better. ▶

BUYING THE BARE BONES

I recently spotted a very useful upgrade from PC suppliers Novatech which might be useful to you if you have an older PC in dire need of a few improvements. Novatech are now selling a 'Bare Bones' system, in both AT and ATX formats, which consists of a midi tower case with power supply, TX chipset motherboard, and floppy drive. The AT system costs £116 and the ATX (which will probably be more suitable for most musicians) is £222.

Most people agree that, of all upgrades, installing a new motherboard is the most fiddly, so as this has already been done all you need to do is plug in the easy bits. To complete your system, you can either buy a full set of components from Novatech, or simply cannibalise the majority of parts from your previous machine. These include the hard drive, CD-ROM drive, video card and RAM — although, in keeping with the latest trends, the motherboard only has DIMM sockets, so this is your opportunity to upgrade to the latest SDRAM (see main text). Of course, you can carry on using your old monitor, keyboard and mouse. Finally (and the main reason for your upgrade), you can plug in a faster processor, such as a Pentium 200MHz MMX.



This 'Bare Bones' ATX System from Novatech allows you to upgrade to the roomier ATX motherboard, so that every expansion card can be full length if required. With case, motherboard and floppy drive already assembled, you simply add the remainder of your existing components.

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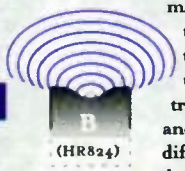
Imaging and definition are compromised. The "sweet spot" gets very small.

Like biamped speakers, wave guides aren't a new concept. But it takes optimized internal electronics and a systems approach to make them work in near-field applications.

The HR824's wave guide (Fig. B) maximizes dispersion, time aligns the acoustic center of the HF transducer to the LF transducer's center, and avoids enclosure diffraction (notice that the monitor's face is perfectly smooth.) The exponential guide also increases low treble sensitivity, enabling the HF transducer to handle more power and produce flat response at high SPLs.



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First, the HR824's FR Series 150-watt bass amplifier is directly coupled in a servo loop to the 8.75-inch mineral-filled polypropylene low frequency transducer.

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Second, the HR824's low frequency driver is coupled to a pair of aluminum mass-loaded, acoustic-insulated 6.5-inch passive drivers. These ultra-rigid drivers eliminate problems like vent noise, power compression, and low frequency distortion — and couple much more effectively with the control room's air mass. They achieve the equivalent radiating area of a 12-inch woofer cone, allowing the HR824 to deliver FLAT response to 42Hz with a 38Hz, 3dB-down point.

Third, the woofer enclosure is air-displaced with high-density adiabatic foam. It damps internal midrange reflections so they can't bleed back through the LF transducer cone and reach your ears. The typical problem of small-monitor midrange "boxiness" is eliminated.

HR824 Active Monitors accept balanced or unbalanced ¼" and XLR inputs. Jacks & removable IEC power cord face downward so that the speaker can be placed close to rear wall surfaces.

A TRUE PISTONIC HIGH-FREQUENCY RADIATOR.

We scoured the earth for the finest high frequency transducers and then subjected them to rigorous evaluation. One test, *scanning laser vibrometry*, gives a true picture of surface vibration patterns. Two test results are shown in the upper right hand corner of this ad. Figure C is a conventional fabric dome tweeter in motion. You needn't be an acoustic engineer to see that the dome is NOT behaving as a true piston.

The Mackie HR824 Active Monitor. ±1.5dB from 42 to 20kHz.

Figure D shows our High Resolution metal alloy dome at the same frequency. It acts as a rigid piston up to 22kHz, delivering pristine, uncolored treble output that reproduces *exactly* what you're recording.

INDIVIDUALLY OPTIMIZED.

We precisely match each transducer's actual output via electronic adjustments. During final assembly, each HR824 is carefully *hand-trimmed* to ±1.5dB, 42Hz-20kHz. As proof, each monitor comes certified with its own serialized, guaranteed frequency response printout.

The HR824's front board has "radiused" edges to further eliminate diffraction; an "H" brace bisects the enclosure for extra rigidity.

Fig. C: Uneven fabric dome tweeter motion distorts high frequencies.

Fig. D: HR824 alloy dome's uniform, accurate pistonic motion.

Mackie is one of the few active monitor manufacturers that also has experience building stand-alone professional power amps. Our HR824 employs two smaller versions of our FR Series M•1200 power amplifier — 100 watts (with 150W bursts) for high frequencies, and 150 watts (200W peak output) for low frequencies. Both amps make use of high-speed, latch-proof Fast Recovery design using extremely low negative feedback.

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If you've never experienced active monitors before, you're going to love the unflinching accuracy of Mackie Designs' HR824s.

If you've priced other 2-way active monitors, you're going to love the HR824's price AND its accuracy.

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PC Processor Update

Nearly all modern graphics and hard disk controller cards are PCI for maximum performance, with the ISA buss being used for devices that don't need so much bandwidth, such as stereo soundcards, MIDI interfaces, and modems. Multi-channel audio cards tend to be of the PCI variety, especially since many sport DSP chips that can be used to offload some of the number-crunching from the PC's main processor, for real-time EQ and effects.

Some motherboards are already showing a tendency to reduce support for the older ISA cards; although you can still buy a large variety which have four each of ISA and PCI card slots (with one being shared, giving a total of seven simultaneous slots, which can be used as 4+3 or 3+4), some new motherboards are only supplying two ISA slots. Since many musicians are struggling to find space for all their existing ISA cards, this is something to watch out for when buying a new PC. In fact, Intel expect ISA-based audio to be generally phased out by the end of 1998, since it is more limited than PCI and is less configurable and manageable as well.

Nowadays, RAM comes in a sometimes bewildering array of packaging — always check what sort is required by your PC for optimum performance.

Ultimately, the PCI buss speed will increase still further. Although some motherboard chipsets already allow the 66MHz motherboard speed to be increased to 75MHz or even 83MHz, Intel do not guarantee their chipsets when running at these greater speeds, and you can run into other problems, since your expansion cards will still be running at half motherboard speed, and therefore beyond their rated spec. As the PCI buss speed rises to 37.5 and 41.5MHz respectively, reliability of the cards may be reduced, or some may refuse to work at all. Intel's new AGP architecture (mentioned in the motherboard section) allows graphics cards to run at the full speed of the motherboard, and even at double speed, but unless you are running heavy 3D graphics you are unlikely to see significant system improvements. The big push will come next year, when Intel introduce their Slot 2 (successor to the Slot 1, as currently used by the Pentium II), which will have a 100MHz PCI buss speed.

THANKS FOR THE MEMORY

When it comes to RAM, it's worth stressing how much better most Windows 95 PCs will perform with 32Mb rather than 16Mb. I noticed a huge difference when switching between applications after upgrading, since ideally Windows 95 likes to have 16Mb all to itself, and once you run an application you need more memory, so something has to be temporarily ferried off to the hard drive, to make more room. This allows you to run lots of applications, even when you have run out of 'real' memory. The technique is known as virtual memory, with the portion of the hard drive used called a swap file. Once you have 32Mb of RAM, your swap file will remain fairly small, so switching between applications will become much faster.

> "Some motherboards are already showing a tendency to reduce support for the older ISA cards"

However, the latest applications, such as *Cubase VST*, require a minimum of 24Mb of RAM, to provide all the memory buffers that allow so many channels of audio to be used. If there's one thing I've learnt over the years it's that when a minimum is mentioned, you will nearly always get significant benefits by doubling it. The amount of RAM recommended for *Cubase VST* is 32Mb, but on my system (which has 32Mb) only about 5Mb is left after I launch *VST*, so if you want to run another application (such as an sound editor, librarian, or software synthesizer) you'll soon be back into virtual territory. I'm going to upgrade to 48 or even 64Mb in the near future.

When it comes to memory types, there are two main packages: SIMMs and DIMMs. Modern SIMMs (Single In-line Memory Modules) have 72 pins and are used in pairs of the same value (for ▶

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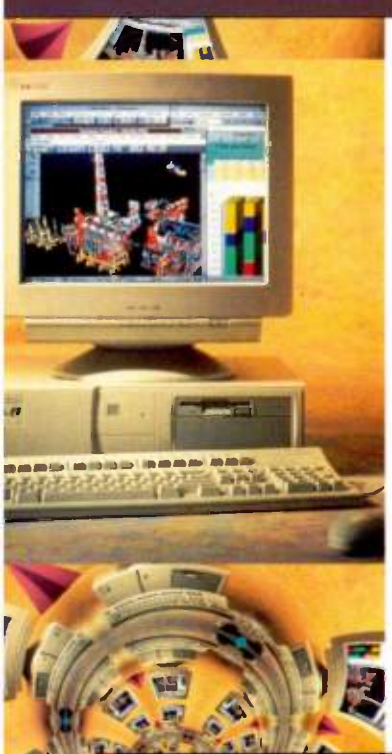
PC Processor Update

instance, a pair of 16Mb SIMMs will be needed for a 32Mb upgrade). Since most motherboards only provide four SIMM slots in total, this only allows you to upgrade once. However, popular SIMM sizes include 8, 16 and 32Mb, allowing you to install 16, 32, or 64Mb per pair respectively. DIMMs (Dual In-line Memory Modules), as their name suggests, provide the equivalent of two SIMMs in a single convenient 168-pin package.

> "There does seem to be genuine evidence that occasional random PC crashes can sometimes be caused by cheap RAM running 'on the edge'."



However, many motherboards only provide two DIMM sockets, so you are little better off when upgrading than with the SIMM type, although different sizes can be mixed at will.

Many motherboards provide both SIMM and DIMM sockets for memory, but few allow both types to be mixed, as memory must be installed in 'banks', and in most cases the SIMM and DIMM sockets are connected to the same banks, providing 'either but not both' support. Some only have SIMM sockets, but more of them (as many as eight in some models), and others only have DIMM sockets. You may even find a particular design of motherboard available in different versions, with either three DIMM sockets, or two DIMM and four SIMM sockets. Most of the time, therefore, the decision on which memory type to use when upgrading is taken out of your hands.

What's more important is that you match the speed of your memory upgrade with that already installed. Most modern PCs use EDO RAM, and this can be bought in three speeds: 70ns, 60ns, and 50ns. Don't ever buy 70ns, as this is too slow to work with any processor running at 100MHz or faster. If your machine has a 66MHz buss speed (100, 133, 166, 200MHz processors), you will need 60ns RAM, although some new motherboards can support the more expensive (and difficult to obtain) 50ns variety. Although you could mix 50ns RAM with existing 60ns memory, you would still have to run it all at the slower motherboard speed settings, so there's no real point in doing this. Also, much like the recent news in *SOS* that sampler RAM quality is definitely important, there are many reports on the Internet that, in PCs which have been tweaked to be even faster than normal, quality 60ns RAM tends to be more reliable than cheap 50ns RAM; there does seem to be genuine evidence that occasional random PC crashes can sometimes be caused by cheap RAM running 'on the edge'.

More esoteric memory choices, such as EDO (Extended Data Out) or SDRAM are, again, largely determined by the motherboard design. Unless you're contemplating buying or building a new machine, the only time you'll need to find out the type your motherboard is already using is if you want to add more RAM, as 'mixing and matching' is rarely an option. It's probably true to say that EDO RAM is currently fitted in the majority of modern machines (either in SIMM or DIMM packages), with SDRAM starting to appear more in higher end PCs (always in a DIMM package).

Many people think that SDRAM is the way forward, because although it currently costs more than other types it has the potential to give better system performance with faster machines. However, at motherboard buss speeds of 66MHz, you are unlikely to see any real improvements in performance with SDRAM. Testing the same system with first EDO RAM and then SDRAM is likely to show no significant change with the VX motherboard chipset, though the latest TX chipset will probably show a small improvement, in the order of 2%. Another advantage of TX is that it allows you to use 64Mb SDRAM modules, as well as 128Mb EDO modules, both in DIMM format. When the new PCI buss speed of 100MHz arrives next year, SDRAM should become more important.

THE UPGRADE PATH

As always, if you want to buy now you have to weigh up your desire to future-proof your system against what your wallet can actually stand. Since PCs are advancing in performance at such a rapid rate, you can adopt one of two approaches if you want to stay abreast of the latest technologies. Either you buy a complete high-performance system for about £1500, use it for a year or two, and then sell it (or trade it in) and buy a completely new system, or you adopt a continuous upgrade policy — buy new components for your existing system as you need them. If you decide on the latter approach you'll probably end up spending a few hundred pounds, three or four times a year,

CRYSTAL BALL GAZING

There seems to be a general consensus that the current Socket 7 system, with a 66MHz PCI buss, will support processors up to 300MHz, but no further. Currently the favourite multimedia systems are favouring Pentium 200MHz MMX, or AMD K6 processors at the same speed, although the K6 is not so useful for musicians, for the reasons given in the main text. The latest TX chipset is also likely to be the last one developed for this system. Certainly, industry pundits expect the Pentium II to take over in 1998, and for even the Pentium 200MMX to start to disappear about halfway through next year.

You can already buy a complete Pentium II 266MHz system for about £1600 including VAT, which points to prices of more like £1000 once we get into 1998. The beauty of the Pentium II is that it combines features of the Pentium Pro range (such as multiple processor support) with the MMX enhancements of the standard Pentium range that it will eventually replace. The next architecture for processors is called Slot 2 and features the 100MHz buss also mentioned in the main text. The working name of this processor is 'Deschutes' [*also the name of a 1.6-million acre forest in Oregon, USA — News Ed*] and the launch model is planned for about the second quarter of 1998, with a 400MHz clock speed, and requiring a new chipset known as the 450NX. Faster versions of the Pentium II are also expected — a 333MHz version early in 1998, which will use the same 66MHz buss as the current Pentium II models, followed by 350, 400, and 450MHz versions, all of which will need the 100MHz buss of the 440BX chipset.

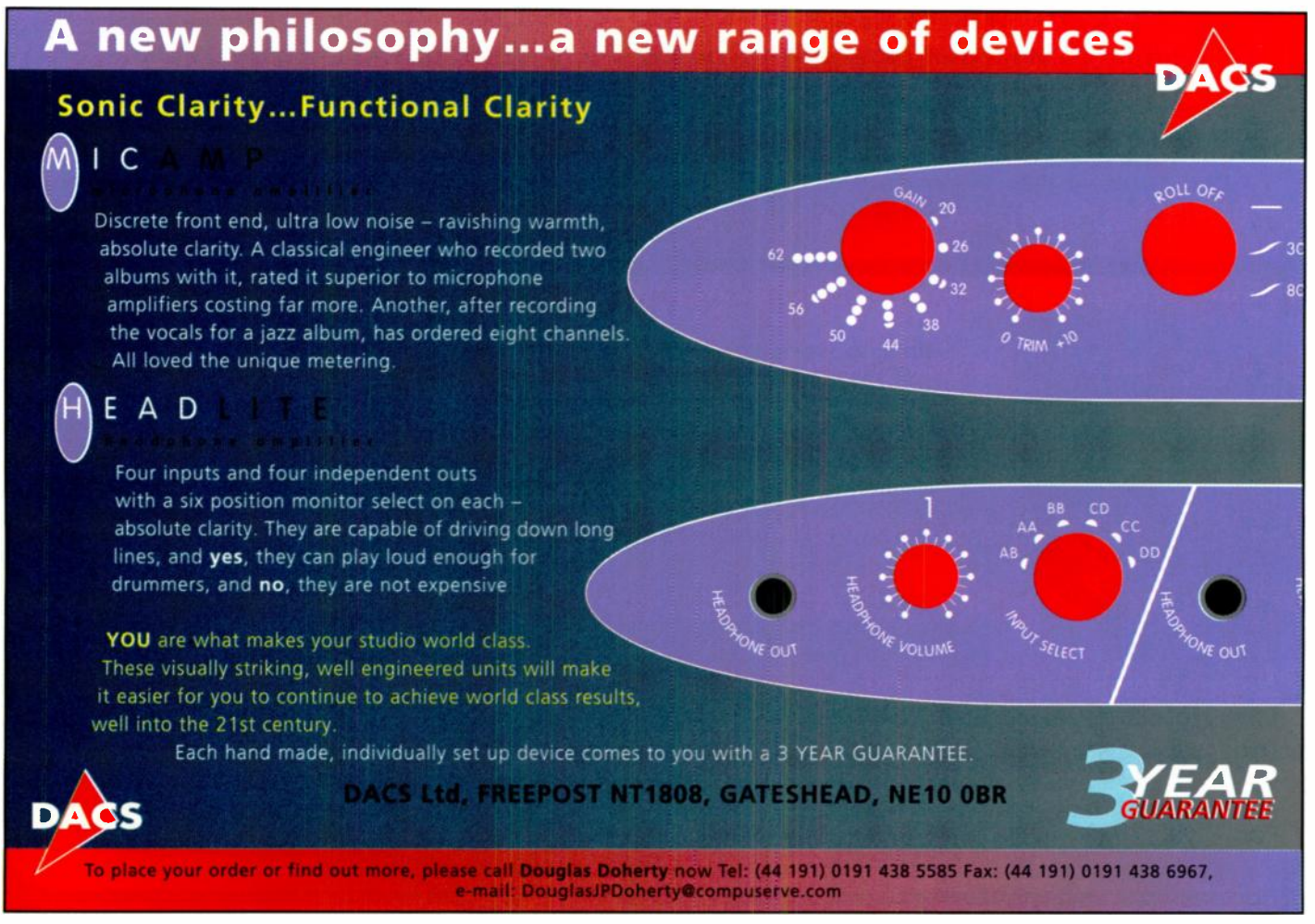
to get more memory, a faster processor, a larger and faster hard drive, and so on. Eventually you're likely to need a completely new motherboard, but a local supplier can fit this for you if you don't want to take on the task yourself, and this will keep your system up to scratch for significantly longer.

Sadly, audio applications seem to be optimised for Intel processors so, as mentioned earlier, it's a bit dicey to save money by buying an AMD or Cyrix chip. If you want to stay future-proof for a little while longer, and are considering buying a completely new PC, look at a Pentium II system and you should be OK for at least a year. Unfortunately, if you want to upgrade on a component basis, Pentium II processors bought by themselves are still very expensive, and as you would also need a new motherboard (another £200 or so) you'd be better off going for a complete system and selling your existing machine. However, for those with an eye for a short-term bargain, the Pentium Pro 200MHz is still 50% faster than the Pentium MMX 200MHz when running programs such as *Reality*, so as long as you don't mind having to upgrade again within a year, you might just find one of these at an excellent price by early 1998. Bear in mind, though, that you won't get much for it when you come to upgrade again.

If you're seriously strapped for cash (aren't we all?), buy a system featuring a TX chipset on the motherboard and get the fastest Intel Pentium MMX processor you can afford. The TX chipset should carry on at least till the end of 1998, and is the final and best option for Socket 7 processors (unless the rival processor manufacturers come up with something to keep things going a bit longer). To be honest, although you could start preparing for the move to Pentium II by spending a little more to buy the faster SDRAM memory instead of EDO, it may be better to sell your complete MMX system when the time comes, to get a better price, and then start afresh. By the time Pentium II systems are below £1000, mass-market pricing should ensure that the other components they use will have come down in price significantly as well.

Of course, no-one is forcing you to upgrade; as long as your current system is fast enough to support the applications you want to run, by all means stick with it. However, the fact remains that major updates for each sequencer seem to occur about every 18 months or so, and it is likely that Pentium II systems will be required for efficient operation of state-of-the-art software by the end of 1998. SOS

"When it comes to music applications, it pays to have Intel Inside."



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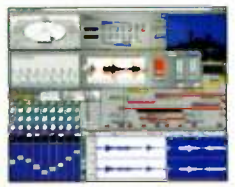

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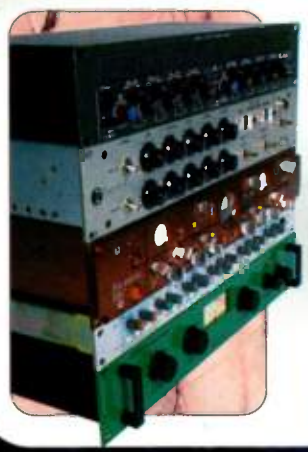

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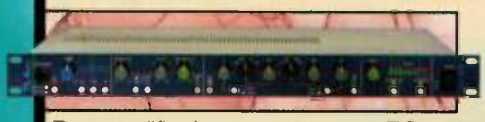

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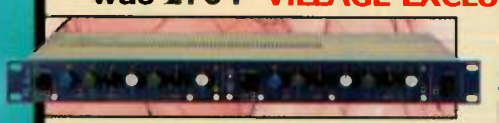

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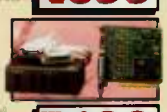

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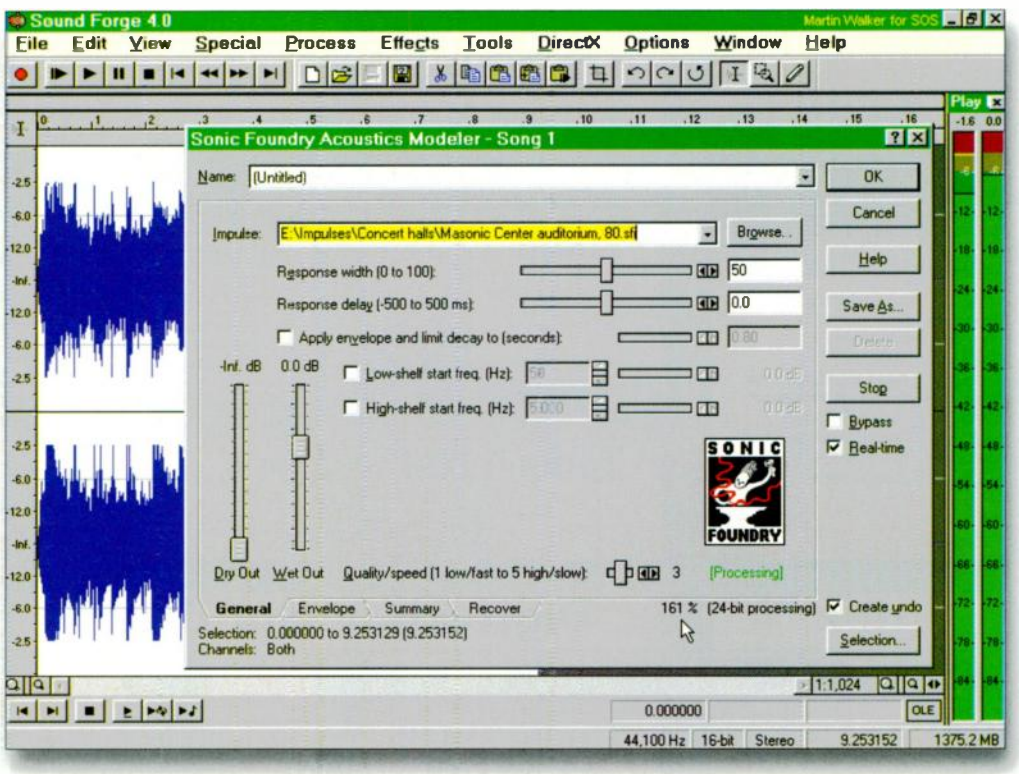
outer spaces

SONIC FOUNDRY *ACOUSTICS MODELER* DIRECTX PLUG-IN FOR PC

If you want to recreate the sound of a particular hall or studio live room, why not capture its essence and then use this to treat your music? Sonic Foundry's new software makes it all possible. MARTIN WALKER samples the results.



Here is the Acoustics Modeler window inside Sound Forge. The auditorium sound currently running in real time takes more than 100% of the computer's processing power with a Pentium 166MMX — but who said realism was easy?

Acoustics Modeler is a new PC plug-in from those clever people who designed *Sound Forge* (and for those who don't know, the name is not a misprint, but the American spelling of 'Modeller'). Rather than launching yet another reverb plug-in, Sonic Foundry have provided a way to capture the sound of real acoustic spaces, such as actual halls, rooms and churches, reduce each of these to an 'acoustic signature', and then allow you to use these to add the effect of the chosen environment to any audio recording. Since the signature is of a real environment, the result can be uncannily real. However, *Acoustics Modeler* doesn't stop there — the same system can capture the signature of a music signal emerging from another piece of equipment, such as an existing reverb unit, or an expensive condenser mic, to simulate passing your music through the same device. It can even be used in a totally off-the-wall fashion, by creating signatures from synth patches, or indeed any recorded sound, and using these to process other sounds, for some totally unique results. Appetite whetted? Let's take a closer look.

SOFTWARE SUPPORT

Since *Acoustics Modeler* is compatible with Microsoft's DirectX plug-in standard, it can be accessed from any application that supports DirectX, such as the 'big three' PC MIDI + Audio sequencers (*Cakewalk Pro Audio* v6, *Cubase VST PC* v3.5, and *Logic Audio* v3.0), as well as audio editors such as *Sound Forge* v4.0 itself, and *WaveLab* v1.6. The installation routine checks that you have DMSS (DirectX Media Streaming Services) on your PC, and if not, offers to install it for you. Copy protection is taken care of via a unique serial number found inside the front cover of the manual, which must be entered just once, but the CD-ROM will be required again if you download ▶

pros & cons

SONIC FOUNDRY *ACOUSTICS MODELER*
£199

pros
- Wide variety of realistic reverb effects.
- Realistic price as well.
- Ability to capture your own sounds.

cons
- Heavy-duty processor needed for real-time operation.

summary
An extremely clever plug-in that provides a host of unique reverb sounds, as well as many bizarre treatments.

SOUND ON SOUND

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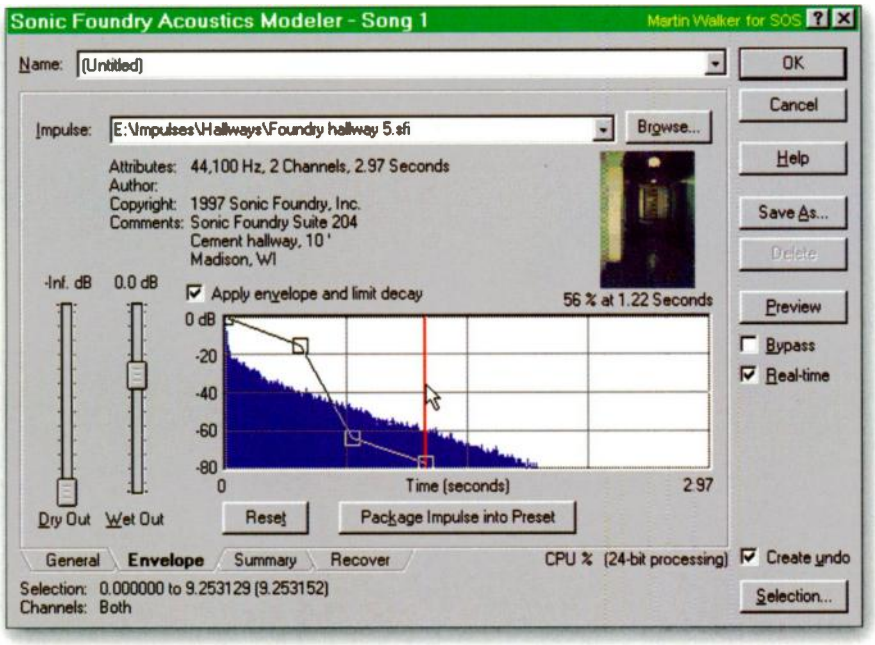
any free software update from the Sonic Foundry web site, just to check your honesty. As with all audio software, your PC must be fairly powerful, but *Acoustics Modeler* needs more power than most for real-time operation. You will need a Pentium, but a Pentium Pro is recommended, along with Windows 95 or NT 4.0 (or later). Due to the large amount of data processing, 24Mb of RAM is required, along with several hundred megabytes of temporary storage space on your hard disk.



The Envelope page allows the user to create gating effects, and impose a volume envelope to change the recorded decay characteristics of the chosen environment.

Once installed, the program can be accessed from any DMSS-compatible host, and basic operation is simplicity itself. You just choose an Impulse file (which contains the acoustic 'distillation'), either by typing in its name, or using the Browse button to call up a list of such files provided with the package — there are a wide variety on the CD-ROM. These normally have a Sonic Foundry Impulse file extender (.SFI), although choosing a normal WAV file can also produce interesting (although often unusual) results. The natural sounds include not only standard environments like halls, churches, and auditoria, along with hallways, tunnels, and bridges, but also extend to forests and caves. On the equipment front, there is a range of mics (including condenser, dynamic, and ribbon), guitar amp spring reverbs, and a selection of real reverb plates. However, nothing escapes the microphones of the Sonic Foundry team, and even showers, bathrooms, kitchens, and their new office have been pressed into service (before the furnishings went in, by the sound of it!).

Once you start to think of these Impulses as simply acoustic events, changing over time, you start to realise why there are also folders containing the sound of running streams, footsteps, synth sweeps, and even drum loops — any changing sound can be mapped onto an audio signal, to give all sorts of weird acoustic vocoder-like effects.

SOUNDING IT OUT

Once you have chosen an Impulse, you simply preview the sound as with any other plug-in, either in real time, or letting the program build a preview. Since *Acoustics Modeler* takes a lot of processing power, there is a five-way Quality/Speed setting which defaults to position 3 — the lower the setting, the less processing power is required, and the more likely you are to get a glitch-free preview. However, the drop in quality is significant: position 1 is in mono, and position 2 often sounds quite 'grainy'. As you increase the Quality/Speed setting up to 5, the spatial characteristics become more pronounced. The top position is obviously the setting to use when treating your sounds, but many people will lack sufficient power to hear these in real time, especially with the larger environments, whose decay times are longer.

Since what you hear from *Acoustic Modeler* is the effect of a real 'space', at a predetermined distance, you will normally only want to use the 'Wet' signal, as real reverb already includes the correct proportion of Dry and Wet sound. However, vertical sliders are provided so that you can set up your own balance if you wish. There are four pages of software settings: General, Envelope, Summary, and Recover. On the General page, besides the Dry and Wet controls (which are duplicated on several of the other pages), there are five additional horizontal slider controls (see the main screen on the first page of this article). Response Width defaults to 50% (the normal stereo response, as

DOING IT THE HARD WAY

Simulating real spaces using normal reverb algorithms can often prove frustrating. What if you find that a drum kit sounds wonderful in a certain stone cellar, or in the church hall that you use to practise in? If you attempt to recreate this environment using a standard rackmount reverb unit, you'll probably end up suffering from terminal frustration. When reviewing effects units, I've often tried to duplicate the sound of one reverb patch on another unit, and although you can quickly get fairly close when listening, for instance, to a single drum hit, as soon as you compare the two patches with another sound source, you realise how much is still different — the changing frequency response of the reverb tail as it decays and the spread of reflections all conspire against you in duplicating a reverb 'sound'.

Some units provide a Room Size parameter, which is a good start, but you've still got to know enough about acoustics to adjust all the other parameters correctly (or have golden ears). Although controls for decay time, along with low- and high-frequency Damping, can be set fairly quickly by ear to approximate the size, surfaces and materials used in the room, the grouping of initial reflections can make or break the overall effect. All of these parameters are incorporated into the complex algorithms locked away inside the DSP chips of the reverb unit. The algorithms on high-end units such as those made by Lexicon are world-renowned for their clarity and smoothness, but every manufacturer will have a subtly different sound.

Acoustic modelling does offer a way for musicians with powerful computers to gain access to extremely realistic environments. The only alternative is to get out the microphones and record your sounds at the appropriate venue — this may arguably produce more hi-fi results, but at the expense of flexibility and easy access. It also assumes you have the cash to re-hire the Royal Albert Hall every time you need to add a touch more reverb to that drum sound!

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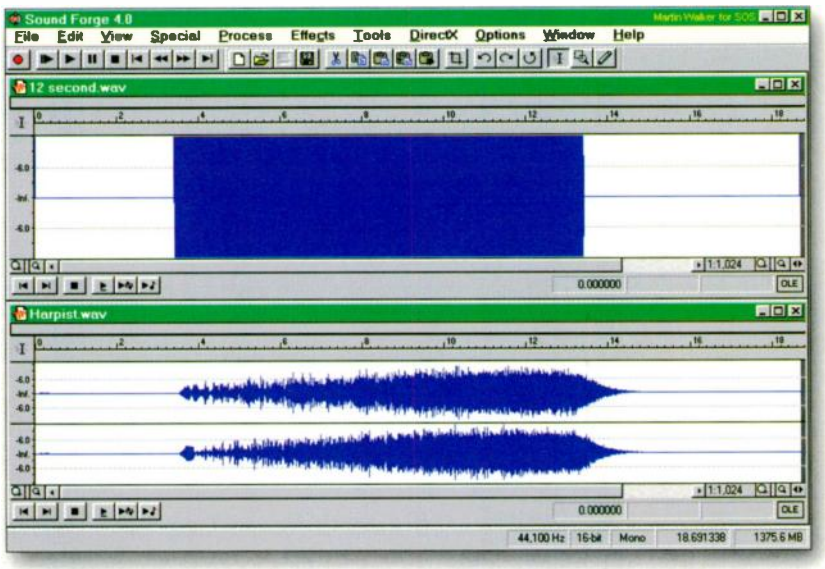
initially recorded in the Impulse), but you can reduce it all the way down to 0% for a totally mono result, and increase it 'beyond the speakers', all the way to 100%, although this does sound rather unnatural at extreme settings. Response Delay alters the relative timing between the Dry and Wet signals (-500ms to +500ms). Again, the default position is in the middle, with other positive values delaying the wet signal, and negative ones producing pre-delay, with the dry signal after the wet, for special effects.

it can also be a good way to manage those Impulses with longer decays (less PC processing power is needed if the modelling is applied to a truncated version of the sample). The Reset button returns the envelope to its default (flat out) setting, and the 'Package Impulse into Preset' button combines the Impulse with your current control settings, and saves it. The Envelope page also displays a small graphic showing where the Impulse was recorded (if a graphic was attached to the Impulse file).

"*Acoustics Modeler* should come into its own for special effects — if you find yourself wondering what that synth pad would sound like in the bowels of a cave, within a huge forest, or even underwater, now's your chance to find out for real!"



I grabbed a reverb preset from my Alesis Midiverb 4: the upper plot show the test-tone frequency sweep, along with the two spikes (extreme beginning and end). The lower plot shows the WAV file recorded from the output of the Midiverb 4 — the Impulse is extracted from this.

There are two shelving filters, each with a +/- 15dB range; the low shelving one can be set between 15 and 15000Hz, and the high shelving one between 20 and 20000Hz.

The final horizontal slider on the General page also features a graphic display from inside the main display of the Envelope page (see screenshot on page 120). If the checkable option box marked 'Apply envelope and limit decay' is selected, you can drag the vertical red line on the graphic display (the decay time) to chop off the decay portion of the sound and create gating effects. The actual volume envelope can also be modified, by creating and dragging any number of graphic envelope points. Although you can use this for special effects,

The Summary page simply shows a larger version of the same picture, along with any descriptive notes that have been saved with the Impulse. The fourth and final page is Recover, and this is where you can convert your own WAV files into Impulses (the acoustic signature is 'recovered' from the WAV file). This is one of the main beauties of this program — you aren't restricted to what the manufacturer provides. Several test signals are provided on the CD-ROM; they all consist of a full-frequency sweep signal, with a single narrow pulse recorded a few seconds before the start of the sweep, and again after it finishes. The idea is that you set up a loudspeaker in your environment, replay the test signal, and then record the resulting sound, using a stereo microphone (or crossed pair), into your soundcard, using any stereo recording application (such as *Sound Forge* itself). The distance between the loudspeaker and the microphone will determine the wet/dry balance (this is real life, after all), and the room will add its sound to the test signal.

Once you have a stereo WAV file, this is 'topped and tailed', to remove all but the initial spike (for timing information), the sweep (containing the frequency response against time, including the early reflection information), and the decay right up to the start of the second spike (to ensure that the program knows what happens after the sweep has finished, to calculate the remainder of the reverb decay). Then you enter the Recover page, point to your recorded file,

APPLYING MORE THOUGHT

Once you get past the initial 'gee-whiz' factor, *Acoustics Modeler* would seem to have many additional uses, apart from providing a software reverb with presets named 'Royal Albert Hall', 'Ronnie Scott's with lots of people crammed in', and 'Taj Mahal at sunset'. It would seem ideal for film and TV post-production, where Impulses could be captured on location, for adding to overdubbed dialogue later in the studio. Sound effects (foley) could still be produced in the studio, but again with acoustics captured previously from the actual set or location.

One thing this plug-in can't do is model non-linear systems, such as valve enhancers and guitar stomp boxes. This is because a different Impulse would be produced at every input level, since the frequency response is constantly changing, depending on the level presented to the input. I was surprised at some of the results given by using standard WAV files as Impulses. Rather than simply producing novelty effects, the process often created sounds that were a strange amalgam of the two sources. I suspect that creative users of *Acoustics Modeler* won't just use it to add a modelled 'space' around existing tracks, but also to twist new textures from their music, or to create new standalone samples.

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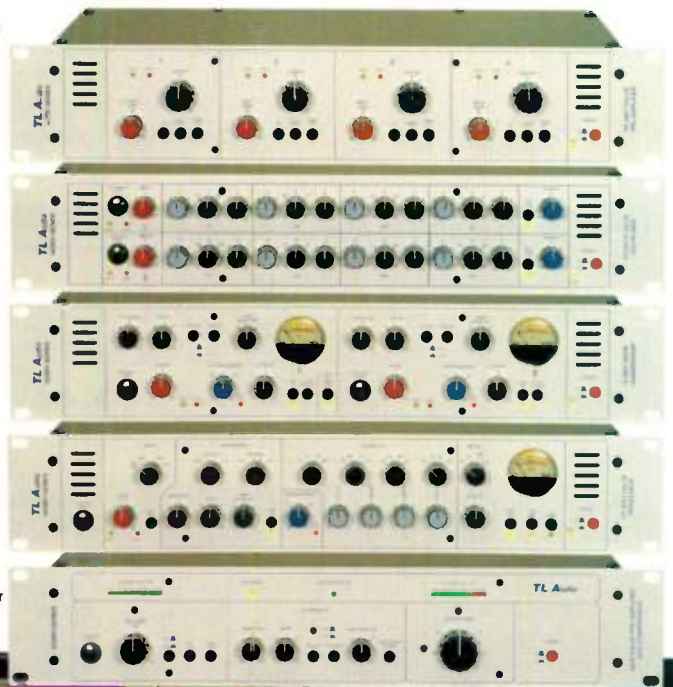

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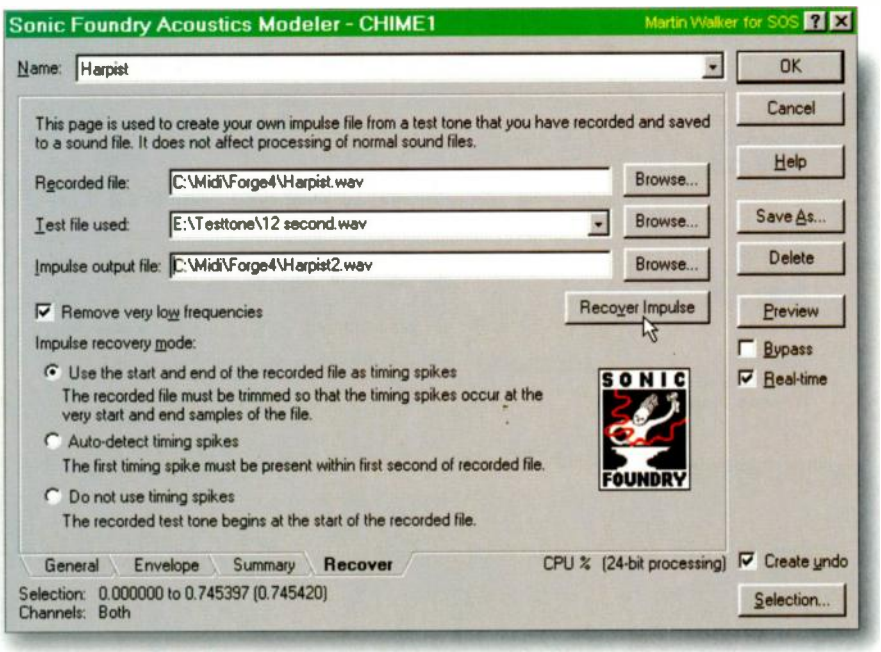
to the test tone that you used to create it, select an output filename, and then press the Recover Impulse button (see the screenshot below). The Impulse file is then written as a new WAV file in just a few tens of seconds, depending on its length.

THE PROOF OF THE PROCESSING

The Impulses provided with the program give a huge range of quality sounds, with a wider spread of reverbs than you could create in the majority of rackmount reverb units. Some of the really huge ones, such as 'State Capitol Dome', are wonderful, although more mundane settings such as multi-storey car parks still provide exciting results. More unusual sources, such as 'Barn Silo', gave a useful reverb, but with an almost vocoded after-echo. You do have to be careful to avoid overload, and normalised input signals can cause problems unless you pull down the Wet Out slider a bit — just adjust it so that the output play meters never clip.



Once you have recorded your test tone output, you simply load it into the Recover page, and press the Recover Impulse button, and yet another acoustic environment is saved to your hard disk.

My Pentium 166MMX showed occasional readings of 2000% processor overhead, but quite often there were still no audible glitches, which makes me wonder just what the processor overhead indicator is reading. However, when they did occur, the gaps in the waveform lasted a second or so, although they never crashed *Sound Forge*. The audible results seemed far better than the processor overhead would indicate, and Sonic Foundry do mention various buffering tweaks that managed to get rid of my gapping in most cases.

As with all products that push back the boundaries, there are a few initial teething troubles with host applications other than *Sound Forge* itself. Apparently, both *WaveLab* and *Cakewalk* can crash and stutter during real-time playback, and *WaveLab* only shows one of the four available pages. Philippe Goutier (the designer of *WaveLab*) sent me a pre-release patch during the course of this review, which cures both these problems, and which should be generally available shortly. Expect speedy updates to all of these problems — thankfully, manufacturers of real time plug-ins seem to be pulling together, as compatibility is the major lure for future customers.

To find out just how much information could be extracted via the Impulse, I grabbed the output of a reverb patch (see screenshot on page 122), and then created an Impulse from it. Comparing an 'Impulse-treated' sound using *Acoustics Modeler* with the actual reverb unit sound was very interesting; despite the limitations of the average PC soundcard, the sounds were very close, and it should prove an ideal way of storing a selection of unique reverb effects. Of course, it is far less convenient than using a real-time external reverb unit, but then not everyone can have access to a £2500 Lexicon!

SUMMARY

This is an extremely clever program, with a wide variety of potential applications. Sadly, its high processing needs make it unlikely to run successfully in real time for all but shorter Impulses, unless you have a powerful processor (Sonic Foundry are being realistic in recommending a Pentium Pro). This will probably preclude it from use inside many people's MIDI + Audio sequencers, although you could still treat the required track off-line, and then use the permanently altered version. This would also allow you to always use the highest quality settings, for best audio results.

I suspect that some people will buy this program to use as a bit of a gimmick, but it's far more than that — the ability to accurately recreate the sound of any real environment is an extremely powerful one, especially for TV or film work (see the 'Applying More Thought' box). Indeed, once you start trying out some of the more unusual impulses provided, it becomes obvious that the sound-changing possibilities go far beyond reverbs. Being able to impose the frequency and decay characteristics of one sound on another is a bit like vocoding, although the modulator needs in this case to be a shorter 'hit', rather than a continuous second signal, as processing requirements rise with the Impulse length. The beauty of Impulses is that if you want a particular setting, you choose it from nature, rather than attempting to work out what knob settings to dial in on a rack unit. *Acoustics Modeler* is excellent value, and comes into its own for special effects — if you find yourself wondering what that synth pad would sound like in the bowels of a cave, within a huge forest, or even underwater, now's your chance to find out for real!

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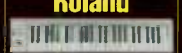

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The Control 16 hardware control surface — there's no need to tackle virtual faders in PARIS if you don't want to.

french ...

ENSONIQ PARIS II

SPEC CHECK

Surprisingly, unless I went blind through twiddling so many knobs during the course of this review, Ensoniq don't seem to provide a technical specification in the otherwise well-written reference manual (143 A4 pages, paperback, in English). However, I managed to cobble the following together from various pages on the web site, and from my own measurements:

- **A/D conversion: 20-bit, 128x oversampling**
- **D/A conversion: 20-bit, 128x oversampling**
- **Sampling Rates: 44.1, 48kHz**
- **Internal processing: 24-bit**
- **Input s/n ratio: Not stated, but measured at -90dB (unweighted)**

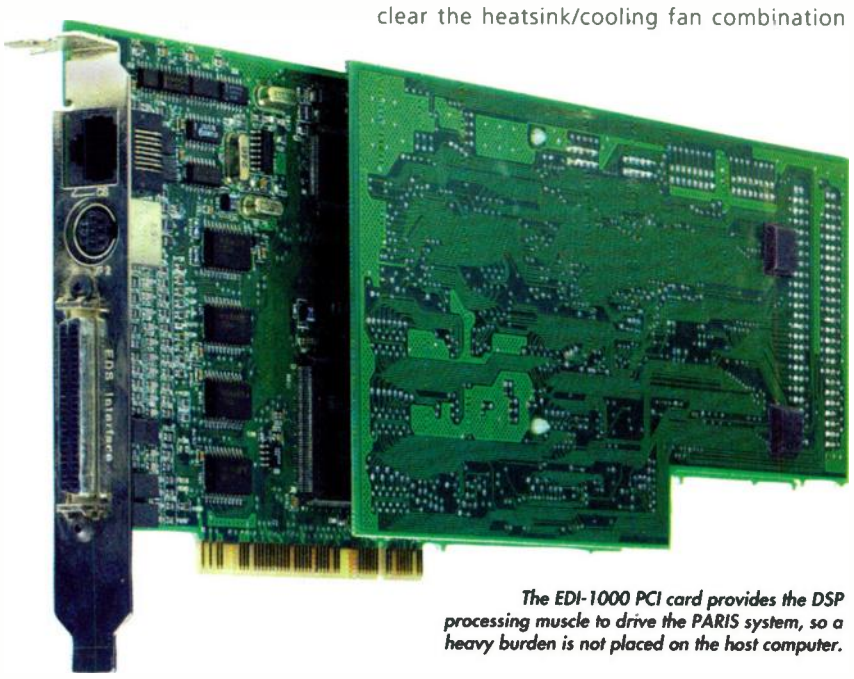
▶ PARIS also uses its own optimised 16- and 24-bit file formats. On the PC side, PARIS is compatible with MMX processors, but does not yet use their extra facilities directly, although this is mooted for a future update. Also, the soundcard has no MME drivers for general-purpose use, although there should be no conflicts if you run an additional soundcard, for use with other applications such as *WaveLab* or *Sound Forge* for mastering. Let's get Bundle II plugged in, before I need to have a lie down from over-excitement.

INSTALLATION

Unusually, the PARIS system provides software support for both PC and Mac right from the outset, but my first job was to get the EDI-1000 plugged into a PCI expansion card slot in my PC. At 11.25 inches long it's not the longest card to date (that dubious honour is still held by DAL's V8), but it is long enough to cause problems in many PCs with the Baby AT motherboard format. These place the main processor (CPU) directly in line with the PCI slots, and although Ensoniq have sensibly provided a cutaway where the card is likely to foul the processor, it is still insufficient to clear the heatsink/cooling fan combination strapped onto most high-speed MMX chips. I managed to scrape through (quite literally) by removing the cooling fan and relying on the heatsink alone. For the short-term purposes of this review I was prepared to risk my processor temperature rising significantly, but I would not recommend it for a proper installation. ATX motherboard owners will have no such problems, but do check the situation inside your own machine before making a purchase [*see 'Chips with Everything' feature starting on page 100 of this issue for more information*].

Once the card is in place, there are two supplied cables to connect it to the outside world — a 50-way SCSI II cable to the 442 interface, and an RJ45 network-type cable to the Control 16. These are both also available as standard items from many computer suppliers, which makes it easy to replace the cables, or to extend them, although Ensoniq do point out that you can damage the PARIS system if you plug its components by mistake into a SCSI II buss or Ethernet socket on your computer. The maximum cable lengths recommended are 10 feet for the interface, and 50 feet for the Control 16, which allows you to place it exactly where you need it.

Every PCI card I have ever installed seems to sail through the software installation, and this one was no exception — Plug and Play set up the single interrupt required, and Windows 95 requested the driver disk at the appropriate point in the proceedings and installed the driver with no problems. The supplied software also installed without a hitch, and despite my heatsink manipulations, I was up and running within an hour of unpacking the hardware from the boxes.



The EDI-1000 PCI card provides the DSP processing muscle to drive the PARIS system, so a heavy burden is not placed on the host computer.

UNDER DEVELOPMENT

You should always decide to buy on the basis of what is available now, rather than relying on promised future releases. However, the PARIS system web site already has photographs of three expansion modules for the MEC which appear to be close to completion, so it's worth taking a quick look. First, A8oT-20 provides a further eight analogue outputs on quarter-inch TRS connectors, and the A8iT-20 gives you the same input expansion. The ADI is an 8-channel optical ADAT interface.

Also planned (but maybe just a twinkle in the designer's eye at the moment) is a pair of modules providing four analogue inputs and four analogue outputs, both with combination XLR/jack sockets, a SMPTE timecode card, 8-channel Tascam TDIF digital interface, and a 2-channel AES/EBU and S/PDIF digital I/O, which will please those using the more professional standard. Unlike many promises given by manufacturers, which rely on DSP power being used in ever-more clever ways by software upgrades, these projected Ensoniq developments are hardware add-ons. Of the two approaches, it is always far more likely that hardware will appear as promised, since, however clever the software designers, there's always a limit to how much can be achieved using software alone.

SOCKET SURVEY

The 442 interface provided with Bundle II has four analogue inputs and four analogue outputs. These are all on electronically balanced TRS quarter-inch jack sockets, and there's a global ground-lift switch for all inputs and another for all the outputs. There's a software setting to switch between -10dBV and +4dBu levels in the Patchbay window of the software. Also on the 442's back panel are clock input and output (both on lockable BNCs), S/PDIF in and out (on co-axial phonos), and the Interface 2 socket (as mentioned earlier). Although AES/EBU sockets are not provided, Ensoniq state in the manual that these signals will be compatible, as long as electrical conversion (using some sort of adaptor box) is carried out first. On the front panel there's a line of LED indicators, with each of the four inputs having a pair of level indicators (green for 'signal present' at -30dB, and red at 6dB below clipping point). Another pair of LEDs monitors the sample rate, and a combination of steady or blinking output from each one indicates 44.1kHz, 40kHz-46079Hz, 48kHz, 46080Hz-50kHz, or 32kHz (playback only — recording at this rate is not supported), which covers most bases. The final four LEDs indicate sync source, and are labelled ▶

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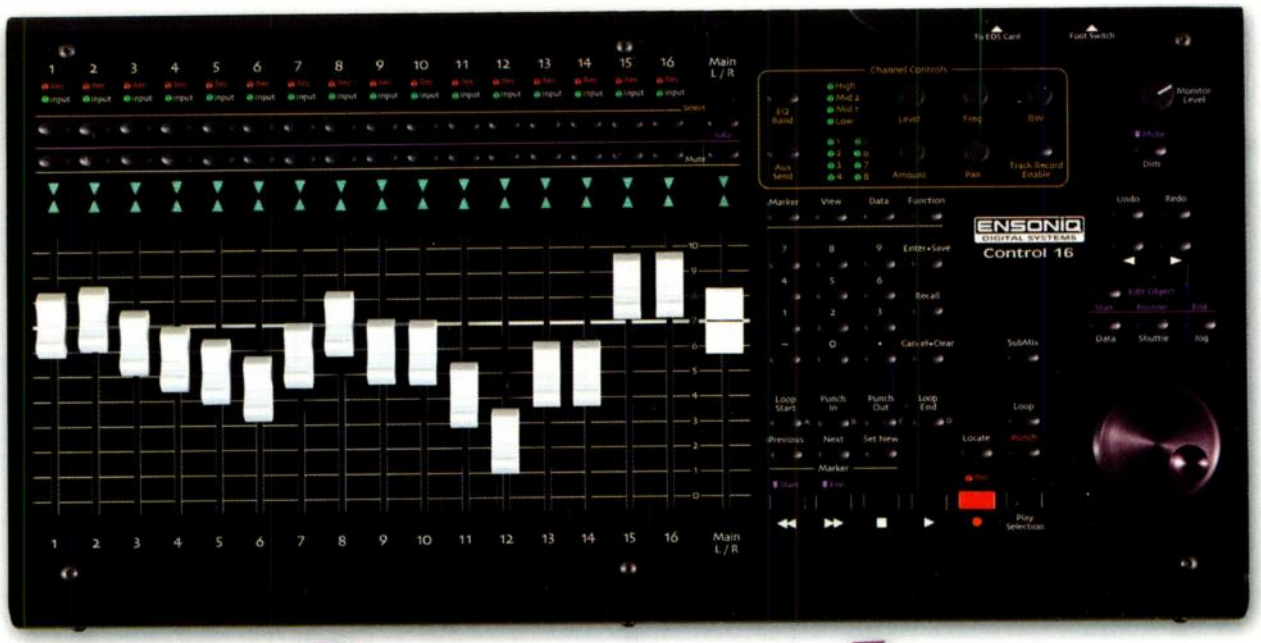
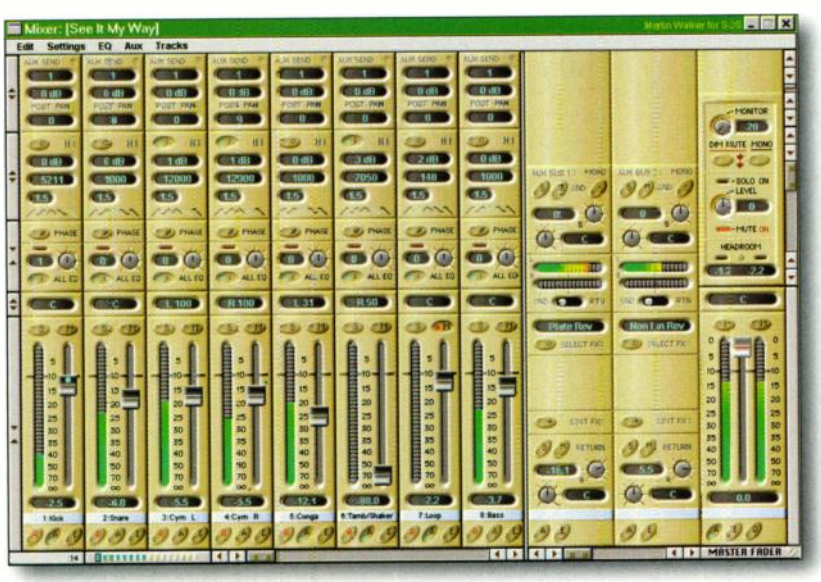


The Control 16 hardware control surface — there's no need to tackle virtual faders in PARIS if you don't want to.

french polish

ENSONIQ PARIS II PCI HARD DISK RECORDING SYSTEM

When it comes to computer audio editing, the user interface is extremely important. Having physical controls to grab hold of has already given Ensoniq a lot of advance publicity for their PARIS hard disk recording system. MARTIN WALKER plugs in, turns on and, for once, slides up and down as well.



Tasty or what? This is the full-size Mixer page, showing the sculpted panelwork. The scroll bars (at the bottom of the display) allow you to selectively view different inputs of the 16 available.

There seem to be as many different approaches to designing hard disk recording hardware as there are variations in the computers destined to run them. The Ensoniq PARIS hard disk recording system was formally unveiled at the recent AES show in New York, and has already generated a huge amount of interest, for reasons that will soon become clear. PARIS stands for Professional Audio Recording Integrated System, and provides playback of between 16 and 128 virtual channels at 16-bit resolution and 44.1 or 48kHz sample rate, using 20-bit A/D and D/A converters, and a 24-bit internal audio path. It consists of one or more PCI cards (along with software that allows them to work with both PC and Mac), a selection of external interfaces (depending on the bundle), and a control surface. This latter item is the source of a lot of the interest, since it provides a tactile interface (knobs and faders to you and me) and removes the biggest bugbear of most computer-based editors — that although operating a virtual mixer with a mouse may be flexible and fast, being able to grab a handful of physical controls and give them a tweak always wins hands down (literally).

The system's second important distinction is that, rather than grinding to a halt when called on to run a host of DSP effects using software alone, the PARIS card incorporates six of Ensoniq's ESP2 proprietary 24-bit digital signal processors, as used in their DP/Pro effects unit. If there's one thing I've learnt from all the hard disk recording systems I've looked at to date, it's that if you want to keep ▶

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pros & cons

ENSONIQ PARIS

pros

- Excellent sound quality.
- Hardware real-time EQ and effects.
- Runs on modest computer systems.
- Lots of knobs!
- Both PC and Mac software included in price.

cons

- Card may not fit into many Baby AT PC motherboards.
- No built-in support for AES/EBU hardware.
- Cannot be accessed by other MIDI + Audio sequencers.

summary

A very flexible and expandable system, with excellent audio quality, built-in effects and EQ in hardware, and the huge advantage of real knobs.

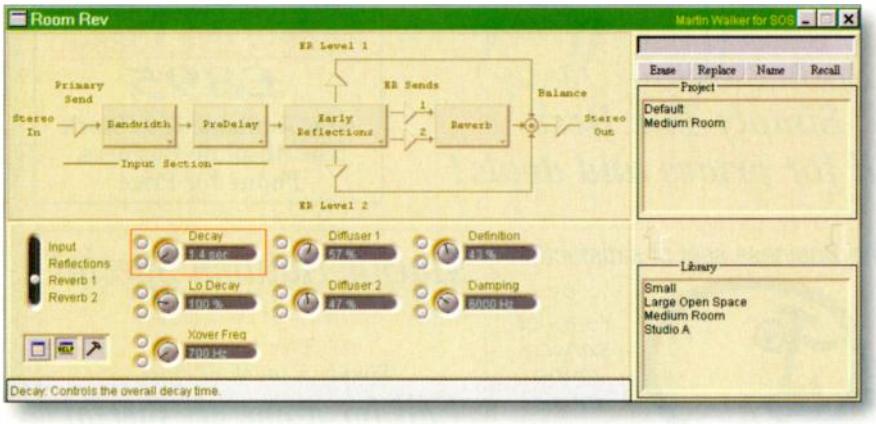
SOUND ON SOUND

all of your audio in the digital domain you always need a quality digital reverb, and these always take a huge chunk of processor power. If you have an extremely powerful computer, you may be able to use a program like *Cubase VST* and get all the effects you want from software alone. However, realistically, if you want to replace a typical multi-effects analogue mixing system, hardware assistance is almost essential. Ensoniq have a head start in this area, since their expertise in DSP effects is already extremely well established (the Ensoniq DP/4, released way back in 1992, already provided four completely separate effects processors in a single box). Only Lexicon, with their forthcoming Studio system (which incorporates the equivalent of a PCM90), are likely to steal any of PARIS's thunder. Of course, Ensoniq are hoping for third-party plug-in support, but to launch any system with quality effects already built in is a major plus.

BUNDLES OF JOY

For once, PARIS allows you to start in a fairly modest way, without tying you down too much. There are currently three bundles on offer: they all include the core system (EDI-1000 PCI card, Control 16 control surface, and cross-platform software), but provide different input/output options. Bundle I has the Interface 2, which is a basic 2-channel external interface with two independent inputs and outputs (balanced quarter-inch TRS jack connectors), and an audio level-matching switch. Bundle II (the subject of this review) provides the interface 442 — a 1U rackmounting case with four independent inputs and outputs, a stereo digital input and output, and external clock input and output, for sync'ing to other equipment. However, even if you started with the Interface 2, you could still plug this into an expansion connector on the 442.

Bundle III, for those with larger bank balances, introduces us to the MEC (Modular Expansion Chassis). This is a 5U rackmounting 'cage', which includes a unit based on the 442, but with an added front-panel headphone jack and level control. There's also additional space to plug in up to nine more expansion modules, if you need more inputs and outputs.



Each of the 13 effect algorithms on offer can be edited, and they give a huge amount of flexibility. This is the Room Reverb, with a schematic above and the adjustable controls beneath. The 4-way switch on the left brings up additional controls for each section — there are 22 controls in total for the Room Reverb!

The control surface features 16 100mm faders, a large weighted shuttle wheel (for scrubbing, editing and data entry), a numeric keypad (for markers, screen views and data entry), and the *piece de resistance* for most people — a complete dedicated set of transport buttons.

It seems odd to talk about the soundcard last of all, but I think this partly explains the level of interest in PARIS — most musicians are far more concerned about the ins, outs, and user interface than they are about what's under the bonnet. However, without sufficient power the system would grind to a halt, so the spec of the EDI-1000 card is reassuring. Being PCI, it will plug into either a Pentium PC or PowerPC Mac computer, and allow up to 24 simultaneous streams of digital data using Buss Master DMA, which leaves the computer's main processor (CPU) to carry on its normal activities without being slowed down at all. The card provides 20 inputs and 20 outputs with 24-bit resolution, and any combination of 16 simultaneous tracks split between recording and playback. The final carrot is due to the special on-board Ensoniq VLSI chips mentioned earlier: straight from the box, PARIS has a library of real-time reverbs, compressors and EQs based on the well-respected DP/Pro. However, both the main computer processor and the on-board DSPs are used for audio processing, so the publicity claims that you get the best of both worlds.

OVERVIEW

PARIS is supplied as a complete hard disk audio recording system, running with its own proprietary audio software. The on-board DSP power is sufficient to provide a fully-fledged mixer with 16 channels, each with up to four parametric EQ sections — a total of 64 bands of EQ is possible, chosen from low-pass, low-shelf, band-pass, high-pass and high-shelf. However, they do not steal any DSP power from the effects — up to 16 mono or eight stereo real-time effects (or any combination) can be run simultaneously, and these can be configured either with aux send/returns (up to eight), or given an individual channel insert. Automation of all faders, pan controls and mutes is also provided. Support for multiple cards allows the user to further expand the system beyond the basic 16 channels or so achievable by a single card. The maximum configuration will depend on the number of PCI expansion slots available in your computer, as well as its processing power.

Being PCI, either a PC or Mac can be used, as I mentioned earlier: Ensoniq recommend minimum specs of a 120MHz PowerPC 604/604e, a 150MHz PowerPC 603/603e, or a 133MHz Pentium, all with 32Mb of RAM (although 48Mb is preferred for the Macs). The 601 processor of the Apple 7200 is not recommended. There are no MIDI recording facilities — although you can use PARIS to provide sync for external MIDI sequencers such as *Cubase VST*, *Cubase* cannot directly access the on-board PARIS DSP power. *Sound Designer II* and WAV file formats are supported, although

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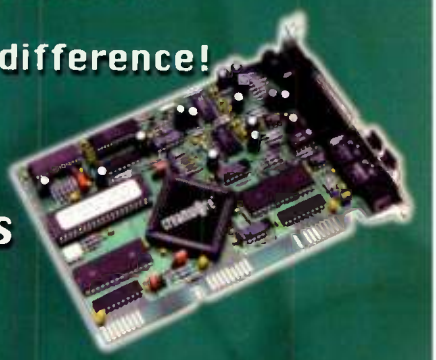

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SPEC CHECK

Surprisingly, unless I went blind through twiddling so many knobs during the course of this review, Ensoniq don't seem to provide a technical specification in the otherwise well-written reference manual (143 A4 pages, paperback, in English). However, I managed to cobble the following together from various pages on the web site, and from my own measurements:

- A/D conversion: 20-bit, 128x oversampling
- D/A conversion: 20-bit, 128x oversampling
- Sampling Rates: 44.1, 48kHz
- Internal processing: 24-bit
- Input s/n ratio: Not stated, but measured at -90dB (unweighted)

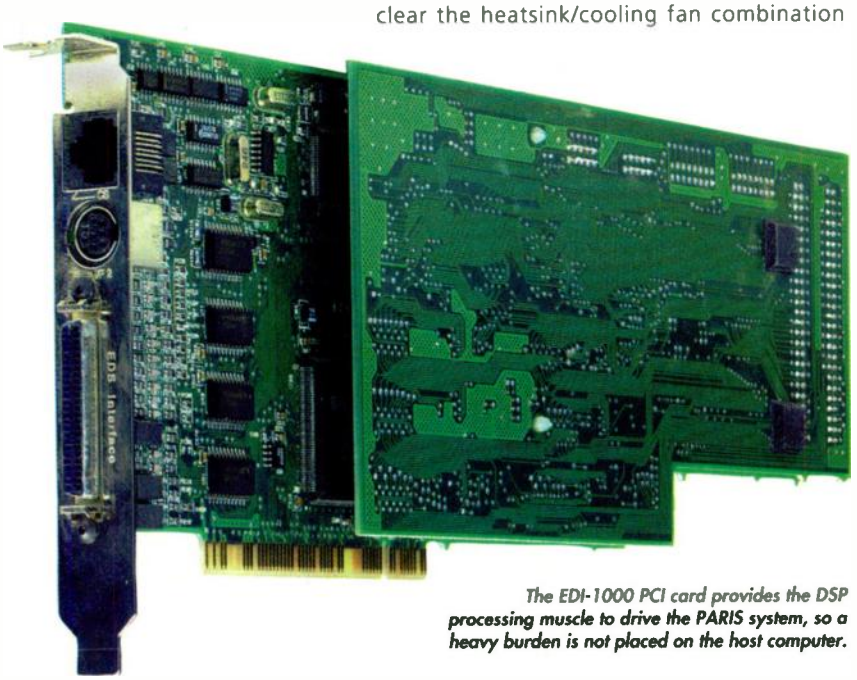
PARIS also uses its own optimised 16- and 24-bit file formats. On the PC side, PARIS is compatible with MMX processors, but does not yet use their extra facilities directly, although this is mooted for a future update. Also, the soundcard has no MME drivers for general-purpose use, although there should be no conflicts if you run an additional soundcard, for use with other applications such as *WaveLab* or *Sound Forge* for mastering. Let's get Bundle II plugged in, before I need to have a lie down from over-excitement.

INSTALLATION

Unusually, the PARIS system provides software support for both PC and Mac right from the outset, but my first job was to get the EDI-1000 plugged into a PCI expansion card slot in my PC. At 11.25 inches long it's not the longest card to date (that dubious honour is still held by DAL's V8), but it is long enough to cause problems in many PCs with the Baby AT motherboard format. These place the main processor (CPU) directly in line with the PCI slots, and although Ensoniq have sensibly provided a cutaway where the card is likely to foul the processor, it is still insufficient to clear the heatsink/cooling fan combination strapped onto most high-speed MMX chips. I managed to scrape through (quite literally) by removing the cooling fan and relying on the heatsink alone. For the short-term purposes of this review I was prepared to risk my processor temperature rising significantly, but I would not recommend it for a proper installation. ATX motherboard owners will have no such problems, but do check the situation inside your own machine before making a purchase [*see 'Chips with Everything' feature starting on page 100 of this issue for more information*].

Once the card is in place, there are two supplied cables to connect it to the outside world — a 50-way SCSI II cable to the 442 interface, and an RJ45 network-type cable to the Control 16. These are both also available as standard items from many computer suppliers, which makes it easy to replace the cables, or to extend them, although Ensoniq do point out that you can damage the PARIS system if you plug its components by mistake into a SCSI II buss or Ethernet socket on your computer. The maximum cable lengths recommended are 10 feet for the interface, and 50 feet for the Control 16, which allows you to place it exactly where you need it.

Every PCI card I have ever installed seems to sail through the software installation, and this one was no exception — Plug and Play set up the single interrupt required, and Windows 95 requested the driver disk at the appropriate point in the proceedings and installed the driver with no problems. The supplied software also installed without a hitch, and despite my heatsink manipulations, I was up and running within an hour of unpacking the hardware from the boxes.



The EDI-1000 PCI card provides the DSP processing muscle to drive the PARIS system, so a heavy burden is not placed on the host computer.

SOCKET SURVEY

The 442 interface provided with Bundle II has four analogue inputs and four analogue outputs. These are all on electronically balanced TRS quarter-inch jack sockets, and there's a global ground-lift switch for all inputs and another for all the outputs. There's a software setting to switch between -10dBV and +4dBu levels in the Patchbay window of the software. Also on the 442's back panel are clock input and output (both on lockable BNCs), S/PDIF in and out (on co-axial phonos), and the Interface 2 socket (as mentioned earlier). Although AES/EBU sockets are not provided, Ensoniq state in the manual that these signals will be compatible, as long as electrical conversion (using some sort of adaptor box) is carried out first. On the front panel there's a line of LED indicators, with each of the four inputs having a pair of level indicators (green for 'signal present' at -30dB, and red at 6dB below clipping point). Another pair of LEDs monitors the sample rate, and a combination of steady or blinking output from each one indicates 44.1kHz, 40kHz-46079Hz, 48kHz, 46080Hz-50kHz, or 32kHz (playback only — recording at this rate is not supported), which covers most bases. The final four LEDs indicate sync source, and are labelled

UNDER DEVELOPMENT

You should always decide to buy on the basis of what is available now, rather than relying on promised future releases. However, the PARIS system web site already has photographs of three expansion modules for the MEC which appear to be close to completion, so it's worth taking a quick look. First, A8oT-20 provides a further eight analogue outputs on quarter-inch TRS connectors, and the A8iT-20 gives you the same input expansion. The ADI is an 8-channel optical ADAT interface.

Also planned (but maybe just a twinkle in the designer's eye at the moment) is a pair of modules providing four analogue inputs and four analogue outputs, both with combination XLR/jack sockets, a SMPTE timecode card, 8-channel Tascam TDIF digital interface, and a 2-channel AES/EBU and S/PDIF digital I/O, which will please those using the more professional standard. Unlike many promises given by manufacturers, which rely on DSP power being used in ever-more clever ways by software upgrades, these projected Ensoniq developments are hardware add-ons. Of the two approaches, it is always far more likely that hardware will appear as promised, since, however clever the software designers, there's always a limit to how much can be achieved using software alone.

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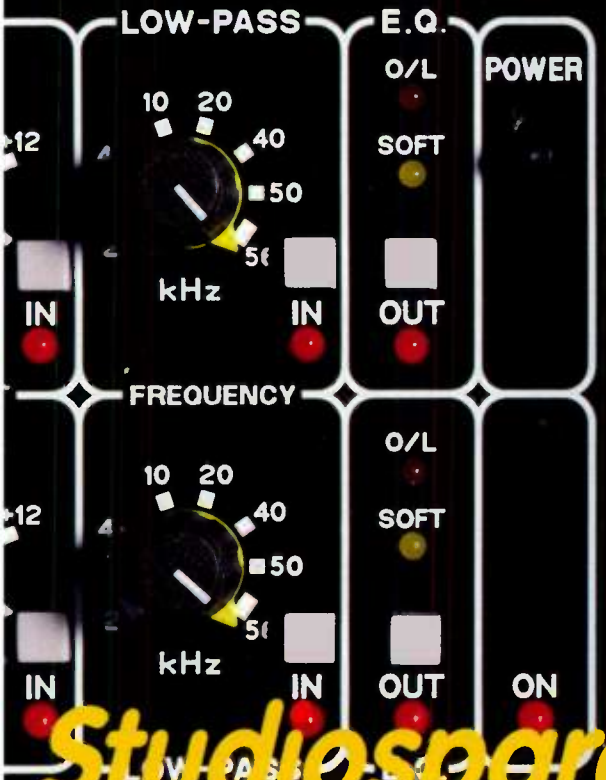

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The first thing that strikes you about the system, once everything is plugged in and working, is just how much control is available. The Control 16 looks more like a small mixer than a remote control, with 16 100mm faders plus a main stereo mix fader, and about 60 buttons and rotary controls, plus a weighted shuttle/jog wheel. In fact, there are so many controls that rather than listing them it will be easier to explain their function whilst examining the software.

The 442 digital I/O interface for the Paris II system.

COMPATIBILITY

PARIS has already been tested with various MIDI sequencers, and MTC is output during playback so that you can slave up a sequencer. A Windows 95 MIDI driver is provided that allows you to sync internally on a PC. Since most people will require MIDI support, here is the up-to-date compatibility list as reported by the Ensoniq web site:

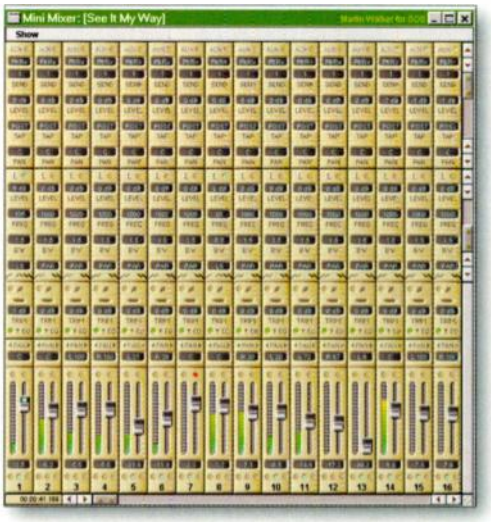
MAC OS:
- Emagic *Logic* 2.5 or higher
- Emagic *Logic Audio* 2.5 or higher
- Opcode *Studio Vision* 3.0 or higher
- Steinberg *Cubase VST*

WINDOWS 95:
- *Cakewalk Pro* 3.0
- *Cakewalk Pro Audio* 6.0
- Emagic *Logic* (not fully compatible at this time)
- Opcode *Vision* 2.5 or higher
- Steinberg *Cubase* 2.5 or higher
- Steinberg *Cubase XT* 3.0 or higher
- Steinberg *Cubase VST*

MIXING IT UP

The software is supplied on four floppy disks, two each for Mac OS version 7.5 (and above) and Windows 95 operating systems. With so much 'bloatware' being supplied nowadays, it's refreshing to find a complete system, complete with beautifully styled graphic interface, that occupies less than 4Mb on your hard drive.

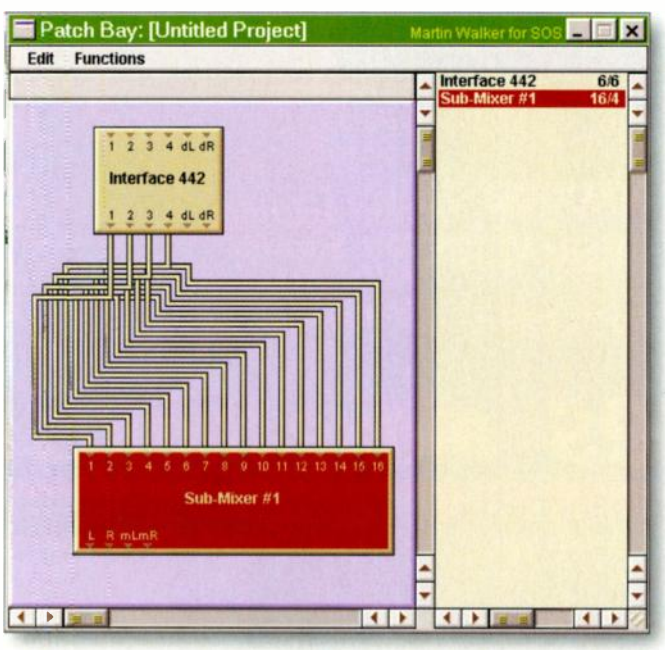
After the loading screen, which initialises all the hardware, the first Window to appear is a small text Project window showing the current settings. From here, once you supply a Record path, so that the software knows where to store your audio files, you can create a new Project, open an existing one, or explore some of the many other graphic windows available. The easiest way to start is to open up the demo provided (on a separate CD-ROM, and occupying 250Mb of hard disk if you decide to copy it across to try it out). This is a three-minute song containing 16 tracks (including guitars, multitrack vocals, drums and percussion), and it shows off the features of PARIS very well. There's full fader automation, with moving graphic faders on the computer screen (but at this price it's not surprising that the physical faders are not motorised), and sound quality is excellent. Most of the time I suspect that you'll be using the Mixer and Editor windows, so let's look at these first.



The Mini Mixer sacrifices individual channel size to allow you to see more at once. Here you can see 16 channels side by side and still have room to position the Transport Bar and other windows, without constantly changing focus (bringing different windows to the front).

The Mixer Window consists of three parts: the Channel section (showing all the inputs), the Aux Master section, and the Master section (the main stereo output). The mixer graphics are lovely, sporting a modern, gold-anodised, sculpted look, and the only area for possible improvement is the markings on the rotary knobs, which could be made a bit more obvious. There's a huge amount on offer, but each horizontal section of the mixer can be separately collapsed to a thinner version showing only the current values (see above), or expanded to show every rotary knob, button and fader available, for easier tweaking. This is an excellent idea, as even with the typical 1024 x 768 screen of a 17-inch monitor it's impossible to see every control of a 16-channel mixer at once and still be able to have it large enough to see clearly. Menu options allow you to selectively Hide or Show EQ, inserts and aux sends, as well as any combination of the 16 tracks, and you can adjust the width of the Channel section in increments of a channel width. If you can use a 1280 x 1024 screen it's possible to view all 16 channels simultaneously, but you'd still run out of space in the vertical direction if all EQ and aux sections were expanded.

The Control 16 allows you to edit every channel control from the hardware. Initially the physical fader position will probably be different from the current virtual one, and the hardware employs the 'up a bit, down a bit' approach, using an up and down arrow LED for each channel. You push the physical fader in the direction indicated, and when you get close the indicators start to flash, first quickly, and then more slowly as you approach the correct position. Finally both extinguish when the fader has arrived at exactly the right position. ▶



The Patchbay window allows the soundcard and any available interface to be interconnected. You can draw virtual patchcords to connect the internal workings of your system. Normally, inputs 1-4 of your interface will be connected to channels 1-4 on the mixer, and so on, so that you can record to any channel from the outside world.

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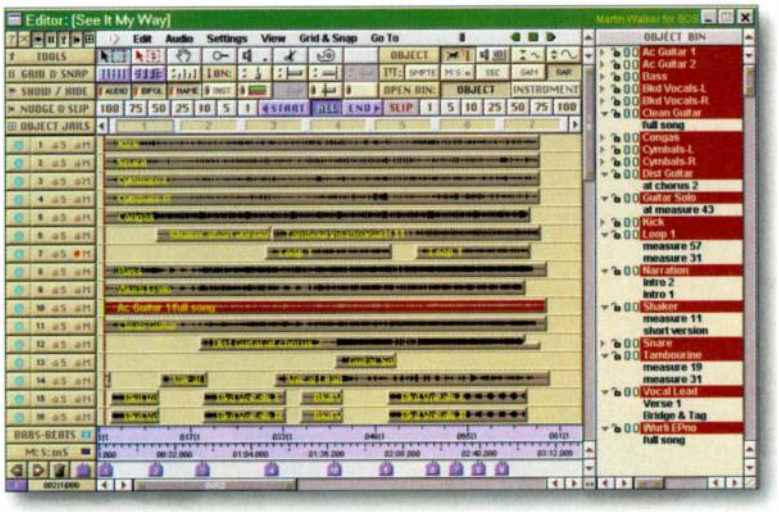

The Editor window provides an overview of the project, showing audio files in their respective positions and featuring the cut-and-paste-style editing features we all know and love.

▶ Once 'in sync', any physical fader can be moved at any time, and the on-screen one will follow it. Other channel adjustments, such as EQ and aux sends, are controlled by pressing a Select button (there's one above each physical fader). Once a channel is selected, a separate hardware panel section allows full adjustment of any equivalent on-screen control.

The mixer Aux section provides full access to the effects, and very nice these are too. Since the chips are identical to those in the Ensoniq DP Pro, quality is not an issue — the screenshot on the first page of this article shows the amount of control on offer, and the sounds are great; just what you'd expect using the 24-bit internal audio path.

GIVING IT A PASTING

The Editor window contains an Object Bin (showing all the data files associated with your Project), the Playing Field (graphic waveform overview, similar to the *Cubase* Arrange page), Command and Menu bars, Rulers and Markers. From the Editor window you can move chunks of audio about, set markers, define crossfades, and edit individual audio objects, with standard cut, copy and paste commands, as well as using DSP functions such as normalise, time-compression and expansion, and pitch-shift. Two modes of editing operation are provided:

- Constrained mode provides the familiar virtual multitrack tape machine approach, with each editor track corresponding to a single channel fader.
- The more advanced Free Form mode uses what Ensoniq term 'Flex Tracks', which allow multiple performances or overdubs on different recorded tracks to make up a composite 'Instrument', which is then assigned to a fader. This is where the 'up to 128 virtual tracks' part of the spec comes in, although there are still only up to 16 playback channels per soundcard.

Full integration is again provided for the Control 16, and many of the editing jobs that can be carried out using a mouse can also directly use dedicated hardware buttons. Navigating through a Project can be done using either keyboard shortcuts; the mouse with the Transport Bar (in yet another window); the equivalent controls on the Control 16; or the Jog/Shuttle wheel (there is currently no audio scrubbing, but this is expected in a future update). All the normal controls, such as Play, Stop, Record, Fast Forward and Rewind, are provided. Comprehensive Markers can also be set (up to 999) to start playback from specific points in a song, Punch In and Out, or loop round a certain section.

SUMMARY

The Ensoniq PARIS surprised me. When you first see the hardware, and in particular the Control 16, it's easy to jump to the conclusion that it is a professional high-end system for those with lots of money. However, at £2499, Bundle II provides a

PARIS AND THE MAC

Installing the software onto a Power PC 603e/160 took only a couple of minutes, and once the hardware was connected and switched on the screen came to life with exactly the same graphics as the PC version. As shipped, this system came with a very early software release, though I'm told that a revised version is already available on the Internet, and by the time you actually get around to reading this there may well be a further revision.

Ensoniq have always had a slightly annoying habit of trying to reinvent the wheel when there was nothing much wrong with the wheel in the first place. Their synth interfaces were 'improved and simplified' to the point where I couldn't make any sense of them whatsoever without the manual, and they seem to have done the same thing with parts of this software. Specifically, the usual window scrollbars and fixed menu bars have been replaced by Ensoniq's own scroll arrows and expand buttons that let you move along the mixer channels, or expand various sections of the mixer. In theory this is OK if it works, but on my 15-inch monitor I couldn't access the first few mixer channels — they were always off the left-hand end of the screen, but as there were no scrollbars, I couldn't get to them. It's almost as though the program was set up for a larger monitor, but as the Preferences menu was permanently greyed out on this version, there was no way I could get in to see if I could change anything. You can resize mixer windows, but only to make them narrower from the right-hand side. Try as I might, I never got access to those first few channels. What's more, it's necessary to use key commands to get to a new window, as the familiar window-close button has also been removed in a bid to simplify our lives! Assuming the new software revision sorts out the monitor size problem, the interface is smart, clear and manageable — but dumping the standard Mac window-handling protocol still irritates the hell out of me!

Other software problems soon became evident, not so much in the form of crashes, but more akin to what happens when you top up a petrol car with diesel. On several occasions, contact with the interface was lost and it took several cold boots (thermally depleted stout footwear?) to get things back to normal.

Using the system is relatively straightforward, especially for anyone who's had previous experience with Pro Tools or a similar package, though the fader automation is fairly basic and isn't adequately covered in the manual. Indeed, out of a 140-page manual, I could only find about half a page relating to fader automation, and from what I can extract from it, there's only one mode — to edit fader data, you simply replace it; there's no update or trim mode that I could find. Some operations rely on the faders being nulled to their previously stored value using the two green arrow LEDs adjacent to the fader, but finding the null point where both LEDs are off can be fiddly, and at lower fader settings it can be virtually impossible. This could be sorted out in software, but as it stands it's rather too sensitive.

I like being able to use the individual channel Select buttons to drop individual channels in and out of automation edit mode, but the preamble you have to go through to get into automation edit mode is a little long-winded, and necessitates the relevant tracks being armed via mouse in the display window. A single

very competitive package that could still form the basis of a much larger system in the future. Although there are only four analogue ins and outs, the built-in effects ensure that many people will still be happy. Unless you need to record drums or live ensembles, four simultaneous inputs should be sufficient, and if you configure the four outputs as a stereo master and two aux sends, there's still a lot you can do — again, those built-in effects count for a lot. The bundled software looks gorgeous, and although the multiple-window approach can be a bit convoluted at times it soon becomes second nature when you can jump between the windows with computer keyboard shortcuts or just by relying on the Control 16.

Because PARIS offers so much hardware EQ and effects power right from the basic core system, you don't need a state-of-the-art computer, as you do for a software-only system. However, you still have the option of adding other interfaces in the future, for additional analogue inputs and outputs, ADATs and so on, so you overcome the problem of tying yourself down to a rigid spec right from the start. What most people need is the promise of enough power to exceed their current requirements, with enough flexibility to expand to whatever they might need in the future.

As far as the competition goes, there's not a lot that comes close. DAL's V8 system costs £3200 for the basic package without software or effects, but does provide eight ins and outs, and the forthcoming Lexicon *Studio* system has built-in effects, and seamlessly integrates with *Cubase VST*. However, neither of these systems has the Control 16, which will win many people over, and providing stable software support for both PC and Mac from day one is unusual, to say the least. I think that Ensoniq have a winner on their hands with PARIS. Whichever package you opt for, I think you'll go a bundle on it. *Formidable!* SOS

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hardware switch to put the system into automation edit mode, followed by the use of individual select buttons to drop in and out of fader record mode, would have been more straightforward.

Despite these obvious shortcomings, I can't argue with the sound quality or the flexibility of the system, which I think is excellent. I have little doubt that the more serious software foibles will be fixed in pretty short order, and though you might think the system is a little expensive compared to a basic soundcard, you get a lovely hardware interface and a sensibly designed, very powerful DSP and effects section that doesn't burden your computer too heavily. At the very least, this should enable you to hang onto the computer you have for a while rather than upgrading every six months, and because the effects don't use the same DSP as the EQ, you shouldn't end up in the frustrating situation where you have to give up half a dozen channels of EQ to use another chorus module.

The current software doesn't support audio scrubbing or MTC output, though the revision now on the web site is said to implement MTC, as well as improving a few other sync aspects. Even with this update, though, it seems that Paris will only run alongside a MIDI sequencer — it won't integrate with it in the same way that something like Soundscape or Pro Tools will. How much of a limitation this is depends very much on how you work, but if you're used to working in an integrated MIDI + Audio environment, you may find it frustrating. That restriction aside, the power, expandability and potential for future growth of this system definitely make it one to watch. *Paul White*

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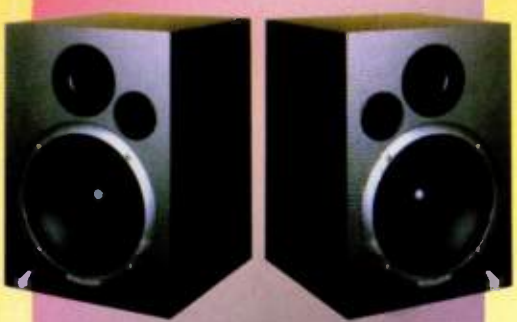

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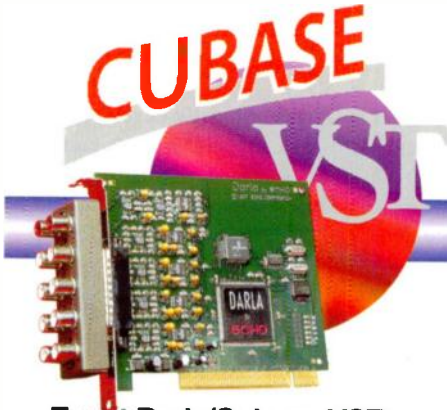

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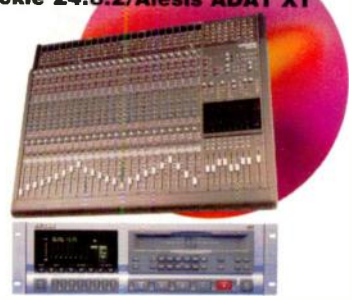

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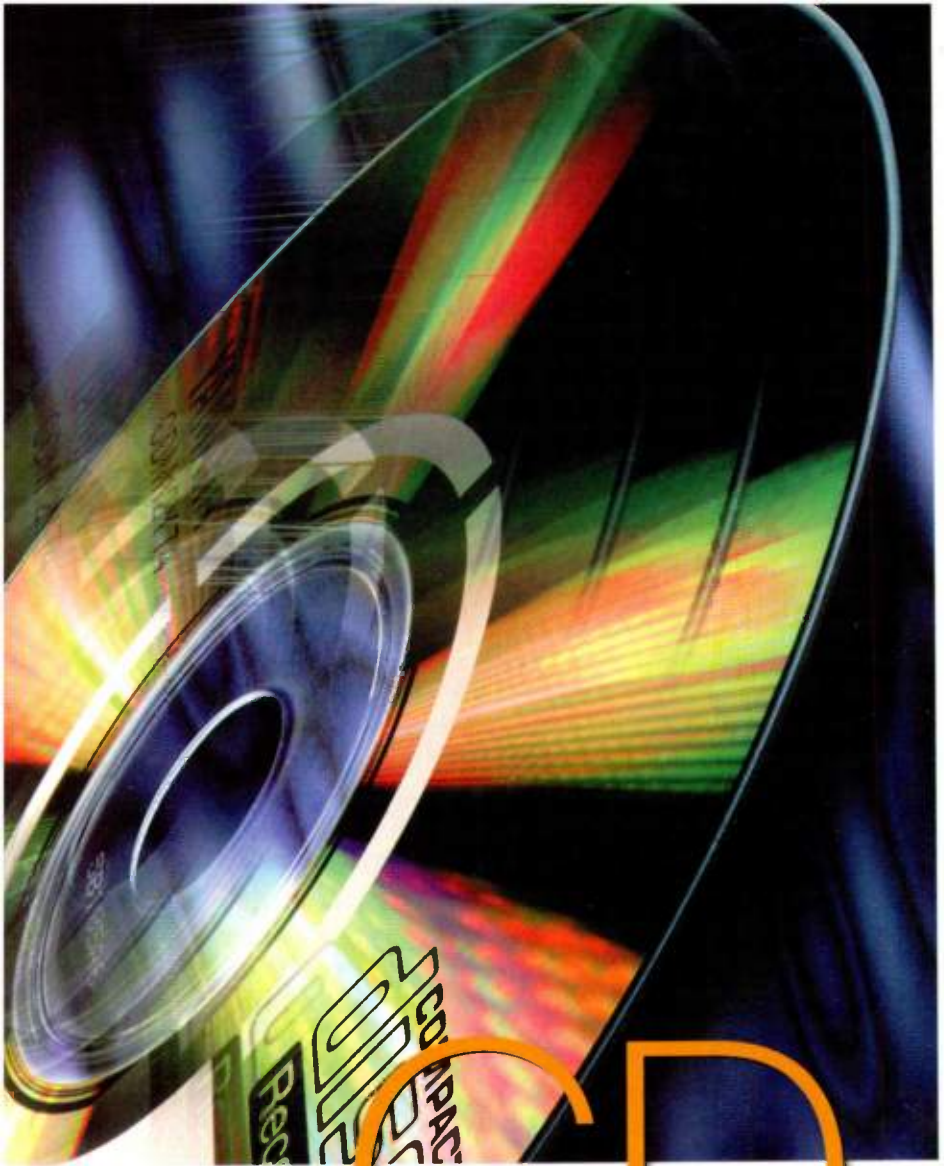


CDs by the Book

COMPACT DISC FORMATS EXPLAINED

Many of us can now afford the once-unthinkable luxury of making our own CDs, for one-off music demos, mass CD duplication or general data storage. But few of us know the full story behind the numerous 'Book' standards governing the kind of data that can be stored on a CD. MIKE COLLINS colours by numbers...

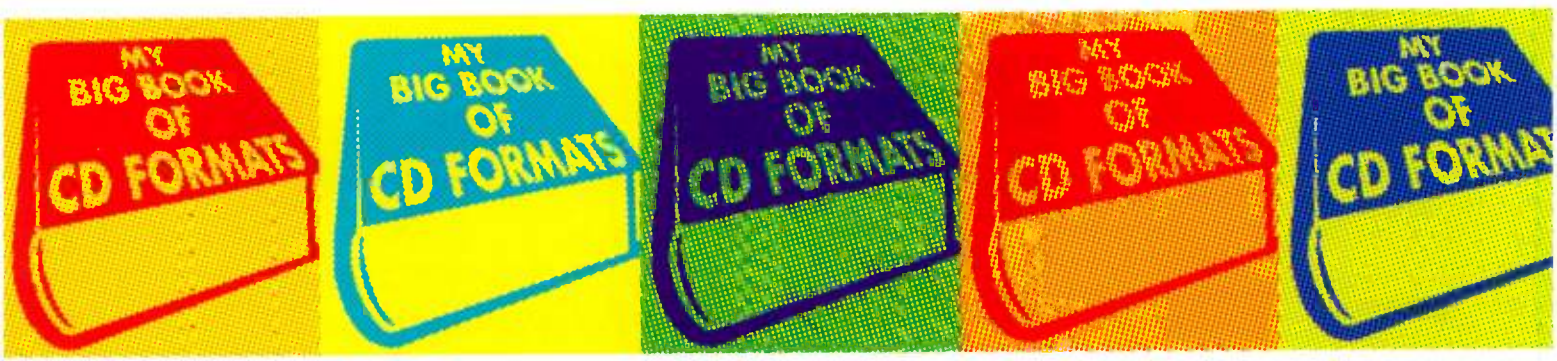
Now that you can buy a CD recorder for well under £500, and now that some computers are being supplied with a recordable CD drive built in, rather than just a CD-ROM player, more people than ever are starting to make their own CDs. But CDs come in lots of different flavours these days: CD-DA, CD-ROM, CD-ROM/XA, CD-i and other types. Their specifications are spelt out in a series of technical documents which are known by the colours of their covers — Red Book, Yellow Book, Green Book, Orange Book, White Book and Blue Book — and it pays to know just what each format means.

HISTORY

The Compact Disc was originally developed by Philips and Sony as a means of distributing high-quality audio to consumers — a replacement for vinyl records. The Compact Disc Digital Audio Standard, commonly referred to as the Red Book, describes the physical and logical format of these discs, which store digital audio data in a convenient form. But digital data is digital data, so why not use CDs for other forms of digital data? The same thought thought occurred to others, too, so extensions to the Red Book standard were developed for storing computer data, compressed audio, video, and graphical information on CD. It is these standards which are now typically referred to by the colour of their covers.

TECHNICALLY SPEAKING

The information on all compact discs is divided into chunks of uniform size, called sectors, and adjoining sectors are then grouped to form tracks, which are listed in the disc's Table Of Contents (TOC), a special un-numbered track that plays first. Every sector on every type of CD contains 3234 bytes of ▶



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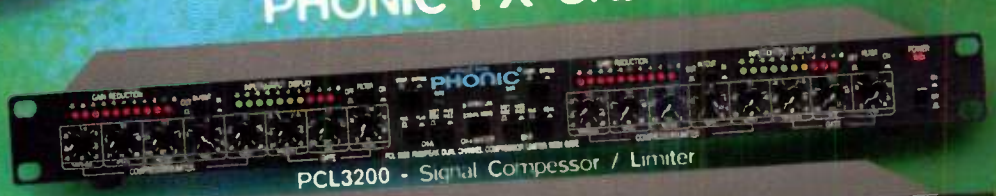

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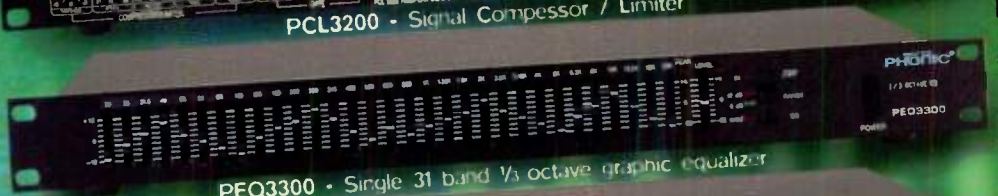

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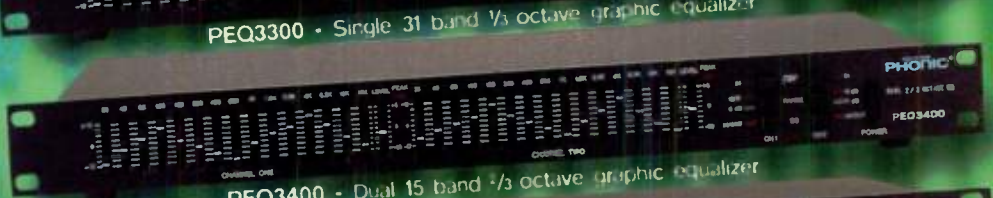

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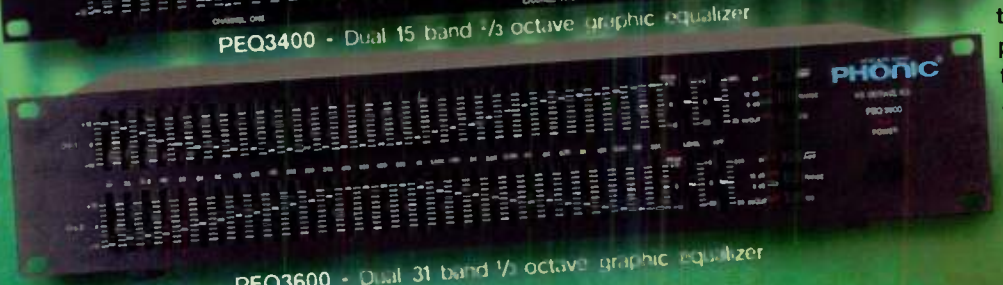

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data, 882 bytes of which are reserved for error detection and correction code and control bytes, leaving 2352 bytes (3234 minus 882) to hold audio data in a Red Book CD-Audio disc. One of the keys to understanding the different formats thoroughly is to look at how the other formats use this 2352 bytes of space. CD-Audio discs use the space for digitally recorded sound and error-correction data, while other types of CDs may contain computer data, including executable programs, text, graphics, and compressed audio or video.

• RED BOOK

Red Book is the standard for Compact Disc-Digital Audio (CD-DA) and was established in 1980 as the first of the 'books' which defined the CD for audio use in domestic CD players. To identify themselves, Red Book discs usually have the familiar 'Compact Disc Digital Audio' logo printed within the label area.

The Red Book standard specifies that a compact disc can have up to 99 tracks of data, with each track containing a single audio selection. These tracks are divided into blocks of data referred to as sectors. Each sector holds 3234 bytes of data, as mentioned earlier, arranged as 2352 bytes of audio data, plus two 392-byte layers of error-detection and error-correction codes (commonly referred to as EDC/ECC), along with 98 control bytes which are often referred to as the sub-codes or sub-channels and are designated by the letters P through to W. These control bytes contain the timing information which allows the CD player to cue instantly to the beginning of each selection, display the selection's number and running time, and provide a continuous display of elapsed time.

• YELLOW BOOK

Yellow Book is the standard for Compact Disc-Read Only Memory (CD-ROM), and this extends the Red Book specification by adding two new track types: CD-ROM Mode 1 and CD-ROM Mode 2. Mode 1 tracks are designed for storing computer data, while Mode 2 tracks store compressed audio, video and picture data. Yellow Book discs usually have the words 'Data Storage' in small letters beneath the Compact Disc logo.

Mode 1 sectors include a third layer of EDC/ECC which improves the error-detection and error-correction capability by a factor of 1000. The extra error correction is essential because this mode is designed for storing computer data, where even the loss of one bit of data could be disastrous. (With audio, the result of losing even several bits may be inaudible.)

CD-ROM tracks also use part of the space in the sectors for synchronisation data and a header. Let me explain: on an audio CD, the information used by the drive to position the laser pickup at a specific location is contained in the 'Q' subcode, and the Red Book specifies that this 'Q' channel information should position the pickup to an accuracy of +1 second. For audio playback applications this degree of accuracy is perfectly sufficient, but for computer applications the drive must be able to locate and retrieve a specific sector — which requires an accuracy of 1/75th of a second. It is to achieve this degree of positioning accuracy that the Yellow Book specifies the inclusion of synchronisation and header information in each sector. The sync bytes specified occur in a particular pattern (0, followed by 10 bytes of FF, followed by another 0) which allows the start of each new sector to be recognised as such. The header contains the absolute address of the sector, specified in minutes, seconds and data blocks, and also has a byte to indicate whether the sector is in a Mode 1 or Mode 2 track.

As with Red Book, each sector on the disc holds 3234 bytes of data, but Mode 1 sectors start with the 12 bytes of sync data, followed by 4 bytes of header information. The space for user data is 2048 bytes and this is followed by the extra layer of error correction, which consists of 4 bytes of EDC, 8 bytes of blank space, and 276 bytes of ECC. Then, as with all CDs, you have the 882 bytes which contain the first and second layer Red Book-style EDC/ECC and Control Bytes. Mode 2 sectors are primarily used where the absolute integrity of the data is not as important — for, say, audio or animation — so Mode 2 sectors do not have the extra layer of error correction. They do still use the sync and header information, though, so there are 2336 bytes remaining for data.

CD-ROM/XA (Extended Architecture) discs were developed to allow audio or video to be played back at the same time as computer data. The original Yellow Book CD-ROMs were designed for storing and publishing data — not for playing audio or video. The format was extended in 1988 with the addition of two new track types — Mode 2, Form 1, and Mode 2, Form 2 — which have a sub-header field within each sector to describe the sector contents. This makes it possible to interleave Form 1 sectors containing computer

DISC-AT-ONCE VS TRACK-AT-ONCE

When you're buying a CD recorder it can be important to check whether it's capable of recording in Disc-At-Once mode if you want to write discs to master from, because some CD-recorders can only write using Track-At-Once mode. With Disk-At-Once recording, the whole disc is written in one pass without turning off the laser, while Track-At-Once mode only allows you to write one track at a time. When you use Track-At-Once mode, the laser will stop writing between each track, but the laser beam doesn't turn off immediately, so a couple of sectors are allocated at the end of each track which will be wasted as the laser shuts down. These are called the 'run-out' sectors and account for the fact that Track-At-Once recorders have a fixed track spacing of 2 seconds. With Disc-At-Once mode, no run-out sectors are generated between tracks, so the pause between each track can be of any length, and songs can even be run together with no gap.

Note that if you're making audio CDs to be commercially produced, the run-out sectors created in Track-At-Once mode may be considered as unrecoverable 'E32' errors when the disc is checked at the pressing plant, and the disc may be rejected as unsuitable for pressing from. This situation is changing, though. Reportedly, Doug Carson Associates, who provide glass mastering and format-transfer software to pressing plants, have solved the problem. DCA's latest software version apparently checks the TOC on the CD-R to find out where the gaps are, and whenever it finds E32 errors there (generated by the laser turning on and off between tracks) it replaces them with digital silence. So, unless you have CD-Rs with E32 errors in places other than the gaps between tracks, pressing plants using the latest DCA software will not reject CD-Rs made using Track-At-Once mode.

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data with Form 2 sectors containing audio, video or picture data, all within a single track. Using specialised hardware in the CD-ROM drive, it is then possible to separate the audio data sectors from the computer data sectors, decompress the audio data and play it back through the CD-ROM drive's audio outputs, while simultaneously transmitting the computer data to a personal computer for processing or display.

A CD-ROM Mode 2, Form 1 sector is identical to a CD-ROM Mode 1 sector, except that the 8 bytes of blanks in a Mode 1 sector have been moved to follow the header information within the sector, and are used to hold the sub-header information. As with Mode 1 sectors, 2048 bytes are available for the user data (normally computer data which requires the extra layer of error detection and correction provided in Mode 1 sectors).

A Mode 2, Form 2 sector also contains the synchronisation, header, and sub-header bytes, along with the 4 additional EDC bytes that appear in Mode 1 and Mode 2, Form 1 sectors. However, because the Form 2 sectors are used to hold audio, video or picture data — which doesn't require the high level of data integrity necessary for computer data — the 276 bytes of error-correction data used in Form 1 sectors are not included, leaving 2324 bytes available for user data.

CD-ROM/XA discs can be played back on personal computers with suitable hardware and software, and on specially-equipped CD-ROM drives or CD-i players. CD-ROM/XA was developed as a 'bridging' format between CD-ROM and CD-i, and this means that an application designed for CD-ROM/XA can be made playable on a CD-i player sharing the same audio and graphics resources. As with CD-i, you can interleave up to 16 hours of ADPCM-compressed audio with data, to allow the data to be retrieved from the disc while the audio plays back.

• PHOTO CD

The most well-known example of CD-ROM/XA discs are Photo CD discs, Eastman Kodak's digital image storage and distribution system. You can now get your 35mm snapshots supplied as digital files on a Photo CD disc from Boots or other places which process film. Discs can be written to using multi-session recorders, so the images do not have to be put on the CD disc all at the same time. You can fill part of the disc, take this home, then take the disc back to add your next and subsequent rolls of film, until the disc is full. You can view your photographs at home on your TV screen using a CD-i player or a dedicated Photo CD player, and you can also read the files on a Macintosh computer using software such as *Photoshop*.

• KARAOKE CD

Karaoke CD discs are another example of CD-ROM/XA discs, which you can play on a dedicated Karaoke CD player or on a CD-i player equipped with a Digital Video cartridge (although CD-i discs will not play on a Karaoke CD player). Karaoke CDs usually have the word 'Graphics' in small letters beneath the Compact Disc logo, and they feature full-screen, full-motion video and CD-quality audio using the MPEG-1 compression standard.

• GREEN BOOK

Green Book is the standard for Compact Disc-Interactive (CD-i) and is an extension of Yellow Book to allow discs to contain a mix of video and audio, plus data which the user can control interactively, making it ideal for games, encyclopaedias, educational material or business applications. CD-i discs use Mode 2, Form 1 and Mode 2, Form 2 tracks, which, as with CD-ROM XA, enable computer data and compressed audio, video or pictures to be played back at the same time.

A CD-i player looks similar to a CD-Audio player, but you can hook it up to a TV or a colour monitor and it has a computer inside which you can control using a hand-held remote. The computer uses a fairly obscure operating system

ABOUT THE BOOKS

- System Description Compact Disc Digital Audio (Red Book), NV Philips and Sony Corporation.
- System Description Compact Disc Read Only Memory (Yellow Book), NV Philips and Sony Corporation.
- System Description Compact Disc Read Only Memory Extended Architecture (Green Book), NV Philips and Sony Corporation.
- System Description Compact Disc Systems Part II: CD-WO (Orange Book), NV Philips and Sony Corporation.
- Update to System Description Compact Disc Systems Part II: CD-WO (Orange Book), NV Philips and Sony Corporation.
- System Description Compact Disc Bridge (White Book), NV Philips and Sony Corporation.
- ISO Standard 9660: Information Processing — Volume and file structure of CD-ROM for Information Interchange.

For more information on the Book standards, contact the following address:

- American National Standards Institute, 1413 Broadway, New York, NY 10018. Tel: 001 212 642 4900.

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Compact Disc Formats

called OS/9, so CD-i tracks cannot be played on normal CD-ROM drives. On the other hand, CD-i players can play audio CDs, CD+Graphics (CD+G), Photo CD, and, with a Digital Video cartridge, Karaoke CD or Video CD discs — a pretty versatile player!

• ORANGE BOOK

Orange Book is the standard for write-once compact discs. This specification covers both single (Disk-At-Once) and incremental multi-session (Track-At-Once) recording. Multi-session allows you to record a 'session' to part of the disc and then add subsequent sessions at a later date, until the disc is full. A new session will contain a table of contents featuring the old and the new information on the disc, so any CD-ROM player you want to use to read a multi-session disc needs to take this into account by reading the last-written table of contents or directory. Many older CD-ROM drives cannot read multi-session discs, so watch out for this. The disc can subsequently be converted to a Red/Yellow/Green book disc by 'Finalising' the session, to add a final Table Of Contents which can be read by any CD-ROM player.

• WHITE BOOK

The White Book specification was developed to cover the Video CD format, which is supported by JVC and Matsushita as well as Philips and Sony. These Video CD discs are a special kind of CD-ROM/XA bridge disc that allow you to play feature films and music videos on a dedicated Video CD player, or on a CD-i player equipped with a Digital Video cartridge. A computer equipped with a CD-ROM/XA drive, an MPEG-1 decoder and a host playback application can also be used to play the discs, so they can also be used for computer-based training applications. Based on the Karaoke CD standard, Video CD features full-screen, full-motion video along with with CD-quality audio, and is independent of broadcast standards such as NTSC and PAL, so (unlike video-cassette and laser disc formats) a single disc plays on any Video CD platform worldwide.

• BLUE BOOK

Blue Book is the most recent of the 'colouring books' to appear, and this specifies the CD Extra standard, which was developed as a way to include CD-ROM data on an audio disc. The idea here is that a standard audio CD will give up a little of its space so that you can include a track of CD-ROM data containing some kind of interactive data related to the audio — which you can play using your computer's CD-ROM drive and screen. This might be an animated presentation of some aspect of the artist's work, such as expanded sleeve notes, lyrics or music, or just some wildly creative images to accompany the music. Possibly it could be a 'taster' for a full-blown interactive CD-ROM version of the album. Also known as Enhanced CD, a CD Extra is actually a multi-session CD which contains audio tracks in its first session, followed by a data track in the second session. Early attempts to make this kind of CD suffered from the problem that the first track was the data track and could produce a loud clicking in your speakers if you inadvertently tried to play it — despite the large warning stickers on the packaging telling you not to do this! This was all sorted out with the Blue Book standard, so now the CD player will not attempt to play the data track. ▶

SUB-CODES

Each sector on an audio CD contains control bytes identified by the letters P through to W. These are often referred to as sub-channels or sub-codes, and the most important are the first two — the P and Q sub-codes which you may have seen referred to in this magazine before.

For instance, in the Lead-In area, the Q sub-code contains the Table Of Contents, while in the Program area of the disc the P sub-code contains information about where the music starts and ends, and the Q sub-code contains absolute and relative time information.

The other sub-codes, identified as R to W, are not always used, but it is perfectly possible to store additional information in them. An early extension of the basic CD format, called 'CD + g', used these bits to add graphics and MIDI data for each track, and some specialised CD + g players were produced which had video and MIDI outputs. These were never available in the UK, as far as I am aware.

There are various other codes which can be set for CD discs and which you need to be aware of. For example, if you want to make sure that all the rights-holders get paid when your disc is broadcast, you should be including an ISRC code. This is the International Standard Recording Code which can be assigned to each and any final mix to uniquely identify this mix. The code can then be used, along with records kept by the record companies, royalty-collection organisations and rights organisations, to track the owners and rights-holders who should be paid when the recording is broadcast publicly or exploited commercially.

If the disc is released commercially, it will almost certainly include a Media Catalogue Number, which is a unique identification number for the CD in the form of a UPC or EAN bar-code. These code numbers are allocated by the EAN or UPC authorities and consist of 13 consecutive digits which are allocated by one of these organisations.

Older DAT and other digital recorders sometimes used a system of 'pre-emphasis' on recorded material, with a corresponding 'de-emphasis' on playback. Pre-emphasis boosts the high frequencies prior to A/D conversion, while de-emphasis removes the boost after D/A conversion. De-emphasis circuitry is built into all CD players to provide compatibility with any material recorded using pre-emphasis. However, the emphasis bit must be set to 'on' in the track's Q code so that the CD player will know that it should use the de-emphasis circuitry while this track plays back.

Each track on a CD has a Copy Prohibit 'flag' bit setting in the track's Q sub-code, to indicate whether copying the track is allowed. This Copy Prohibit bit was originally intended to prevent direct digital copying using DAT recorders, but virtually no recording equipment uses this today, so it has no effect in practice. Subsequently, the Serial Copy Management System (SCMS) was developed to prevent users from making a digital copy of a digital copy. In this system, the SCMS 'flag' bit is incremented when the source material is digitally copied from one digital recording device to another, so you're allowed to make one digital copy of the source material using SCMS-equipped recorders, but you won't be able to make any further digital copies of that recording.

Checking this 'flag' on any CD tracks before you write the CD identifies these tracks as the first copies, so you won't be able to record them digitally from the CD onto an SCMS-equipped digital recorder. If you *want* to allow digital copies to be made, don't set the SCMS flags on the CD. Then, if you use an SCMS-equipped recorder to make a copy of the CD, it will be the first digital copy and will have the SCMS flags set for each track by the system built into the recorder. Now if you try to copy *that* recording digitally, SCMS will prevent you.

By the way, just in case you were wondering, checking SCMS will override the setting for Copy Prohibit.

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ALL ABOUT FILE FORMATS

The Yellow Book standard did not specify any file formats, so early CD-ROM developers had to 'roll their own' — and these were not compatible with each other. Fortunately, manufacturers quickly realized that standardisation was needed, and the International Standards Organisation ISO 9660 file format subsequently emerged. You can create applications for Mac, PC or UNIX systems using this file format, and you can even have application programs for all three platforms on one CD-ROM, with all three able to access the same set of data files. The problem with ISO 9660 is that it restricts developers to a lowest common denominator in terms of how many characters can be used for the file names, for instance, so this is not so popular any more.

It is perfectly possible to design a CD-ROM for use with one particular operating system, which lets developers use the full range of features of that operating system, such as long file names, desktop icons and so forth. So, for instance, you can create CD-ROM discs in Macintosh HFS format which will 'mount' on the desktop of any Macintosh computer, just as though they were disks from any other type of disk drive. These can hold up to 650Mb of your computer files in a read-only format. Rewritable CD machines are beginning to appear, but these are not commonly in use as yet, so you will mostly encounter discs which can only be written to once.

Hybrid discs — which will work with Mac and PC — are also very popular, as you might imagine. You can create a CD-ROM with both Mac HFS and ISO 9660 file systems which share the same data and can be read on both Mac and PC. This solves the problem of having to produce a Macintosh-specific CD for Macintosh users and an ISO 9660 CD for PC and UNIX users.

You can also mix audio and computer data on one disc in various ways. Originally, a mixed-mode CD would consist of one data track and several audio tracks, with both data and audio written in one session. The data track would always be placed in track 1 — just in front of the audio tracks on the disc — which was a problem, as I mentioned earlier, since the data track would produce clicks in the speakers if inadvertently played on an audio CD player. This mixed-mode format has largely been superseded by an audio/data multi-session format where the first session consists of audio tracks and the second session consists of data. Another twist in the tale is that this second session data can be in CD Extra format, or in HFS or ISO 9660 XA formats, or in Mac/ISO Hybrid XA format — which makes the format even more versatile!

As you may already have gathered, a multi-session disc is so-called because you can write one set of data to fill part of the disc, and then write one (or more) additional sets of data to fill the rest of the disc. These sessions are linked together in such a way that only one logical device appears when the CD is mounted. However, not all CD-recorders can record this type of CD and not all CD-ROM drives can read them.

A 'multi-volume' CD also consists of multiple sessions, each recorded at a different time, but, in this case, each of the sessions is completely independent of the others. When this type of CD-ROM is mounted on your computer's desktop, each session will appear as an individual logical 'volume'. In other words, if you put two sessions on your CD-ROM in, say, Mac HFS format, when you put this into your Mac's CD-ROM drive, two icons will appear on your desktop, each representing one of these 'volumes' of data. These look and behave just like hard disk icons, except that there is a small locked padlock in the top left-hand corner of the window which appears when you open either of these volumes onto your desktop. This indicates that the disc is read-only. Again, not all CD-recorders can record this type of CD, and not all CD-ROM drives can read them. Finally, it's worth noting that Mac HFS CD-ROMs can only be multi-volume rather than multi-session. SOS

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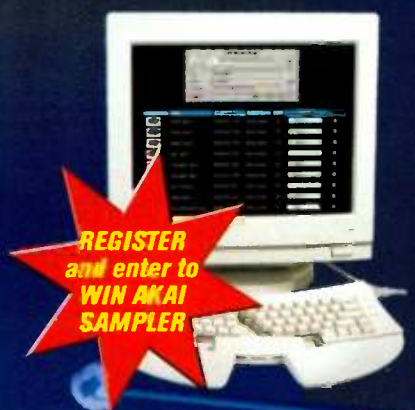

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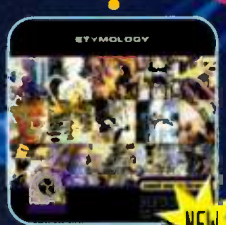

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Pitbull is a huge collection of original Drum 'N' Bass, Hardcore and intelligent, and extreme loops for producers, remixers and students of Jungle. A large selection of individual drum samples is also included so you can customize the loops and add your own fills, etc. Loops are grouped in increments of 5 BPM from 150 to 170 BPM for easy mixing/matching. (£59.95)

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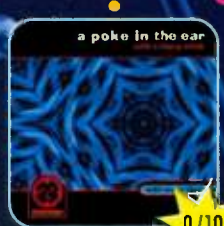

AUDIO CD/AKAI/AIFF CD-R

KEYBOARD said in REVIEW "These guys sound dangerous" The sounds hover between scintillating and demanding, to disturbing and bizarre. Metallic Percussion, Crushing Machine Loops, Dark, Ugly, Disturbing Ambient Textures, Vocal Wails, Rhythmic Noise Loops, Alien Effects. Poke was created by sound designers who live by the credo No French Horns! (£59.95)

Def House

AUDIO CD/AKAI CD-RO

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The Ultimate Pianos

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The Ultimate Piano Collection is, in my experience, as close to the real thing as technology will currently allow" - SOS Review - PHEW! The Ultimate Piano Collection includes a Fazioli F228, Steinway D, Steinway C and a Boesendorfer 225. The Ultimate Piano Collection received KEYBOARD (USA) and SOS's highest rating. The industry standard. (£199.95)

Hypnotica

AUDIO CD

Perry Geyer and Greg Hawkes created Technophobia! and Tekno/Industrial - both CDs received Keyboard's HIGHEST RATING. HYPNOTICA is one of two new releases from them that is loaded with cutting edge aural textures, trance and ambient loops, FX, Mind blowing Sweeps, Galactic Noises, Hypnotic sequences. A Magical Mystery Tour (8/10).

Electronica

AUDIO CD

ELECTRONICA features electro industrial loops and samples, many with a construction kit format and MIDIFILES. The MIDIFILE loops contain all the loop elements to enable you recreate the loop with your sequencer, change tempo without affecting pitch, change samples etc.-you can customize each slammin' loop. (9/10 Future Music (UK) and 8/10 Keyboard)

Smoov Grooves

AUDIO/AKAI/ROLAND CD-ROM

SMOOV GROOVES is the long awaited sequel to the critically acclaimed "Funky Ass Loops" from Prince's rhythm section Sonny T. & Michael B and is the finest collection of laidback smoov grooves & 70's funk available. The tempos range from 60-108 BPM. First you get a full mix of each loop, followed by the drums, bass, guitar, perc etc. 5/5 SOS REVIEW (£59.95)

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solid gold?

AKG SOLIDTUBE MIC

PAUL WHITE tests AKG's new budget studio valve mic to see whether it's really possible to build a quality tube capacitor mic for under £1000.

Over the past two or three years, there's been a trend for microphone companies to release large-diaphragm capacitor models priced to appeal to the private studio sector of the market, and though I can't be sure, I think the influx of cheap Russian and former East German mics must have played some part in influencing their market strategies. Capacitor mics are complicated and expensive things to build compared with dynamic models, but one of the ways to keep the cost down is to build single-pattern mics, usually cardioids, rather than multi-pattern models that require dual diaphragms and complex switching arrangements. AKG were one of the first companies to embrace this new challenge with their C3000, which continues to be a top seller today. The C3000 employs a single-sided capsule, one inch in diameter, which is roughly based on one side of a 414 capsule. This capsule includes a microscopically thin, gold-sputtered diaphragm and delivers the crisp top end associated with the 414, though it doesn't claim to sound exactly the same as a 414.

With the budget capacitor mic cracked, the next stage was to find a way to satisfy the growing demand for valve microphones, but valve electronics are much more expensive to build than transistor or FET circuitry, and need separate power supplies — you can't run a valve mic from phantom power. Nevertheless, AKG saw companies such as Audio Technica, Rode and Groove Tubes bring more affordable valve mics to the marketplace, so now they're fighting back — and very aggressively, it seems.

SOLID TUBE?

Why the name SolidTube? Well, AKG's new budget baby combines solid-state power-supply circuitry with an all-valve signal path to provide the warmth and tonal colour of valves at a lower cost. The design starts with a capsule based on that used in the C3000, hence my description of that model earlier, but the housing is much larger, both to provide more air space around the capsule and to accommodate the ECC83 valve. Apparently the ECC83 dual-triode valve was chosen because

pros & cons

AKG SOLIDTUBE £799

pros
- Exceptional value.
- Good standard of engineering.
- Flattering, classy sound.
- Accessories included.

cons
- They want it back!

summary

Though around twice the price of a budget solid-state capacitor mic, this model has a wonderfully sweet sound that makes most voices sound larger than life. It also includes most of the accessories you usually have to buy as options.

SOUND ON SOUND

it is still in production, unlike some of the valves used in true vintage models, and it is run at a full HT voltage rather than in the 'starved' configuration used in some low-voltage designs. Surprisingly, for a low-cost mic, the output stage employs a transformer rather than the more usual electronic balancing, and no doubt this also contributes to the sound.

The SolidTube is a fixed cardioid-pattern model and, as you can see from the photograph, it's tubular in construction, though in real life it looks somehow larger than you'd expect. As with virtually all studio mics, the capsule is mounted for side-fire operation (you sing into the side, not into the end!), and a red perspex window lets you see the valve glow — those long winter evenings must simply fly by! Overall, the standard of construction is just what you'd expect from AKG — solid and nicely engineered. For direct stand-mounting there's a threaded insert in the base of the mic next to the XLR output connector, and a recessed 20dB pad switch is fitted about halfway down the mic body. Because tube mics have special requirements, the output XLR cable has six pins and connects to a separate power supply box.

The PSU box is mains powered, and has a conventional balanced XLR output, but in addition to simply providing power, it also includes a switchable 12dB/octave 100Hz low-cut filter, plus a ground-lift switch. All necessary cables are provided with the mic, but you also get a bright yellow pop shield and a tough elasticated shockmount thrown in — which is a nice surprise when you think that many of the more expensive mics have these accessories as chargeable options. On top of that, AKG pack the whole kit in a foam-lined camera case to keep your mic safe when not in use.

PAPER PERFORMANCE

Though good tube mics can exude a kind of sonic magic, their Achilles heel is noise. Tubes run hot, and in electronic circuits, more heat means more noise. Fortunately, by using a hybrid design incorporating solid-stage amplification in the more vulnerable areas, AKG have managed to produce an unweighted equivalent input noise of 30dB, or 20dB A-weighted. In practical terms, this gives a 74dB A-weighted signal-to-noise ratio (ref 1 Pa), and although there are quieter mics around, this is a good figure for a valve mic, and in typical close-miking studio situations background hiss should not be a significant issue.

The frequency response of the mic is nominally flat from 20Hz to 20kHz, though there is a deliberate presence peak at around 10kHz, with a smaller peak at around 4kHz. This is predominantly a vocal mic and the presence peaks have been tailored to that application, but the SolidTube is also eminently suitable for acoustic instruments, percussion, and even electric guitars. Though quite sensitive, with a quoted 20mV/Pa sensitivity, this mic can handle SPLs of up to 130dB without the pad, or 145dB with the pad switched in, so sticking it in front of a guitar stack isn't likely to frighten it one little bit!

STUDIO TEST

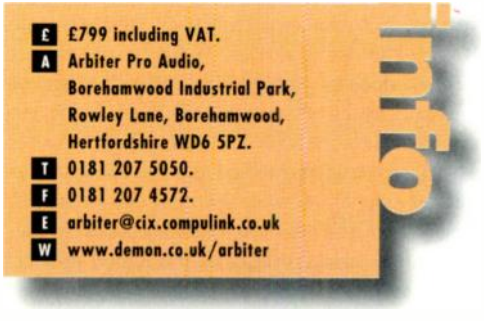
As expected, when used in most normal studio situations the SolidTube is more than adequately quiet, and its sensitivity is comparable to other capacitor mics in my locker. Tonally, the mic is very well behaved and has the smooth yet detailed character associated with good valve microphones, making the sound seem almost slightly compressed. There's plenty of high-end detail, but in a less sibilant way than with most of my solid-state capacitor mics, and the proximity effect can be used to create really warm, intimate vocal sounds without making the result too muddy.

I was surprised to note that in direct comparison with microphones that I know are good studio performers, the SolidTube sounded less honky or nasal, even though these were characteristics I'd never have associated with the other mics without this direct comparison. It's almost as though solid-state mics leave the voice sounding somehow exposed, while the SolidTube produces an integrated, very comfortable tonality, making the voice seem bigger and helping it sit better with the backing track. If there's a downside to this, it's that people whose voices lack edge or projection might find they don't cut through a mix as well as they do with a more conventional mic, but for the majority of voices I think this mic will just make them sound more as their owners would like them to sound.

SUMMARY

I think it would be both fair and accurate to say that this is the nicest vocal mic I've tried in the sub-£1000 price bracket — and there are several competitors well on the wrong side of £1000 that don't sound as sweet. As with all nice mics, it's difficult to put your finger on exactly what makes them sound so good —it's almost as though they project the whole of the voice rather than just taking one element of it and emphasising it. How much influence the valve has in all this I wouldn't like to say, but the sound certainly has that slightly compressed quality normally associated with valve mics, and the delivery of high-frequency detail and transients is very smooth, without dulling the sound in any way.

Other considerations include the impressively solid construction (which should be good for client confidence), the excellent shockmount, and the inclusive camera case. At under £800 full list price, including VAT, the SolidTube can hardly fail to be a winner. This is one mic you simply have to try — the SolidTube is no pipe dream. SOS



"I think it would be both fair and accurate to say that this is the nicest vocal mic I've tried in the sub-£1000 price bracket."

UNSOUND RECORDINGS

RECOIL • ALAN WILDER

Anyone in any doubt as to the popularity of Depeche Mode should see this man's studio. Alan Wilder, formerly the programming powerhouse of the group, and now striking out on his own, has poured the profits of his years with the Mode into this astonishing home setup. Here he talks to BILL BRUCE about the studio, his new album, and his days with Depeche.

For many of us a home studio is a loft or bedroom crammed — if we're lucky — with a sampler, synth, computer, some effects and a DAT player. Alan Wilder, late of Depeche Mode and currently working on a studio-based recording project entitled Recoil, may have a home studio somewhat grander than most, but he maintains that his setup is surprisingly simple. The main work area was actually planned by a interior design company, and consequently exhibits the same exquisite, minimalist, open-plan design as his family home (as you can see from the pictures accompanying this article). The studio is not divided into a control room and live room; in fact the main studio floor has no dividers or acoustic booths of any kind. This was a conscious decision on Alan's part intended to meet his own methodology:

"It's important for me to have space. Both at home and in the studio. This place was never designed to have a controlled sound or environment like a traditional studio, but rather to have the feel of a workshop, with plenty of light and space."

POP WILL EAT ITSELF

As though some perverse inverse square law is at work, the amount of light and space in this amazing home studio appears in total contrast to the sound of the new Recoil album *Unsound Methods*, which is a densely-plotted, dark and atmospheric work. It's all quite some way from Wilder's work with Depeche Mode, with whom he shot to fame in the '80s. Answering an anonymous group's *Melody Maker* Wanted ad for a keyboard player in 1981, Alan was fairly surprised to find himself in Depeche Mode, replacing Vince Clarke (until this point the chief songwriter in the band), who had just left the group. Songwriting duties in Depeche were subsequently taken over by Martin Gore, and Wilder became responsible for programming, sound design and production in the group as time went on, leaving no outlet for his own musical compositions; a handful were released on Depeche Mode B-sides or as the very occasional low-key album track, but that was all. It is now tempting to view Wilder's solo project Recoil, which he launched in 1986, as his way of musically letting off steam from Depeche Mode, but as he explains, the idea of the frustrated composer desperately struggling to find an outlet for his darker musical outpourings while operating day-to-day in a hugely successful pop band somewhat belies the true, much more casual origins of the Recoil project. Admittedly, since his well-documented split from Depeche a couple of years ago, Recoil has become the focus for Wilder's creative energies, becoming a one-man musical melting pot which has so far managed to mix blues, rock, electronics, classical elements, ambient and rap (and that's just for starters). But in the beginning, there was just a collection of tracks released in the mid-'80s, entitled (with typical minimalism) *1+2*; just a home demo which hadn't even been intended to lead anywhere in particular.

Wilder: "*1+2* was really just me mucking around at home. It was a cassette demo on a 4-track Fostex or Tascam, and only ended up being released after I played it to Daniel [*Miller, Managing Director of Mute Records, Depeche Mode's independent record label*]. He said, 'could you re-do this?' I didn't really have time to do it properly, so we just decided to release it inconspicuously, as it was, and not pay too much attention to it."

The modest success of *1+2* led Wilder to release a more ambitious follow-up three years later. 1989's *Hydrology* was still a far cry from the commercial pop sound of Wilder's day job, however. It remained entirely instrumental, and was still recorded on a fairly modest setup. "*Hydrology* was a step up from *1+2*. It was done on a half-inch 16-track Fostex machine. So there were limitations, but it was much more versatile than the first thing I had done. Recoil was still very much an aside to Depeche Mode, with no pressure or expectations placed upon it. In other words, it wasn't my main concern, and was always going to be an 'antidote' to Depeche Mode in some ways; a way to alleviate the frustrations of always working within a pop format. I have nothing against the pop format, but if I was going to do something on my own, there was no point in repeating what I was already doing in the group. It was intended to be completely different and experimental. It didn't matter if it was too left-field or too weird for people, because I was still doing the pop thing on the other side."

However, it could be argued that *Bloodline*, released in 1991, was a much more commercial effort. With vocals from Douglas McCarthy of Nitzer Ebb, Toni Halliday of Curve, and Moby, it came closer to having actual songs, albeit songs which split and divided with alarming regularity. For Wilder, though, there was no conscious attempt to change: "I certainly didn't feel a pressure to make it more conventional, but I did feel that I couldn't just keep producing experimental instrumental music all the time.

"I'd quite often get to a stage where I thought the music lacked something, and reasoned that if I was to progress with it in any way, I would have to bring something else in — be it vocals or whatever — to enhance what were basically backing tracks. *Bloodline* was a halfway-house between the early stuff and what I'm doing now. I brought the vocals in, but I didn't really see it through in the way I ▶

Chez Wilder... not your average bedroom studio!

should have done; I think I lacked the energy. I had Depeche Mode commitments, and I was really fitting *Bloodline* into the first real break the band had taken in 10 years.

"By the end of that year — while also producing a Nitzer Ebb album — I'd just run out of energy. I think the album suffers a little bit because of it, especially the vocals. They're there as almost last-minute atmospherics rather than to make real songs."

"I always felt that using electronics had some great advantages, but usually at the expense of a certain groove. Now I want to keep the electronics at the appropriate level."

UNSOUND ON SOUND

And so to this year's *Unsound Methods*, which continues the collaborative style of *Bloodline*. Douglas McCarthy returns on the *Apocalypse Now*-inspired track 'Incubus', as well as the sinister 'Stalker', and Alan has also roped in his partner, Hepzibah Sessa, formerly of Miranda Sex Garden, on backing vocals. In addition to Hepzibah, other vocals are supplied by Hildia Cambell, a session singer, whom Wilder previously worked with on his final Depeche Mode album, *Songs Of Faith & Devotion*. Two complete newcomers are New York artist and poet Maggie Estep, who brings her own unique slant to the spoken-word narratives of 'Luscious Apparatus' and 'Control Freak', and a young singer named Siobhan Lynch, whose demo was passed on to Wilder, and who guests on two tracks 'Drifting' and 'Missing Piece'. However, Wilder explains that many of these collaborations are borne of necessity rather than through any great desire to have anyone else involved.

"It sounds arrogant, but if I could do everything myself I would. It's just that sometimes the music requires aspects that don't come naturally to me. Lyrics and vocals are obvious examples. When it comes to engineering, I would prefer to do it all myself, although by the time I get to the final mix stage it can become a lot more complicated for me to deal with everything objectively. [*In fact, long-time Depeche Mode collaborator Steve Lyon assisted with the engineering and mixing on* Unsound Methods.] I suppose what I'm really saying is I like to work alone — though this doesn't mean that I don't ever want other people's input. I enjoy collaborating, but not on a permanent basis. With Depeche Mode, what I learned over the years from working with other people has been invaluable. It's left me in a position where I know what I want in terms of production. Nowadays, I find that working with other people slows that process down, and sometimes turns it into a battle. At this stage in my life, I don't feel I want that any more."

Another potential drawback when bringing in people new to the music business, like Siobhan Lynch, can be a feeling of intimidation on the part of the newcomer, as they start work with someone who already has a successful career in the business. Wilder agrees that it can be difficult to get over this, but in this case, he minimised problems by entering into a musical collaboration with Lynch before the two of them actually met, by demo'ing songs on DAT and sending them back and forth, each musical partner expanding on what was on the tape with each pass. Wilder: "It seemed quite a modern way of working. I didn't want to get too embroiled with someone and find out we were completely incompatible. This way you can avoid a head-on collision."

Perhaps because of such precautions, Alan feels he rarely clashes with people when recording: "I think I'm quite diplomatic in the studio. I'm able to put people at ease, and encourage them to bring the best out of themselves. I know that's why

Douglas [*McCarthy*] likes working with me: I've always been able to get the best out of him. Not that he lacks confidence, but a lot of singers do need some guidance, and to work with someone who is going to push them. Dave [*Gahan, singer with Depeche Mode*] loved being driven hard, even to the point where he would become frustrated; but then the next day he would say, 'I'm so glad you did that, because I'm really pleased with how my vocal sounds'.

It would seem that once in the studio, Siobhan Lynch also responded well to Wilder's diplomatic approach to recording. "Siobhan had a maturity in her voice that to me was way beyond her years; it was full of intensity and emotion, and in the studio, that intensity poured out of her.

"All the collaborations worked in slightly different ways. With Hildia, I wanted her to act like a session singer, and really just recreate an idea I already had. With Maggie, I hadn't heard anything she had in mind for the music until she arrived, and that was the most exciting but also the most tense collaboration, because I didn't really know what to expect. She came with a whole set of lyrics and recited her words pretty much from start to finish. Then I pieced it together with a hard disk editor.

"As I've said, on *Bloodline*, I almost purposely held the vocals back; at the time I wasn't so interested in the words, only the textures. This time around, the words were really the top line. I'm very careful about the placement of everything, that's the part of the process I enjoy. For me, this process is crucial to provide an overall continuity, so that I can use four completely different vocalists without the record sounding chaotic and unfocused."

SOUNDS OF FAITH & DEVOTION

For years, Alan was happy to take similar care over the production on Depeche Mode's albums, but when he split from the band in the mid-'90s, the press release he issued to explain his reasons for leaving stated that he felt his work was being taken for granted. Though reluctant to discuss this subject in too much detail, he is, at least, keen to stress that it wasn't the *amount* of work that made him leave: "I wouldn't say the workload soured me in any way. I enjoyed being involved in production and programming; it was something I was good at, so I had no resentment about that. I just felt that it was taken for granted. It's not something I want to dwell on. I just wanted to put a lid on it all.

"I feel I'd gone as far as I could within the group. Now, I think I'm in the ultimate position to work with different people at

FIT TO POP?

Alan Wilder may not be making pop records these days, yet you might get the impression his albums consist of nothing but white noise and electronic feedback. However, tracks like 'Luscious Apparatus' or 'Missing Piece' from *Unsound Methods* almost qualify as pop songs, albeit with twisting hooks and a spiky delivery. They might not give Oasis any sleepless nights, but Wilder seems sanguine about the possibilities for the project:

"It's obvious I'm not trying to make a commercial, radio-friendly, record, but of course it can be frustrating when you're trying to get the music across to people and the reaction you get is, 'oh, it's difficult music for weird people, to me, it's not that weird, but I suppose it does require the listener's full attention — if you just want one-dimensional pub rock then it probably won't be for you, but if you like music that's going to throw up something new every time you listen to it, you should at least have the opportunity to check it out for yourself. It would be naive to expect *Unsound Methods* to have mass appeal, but I do think there is a way to challenge people to investigate something a bit different." He sinks back into his chair and shakes his head. "It annoys me that the BBC are going on just now about the wonderful cross-section of music they promote with their 'Perfect Day' record, when all you really get is half-an-hour of dross on *Top Of The Pops*, and a rock programme which goes out at 2 o'clock in the morning. There are *so many* different kinds of music that don't get any coverage."

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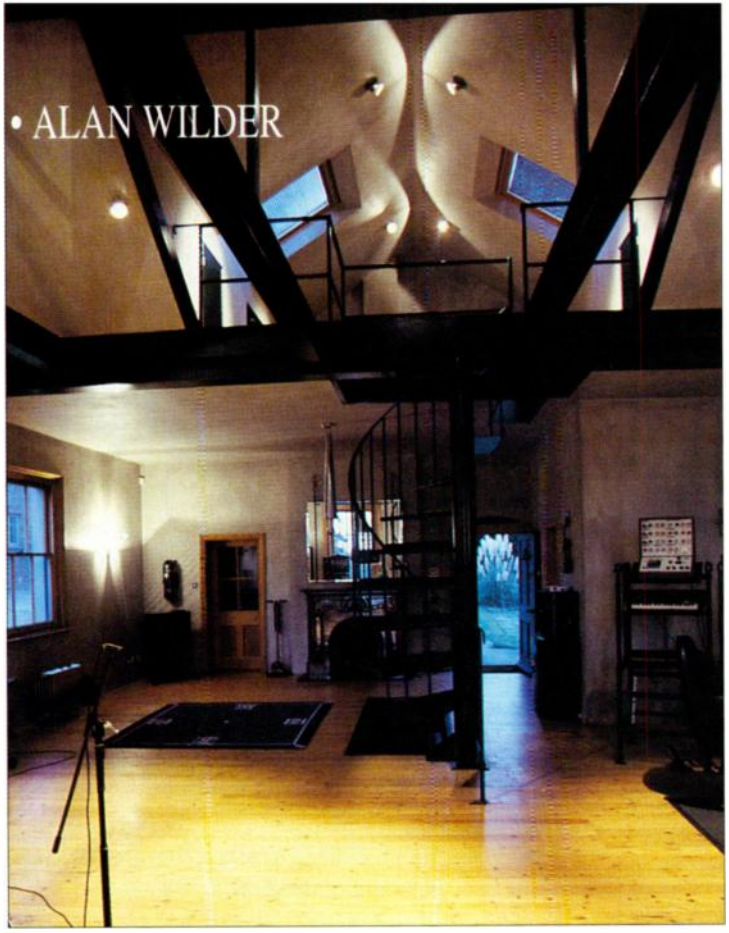

Cables festoon the cramped facilities in Alan's tiny studio, as you can see...

▶ different times. I've gained the experience and the rewards of being in a successful group, which has enabled me to do exactly what I want now. I've done very well out of the music business, and I don't mean that in boastful sense, but rather that I value it and the advantages it can offer."

At no time does Alan snipe at or carp about his former bandmates. Aspects of the split make him uncomfortable, yet he will quite cheerily reminisce about a particular tour, party or recording session: "I don't mind talking about the Depeche Mode connection at all, because it's obviously relevant to where I am now. However, in two or three years, when I make another Recoil album, it's going to become more tedious to me. I would hope by then that most people will leave it alone."

When he is asked how it felt to listen to *Ultra*, Depeche's most recent album and their first without him, he admits it was a weird experience: "I can't hear it in the same way as any record I was involved with, but I certainly don't feel a yearning to be involved again, and I've no regrets about leaving at all. The album is difficult for me to comment on, though I do have something of a stock answer, which is: you can probably work out what I think about it by listening to *Unsound Methods* and then *Ultra*, because the two records tell you everything you need to know about what the musical relationship was between myself and Martin [*Gore*]. It's almost as if we've gone to the two extremes of what we were when we were together. What the band had before was a combination of those extremes. It had run its course for me — and that isn't me saying the group itself has run its course. What I mean is that *I* didn't have anything else to contribute within the band."

Alan Wilder's time in Depeche Mode saw the band's sound mature into an organic, atmospheric blend of electronics with elements of pop, rock, blues and experimental music. This obviously still appeals to him: "I love that hybrid mixing of styles where you blend electronics with gospel, for example. One reviewer compared *Unsound Methods* to Paul Hardcastle, saying it was electro-nonsense or something. This album is so un-electro, that's the thing. There is much more of an organic slant on this than on anything I've done before. To dismiss it as electro-Paul Hardcastle is disappointing, lazy journalism. I think, in fact, it has more in common with *Songs Of Faith And Devotion* than it does with *Bloodline*. I always felt that using electronics had some great advantages, but usually at the expense of a certain groove. So I don't want to get sucked into that again. I want to keep the electronics at the appropriate level, making sure they have something to contribute, but also making sure the sound and atmosphere has a feel and a roundness."

By the time Wilder left Depeche Mode, after the *Songs Of Faith & Devotion* album, the group had moved firmly away from what had been described as 'plink-plonk' synth pop. Strangely, this led to the band receiving flak at the other extreme, from synth purists. Alan nods, "There was a criticism levelled at *Songs Of Faith & Devotion*, that it was somehow a rock album. Yet if you listen to it, it's so far from a rock album, it's untrue. Okay, so there's some live drums and guitars on it — so that somehow makes it a rock album? In the early days, we had silly rules about not using guitars, and then we realised it was ridiculous to have any rules about instrumentation. You could use any instrument if it works. I mean, there are guitars on [*1983's*] *Construction Time Again*. With *Songs Of Faith &*

GEAR *À LA MODE*

Looking around Alan's studio, it's clear that, despite his continued usage of older gear, things have come on a great deal technologically since he started with Depeche Mode in 1981. I asked him for a personal account of how the technology he used had changed over the years. "Pre-Depeche Mode, my ideal setup would have been a Hammond C3 (with Leslie cabinet), a Minimoog and a full-size Fender Rhodes piano; the full Rick Wakeman setup. When I joined Depeche Mode it was quite a shock, because at the time they were using three of the smallest synths you could find. At my audition, Martin had a little Yamaha CS5 — which was only about a foot wide — Fletch [*Andrew Fletcher*] was on a Moog Source, and I was given a Moog Prodigy. We all played one-note riffs," Alan laughs, "and I have to admit I felt a little bit naked without more keyboards around me.

"At that point Daniel [*Miller, Mute Records boss*] was influential in terms of what equipment we were using. He would bring in his ARP2600 and the sequencer which accompanied it. For the first Depeche Mode albums, a Roland MC4 was used to trigger the synths. In fact, as a sync'ing system, voltage control still works better with analogue gear than MIDI. By 1983, and *Construction Time Again*, we were using a BBC Micro computer to sequence everything, and eventually we did move on to software sequencers like *Cubase*."

People might have had the impression from the sample-ridden *Construction Time Again* album that Depeche Mode were ditching synths in favour of exclusively sample-based backing, but, as Alan explains, this was not the case:

"We used a PPG Wave, which was our first digital synth, although we also had the Synclavier and the Emu Emulator I by this point. What people forget about the Synclavier is that it's also a very powerful synthesizer. A lot of the synth sounds on *Construction Time Again*, *Some Great Reward* and *Black Celebration* were actually generated from the Synclavier. Once the samplers appeared, though, our setup didn't change very much. Actually, a lot of the changes to the band's gear happened so that we could take songs out on the road. For example, the Emu Emax was a very rugged, user-friendly keyboard which would hold a lot of our sounds and was ideal for live work."

Devotion, the songs seemed to lend themselves to a more aggressive, looser feel. *Violator [1990]* had been a more precise record, although there were a lot of guitars on there as well. Yet somehow it was still very programmed and rigid. *Songs Of Faith & Devotion* was much less inhibited and dynamic, but far from being a rock album."

This process of disinhibition has continued in Wilder's work with Recoil, and is clearly something he welcomes. Alan is the first to admit that in the synth- and sampler-dominated early and mid-'80s, Depeche Mode sometimes went *way* overboard to get a sound: "By the time we came to record *[1984's] Some Great Reward* we not only had the Emulator, but Daniel Miller had invested £60,000 in a Synclavier which rarely worked — although when it did it sounded great. I think there was a time when Daniel got too involved in the technology: I can remember one particular sound we created for 'Shake The Disease'. The part itself was virtually moronic. It was so simple it was unbelievable; a two-note riff. And we ended up using 24 sounds layered on top of each other, every sound in the orchestra! These, of course, all then cancelled each other out, and the end result sounded like a sine wave! That epitomised how far up your arse you could go.

"These days I can still use 40 or 50 sounds per song, but somehow there's still space in the music. To me, the details are very important, and I'm not content with guitar, bass and drums as my only instrumentation. If you've got the possibility to refine your music by bringing in a variety of atmospheres and textures, then why not do it? You can draw people into the music even though all the little details don't really make themselves apparent right away.

"Depeche Mode spent a lot of time farting around, possibly with too much equipment. We also tried too many ways of doing something that was really very simple. I think one of the benefits of working on my own is I don't have to go through everybody's ideas. I don't have to answer to anyone."

Alan's guitar and processing rack, containing his Drawmer compressors and gates, Lexicon PCM70 reverb, Yamaha SPX90 effects, and Roland R880 reverb/delay.

TECHNOLOGY? WELL, PERHAPS A *BIT*...

It's easy to assume from looking at Alan's amazing studio that he's a technology addict, ▶

▶ especially when he presses a button and part of the studio floor slides away, James Bond-style, to reveal a basement 'store room', housing a host of older samplers, amongst them an Emu Emulator II, and an original Emax. But, in fact, Alan has a cautious outlook when it comes to purchasing gear, and though *Unsound Methods* is a dense, dark album sonically, it belies the actual amount of equipment used to create it.

"I've never really had a particularly complicated equipment setup," he explains, "Obviously, I do embrace technology, but I never spend a lot of time researching all the latest equipment. I'm like most people, really... I get something that works and I stick with it. Occasionally, I update when it becomes obvious I need to, but basically I like to get a setup that works for me, then I don't think about it too much. I can't stand equipment manuals, so I never even read them. I just find it boring. If you really get too involved in technology you go crazy, because there's too much choice. I try to use tools to their optimum, but if I really took time to fully explore the technology, I would never get any work done!"

A staple of Recoil's output is the re-use of familiar sounds from Depeche Mode or previous Recoil albums. For this reason, a lot of Recoil's equipment has been around since Alan first started with Depeche Mode.

RECOIL EQUIPMENT LIST

SYNTHS/KEYBOARDS
- ARP Odyssey
- EDP Wasp (with Spider sequencer)
- EMS Synthi
- Korg 01/W ProX Workstation
- Moog MIDImoog (rackmount)
- Moog Minimoog
- Oberheim OB8
- Obi Rack
- Waldorf Microwave

RECORDING
- Akai ADAM DR1200 12-track digital multitrack (x2)
- AR100 nearfield monitors (quad powered)
- Bruel & Kjaer 4006 mic
- Bruel & Kjaer 4011 mic
- Drawmer gates & compressors (various)
- Dynaudio main monitors (powered by Manley valve amplifiers)
- Lexicon PCM70 reverb
- Roland R880 reverb/delay
- Sony DAT machine
- Soundtracs 3632 in-line console
- Yamaha SPX90 MkII effects (x3)
- Zoom guitar processor

COMPUTERS/SOFTWARE
- Apple Power Mac 7600 (with 17-inch Monitor, Digidesign Audiomedia III PCI I/O card & 2Gb hard disk)
- Steinberg *Cubase XT* v3.0 sequencer
- Steinberg *Recycle* sample editor

SAMPLERS
- Akai S1100 (16Mb of RAM)
- Akai S3000XL (32Mb of RAM)
- Emu Emax
- Emu Emulator II
- Emu Emulator III

DRUM MACHINE
- Emu Drumulator

MISCELLANEOUS
- Bösendorfer 6ft grand piano
- Iomega 1Gb Jaz sample storage drive
- Knight guitar (Gretsch copy)
- Mark Of The Unicorn MTP AV 8-in,8-out MIDI interface/SMPTE synchroniser
- Steinway 6ft grand piano
- Syquest 230Mb EZFlyer
- Yamaha drumkit (with Nobel & Couley snares & Zildjian cymbals)

The main keyboard and module racks, including EMS Synthi, ARP Odyssey, EDP Wasp and Spider MIDImoog, Obi rack, Minimoog, Waldorf Microwave, Akai S1000, S1100, and S3000 samplers, Korg 01/W ProX, and Emu Emulator III.

"My studio now is made up of bits and pieces I've acquired over the years. I always had things like my Minimoog anyway, and then I'd bring keyboards like the Emulators home. In fact, I was working with the internal sequencer in the Emulator for a while, which wasn't very good, but it was all I had around. In terms of recording, everything was going onto a 4-track reel-to-reel, so it was a very basic setup to begin with.

"The Minimoog is a machine I return to now because there are sounds in there I particularly like for a certain job. I use it for sequencer-type basslines or for a mid-range parts — sort of bubbly synth sounds with a wide dynamic range, using velocity sensitivity. That doesn't mean it's not capable of doing other things, of course.

"Most of what I'm doing at the moment is very sample-based, with an original source sample providing the sound. I then use the samplers as a tool to manipulate that source sound, and in that respect I always look for an instrument which has really good filtering, time-stretching and lots of possibilities for stacking sounds on top of each other. Those kind of facilities are what interest me. Consequently, I end up using Akais. I prefer them to my Emulator III, mainly because of the Akai's better output assignment facilities, and also the fact that you can stack more sounds on top of each other. The EIII actually *sounds* very good, but is a bit limited in that department.

"I also got fed up with Emulators because I would purchase one for a lot of money, and then six months later they'd bring out an incompatible new model that rendered mine redundant. I got very angry about that, which is another reason why I ended up with these Akais. They seem to do what I want, so I stuck with them."

Alan also finds it important to have easy access to the equipment in his setup. To this end, a Mark Of The Unicorn MIDI Time Piece AV is invaluable. "I use a Korg 01/W ProX as my master keyboard. All the other keyboards and modules run through the MTP AV. Then I can assign parts to any machine. I've just got one patch on the MTP which allows me at least 64 MIDI channels. I can have 8x16 MIDI possibilities via the MTP, which is easily enough."

The heart of the Recoil setup is Alan's Power Mac running *Cubase XT* v3.0. His ultimate aim is to run all the tracks, his effects and acoustic parts from the computer, without laying anything to tape at any stage: "I've always dreamed of being able to have everything immediately accessible and totally flexible. In the past, there has always been some limitation or other. I've had to commit my work to a format which allows no room for change later, like tape. Now everything is flexible — including the vocals. I'm able to restructure what someone has given me, such as a lead vocal, and pick pieces up and move them around.

Master of all he surveys... Alan with his main keyboard rocks.

If you want to go to the chorus it's simple, there's no spooling of tape or sync'ing things up. It's just *there*. That's why I really love *Cubase*'s Cycle Mode. If I want to work on a two-bar sequence in the middle of a chorus, I can go into Cycle and repeat it over and over, making adjustments as it goes. You just couldn't do that in the '70s!"

Despite the freedom technology offers the modern musician, it also brings its own unique problems, as the average *SOS* reader will be aware, and, like everyone else, Alan suffers the occasional technological irritation. "I do find there are drawbacks with *Cubase* sometimes, in terms of sync'ing over MIDI. Sometimes my drum loops aren't tight enough, but at the end of the day, if it feels good, things like that don't bother me, although by the same token, slight timing discrepancies can be crucial to the 'feel' in a track, and in that respect I often want to put them right. If that makes me seem like a trainspotter then I would argue against that; I'm very conscious of the feel and the groove of music, to the point where I am almost obsessed by it. Not because I want everything regimented, but because I want to optimise that aspect."

Although the developments in direct-to-disk recording are the best thing to happen to the recording studio since the invention of the tape-based multitrack, Alan is aware he still hasn't put together his ideal setup: "There is so much technology out there which is better than what I'm using at present. This is probably because I haven't got the patience to explore it all. My ideal setup would be if I could do everything with just the computer — as long as it could still give me the sound of all that brilliant outboard gear, the valve compression, amplification, and EQ... but in software, in a computer-based format.

"I'm not that far off having that capability, but I do need to refine my setup a little bit, so that with the next album I won't have to pick up my studio and transport it to a 'not-very-good' commercial studio with an automated desk and a more controlled sound, spending lots of money in the process, which was what I had to do on this particular album."

THE ART OF DARKNESS

Later in the evening, as Alan Wilder stretches out on his living room floor, relaxing with his family, I begin to wonder if this is the same man responsible for an album full of darkness and barely concealed violence. But he shrugs this off: "Martin always thought there was a lot of humour in Depeche Mode's music. I didn't think so particularly, although the people themselves were funny and humorous. I don't understand why it is you have to be like your music, or why making music which reflects your own personality is important. The darker sides of people's characters are much more interesting than the side they let you see. I heard a member of a particularly well-known band ask recently why it is that people always assume that just because you're in a band with two or three other people, you must all be great buddies?

"It doesn't necessarily follow that you have to be great friends to have a good working relationship. And you don't have to be a certain kind of person to make a certain kind of music. What's wrong with being observational? A filmmaker can tell a story, he doesn't have to live the life. Mike Leigh observes the entire class system; he doesn't have to put himself on the screen. I was in a band that wrote melodic pop songs — if I don't do that, is everything I do now a failure?"

The darkness at the heart of *Unsound Methods* is almost relentless, which seems to be exactly what was intended. Alan agrees with this heartily: "In the end, it's a solid body of work that has a continuity and seems to subconsciously deal with the same thing over and over again; this idea of obsession, no matter how that manifests itself. I'm not an obsessive character, so it's intriguing that I should have an interest in subjects which revolve about that." He mulls this over for a second and adds, "It's obviously something I need to get out somehow, bearing in mind I don't write the words to these songs. Nevertheless, the atmosphere and subject matter still comes from me. It's just a side of life that interests me more than writing about having babies."

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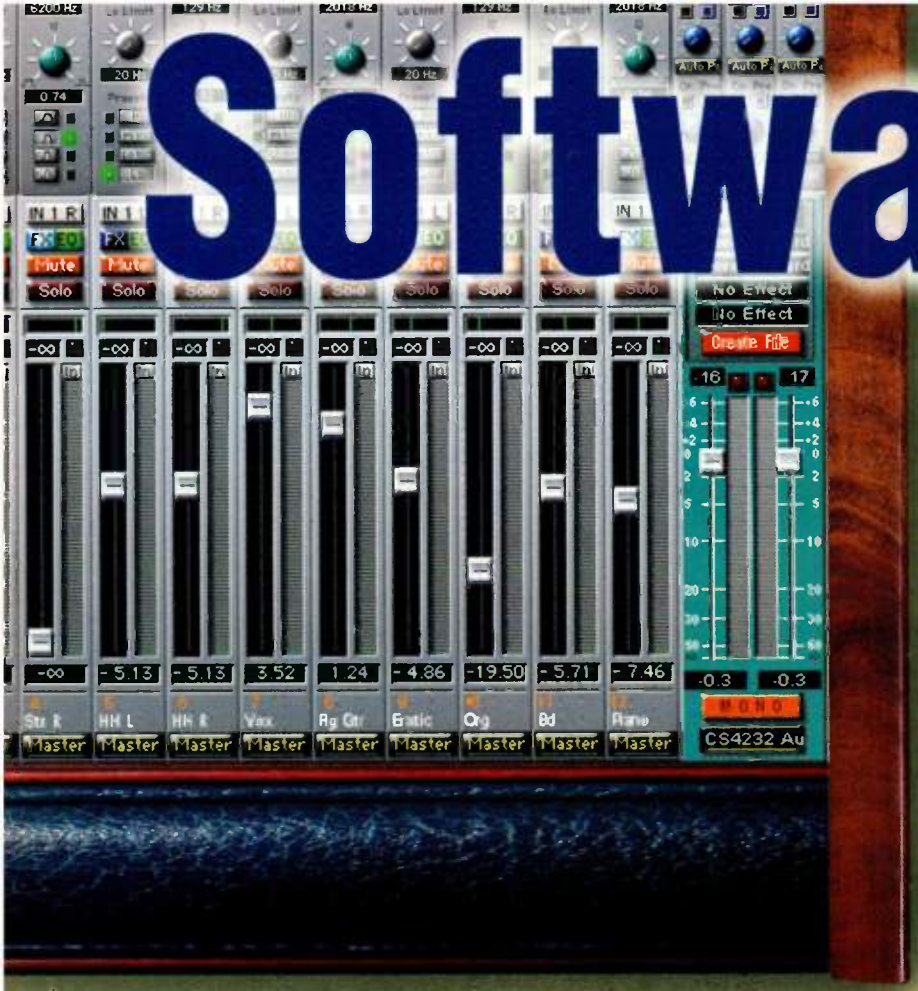


Although the answer is software, the **VST** experience lies somewhere between the two.

Steinberg's revolutionary **Virtual Studio Technology** is at the heart of the latest Cubase VST 3.5 for Mac OS and Windows platforms.

At first glance Virtual Studio Technology replaces a truckload of hardware, offering all the essential studio components in a reassuringly familiar format Mixers have long throw faders and bargraphs, effects processors have buttons, knobs and LED displays.

Plug-In to These

An ever-expanding range of Cubase-compatible software effects are available from manufactures such as Spectral Design, Waves, Arboretum and TC Works. VST for Windows supports the new Microsoft Direct X standard. Here's a couple of examples:

DeNoiser - RRP £299
Ideal for removing tape hiss or broadband noise this plug-in perform as well as equipment costing 50 times more.

DeClicker - RRP £299
Pro quality real time audio restoration. Ideal for restoring vintage recordings, masking tape drop-outs, softening digital distortion and removing digital clicks.

LoudnessMaximizer - RRP £299
Loudness Maximizer can increase the subjective loudness and boost the 'punchiness' of even the most overmixed/ saturated material.

Spectralizer - RRP £299
Boost 2nd and 3rd harmonics with the Spectralizer and make your recordings sound crisp and clear.

Magneto - RRP £299
Magneto emulates analogue tape saturation to add warmth or compression to your recording . Who said digital audio has to sound sterile?

AudioTrack - RRP £169
High quality Compression/Expander /Gate/Eq in a single plug-in at a remarkable price.

For detailed spec and a full list of available plug-ins, please phone or fax for our catalogue.

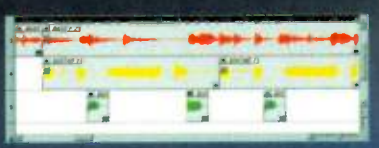
The Arrange Page

The award-winning Arrangement Page is what makes Cubase unique. Both audio & midi are easily edited with the tools from the toolbox, copied across the page and positioned accurately with a minimum of fuss. And once you are familiar with the tools in the arrangement page, you will find the same operation will create a similar result in all other midi & audio editors.

The Steinberg philosophy is don't stop the music. That's why the programmers have skillfully avoided endless sub-menus and ensured that whatever you want to do, you don't have to stop playback first. Cubase is a true realtime environment designed to aid the composer.

Audio Editing Made Simple

Just double clicking an audio part will open the audio editor. The toolbox



makes it easy to cut, copy, move or paste audio and best of all, its totally non-destructive even if you archive a composition for future use.

Quantize Your Groove

Analyse the rhythmic structure of one audio recording and apply it to another, or apply it to a MIDI recording, even apply the feel of a midi recording to your audio. Cubase

can do all this making the task of working with MIDI and audio easier than ever before.

More Ins & Outs

Cubase is a complete virtual recording studio. But if you need to mix

Hardware?

But take a closer look and you'll discover an advanced level of functionality only possible in a software based environment. Like total recall of every operation and setting, the ability to arrange MIDI and audio simultaneously and specs that would simply break the bank in hardware - Try costing 32 channels of CD quality digital recording and mixing with 128 real time eq's

It's this combination of software power and flexibility with hardware sound and feel that makes VST a uniquely productive studio system.

externally then choose one of the many brand name multiple I/O cards. There is compatibility with any card complying with the current Windows MME standard and special drivers are written for the Mac platform. For each available stereo in/output Cubase will create a stereo subgroup to which every channel can be routed. Even auxiliaries can be routed allowing complete integration of external hardware.

Event, Korg, Lexicon, DigiDesign,

TimeStretching & PitchShifting

If a drum loop doesn't exactly fit or a vocal note is slightly flat then simply use

the built-in DSP facilities to solve the problem and the new natural-sounding Formant Algorithm consigns Pinky and Perky to the toy cupboard forever.

Native Effect processing

Native audio processing uses the computers own processor to perform all effects functions without the need for any additional DSP hardware. Cubase comes complete with a whole arsenal of high quality native effects. Choose up to 4 simultaneous Aux and Master effects from

- Reverb
- Chorus/Flanger
- Stereo delay
- AutoPanner
- Fuzz pedal
- Stereo Wizard
- Spatial Enhancer
- Oscilloscope

VIRTUAL STUDIO TECHNOLOGY
Leather, teak, flightcase and light module regrettably not included!

Cubase VST 3.5 RRP £329
Cubase Score VST RRP £499

System Requirements:

Minimum: Windows 95 • Intel Pentium 100 MHz • 24Mb RAM • 256 colours 800x600 • Windows 95 compatible soundcard • Fast E-IDE or SCSI hard disc. **Recommended:** Windows 95 • Intel Pentium 166 MHz • 24Mb RAM • High colour (16 bit) 1024x768

PowerMac or compatible computer • At least PPC 601/80 processor, faster recommended • Minimum 16Mb RAM, 24Mb recommended • Second level Cache required • System 7.5.3 or higher

Burn your own CD's

Wavelab 1.6 is a dedicated audio processing and editing system for stereo mastering applications, including CD burning with PQ encoding and master listing.

Highly regarded for its ease of use and amazing processing speed, the programme has a comprehensive spec., including:

Time stretching/Pitch correction
Parametric & compression
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Audio access database
Spectrum analysis
Realtime plug-in interface with 9 effects

RRP £329

Wavelab 1.6 for Windows

CUBASE VST 3.5 Steinberg

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carry on Doctor

BOSS DR SAMPLE SP202 DJ LOOPING SAMPLER

Boss's popular 'Doctor' range of inexpensive and useful studio gear is now over 15 years old, but remains very much alive, and the Dr Sample SP202 is the latest newcomer, offering quick and easy sampling for DJs or beginners in the field. CHRIS CARTER gives it a full physical...

First, let me ask you a question: hands up anyone who can tell me the criteria for deciding whether a product is released under the Roland or the Boss moniker? After all, both ranges are made at the same factory, are probably designed by the same R&D team, and are both produced for musicians. Maybe Roland products are perceived as more pro while Boss are more hip? Answers on a £50 note please...

The Boss 'Doctor' range started way back in 1980 with the original Dr Rhythm drum machine, the funky DR55 (sadly, my own is long deceased and gone to silicon heaven), and although the SP202 is the latest product in the long-lived range, it isn't the first portable sampler from Boss. The DSD2 Sampler, produced in 1986, was a 12-bit, single-sample footpedal which could drain a PP3 battery in about 15 minutes (believe me — I used to have one!). Happily, things have improved a lot since then; the SP202 will happily run on six AA-sized Duracells for up to eight hours of continuous use.

TRUST ME, I'M A DOCTOR

Before I get I get down to the nitty-gritty, let me just give you a quick run down of the vitals. The Dr Sample is a 4-voice, 16-bit stereo sampler, with a bpm calculator, a 3-digit LED display, built-in effects, a built-in microphone, stereo audio line in and line out, and MIDI (in a very basic form). It's designed primarily as a portable DJ looping sampler, and with this in mind, Boss have not only made it quick and easy to sample and loop with the Dr Sample, but have also endowed it with options for mains or battery power, and given it the capacity to retain samples even without main batteries installed or external power. Very useful indeed, particularly if your batteries have run flat and you can't get replacements in a hurry. On the rear panel, connections to and from the outside world are via four phono sockets, a MIDI In socket, a power input socket (9V) and an on/off switch. Round the front, there's a stereo mini-jack headphone socket, a standard mono quarter-inch jack socket for an external microphone, a mic/line selector, a Source Mix on/off switch and a small slot for Smart Media memory cards.

ALL THE STYLE OF... A TRICORDER?

Straight out of the box, the stylish Dr Sample catches your eye immediately, with its minimalist black casing, oversized orange lettering and generous complement of buttons. This feeling is enhanced when you switch on the power; 18 of the 30 rubberised buttons and pads glow bright red when pressed, and there are plenty of flashing LEDs. Also, I'm apparently not the first person to point out that

the SP202 bears an uncanny resemblance to Dr McCoy's Medical Tricorder in *Star Trek* (the original series, of course, not *The Next Generation*). Perhaps the Boss design team are Trekkies...?

Even though it's slightly larger than a house brick, the Dr Sample weighs only 850g (with batteries) and could, at a push, be described as hand-held (if you have big hands). The build quality is up to Boss's usual high standard, and the main control surface is fairly busy, but even so, everything is logically laid out with all the controls clearly labelled, and because of the contrasting colour scheme, nobody should have any trouble using it on a dim stage.

WHAT'S UP, DOC?

Up to 16 mono or eight stereo samples can be recorded into the two internal banks, and samples can be recorded at four sampling frequencies: Hi-Fi (31.25kHz), Standard (15.63kHz), Lo-Fi 1 (7.81kHz) and Lo-Fi 2 (3.91kHz). Using Hi-Fi mode, the maximum sample time in mono is 32 seconds, and this jumps to an amazing (but distinctly grungy) 4 minutes 27 seconds mono in Lo-Fi 2 mode. This is quite impressive, because by my reckoning the internal memory is only about 500K, which means there must be some serious data compression going on inside this Doctor. Sampling times and the number of samples available can be increased dramatically by plugging Smart Media cards into the memory slot on the front panel (more on this in the 'Get Smart' box elsewhere in this article).

IT'S A SAMPLER, JIM...

Starting at the front edge of the top control panel and working our way back, we first encounter eight reasonably-sized sample pads which are used for recording and playing back samples, though sadly they're not velocity sensitive. As I mentioned earlier, these pads glow bright red when hit and stay lit for as long as the sample is playing, which makes it very easy to see what's going on, even from across a studio. Next to the sample pads is a Hold key for temporarily sustaining samples that haven't been programmed to loop indefinitely, and a Source button which directs any signal connected to either the line or mic inputs through the effects section.

Above these pads is a row of smaller buttons for recording, deleting and setting the start and end points of a sample, plus a Cancel button and a Remain button for checking how much sample time is available. Two Bank Select buttons, A/B and C/D, let you choose which pads are active from two internal sample banks or, if a memory card is inserted, two external banks.

A LITTLE CUT HERE, A LITTLE CUT THERE

Directly above these controls is another row of even smaller Edit buttons and LEDs to control the sample editing and playback options. The sample editing functions are minimalist in the extreme; they just about do the job, but only by a cat's whisker. There are options for forward or reverse, looping or one-shot playback modes, gate or trigger and sample start and end point adjustment. That's yer lot! No sound-shaping, no velocity and no sample level adjustment options. The start and end points are set with a single button labelled Mark (nice lad, but a bit dim) and any trimming is done entirely by ear and finger coordination, with no displays or digits; so don't try this if you've been partying all night! Editing involves pushing Mark once where you want the sample (looping or not) to begin and then tapping it again where you want the sample to end. Er, that's it. I know this sounds pretty fast and intuitive, but actually it isn't. If you are trying to edit a short loop it's almost impossible to get decent results; I found it quicker to sample the loop again from scratch. The moral of this is: get it right in the sampling stage. To make the most of the available memory, you can delete any unwanted portions of the edited sample by pressing the Del button.

While we are on the subject of sampling, another option available is the Source Mix on/off switch on the front of the unit. This allows you to feed the audio input signal (mic or line) straight through to the Dr Sample line outputs and is handy if you need to monitor the input source before sampling. Otherwise you will only hear the input signal if you go into record mode or if you press the Source button next to the sample pads.

TAP TAP TAP

Above the sample editing controls, there is the bpm/Tap section, which comprises the 3-digit display, Up/Down buttons and a large Tap pad. Though this may seem basic, the section does perform a couple of nifty tricks, even if it isn't always entirely successful. The Tap function works just like any other bpm calculator; you just tap in a regular beat and the Dr Sample displays what it thinks the bpm is, and quickly too. Sometimes, it's almost too quick; unless you are spot-on with your timing, the bpm figures constantly shift up and down while you're tapping, which can be pretty distracting.

If you set a bpm figure before you sample a phrase or loop, (with the bpm Up/Down button or by using the Tap function), the Dr Sample will try and assist you by quantising the record stop point to the nearest bpm beat figure. This sounds fine in theory, but you still have to be fairly accurate with your own timing, otherwise the Dr Sample will move the bpm amount a couple of digits higher or lower ▶

pros & cons

BOSS DR SAMPLE £299

pros

- Excellent sound (when using Hi-Fi setting).
- Fast and easy to use.
- Impressive sampling times.
- Uses affordable Smart Media cards for longer sampling times and backup.
- Some useful and novel effects.
- Built-in microphone makes it easy to sample in a hurry.
- Extremely portable and quite happily runs on batteries for hours.
- Looks great, especially with the lights off!

cons

- Only 4-note polyphony at maximum, and less with effects and stereo samples.
- Minimalist sample editing.
- Basic MIDI specification.
- Annoying playback interruptions when using effects and/or stereo samples.
- No footswitch facility.
- Power supply not included.

summary

With a great sound that can really kick, and a couple of interesting effects to boot, sampling loops has never been easier or quicker. With a little practice, and when used in the right situation, this can be a storming little machine. Just don't expect too much of it in the MIDI or sample editing departments.

SOUND ON SOUND

GET SMART

One of the most innovative, not to mention useful features of the Dr Sample is the way it handles sample storage and backup in the absence of a floppy disk drive, SCSI and MIDI SysEx facilities. Instead, there's a slot at the front that accepts small RAM memory cards called Smart Media. Looking at the total sampling time table elsewhere in this review chart (see the 'Hi-Fi Or Lo-Fi?' box) you will see that using these cards increases sampling times quite substantially. The Smart Media RAM cards have been adopted by most of the major electronics manufacturers for use with the new generation of digital cameras and personal organisers that are seemingly appearing on a weekly basis. The consequence of this fast take-up is that Smart Media cards are quickly becoming something of an an industry standard, resulting in dramatic price reductions as production increases. There are two types of card available: the S2M5 with a 2Mb capacity, and the S4M5 with a 4Mb capacity. At my local Tecno camera store, the cards currently sell for £40 and £50 respectively, while Boss will also be selling their own, though their prices have yet to be confirmed. It pays to shop around, too — Dixons quoted me £249 for a single 2Mb card, which is pretty outrageous!

HI-FI OR LO-FI?

Here are the total sampling times offered by the Dr Sample (total time available for 16 samples across 2 banks).

GRADE	FREQUENCY	INTERNAL	2MB CARD	4MB CARD
Hi-Fi	31.25kHz	0m 32s	2m 14s	4m 27s
Standard	15.63kHz	1m 05s	4m 27s	8m 55s
Lo-Fi 1	7.81kHz	2m 10s	8m 55s	17m 51s
Lo-Fi 2	3.91kHz	4m 20s	17m 51s	35m 43s

THE DOCTOR'S SYMPTOMS — FEATURE LIST

- 4-note polyphony
- 16 samples using internal memory
- 16 samples on Smart Media card
- 16-bit A/D and D/A converters
- Time-stretch, Filter and Ring Modulator
- Various sample times (see 'Hi-fi Or Lo-Fi?' box)
- Stereo line out @ -10dBm
- Stereo line in @ +4dBm
- Mic input @ -60dBm to 30dBm
- MIDI in
- 9V DC in
- Eight hours continuous use on battery power
- Size: 83mm x 145 x 221 (hwd)

▶ than you expected it to be. If you are having trouble getting a loop to play back at the correct bpm, you can, as an alternative, use the Pitch or Time effects button (or both) to move the bpm (which is always displayed for the most recent sample selected) to a new figure. This works surprisingly well, but has a major drawback of robbing any other samples of any effects they may have been using.

THE EFFECTS

Above the Tap section, you find the controls relating to the Dr Sample's effects section. I must admit to being surprised at finding one of these on a budget sampler, but before you get too excited, let me warn you that this is a bit of a mixed bag, not to mention a downright misnomer in one case. What we have here are six buttons labelled Pitch, Time, Delay, Filter 1, Filter 2 and Ring Mod, plus the Record Level knob, which doubles as an audio input level adjustment and an effect value controller. Unfortunately, the effects section does have a few frustrating restrictions. One is that, with the exception of the Pitch effect, only one sample can use an effect at any one time. This means that if two or more samples are programmed to use an effect and an effected sample is already playing, then playback of the second sample cuts off the other sample, resulting in some unexpected hiccups, if you're not prepared. Other limitations are that the Time and Delay effects won't work with stereo samples. Also, once an effect is selected, voice polyphony is reduced by one for Standard and Lo-Fi grade samples and by two for Hi-Fi grade samples. However, it's not all bad, as a nice feature is that each sample pad remembers any effect and corresponding controller amount assigned to it. Another feature sure to find a lot of friends is the option of feeding external sounds (in stereo or mono) through the filters and ring modulator section of the effects bank, which does offer some exciting possibilities.

Looking at the effects in more detail, Pitch, which is also referred to as the tempo change control, is the only effect that can be used in conjunction with all the other effects. To my mind, this isn't really an effect at all, but a function, and certainly shouldn't rob you of samples when in use. What it does here is change the pitch globally (and hence the tempo) between -20% and +10% for any and all samples that are playing, and it changes them all by the same amount. Usefully, when the Pitch button is active, the bpm display changes to show the new pitch-shifted bpm.

The Time 'effect' is for time-stretching in real time over a range of -50% to +25%, relative to the original bpm. And it works too, although it gets very flammy past -20%, but for fine-tuning bpms without altering the pitch, it works OK. It's a shame that it won't work with stereo samples, though.

Delay adds a single slapback delay, at the same audio level as the selected sample. The delay time is adjustable in 13 quantised steps (relative to the original bpm) from 64th note through to whole note using the controller knob. This also works well enough for what it does, but a proper set of DDL parameters would have been preferable.

Filter 1 and 2 are basic but usable low-pass filters, possibly 12dB types by the sound of them, with the controller knob used to sweep the cutoff frequency (though it sounds distinctly stepped). The only difference between the filters is that Filter 2 has more resonance than 1. Both sound a bit bland unless the sample has a high harmonic content or, funnily enough, if the sample was recorded using Standard or Lo-Fi grade, in which case the filters emphasise the digital grittiness of the sample.

Ring Mod is the truly redeeming effect, and makes up for the shortcomings in the rest of the effects section. Although it does sound a touch digital, it's great fun to use, and really does mangle a sample as a ring modulator should. Also, because you can feed external sounds through it, you can use the Dr Sample as a stand-alone ring modulator, or basic VCF. It's splendid stuff, and ideal for those 'Dalek on heat' impersonations.

SAMPLING — THE FINAL FRONTIER

OK, so that's the tour of the front panel complete — so how easy is it to sample? The answer is "very". If you stick to the default sample settings of mono, Hi-Fi grade, loop on and no bpm set, the actual process of sampling is quick and easy. Select an input from the small recessed switch on the front (microphone or line), adjust the input level until the Peak LED just flickers slightly and hit the Rec button, which starts flashing. Now comes the smart bit, because the Dr Sample automatically chooses an empty sample pad and sets that flashing, to let you know which one it's going to be, so no worries about overwriting an existing sample (assuming all your pads aren't full). Hit the Rec button a second time, preferably on the beat, and it glows steadily; sampling has now commenced. Hit the Rec button once more, again on the beat, and sampling stops. The bpm display then instantly shows the calculated bpm of the sample loop. Like I said, quick and easy! When in record standby (Rec flashing) you can press Cancel at any time to drop out of sampling mode and if you're unhappy with a loop you can either press the Delete button to erase a sample or use some of the editing features to change it.

Determined to put the immediacy of the Dr Sample to the test, I timed how long it took to sample from a cold start using the built-in mic at the default record settings. From switch on, through the initialisation routine where the LEDs do a little dance, to pressing the Rec button and screaming down the mic took just five seconds, pretty fast by any standards. Used in this way, ▶

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> "I expect that distinctive ring modulator effect to start appearing at a lot of clubs *real* soon."

the Dr Sample makes a great sampling notepad for quickly jotting down vocal melodies, phrases, riffs or even spoken instructions. If you set the sampling grade to Lo-Fi 2 you could babble on for more than four minutes (or 35 minutes with a memory card). All this and on battery power too — it's great for anyone on the road. The external microphone input also works well with guitar, and if the level is pushed to distortion, and the filters or ring modulator are active, the Dr Sample produces a very strange-sounding digital overload, which is almost a seventh effect!

SAY AAHH...

Of course, you don't have to record just loops from vinyl and CD with the Dr Sample; there's no reason why you can't record keyboards, pads, effects, percussion or vocals. You can also use the built-in microphone, which sounds surprisingly good, although it does pick up the sound of tapping the Rec button when you begin sampling, which puts a thump at the beginning of each sample recorded through it. Much better results are achieved by using an external mic plugged into the front-mounted socket via an XLR to quarter-inch jack adaptor.

Samples and loops recorded at Hi-Fi grade (31.25kHz) can't really be faulted; sounds are full-bodied and full-ranging, with an impressive bottom end that could give some full-priced samplers a run for their money. And there are no obvious artifacts from the data compression that must be going on to get such long sampling times into such a small amount of memory. Bright or toppy samples recorded at the Standard grade take on a noticeable digital, gritty edge and lose some bass definition, but dull or softer sounds usually emerge, while the two Lo-Fi settings are best kept for special effects or sounds that you hate.

LOOPS, NOT TUNES

Sadly, the Dr Sample's MIDI specification is pretty basic. Although the rather contradictory MIDI specification sheet says otherwise, the SP202 does *not* respond to MIDI velocity. Nor, for that matter, are volume, pitch-bend or modulation data recognised, and although it does respond to MIDI note numbers 35-67, there is no way to play individual samples chromatically across a MIDI keyboard. All the samples are fixed at the pitch at which they were recorded, and are assigned to two preset MIDI maps, one being a Roland GS map, for some reason. The main (and only) MIDI channel can be changed to any from 1-16 and the sample pads glow red when any relevant MIDI notes are received, which is a nice touch, but that's about it as far as MIDI goes. Because of these limitations, you don't really gain much by playing the Dr Sample over MIDI, unless you use it hooked up to a sequencer, and personally I found it more natural to play using the sample pads while twiddling with the effects knob.

CULT CLASSIC?

When I first heard about the Dr Sample, I wasn't quite sure what to expect, because although on paper the features look interesting, I wasn't convinced that a sampler in this price range could sound any good. Fortunately, my concerns were misplaced, because it sounds great, but the effects implementation and MIDI specification are a bit of a let-down.

But these are personal gripes, and I shouldn't lose sight of the intended use of the SP202; it's designed to be sitting next to a DJ's pair of record decks, after all. As a quick and easy looping sampler, it works well, and is eminently suitable for providing spot effects, jingles and ambience and effects loops. And for bands that just want access to a few sampled sounds to jazz up their set but don't want to get a fully featured (and full-priced) sampler, this is the machine. In these sorts of situations, you don't *need* multi-note polyphony, complex control via MIDI and multitimbral voices — just a machine that delivers decent-sounding samples and a reliable and quick way to save and load them, for which the Smart Media cards are excellent. What the Dr Sample isn't suited for is complex MIDI control and integration into a desktop MIDI setup, or anything requiring what top-end samplists would consider quite mundane sample editing and manipulation tasks. In this case, you need something like the Akai S20, which even with its recent price cut is still £200 more than the Dr Sample. As the SP202 is primarily seen as a live performance tool, I would like to have seen some sort of footswitch facility for triggering sample record or playback, and a way of prioritising important samples so they don't cut off in mid-flow just because you have accidentally exceeded the sample polyphony. Also, with the cost of Smart Cards falling so fast, it would be nice if Boss included one in the price (it might be worth seeing if you can come to an arrangement with your dealer over this). Finally, not including a power supply is pretty stingy — come on guys!

You may think the £299 price tag a little high considering some of the Dr Sample's quirks and limitations, but there are a lot of positive features on offer here, including the quality of stereo sampling, ease of use and portability. Will this be another in a long line of Boss/Roland cult classics? Only time will tell, but I expect that distinctive ring modulator effect to start appearing at a lot of clubs *real* soon. SOS

info

£ Dr Sample SP202 £299 including VAT; 2Mb S2M5 & 4Mb S4M5 Smart Media £TBA. Prices include VAT. Although the Smart Media prices from Boss are yet to be confirmed, as Chris says elsewhere in this review, it's worth shopping around camera shops and the like.

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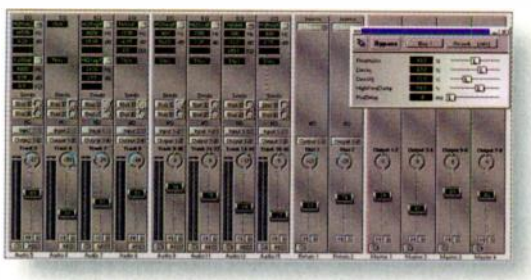

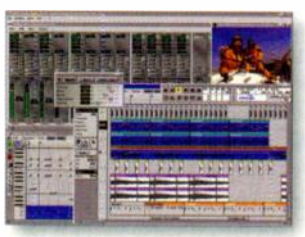

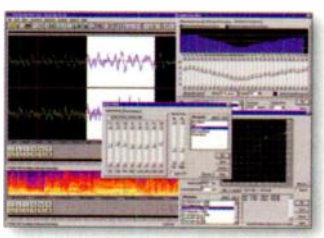

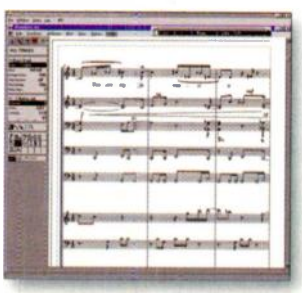

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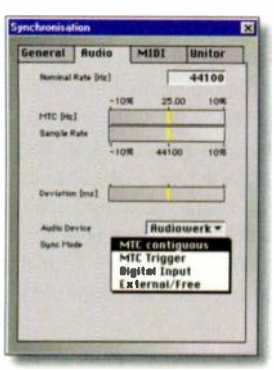

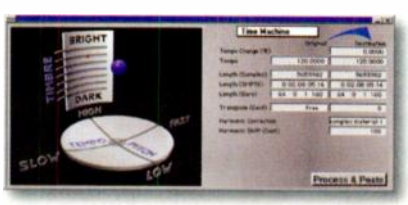

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EMAGIC *LOGIC AUDIO* v3.0 MIDI + AUDIO SEQUENCER UPGRADE

The latest version of this popular audio sequencer sees Emagic's answer to competitor Steinberg's VST built-in effects. But there's rather more to this significant upgrade than that, as PAUL WHITE reports.

Steinberg certainly forced a change of pace in software development when they came up with the Virtual Studio Technology concept for their *Cubase VST* MIDI + Audio sequencer (reviewed *SOS* July 1996 and November 1997), and since then it's been a foregone conclusion that other MIDI + Audio sequencer designers would follow suit. There was much speculation as to what Emagic's response would be, but now the long-awaited *Logic Audio* 3.0 has arrived, and it's got more new features than Michael Jackson at a plastic surgery sales convention. Inevitably there are real-time native signal-processing effects, all with parameter automation, but in addition the old system of having to buy optional software extensions to allow third-party hardware to be supported or used in conjunction with native audio has been abolished (with the exception of the TDM Extension, which is still required to run Digidesign TDM Pro Tools hardware with TDM plug-ins). For example, Mac users can now use the computer's own hardware to record audio and create real-time effects, while at the same time addressing Digidesign hardware for additional tracks, all from the basic v3.0 software. Furthermore, the real-time 'host computer-generated' effects can be used in conjunction with the Mac's own AV inputs and outputs, Emagic's own Audiowerk8 card or Korg's 1212 I/O card, and PC users have the same choices, providing they have a suitable soundcard. Version 3.0 also supports dual Audiowerk8 cards for true 16-out operation and an earlier 'monitor during record' bug has been fixed so that Audiowerk8 owners can hear existing tracks as they overdub.

Any system that uses the computer's own processor to generate effects needs to be pretty powerful if it isn't going to bottle out as soon as you add one or two basic effects, so before you start having unreasonable expectations you should take a look at the 'Realistic System Requirements' box, for an idea of the kind of setup you'll need.

WHERE TO START

To properly cover the basics of *Logic Audio* plus all the new v3.0 features would take up about half this magazine, so I'm going to assume that you already have some idea of what *Logic Audio* is about, and concentrate instead on the enhancements to both the MIDI and audio sides of the program (see our earlier *Logic Audio* reviews in *SOS* February 1996 and November 1996).

The first thing you notice when booting up is a new look to the main Arrange page, with coloured instrument icons in the track list. There's the option to have drop shadows behind the instrument icons or not (I prefer not — they just make the icons look out of focus), and anything with a very light colour shows as a grey icon with a coloured shadow. There are also proper track-mute buttons, plus record-ready buttons for the audio tracks, something I've been pleading for for a long time. Thanks guys!

Once you get into the Environment page where the Audio Objects (virtual mixer inputs, groups and outputs) reside, you'll also notice that these have a smart new 3D look, which is a huge improvement over the rather simplistic line art used in previous versions. Before going any further though, a warning. My review version of *Logic Audio* 3.0 was actually version 3.06, but after the first batch, this was upgraded to 3.08. Should you have bought one of the early copies and need an update, these are available either from Emagic's web site or from the UK distributor, Sound Technology. I ran the updater before continuing with the review.

There's a new and very useful Arrange page function called Skip Cycle, which can be used to mark a section of the song to be skipped during playback. Using this you can skip a verse or middle eight to see how it will sound without messing with your arrangement. This is done by dragging the cursor from right to left in the 'ruler' section at the top of the window, whereupon a black line marks the section to be skipped. To set up a loop marker, you now have to move the cursor from left to right, which fills in the selected area with the familiar black block. In the previous version, dragging in either direction would simply have set up a loop.

Hyperdraw is that helpful feature that lets you draw a graphic envelope to automate virtually any MIDI-controllable parameter, such as volume

pros & cons

EMAGIC *LOGIC AUDIO* v3.0

pros

- Real-time audio effects with parameter automation.
- A huge number of significant improvements to the basic program.
- Exceptionally stable in operation.

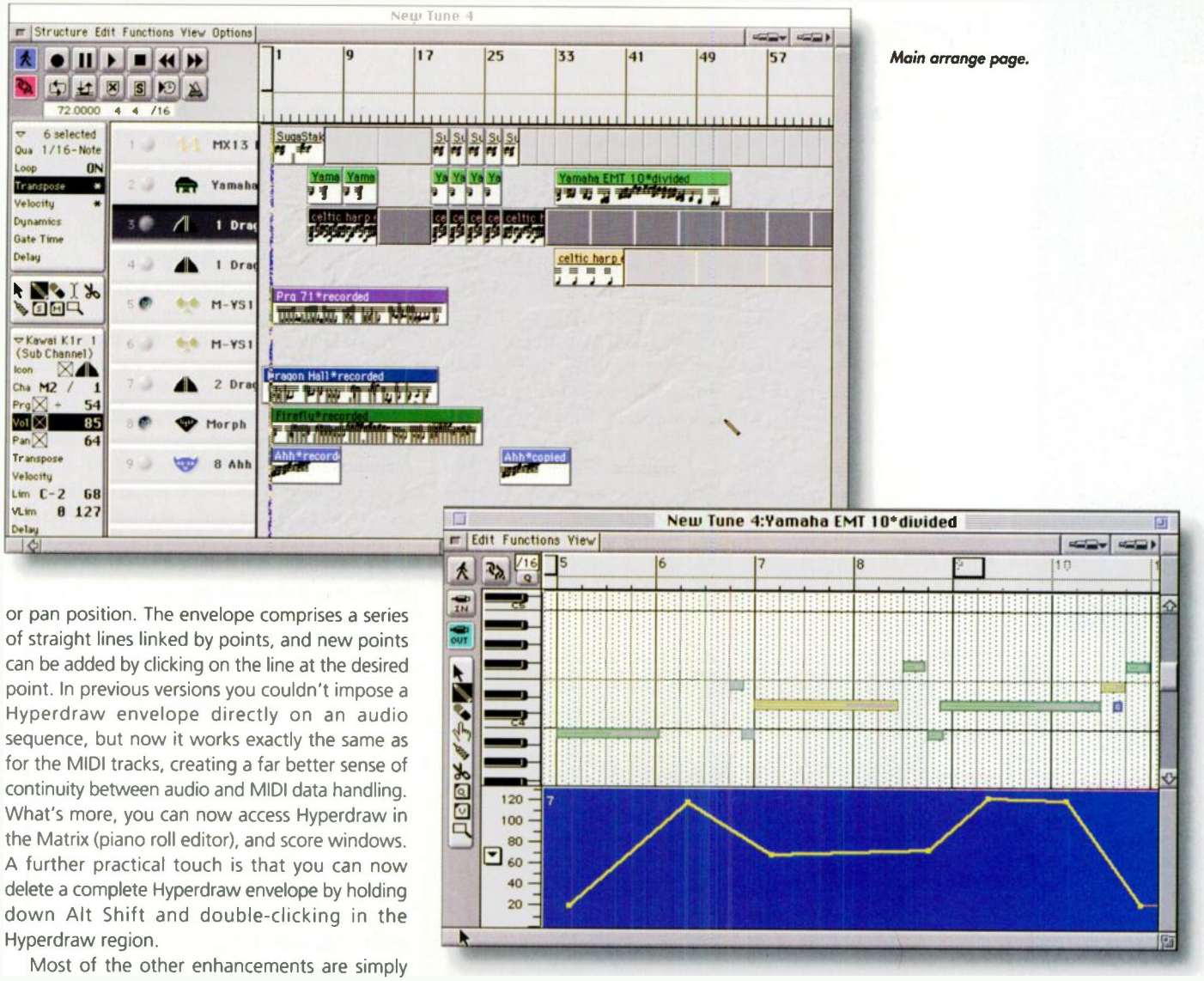
cons

- The manual should explain the strategy of using the Environment page rather better than it does.
- Third-party real-time AV plug-ins not yet supported.
- Audio file management still leaves room for improvement.

summary

Despite a few minor flaws and personal dislikes, *Logic Audio* remains my sequencer of choice and is an immensely powerful and well structured piece of software that enables sophisticated recordings to be made and mixed entirely within the computer.

SOUND ON SOUND



Main arrange page.

The Hyperdraw feature, now accessible from the Matrix editor.

or pan position. The envelope comprises a series of straight lines linked by points, and new points can be added by clicking on the line at the desired point. In previous versions you couldn't impose a Hyperdraw envelope directly on an audio sequence, but now it works exactly the same as for the MIDI tracks, creating a far better sense of continuity between audio and MIDI data handling. What's more, you can now access Hyperdraw in the Matrix (piano roll editor), and score windows. A further practical touch is that you can now delete a complete Hyperdraw envelope by holding down Alt Shift and double-clicking in the Hyperdraw region.

Most of the other enhancements are simply operational niceties, such as the ability to select several different regions in different tracks, then move them all to a new track without disturbing their time relationship. This feature is exactly what's needed when you're trying to compile a track using the best parts of several other tracks. You can now also select similarly coloured objects, and there's automatic marker numbering, but one feature that is more than just an ergonomic tweak is the brand new Linear Quantise option. This is a new algorithm which is always used when a positive value is set for the Quantise Range parameter. Linear Quantise is a type of soft quantise that works well with recordings that already have the right groove, but where the timing may not be quite consistent. Setting quantise to quarter note, then setting the Quantise Range parameter just high enough so that it covers the timing error in the recording, is all that's needed. Now the timing of key beats is tightened up, but any 32nd notes or triplets falling in between are left alone.

A few new moves have turned up in the Edit section too, including a Goto Selection key command that brings the song position line to the first selected event in the currently selected window. This was added to make step-time entry easier. It's also possible to select events by position in the bar, so if you want to select only the snare beats that arrive on the off-beat, you can do it without having to hunt them down individually. The Event Editor has also been given variable scrolling speed, controlled by treating the mouse as a speed slider when using the scroll buttons. Finally, menus can be made to drop down and stay down by clicking on them very quickly. Sadly, with my mouse, no matter how quickly I tried to click, the trick only worked about one time in three.

THE ENVIRONMENT

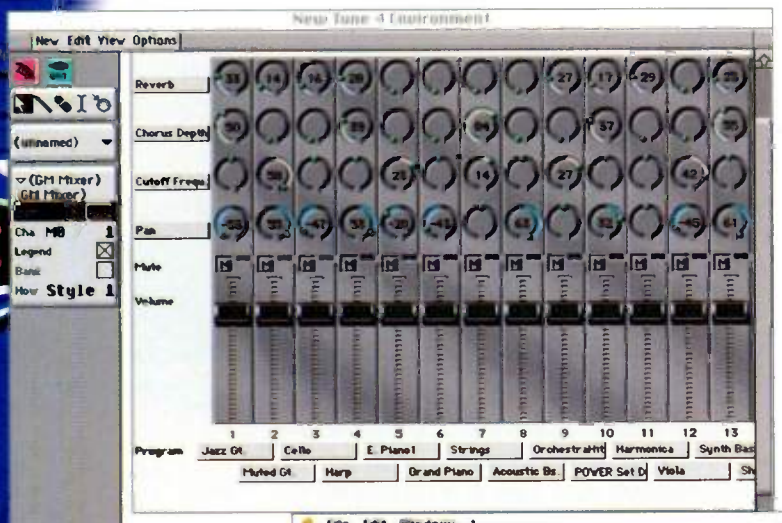
There are three fader automation modes available within the Environment: Merge, Replace and Update. These correspond to the modes used on most console automation systems, where Merge merges new mix data with previous mix data, Update adds new modes to existing modes in the form of offsets (something like Trim mode on a conventional console), and Replace erases old mix data and replaces it with the new fader moves. A soft fade time can be set up to allow the level to move smoothly between old and newly recorded sections, rather than jumping abruptly.

The Environment Object repertoire has been expanded in a few useful areas and a few new model-specific bank-change commands have been added, notably for the Roland JV2080 synth module. Some of the arpeggiator Object's ▶

parameters have been extended to permit rhythmic chordal effects, notes can be played with random velocities, resolutions or lengths, and all parameters can be remote-controlled using real-time controller data.

A smart new GM mixer interface (shown below) has been added, complete with part-mute buttons, which can also work in GS and XG modes. In addition to controls for varying chorus, reverb and pan, there's a fourth control normally assigned to filter cutoff frequency, but all four rows of knobs can be reset to address any MIDI controller. A new Meta event, charmingly called the 'Bang' command, has been added: when a Bang command is received, the fader in question is made to transmit its current setting. Meta events are generally best avoided except by the Kapok Cladding brigade, and if you haven't got a Thermos flask of tea and a knitted balaclava your mum made, don't even think about using them.

The new general MIDI mixer interface, below.

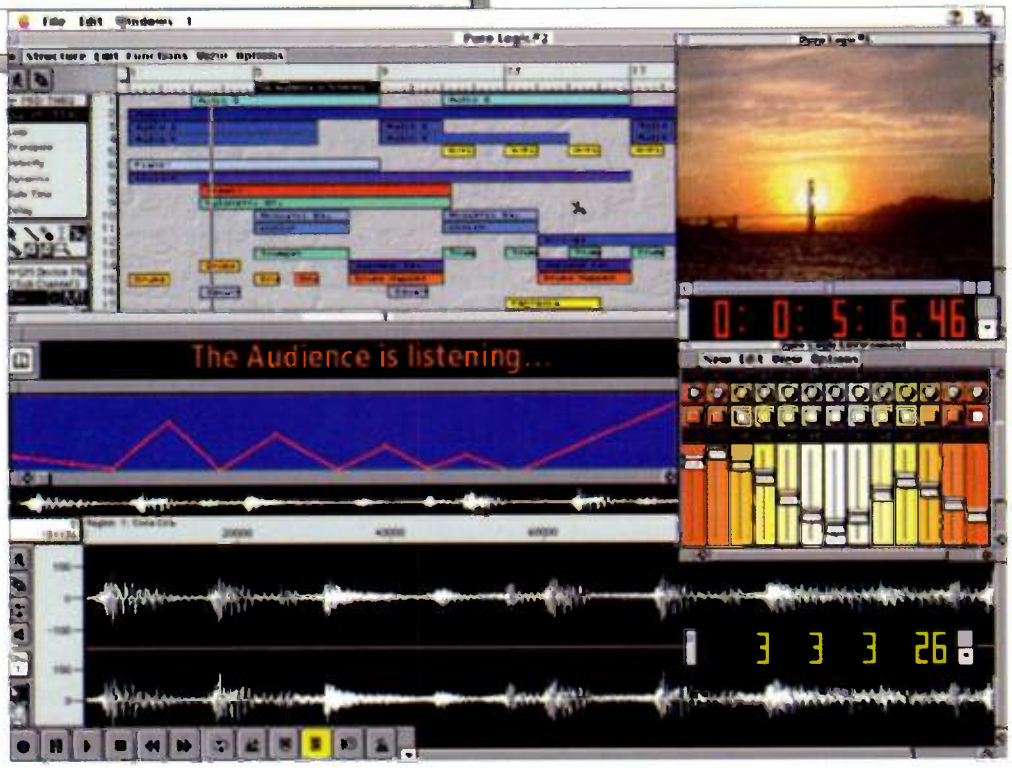


Similarly, the Transfomers have had a few new features added, but unless you need to transpose a sequence by the value of your granny's birthday divided by the square root of the song tempo, you can probably live without them most of the time, though they are useful for simple search and replace operations on MIDI events.

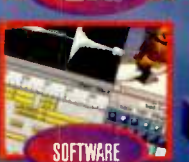
Something I have wanted for a long time is the ability to create a new Multi-Instrument, then give its parts the same colour and icon rather than having to set up each one manually. Now you can, though you can still give all the parts different colours and icons if you want to. However, another feature I wanted *hasn't* turned up, and that's the ability to hide unwanted icons from the vast list of those available. This would make scrolling up and down the list so much easier, but as it is, you have to whizz past countless synths you don't own, past Luger pistols, Swiss mountains and nameless ethnic instruments before you get to something you can use. And while I'm in rant mode, how about the option to type synth names into those icons that contain text, so we can customise them for our own synths?

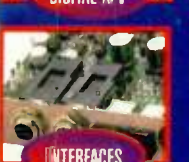
SYNC ISSUES

The problem with many sequencers is that the audio parts behave as triggered samples that only stay in time because the sequencer clock is crystal controlled and very stable. However, if you sync the sequencer to a tape machine that isn't so stable, the audio sequences can drift out of time with the MIDI tracks (actually, it's the MIDI tracks drifting out of time with the audio tracks, but the result is the same!). *Logic Audio* has always been good at timing, but v3.0 increases the possible number of audio tracks to 32 while ensuring continuous sync when used with hardware that



Logic Audio v3.0's Quicktime window, far right.





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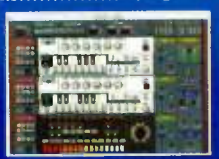

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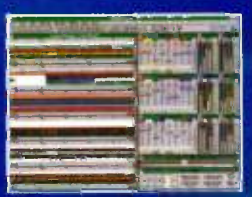

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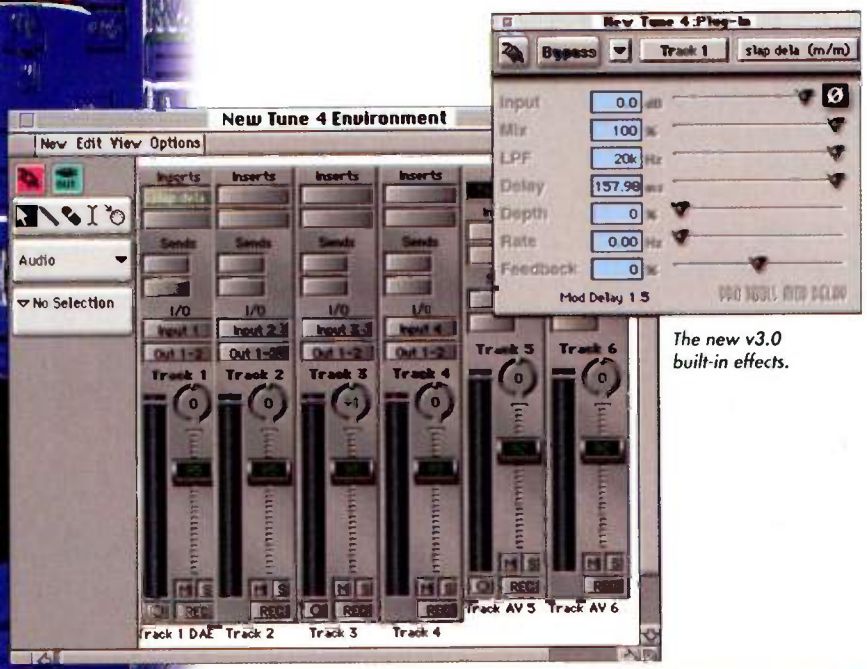
There are times when you only want to work with the MIDI part of your sequencer, and on these occasions you can improve loading times, while reducing the processor/memory overhead, by holding down the Ctrl key while loading the program. This brings up a dialogue box allowing you to bypass some or all of the audio drivers, so that your sequencer is purely MIDI.

▶ supports variable sample rates. In other words, if the device the sequencer is sync'ed to slows down, the sample rate of the audio will also be slowed down slightly to keep the audio in sync with the MIDI data. Various options are provided to allow the user to make the best use of available hardware, and these include MTC Continuous sync; MTC Trigger (where the audio runs free after triggering); MTC Trigger/Speed Detection (where the sequencer adapts to the exact incoming MTC rate, presuming it is stable but not quite accurate); External/Free (where *Logic* doesn't interfere with the sample rate); Digital (for sync'ing to external digital signals); and SMPTE Slave Driver (for those users with a Digidesign SMPTE Slave Driver sync unit).

Staying with the timing theme a while longer, v3.0 now allows you to create up to nine different tempo lists for each song — great for people who aren't quite sure what they want — and the sync options have also been upgraded with new features and smarter dialogue boxes. Sync can be internal, via MTC or MIDI Clock, or manual — the latter mode allows you to tap a tempo using MIDI events that the sequencer will follow. All SMPTE/EBU frame rates are supported, even the really obscure 29.97 and 29.97 drop-frame standards, and when MTC is being used the Auto Detect mode automatically sets the system to the correct MTC format, though it can't distinguish between 30fps and 29.97fps. VITC is also supported when used in conjunction with Emagic's Unitor8 interface, which can simultaneously generate a refreshed timecode.



The new v3.0 built-in effects.

AUDIO

As you might expect, the most significant changes have taken place in the audio section of the program, and it's now possible to utilise real-time effects powered by the computer's own processor when using Apple Sound Manager (Macs only), Audiowerk8 or Korg's 1212 I/O card. Using Digidesign's TDM Pro Tools hardware, only the usual Pro Tools DSP effects and plug-ins can be used, but you can use the Digidesign hardware for some tracks and a Mac's AV I/O for others, to get the best of both worlds. Using Pro Tools hardware, the maximum number of audio tracks supported by the hardware is available — there's no longer a limit of 16. Hardware support is also included for Akai's DR8 and DR16 and non-TDM Digidesign hardware used with Digidesign's DAE software audio engine. Audio files are no longer limited to 2Gb in length, and a new Audio After Pause mode allows recording to be resumed from the current song position.

Logic Audio v3.0 comes with 11 real-time effects that can be connected either via insert points or used via aux sends, just as you'd connect effects to a traditional mixer. These effects include seven different single-band EQs that can be combined to form powerful EQ sections, plus reverb, delay, flanger and chorus. Though the internal reverb isn't likely to cause a crash in Lexicon share prices, it is surprisingly good, but then it does take the most processing power. Up to eight inserts per channel can be created, along with up to eight effects busses, but even the fastest machines will impose some limit on how many you can use at once. The most efficient way to deploy the real-time effects is to use as few EQ bands as you can get away with in the channel inserts and use reverb and other global effects via the aux send system, so that one effect can be shared between several mixer channels.

Each effect has its own little window with a bypass button at the top, and though the windows aren't as flashy as those provided by *Cubase VST*, they are tidy, clear and exude Teutonic efficiency. Horizontal sliders adjust the various effect parameters, while a further slider at the bottom sets the Region Gate time. Region Gate is simply a way of stopping an effect from ▶

REALISTIC SYSTEM REQUIREMENTS

To run *Logic Audio* v3.0, PC users need a minimum of a Pentium 133 machine (running Windows 95), fitted with 32Mb of RAM, a full-duplex soundcard and a suitably fast hard drive, but I can tell you now that if you want to make more than the most basic use of the new onboard effects processing, you're going to need a faster machine, ideally with 48Mb of memory. Being honest, I don't think you'll be able to make really effective use of the features on offer using anything less than a P200.

Mac users are told they can get by with a PowerPC 601 machine fitted with 32Mb of memory, as long as they're running OS 7.6.1 or higher, but again this will only furnish a very basic level of operation. I have a 100MHz 601 Power Computing Nubus Mac, and when the review copy of *Logic Audio* 3.0 arrived the computer only had 24Mb of RAM fitted. This just about managed to run *Logic Audio* in native mode, but as soon as I loaded in Digidesign's DAE to permit me to use my Pro Tools III hardware, all I heard was a hollow sniggering noise from somewhere deep inside the computer case. A quick phone call, an assault on the credit card, and within 24 hours I had a further 32Mb of memory installed and everything coexisted quite comfortably. Of course, with a 100MHz 601 processor, the amount of native processing is still going to be limited, but I found I could get the reverb plus at least one other effect running without any trouble at all. A more realistic system would be a 200MHz 604e machine with a separate hard drive for audio, and around 48Mb of memory, but if you're still using Digidesign Nubus hardware there are restrictions on your choice of machine. In any event, when calculating how much memory you need, don't forget to add the requirements of any TDM plug-ins you have, and also make sure you have the optional TDM extension from Emagic, otherwise TDM will be unavailable. Fortunately memory is cheap right now, so this isn't the concern it would have been a year or two back, when the additional memory might have doubled the cost of the basic system.

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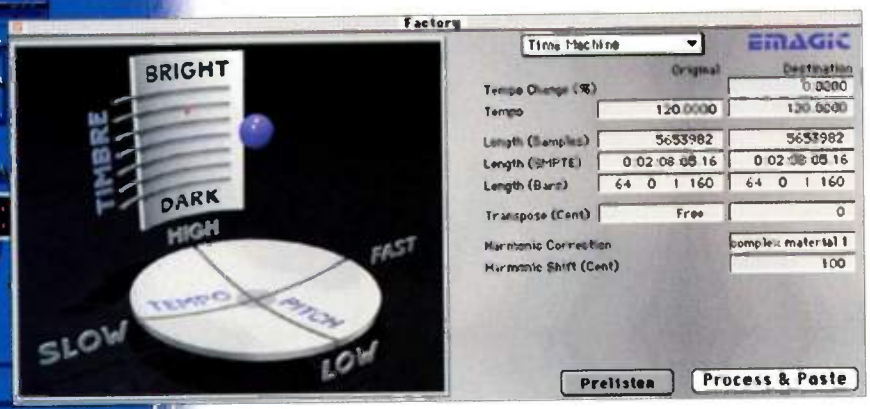
WRH

▶ using processing power when it doesn't need to, so when a region has ended and no new region is playing, the processing stops. With chorus or flanging you can stop the processing pretty much straight away, but with reverb you need to allow it to keep working until the last reflections have died away, hence the variable gate time. The more processor-intensive effects also have different levels of quality that can be selected depending on how much processing power you can afford to dedicate to them, and though the effects tend to have fewer parameters than their hardware counterparts, even the reverb manages room size, decay, density, HF damping and pre-delay control, as well as dry/effect mix. Using *Logic*'s familiar chain icon Link button, effect windows can be made to switch to the appropriate effect type whenever the effect is double-clicked in the relevant insert point, and on systems with small monitors this helps keep the screen clear of unnecessary windows. Effect windows also include a pull-down effect menu, so you can select different effects in that way too. Effects settings are saved with each song, but setups may also be copied and stored for future use.



The 3D Time Machine interface.

Audio Objects may either be mixer input/output channels or busses, the latter being useful for patching in global effects. To set up an aux send, it's necessary to route the desired aux to a buss, then place an effect (or more) in the buss insert point. The buss output is then routed back to the stereo mix. All the effect sliders can be automated in the same way as volume or pan were automated previously. To simplify setup when working with external devices driving the automation, an Auto Define mode allows incoming MIDI controllers to be identified and mapped to the currently selected parameter.

It's also possible to use Adobe *Premier* or Digidesign AudioSuite plug-ins, but these can't be used in real time. They are accessed from the Sample Edit window and used to destructively process audio data off-line. TDM plug-ins may only be used on channels running Digidesign Pro Tools TDM hardware when the TDM extension is present.

In last month's Leader column, I launched a bit of a tirade against hard disk recorders that claimed to replace multitrack tape recorders, yet failed to deliver the most basic necessities, such as punch-in on the fly. Happily, *Logic Audio* v3.0 has an on-the-fly mode, which you access by holding down the record button and selecting from the resulting menu. Punch-in and punch-out is handled just as with a tape machine, using Record to go into record and Play to get out. The edit points are seamless and gapless, but I've yet to find a simple way to map this function to a footswitch. I'm told it's possible to map the Toggle Record keyboard command to a MIDI event, but footswitch punch-in is such an obvious requirement that there's really no excuse for not having a 'Use Sustain Pedal for Punch In/Out' option accessible via a dialogue box.

Another tape machine-like feature is Auto Input Monitoring, which allows you to do all your monitoring from the system's audio outputs. Under most circumstances, this will ensure you hear recorded tracks being played back and new audio as it is being recorded. In Stop mode, the input signal is monitored. As I mentioned at the start of this article, the audio tracks now have record-ready buttons next to their names on the Arrange page, which saves switching back and forth to the Environment window.

Something I've never been too impressed with is how *Logic Audio* handles files, and though Emagic have made attempts to improve this, by adding new record path options, they still haven't added the one thing that I feel is really necessary — a default preference option that automatically names the audio tracks after the song title and stores them in a new folder, also clearly marked with the song title. As it is, you can now set the record path to use different drives for the AV and hardware tracks if you want to, and audio recordings can be automatically named after your Audio Objects, but unless you remember to give the Audio Objects a unique name, you still end up with a drive or folder full of files numbered Audio 1 to Audio infinity. Having each song automatically organise its files into a separate folder as a default condition would make so much more sense.

The file selector has been improved somewhat, so that you can now import several files at once, rather than having to go around the whole routing for each file. Audio files can be auditioned using a Play button in the File Selector dialogue box, and if a file isn't where you thought it was and you have to ask *Logic* to look for it, the search procedure is up to 100 times faster than it used to be. Stereo file handling is also much better, with a simple procedure to disconnect the two halves of a stereo file or to rejoin disconnected stereo files.

USING *LOGIC AUDIO*

Currently at v3.08, *Logic Audio* is extremely stable, and the new-look Environment Audio Objects are much clearer and friendlier than the originals, as are the new GM mixers. Having access to real-time effects, especially reverb and EQ, is marvellous when you only have a pair of outputs, forcing you to pre-mix everything within the machine,

LET'S DO THE TIME WARP AGAIN

One feature, entitled Capture Recording and tucked away in a small section of the manual, has apparently been there since version 2.6, but the first time I came across it was in the course of this review. *Logic* now records MIDI data all the time in play mode, even when you're just doodling, though whenever you move the song position and start recording again, the last bit of covert recording is erased. The point of all this is that if you're just playing along with the sequencer and you produce something particularly good, you can invoke the Capture Recording facility and turn what you've just played into real recorded data, even though the sequencer wasn't in record when you played it. It may not be quite a time machine, but it's the next best thing.

but Audiowerk8 users can have the best of both worlds, by configuring some of their outputs as aux sends, so that internal effects can be used in conjunction with conventional effects hardware and external mixers. Though all the leading-edge MIDI + Audio sequencers have internal mixing facilities, some form of external mixer is still a necessity to add in the MIDI instruments being sequenced, though PC users could conceivably use the MIDI voices available on their soundcards to avoid having to buy any extra hardware at all.

I can't say that I'd want to automate effects very often, but it's good to have the choice, and the new automation modes are more in keeping with what people have come to expect from conventional automated mixing consoles. I particularly welcome the improved Hyperdraw interface, especially now that audio tracks are dealt with in exactly the same way as MIDI tracks, and the addition of Arrange page Record buttons for the audio tracks makes operation a lot simpler.

Because I come from a tape-recording background where on-the-fly punching is one of the main skills an engineer has at his disposal, I was pleased to see this feature added to v3.0, and happy to find that the result of a punch in/out is seamless audio. However, what you hear over your monitoring system while performing the punch-in isn't quite so seamless, though how much of this is due to my relatively slow computer isn't clear.

The operation and subjective quality of the on-board effects is generally good, and though the EQs don't sound quite the same as their analogue counterparts they are both clean and positive. I hope the support for third-party real-time effect plug-ins comes sooner than later, though you can already use Adobe *Premier* compatible plug-ins or Digidesign AudioSuite plug-ins, offline, to augment the Digital Factory's arsenal of tricks.

Score users will also be pleased to note that a few improvements have been added to make their life easier, including user-definable keyboard commands for inputting slurs and accents, Hyperdraw in the score window, and better correlation between note attributes and the MIDI interpretation of them.

SUMMARY

On the whole, this is a most worthwhile upgrade that has added a wealth of new and useful features, as well as addressing some of the shortcomings of the earlier versions. And of course, the real-time effects represent a further evolutionary leap for the program. Audio file-handling still needs to be streamlined further, and I'd like to see support for Event's Gina and Layla breakout boxes, but don't be surprised if internal politics frustrates this.

Whether *Logic Audio* will woo users away from *Cubase VST* remains to be seen — my feeling is that users tend to stick with the platform they are familiar with, and every time a package is upgraded, its learning curve becomes even steeper for those who have no previous experience using it. At least v3.0 should prevent *Logic Audio* users defecting to *VST* for the sake of the internal effects, and when it comes to stability of operation, *Logic* in any of its guises is hard to better. The amended manual is reasonably thorough but, as ever, it explains the existence of features without saying where or why you might use them, and this is particularly true of the Environment page, where the newcomer needs most guidance. The program features an on-line help facility of sorts, but on the current version, this is far from complete.

> "Version 3.0 isn't a free upgrade, but is a 'must have' for any existing *Logic* users."

As an existing *Logic* user I'm probably biased, but I feel Emagic have the lead over their competitors in a number of areas, not to mention those of reliability and accuracy of timing. The way patches and synths can be named without your having to buy an extra librarian program is excellent, as is the fun you can have hooking together Environment Objects such as virtual MIDI delay lines, arpeggiators and chord memorisers, if you're that way inclined. Visually, the *Cubase* virtual effects look prettier, but I feel the Emagic reverb is rather better sounding, and I encountered no weird timing problems or glitching on the audio side. Version 3.0 isn't a free upgrade, but considering the new features and operational improvements it brings, it's a 'must have' for any existing *Logic* users and a great incentive to move over to *Logic Audio* for those working with less advanced software.

info

£ *Logic Audio* v3 for Mac £599; for PC £399; upgrade from v2.6 £49 on both platforms; for upgrade prices from below v2.6, call Sound Technology. TDM extension £149. Prices include VAT.

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SOUNDTECH ST1602 QUANTUM MIX COMPACT MIXER

The range of audio products in the SoundTech range seems to be expanding almost as fast as my waistline these days, and the ST1602 Quantum Mix is one of their latest offerings aimed at those — like myself — who are involved in live sound and/or home and location recording projects. As with all SoundTech gear, this mixer is available only from Smart Sound Direct, who will, I believe, let you have a 10-day home trial so that you can be sure that what you've bought is what you really really want.

The ST1602 is a 16-input, 2 + 2-output compact mixer with a fairly standard complement of eight mono microphone/line channels and four stereo line-input channels. Outputs are main left and right, with an additional 'B-mix' stereo output which is available either as an alternative signal route or as a submix. There are three auxiliary sends, a control room output, and an array of other patching, routing and access features; at first sight this desk appears to pack an awful lot of goodies into its very compact frame.

FIRST IMPRESSIONS

The ST1602 is one of those mixers which takes you aback when you open the box and discover how small it really is. This is a compliment, as all the features you would normally expect are there, plus a fair few you normally wouldn't, and all the main controls and access points are available from the top panel.

As with every other product I've seen from this company, the mixer is finished in black, which gives it a discreet and businesslike appearance. There's quite a bit of information printed on the main control panel, and this makes operating the desk a piece of cake; the functional legends are in white, and there are helpful reminders in green. SoundTech have also gone to considerable trouble to assist the user in other ways, such as providing detented rotary controls not only for the EQ section but also for the aux sends, which makes a starting setup very easy to achieve if it suits your particular way of working.

LET'S GET TECHNICAL

At the risk of incurring the wrath of all the technical anoraks out there, I'd like to avoid a lengthy regurgitation of the facts and figures contained in the manual, and content myself with saying that this mixer is very well specified in all the usual ways; it has excellent response and noise figures, and I didn't come across anything which leads me to doubt its claimed technical performance for a moment. I was very much more interested in actually getting my sticky little fingers all over it, to find out what it does and how well. First, though, it's worth running through the ST1602's feature list.

The first eight inputs are mono channels, and are equipped with those handy dual connectors which will accept both (balanced) XLR and jack plugs. For my money, this is an excellent way of saving space on the panel, and the sockets themselves seem to be rigid and sturdy when used with both types of plug. An insert point is provided by means of a TRS socket just below the input connector. There's a gain/trim control which is marked at the unity point on the line input trim scale — again, a good starting point.

Equalisation on these mono channels is 3-band

pros & cons

SOUNDTECH ST1602 £399

pros
- Well specified.
- Very versatile design.
- Good build quality.
- Excellent performance.

cons
- No dedicated tape level control.
- Twin B-mix faders would increase flexibility.

summary
A well-specified, neat and flexible tool for recording and live sound work.

SOUND ON SOUND

with a swept mid, a facility not by any means to be taken for granted on a mixer in this class. A low-cut filter is also provided for each channel, and when it's selected this introduces a steep (18dB per octave) attenuation below 75Hz, for cleaning up muddy signals, or eliminating unwanted stage noise, for example. I found the EQ worked very well and the swept mid section was especially useful when dealing with vocal parts.

The four stereo channels are somewhat simpler, in that they have twin input jacks which can receive either balanced or unbalanced feeds, and a sensitivity switch instead of the gain/trim pot. EQ is still 3-band, but here the mid control is a 2.5kHz peaking circuit with 12dB of cut or boost.

The three auxiliary sends, common to all channels, are designated as Monitor, Mon/Efx1, and Efx2. Each channel control is marked with a scale from 0 to 10, and the pots are centre detented; this is useful if you make much use of the sends, as it provides a good starting point from which to make finer adjustments. Use of these controls quickly becomes a matter of instinct, and the detent point helps you know roughly where each is set without looking at it.

In addition to the usual pots and pans at the foot of each channel strip, there is a button which will interrupt the signal path and feed it to the 'B mix' master buss, which is, in effect, a second pair of main outputs, controlled via a stereo fader just to the left of the main left/right faders. If used independently of the main mix, this facility could be pressed into service for theatre sound, where a different mix is required to be fed to different parts of the house, or for direct-to-4-track recording, if the tape tracks were fed main left, main right, B-mix left and B-mix right. The entire 'B' mix can also be routed as a submix back into the main mix, and/or sent to the control room outputs.

The master section is pretty much as you would expect, but it ▶

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▶ does include a meaty selection of monitoring options, routing and submixing facilities which should be enough to keep anyone happy. The 3-colour LED meters are clear and bright, and can be used to monitor various signal points; there is even a level set function associated with the PFL button for solo channel adjustment.

The main outputs are on both balanced XLRs and unbalanced jacks, and there is a rear-panel switch which changes the output from line (+4dBm) to a lower 'mic' level — another small feature underlining the thought which has obviously gone into designing this mixer to be as versatile as possible.

Phantom power is available on all eight mono channels, and is globally switched from the rear panel, with an LED indicator on the front panel to indicate when it is active. Next to the stereo auxiliary returns are two sets of RCA sockets for tape in and tape out, although there is no dedicated tape input level control to feed directly into the main mix — it just goes in at whatever level the tape input receives, or it can be controlled by routing it through the Control Room buss.

Power is supplied via a standard IEC mains lead, thank goodness — no wall wart to worry about, tread on or leave at home!

TESTING TIMES

As the ST1602 is aimed at both live sound and recording work, I tried it on a bit of both; the results were all I'd hoped for, and were obtained without the benefit of having much time to get acquainted with the desk beforehand.

As I had promised to make a rough 'songs demo' tape for an acoustic band, I used the ST1602 as the heart of the operation, along with a fairly standard 4-track tape and stereo master setup. The recorder didn't have balanced inputs, so the mixer was an essential part of the process even before I explored its mixdown and monitoring capabilities.

Before starting on the recording proper, I turned all the channel inputs up full, and whacked up the master output into the monitors, just to see how much real-world noise there was. In the context of recording decent signals at sensible levels (ie. without having to use excessive amounts of input gain) the noise was hardly noticeable, even with all channels open. With a signal present, the mixer made no discernible noise contribution to the end result, and I would be more than happy to use it for digital recording or mastering.

The EQ was consistent and docile in use, and the swept mid was a real godsend when balancing between male and female vocal lines. I left the HF and LF more or less flat and swept in around 2dB of mid cut until everyone liked what they heard. The low-cut filters were left switched in on all channels.

The results were very pleasing, and the desk was good to work with. I found it a bit disconcerting at first to have three master faders feeding four recorder channels, but this made no practical difference to this session. I used the desk to mix down to a stereo master tape, and again its low noise and friendly EQ was appreciated.

About the only problem I encountered was with the metering and B-mix routing switches, which are black (like the panel from which they protrude). It's not all that easy to see whether they are in or out, especially if you're directly above the desk. A colour band around the button would help here, and at minimal production cost.

SUGGESTIONS BOX

I have hardly anything to say here, except that I would have found a dedicated level control for the tape inputs very useful, and a pair of mono faders for the B-mix would definitely qualify this as a 16:4 mixer — as well as making it look more symmetrical to an old control freak like me. Oh, and the manual (admittedly comprehensive and clear) could be a bit more interesting, with maybe a few suggested recording/mixdown configurations, because when you get one of these for Christmas you know you won't be allowed to play with it until after dinner, so you'll have to make do with reading the manual all morning, and then in bed for a few nights, and in the bath (where of course you must never, ever use your actual mixer) and so on...

SUMMING UP

This is a highly practical and versatile little mixer, which is ideal for live and home recording, and for smaller live PA work too. The ST1602 manages to squeeze just about everything you could want into a compact and well-engineered package and, with these features and figures, is worthy of a trial anytime. SOS

SOLID AS A ROCK

One of the things I like most about this little mixer is its solid feel. It weighs only 5.5kg, yet it's sturdily constructed and has decent rubber feet which stop it sliding around. It even comes apart fairly easily (I know this because I had a look inside, and can report that all seems well put together and should survive the odd bit of rough handling.)

Ergonomically speaking, the slimline knobs used on all the rotary controls leave enough space to accommodate the average finger, and the faders, although not roller-ball smooth, are perfectly well-behaved, though I found them better when pushed or pulled from the outside of the knob rather than using the finger trough.

At the end of a gig or hard rehearsal, no-one really wants to start heaving gear around. As a change from my usual live desk, which really needs two people to move it (and that usually means me and, well, me) packing up the ST1602 is a bit like not forgetting your handbag. As with all mixers of this type, the controls stick up proud of the top panel, and if used on the road this desk would need the protection of a small flightcase, which at this size shouldn't set you back many quid.

DOWN THE PUB

At a band rehearsal and subsequent live gig, I used the ST1602 as the sole mixer, since the venue wasn't large enough to warrant kit mics or anything extravagant like that. In the dark, smoky and generally doubtful environment which passes for a pub gig these days, the ST1602 was fine, if a little small — I got a few cables plugged in early on so that I could find my way back to it if we became separated in the smog. It was easy to achieve the sound balance I was after, and the swept mid EQ once again came in handy.

The monitor send is a bit of a sparkler on this desk, as you can feed in the other two auxiliary busses; I used this to submix the foldback balance between two basic settings when the band were using different instruments and wanted a different monitor mix — all without having to alter any of the channel settings themselves.

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Sound On Stage

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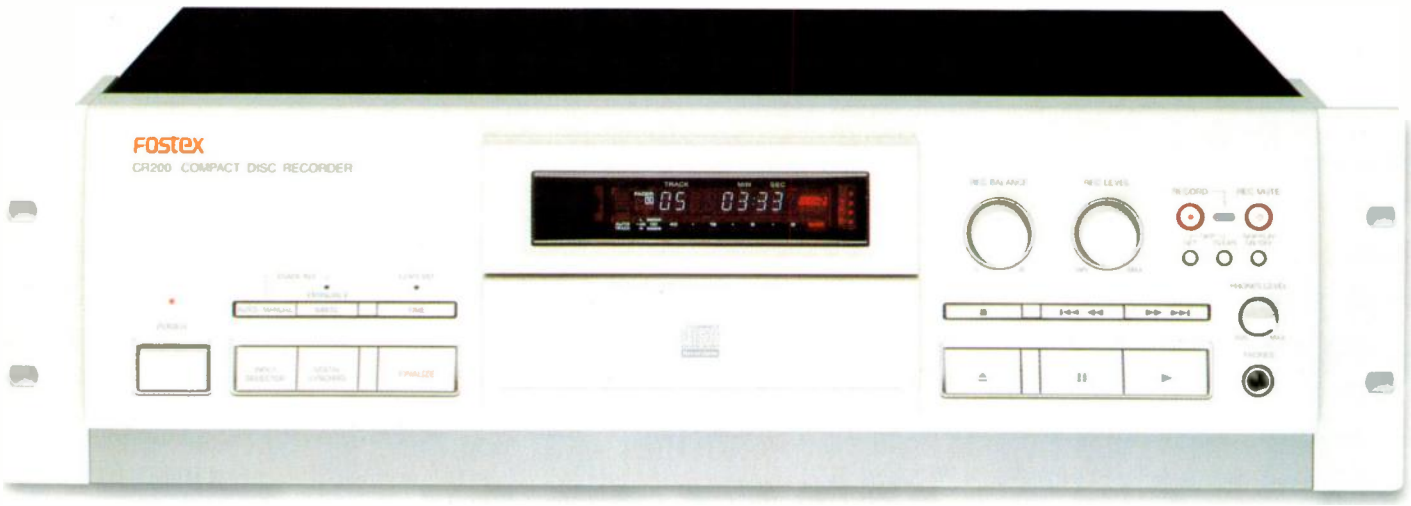

WRITE ON!

Why are CD recorders like buses? PAUL WHITE investigates.

FOSTEX CDR200 RECORDER

Wrong answer. CD-R recorders are like buses because they come in loads of different colours, and with lots of different company names on the side, but the chances are they're all made in the same couple of factories! In the case of the Fostex CDR200, the innards share a common heritage with the HHB CDR800 machine reviewed back in August 1997, and even though there are now machines on the market that cost even less, it's probably still fair to say that this particular mechanism (which is actually built by Pioneer) provides the basis of the least expensive pro machines that can use the low-cost, non-consumer CD-R blanks. In fact, the Fostex machine comes in marginally under the cost of its HHB rival, which leaves you enough change for one or two blank discs.

The appeal of the stand-alone CD-R machine is that you don't have to spend ages messing around on a computer, creating Image files, adjusting PQ track ID points, then swearing at the monitor when you get a buffer under-run and have to scrap the disk. On the other hand, most stand-alone recorders — including this one — won't let you back up computer data. All you need is a DAT tape with the track IDs in the right place and the recorder automatically converts these to track IDs. Of course, copying is limited to real time, but you can always be doing something else while it's going on. You can also record from other digital sources, such as MiniDisc, DCC, CD or computer workstations with S/PDIF outputs, but if you're coming from a computer system that doesn't transmit track IDs, you'll have to enter these manually or use auto silence-detection to do the job for you. When you're working from a source with no track IDs, the CDR200 can recognise the silences between tracks and add IDs automatically, but of course this is only suitable for conventional albums with discretely-spaced tracks. Live albums with audience noise between the tracks will need to be ID'd manually. The track gap recognition is preset to two seconds, which may not suit all material, though the detector threshold that decides what should be interpreted as silence can be reset if needed. Unfortunately, because CD-R is a write-once process, manual track IDs have to be entered during recording, and if you get one wrong you can't change it. The CDR200 is also not equipped to write to re-recordable CD-R.

HARDWARE

The Fostex CDR200 is a neat, 3U rackmounting machine with a grey/beige finish. From what I can tell, its control layout and facilities exactly match those of the HHB CDR800, though the manual is different. This degree of similarity isn't always the case with budget machines, as there are sometimes hidden functions that some manufacturers wish to put under front-panel control, while others prefer to leave them unused.

The analogue inputs are provided on balanced XLRs selectable for either +4dBu or -10dBV, or you can select the unbalanced phones as the recording source, all via the 3-way slide switch on the back panel. Digital sources can be accepted from AES/EBU, S/PDIF co-ax or S/PDIF optical, and a practical touch is that sample-rate conversion is built in. This is obviously good news if you have a consumer DAT or DCC machine that only samples at 48kHz. However, the digital output always mirrors the digital input, so you can't use the unit as an impromptu sample-rate converter, which is a missed opportunity. The sample-rate converter switches itself out of circuit when the input is 44.1kHz, though the manual doesn't mention this. Avoiding unnecessary sample-rate conversion is desirable, as the dithering process used during conversion will tend to undo any sophisticated ▶

pros & cons

FOSTEX CDR200 £1522

pros

- Cost effective, especially as you don't have to buy the more expensive consumer discs.
- Fairly straightforward to use.
- Can produce Red Book, PQ-encoded master discs.
- Can handle digital AES/EBU and S/PDIF sources (optical and co-axial) as well as both balanced and unbalanced.
- Switchable SCMS modes.

cons

- Still no simple and reliable way of sync'ing the end of recording to the desired point on the DAT master.
- The manual makes hard work of describing the workings of an essentially simple product.
- Doesn't work with the new-generation rewritable CDs.

summary

Though computer-based systems and consumer CD-R machines are cheaper, this solution combines pro interfacing and operational simplicity with the ability to use low-cost pro CD blanks.

SOUND ON SOUND

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noise-shaping that's been used to increase the dynamic range during mastering.

There are no XLR analogue outputs, only phonos, but as consumer hi-fi systems tend to use phono connections, that's not really a limitation. S/PDIF co-ax and optical outputs are fitted, but there's no AES/EBU digital output. Those who need to use hard-wired remote control can do so via a rear-panel DIN connector, though an infra-red remote control comes as standard, and some functions (such as setting the SCMS type) can only be accessed from the remote.

The manufacturers make much of the sound quality of this unit, and the analogue input uses good quality, single-bit conversion, though few other technical details concerning the converters are provided. In addition to high-quality electronics, the system employs a copper chassis and an inverted disc mechanism, where the disc sits label-side down on a fairly heavy turntable, ostensibly to improve stability and reduce jitter. This geometry also prevents dust from collecting on the laser optics.

RED BOOK ORANGE BOOK

The CDR200 uses commercial CD-R blanks, most of which have a maximum recording time of 74 minutes, and as with all CD-R machines, a recorded disc needs to be 'finalised' so that it can be played back on a conventional CD player. Non-finalised recordings conform to the Orange Book standard, which means that they won't be recognised by a regular CD player. Pressing Finalise, followed by Pause, creates the Table Of Contents (TOC), which takes around four minutes and brings the disc format up to Red Book standard. This means you now have a PQ-encoded disc that is compatible with consumer hi-fi machines, and which may also be used as a master for commercial CD production. Discs can be recorded in several stages, if preferred, and they may be played back on the CDR200 prior to being finalised. Until the disc is finalised, more material can be recorded, up to the maximum capacity of the disc.

One of the reasons for buying a stand-alone CD-R machine is simplicity of operation, and the CDR200 has much in common with DAT machines and consumer CD players. The display shows all the usual track numbers, playing time, elapsed time and remaining time, and the record-level VU meters are also part of the main display. In general, the CDR200 offers all the programmed play functions you'd expect to find on a hi-fi CD machine, and skip IDs can be added to force the player to skip tracks that you might have messed up. If you want to have commercial CDs produced from your master, you should write your whole disc in one go and not use skips.

BURNING QUESTIONS

Because the audio source material may be either analogue or digital, and because it may or may not contain track ID information, five separate recording modes are provided, the first of which Fostex call Synchro. Selecting the appropriate

SCMS — OR NOT!

SCMS (Serial Copy Management System) has been a constant irritation with consumer DAT machines, and more recently with consumer CD-R recorders, but with the CDR200 the user has the choice of adding SCMS to the final disc or not. The CDR200 has three rear-panel switchable SCMS modes, and can make discs that have no protection at all (copy bit 1), discs that can be copied once (copy bit 0), and copy-prohibited discs (copy bit 1/0). Of course, when it's your own material being duplicated, you might be glad of the facility to protect it.

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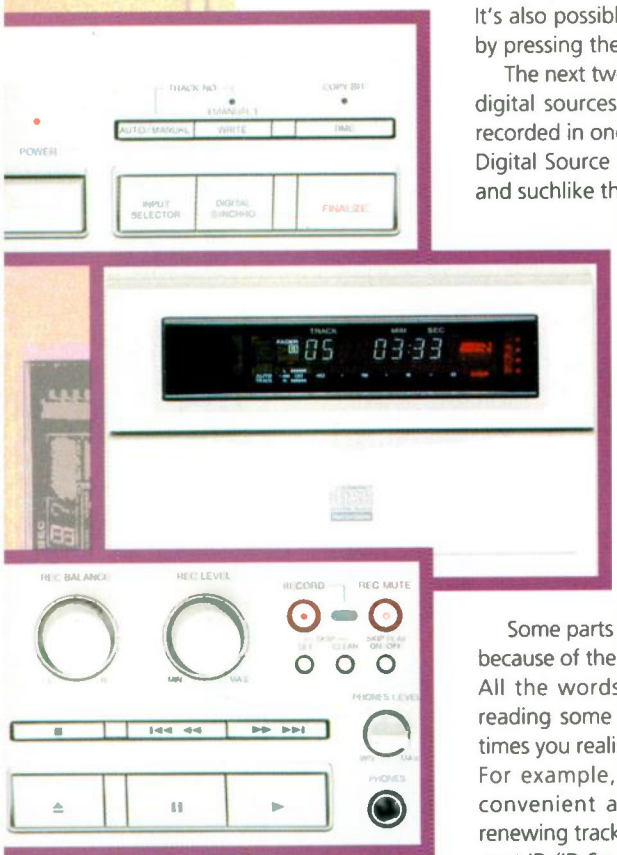

mode is simply a matter of stepping around the five options until the desired one shows up in the display window. Synchro allows you to record one track at a time, such that recording starts automatically when audio is detected, and ends either after a period of around 10 seconds of silence, or in the case of digital sources, it will also stop when the next track ID is encountered. It's also possible to stop the recording manually, by pressing the Stop button.

The next two modes are designed for use with digital sources where multiple tracks are to be recorded in one go. The first of these, Automatic Digital Source Synchro, is for material from CDs and suchlike that has embedded track IDs, which are then transferred directly to the disc as it is recorded. Mode 3 is similar, but is specifically for use with DAT sources, so that the DAT track ID markers can be turned into CD track IDs. This is the recommended mode to use when transferring a compiled DAT to CD in a single session, but you still either have to press the stop button manually or tolerate a long stretch of recorded silence at the end of the last track.

Some parts of the manual are really hard work because of the 'almost English' nature of the text. All the words make perfect sense, but after reading some of the sentences through several times you realise they don't mean anything at all. For example, and I quote, "This function is convenient at start of recording and when renewing track number in accordance to the DAT start ID (ID Sync recording)"!

Manual Digital Source Recording mode is for making digital transfers where there are no embedded track IDs, so you have to put them in manually. Unlike the previous modes, recording must be started and stopped manually. This mode is useful for recording from computer workstations which only output the raw audio data.

Last comes Analogue Source mode — no prizes for guessing that this is the mode to use with analogue source material. In analogue mode you have to set your record levels, just as you would on a DAT machine, and you can either manually write track IDs or rely on the system's own gap detection. Other operations include the facility to set up fade-ins and fade-outs during recording, and to record periods of silence, or even blank tracks. Once recording is complete, you need to press Stop, otherwise you'll end up with a load of blank space at the end of your last track before the machine actually realises you're done. When you don't want to add any more audio to the disc, finalise it to make it playable on Auntie Ethel's hi-fi.

I would imagine that most of us want a CD-R writer to make master or demo CDs of our own material from DAT sources, though you could also use DCC or MiniDisc in much the same way. The first step is to check you have all your DAT IDs in the right place. Because DAT IDs are originally triggered by the incoming audio, it's also a good idea to move them back half a second or so, just to make sure you don't miss the leading edge of the first sound in a track. Most DAT machines allow you to erase and rewrite IDs quite easily. After that, press the Digital Synchro button until Auto ID is selected, after which recording will start as soon as the first ID is detected.

At the end of your tape, recording will continue until around 20 seconds of silence have been recorded, after which recording will cease automatically. However, nobody wants 20 seconds of dead air at the end of their last track, so you really need to invest in a kitchen timer to remind you to come in and press the stop button. All the CD-R machines I've looked at so far seem to have completely missed the point when it comes to ending a recording, because to my mind the whole idea of a stand-alone CD-R machine is that it should do the job unattended while you make money doing something else. If you could put in a dummy DAT start ID at the end of your tape, then tell the recorder which number ID to stop at, it would be fine, but this isn't possible. Until this serious shortcoming is sorted out, I refuse to consider any of these machines entirely suitable for professional use!

SUMMARY

If you need a stand-alone CD recorder that can use the cheaper CD-R (non-consumer) blank discs, the Fostex CDR200 is just about the cheapest solution — although, as I said in the introduction, it appears to be identical to the similarly priced HHB CDR800, aside from a few cosmetic details. On the whole, the machine is easy to use and the various record modes meet most needs, but I still feel uneasy about having to be on hand to physically stop the recording straight after the last track, in order to prevent unwanted 'silent' audio being recorded at the end of the album. The audio quality of the discs appears to be essentially identical to that of the source material, though there may be some small subjective change as you play back on different CD machines, due to the varying quality of converters used in CD players.

For the private studio owner wanting to offer a small-run disc service to clients, this machine is close to ideal, though you can still save money by buying a consumer machine. Which you go for depends on how many discs you're likely to want to record — currently the price difference is around £1 per disc, so the break-even point is at around 500 recordings. SOS

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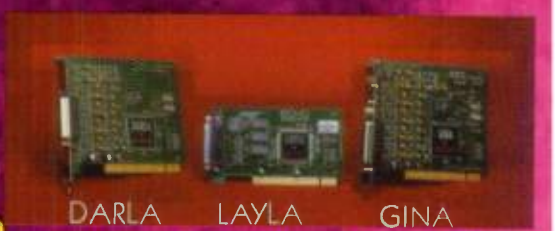

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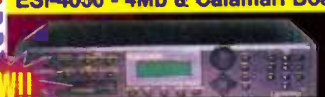

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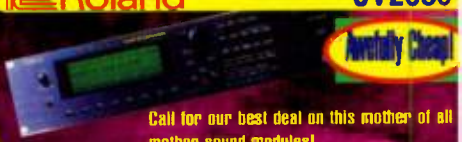

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Out of the Blue

Is the dbx 160S pure technology, a work of art, or a little of both? PAUL WHITE puts it to the test.

DBX 160S COMPRESSOR/LIMITER

You can always tell when a valuable product comes in for review — it turns up in a flightcase, not a cardboard box! The 160S is dbx's top-of-the-range analogue compressor/limiter, and it's pretty clear that the heavy, sculpted front panel and chunky metal knobs have been influenced by Focusrite's high-end 'Red' styling, but the design aim seems to have been to capture the sonic signature of existing dbx classic products, rather than to go all out for sonic neutrality or attempt to create a new compressor characteristic.

As you would expect at this price point, the support circuitry and mechanical design are impeccable, and include the new and impressively specified high-performance dbx V8 VCA to look after the gain control. This is a huge device potted in an aluminium heatsink-style case to maintain an even internal temperature — this is important to maintain matching between the multiple transistors used in the gain-control circuitry. Additionally, there are audiophile-quality input and output stages, Jensen audio transformers, and a sophisticated power supply, but behind all this the aim is to give the user access to the compression characteristics that made the dbx 165 and 160 models famous during the '70s. To this end, both hard-knee and soft-knee compression modes are implemented and, according to dbx, it's possible to make the 160S sound like a 160, a 165, a 166 or a 1066. This feat is accomplished not by emulation, but by duplicating the key control elements from these different models and physically switching them.

INTRODUCTION

Housed in a 2U rackmounting case, the 160S is a 2-channel compressor/limiter with the addition of dbx's proprietary PeakStopPlus limiter on the output. Metering is via moving-coil meters rather than the more usual LED ladders, and full side-chain access is available. The heavy aluminium front panel is blue anodised, and all the controls, buttons included, have a heavy, smooth feel that inspires confidence.

Before going further, it's probably helpful if I explain the presence of the PeakStopPlus limiter in a product that can already function as a limiter in its own right. The most obvious reason for including a separate limiter after a compressor is so that the user can apply gentle compression to the signal using the compressor section, but still have the limiter keeping watch for peaks that might otherwise exceed the safe limit for the next piece of equipment in line. This is particularly important with digital equipment, which doesn't tolerate any overload. However, even if you were to configure the main compressor as a limiter, by using a high ratio and a very fast attack time, you'd find this setting less than ideal for low-frequency sounds, which are treated more kindly if the compressor attack time is set a little longer. Of course, setting anything other than the fastest attack time allows brief peaks to slip through the system unchecked, which is why a separate, very fast output limiter is so useful.

PeakStopPlus is actually a two-stage limiter designed to arrest excessive peaks with the minimum of side-effects, and it does this by first employing what dbx describe as their Instantaneous Transient Clamp, which controls the level using a soft logarithmic function to avoid harsh-sounding clipping effects. This effectively prevents overshoots of more than around 2dB above the set threshold, but then stage two comes into action, introducing another new dbx term — Intelligent Predictive Limiting. I interpret this as a type of look-ahead system that monitors the input level, providing a very short but still useful warning that a peak is about to hit the limiter. Apparently the top couple of dBs of the limiting process provide soft clipping rather than simple truncation which, again, helps produce a more natural sound. PeakStopPlus is provided as a kind of peak level safety net, so under normal circumstances the compressor output level would be set so that the limiter rarely operates (if ever). If desired, however, the limiter can be provoked into more frequent action, allowing its use as a creative effect.

pros & cons

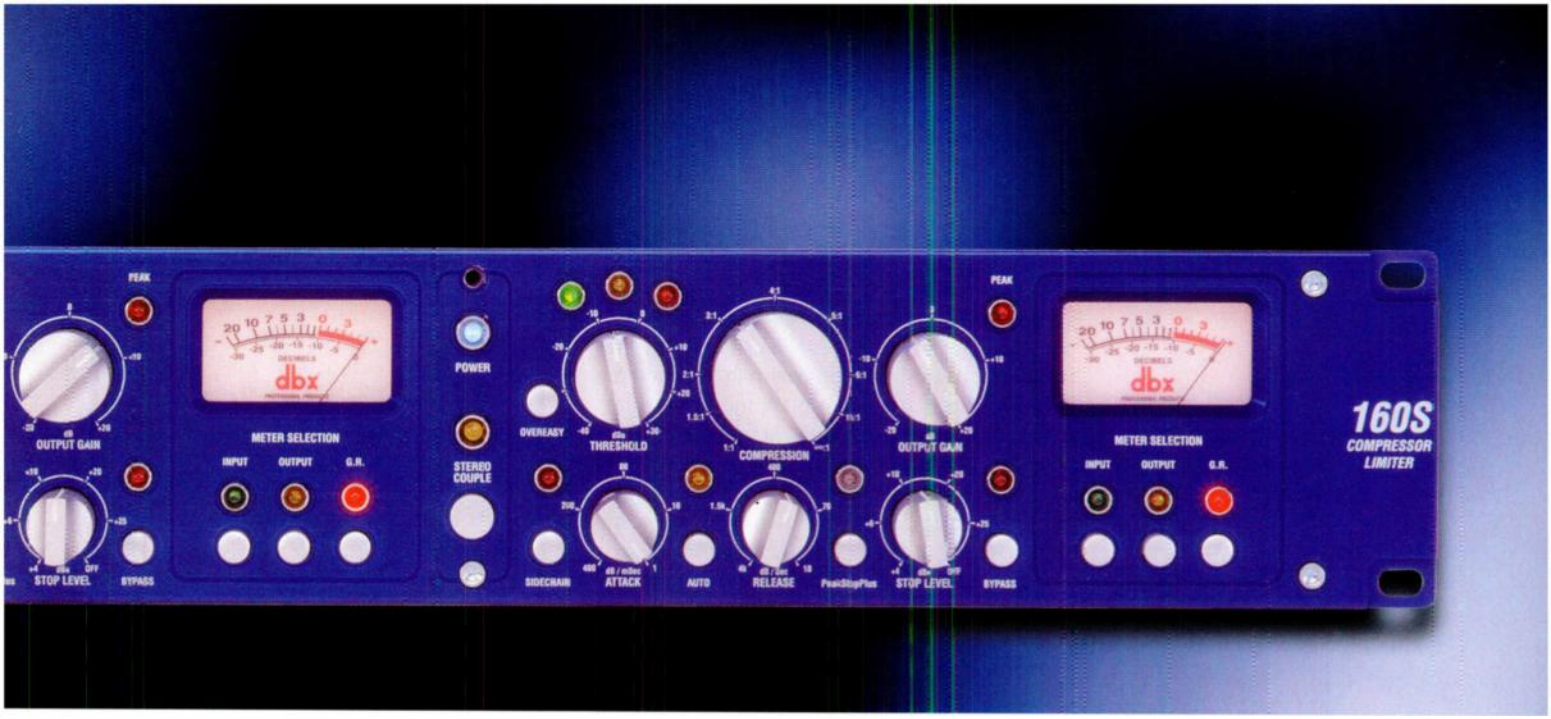
DBX 160S £2349

pros
- Impeccable audio specifications.
- Beautifully engineered and styled.
- Flexible enough to emulate most of the classic dbx compressor sounds.
- Effective limiter.

cons
- Hugely expensive.
- Distortion is audible at short release times on some material. An built-in hold time might have solved this, though the Auto mode seems pretty foolproof.

summary
This is a flagship product, and its price will probably restrict sales to flagship studios, but for those wanting the dbx compressor sound in a technically advanced analogue form, the 160S has to be the one.

SOUND ON SOUND



LAYOUT

Both channels are identical and operate independently unless the centre Stereo Couple button is pressed, in which case the side-chains are linked for accurate stereo tracking. The channel has five rotary controls for the compressor/limiter, with a further single control to set the PeakStop threshold level. The latter operates on the signal after the compressor's Output Gain control and is calibrated from +4 to +30dBu, the maximum level the internal circuitry can handle. A separate bypass button is fitted for the PeakStopPlus section, and in common with every other switch on the front panel, a status LED is provided. A further LED adjacent to the Output Gain knob illuminates when the output signal level exceeds +27dBu — and that still leaves 3dB of headroom before clipping occurs.

To provide maximum flexibility, the compressor section can be switched to hard-knee mode or dbx's soft-knee OverEasy mode, and the threshold is fully variable, with three indicator LEDs: green shows when the input signal is below the threshold, yellow comes on to signify that the compressor is in its soft-knee mode, and the red LED shows that the signal is above the threshold, and therefore subject to processing (providing the ratio is set to greater than 1:1). Ratio is fully variable, from 1:1 to hard limiting, via the large, sensibly calibrated Compression control. Between the Attack and Release controls is an Auto button for switching the unit into programme-dependent mode, where both the attack and release time constants are adjusted on-the-fly according to the envelope characteristics of the input signal. Attack is variable from 400 to 1dB/ms and Release is from 4000 to 10dB/s. This is a slightly unconventional way of showing the response time but it is actually more accurate, as, in fact, response time depends on the signal level going through the unit. A simple time figure is easier to understand, but as most users set the controls by ear I don't suppose it makes much difference either way.

On a personal note, I think the VU meters should have been cream rather than white, to capture a true vintage feel, but they are switchable to monitor the input, output or gain-reduction levels, with a VU-style characteristic.

USING THE 160S

The 160S needs to be mounted fairly high in your rack if the control names aren't to be totally obscured by the knobs, but other than that the control layout is superb, the controls have a wonderful feel to them, and all the buttons are positive and solid. As suggested by the technical spec, the only noise you ever really hear from this unit is what you put into it, and the amount of headroom almost certainly exceeds that of the mixer you're connecting to. At a technical level, I have no complaints about this product at all, and the inclusion of status LEDs on every switch makes it clear what's going on, even from the other side of the studio.

Soundwise, the 160S is classic dbx, and the closest you'll get to transparent compression is by using the Auto mode. Even then, vocals sound as though they're being flattered in some way rather than simply being controlled in level — even in OverEasy mode, using more than a few dBs of compression gives the impression of fairly assertive gain control. Rock vocalists in particular will probably like what the 160S does, and existing 160 users can be assured that they can get their standard 160 effects from this box, but with an extra degree of audiophile gloss.

Using manual attack and release settings on vocals, I found that the release control had to be used in the last quarter of its travel, otherwise distortion was clearly audible, no doubt due to the compressor trying to respond to individual cycles of the low-frequency components of the voice. Increasing the release time cures this completely, but for vocals Auto usually does the best job and never seems to get tripped up, regardless of what you throw at it. The faster manual release times will obviously be useful on percussion.

Setting up the PeakStopPlus limiter so that it ▶

FEEL THE QUALITY

When I said at the start of this review that dbx had tried to build audiophile qualities into the 160S, I wasn't using the term loosely. The new VCA design has a dynamic range of 127dB, and where internal connectors are used they have gold-palladium-nickel contacts. The torroidal transformer used in the power supply is double-shielded to keep spurious electromagnetic radiation to a minimum. Even the audio sockets are Neutrik with gold-plated connectors, and the bypass relay sports even more gold, this time in an hermetically sealed unit. All the audio connectors, including the side-chain send and returns, are balanced XLRs — there are no jack alternatives anywhere.

The output transformers are feats of engineering in their own right, able to drive up to 1000 feet of cable without signal degradation at up to +30dBm, and the circuit boards themselves are heavy glass-fibre. This really is a solidly engineered, beautifully thought-out piece of kit.

rarely comes into operation results in a reasonably benign form of limiting, so the design strategy evidently works. If you deliberately push the levels so that the limiter is working more or less constantly, you hear the level flinch as it hits the limiter, then swell back up over half a second or so, producing an audible pumping effect that could be useful in some creative situations.

SUMMARY

Without doubt, this is a beautiful piece of equipment, both technically and aesthetically, and dbx have designed it to appeal to those countless engineers who already love the dbx sound but who'd like to get it all in one box, and with the ultimate in analogue performance. I've used most of the dbx compressors at one time or another, though I didn't have them for direct comparison during this review, and the 160S is able to get very close to the sound of any of them. As to whether the super audio quality is necessary, this depends on what you want to use the compressor for. If you're mastering or compressing whole subgroups, it could be argued that you need the best signal path available, but if you're simply compressing one channel in a mix, a regular dbx 160A would be a more cost-effective solution, and probably wouldn't make any perceptible difference to the quality of the end result. Whether you would use a dbx compressor for mastering is largely a matter of taste, but I've always thought of them more as 'effect' compressors than as a means of controlling gain without side-effects.

The dbx 160S is certainly the ultimate realisation of the dbx compressor concept and, given the affection felt for dbx by certain mixing engineers, will almost certainly find its way into a number of prestigious studios. If you're a private studio owner, however, you have to look at the recording system as a chain and realise that adding one strong link will not necessarily increase the strength of the chain as a whole. If that is the case, the existing dbx compressor range will serve your sonic needs almost as well, albeit with rather less flexibility and finesse. SOS

THE V8 VCA

The V8 VCA is a state-of-the-art implementation of the original David Blackmer VCA, but whereas the original VCA was a four-transistor log amp multiplier, the new version has 32 transistors used in the same basic topology. Whenever the number of devices is doubled in this circuitry, the headroom goes up by 6dB, but uncorrelated noise increases by only 3dB, which is how the 127dB dynamic range has been achieved.

However, to minimise THD, the transistors draw more current than in the earlier design, so an aluminium-zinc package filled with a thermally conductive resin is used to keep the devices at an even temperature. This is necessary to prevent the performance drifting with temperature fluctuations.

info

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WRH

Hit the factor

PRACTICAL DRUM KIT RECORDING

PART 2: Last month, BENEDICK GRANT explained how to properly mic an acoustic drum kit. In the concluding part of this short series, he turns his attention to committing kit sounds to multitrack.

One of the foremost objectives during the recording process should be to record instruments in such a way that as many creative options as possible remain open at the mixdown stage, so that artistic decisions can still be made at that point. To achieve this in the case of the drum kit, it's desirable to maximise separation between signals from different instruments or sections of the kit. This is best achieved by spreading the drums across as many tracks as possible on the multitrack. In practice, of course, one must strike a compromise.

MAKING TRACKS

When working on 24-track I generally record the bass drum, snare drum and hi-hat on separate tracks, with a stereo pair for the toms and another pair for the overheads. This method is too extravagant for 8-track or 16-track recording, and when I'm constrained by the number of available tracks my first instinct is to combine the toms and overheads onto a single pair of tracks. After that, I would consider combining the hi-hat signal into the toms/overheads stereo mix, retaining just the snare and bass drum on separate tracks, but it's prudent to consider how the drums will be mixed in the context of the type of music *you* are recording, and keep separate those which are most important, or to which you're most likely to want to apply special effects and EQ.

The bass drum and snare drum, and to a lesser extent the hi-hat, form the heart of the drum kit, and it is often desirable to treat them individually during mixdown. I try to keep the bass drum separate if at all possible, even when working with only eight tracks. Where extra percussion instruments are used, they can often be fitted into gaps on other tracks — the hi-hat, for example, is unlikely to be used at the same time as a cow bell, so it would be appropriate to assign both to the same track.

RECORDING LEVELS

Percussive sounds start with an extremely sharp transient, and decay rapidly, so the peak level of a signal from a percussion instrument is very much higher than the RMS (average) level. As a consequence, the same percussion signal will register a much lower level on a VU meter, which displays the average level of the signal, than on a PPM, which is peak reading. Virtually all needle-type meters are VU meters, and LED bargraph displays PPMs. As a rule of thumb when using VU meters, a level of -4dB is appropriate when recording drums, whereas with PPMs a level of +3dB can often be recorded onto analogue tape without audible distortion.

Analogue tape is quite forgiving of transient overload — indeed, just before the onset of clipping, which takes place when the tape is magnetically saturated, there is a stage where the tape behaves in a non-linear fashion and 'tape compression' occurs. This effect can be used creatively because it will often thicken up the

sound of the bass or snare drum. However, caution must be exercised to make sure that the tape is not driven too far into saturation, as this results in a clipped, distorted sound.

Digital recorders, whether tape- or disk-based, *must* be used within their headroom, as any overloading will result in clipping, producing a harsh, granular sound that cannot be salvaged.

MIXING: STEREO IMAGE

The first step in setting up the mix is to pan the signals so that a realistic stereo image is created. Bring up the overheads first, and pan them left and right sufficiently to produce a realistic stereo width. It's not advisable to pan them hard left and right, because this would fill the stereo image and give the implausible illusion of a 20 foot-wide drum kit! It's usual to pan the mics so that the kit is heard from the audience side, with the bass drum central and the hi-hat slightly to the right. The other drum tracks can then be brought up and panned individually. Bear in mind that the overhead mics will have picked up the sound of the whole kit, so these other drum tracks must be panned so that they occupy the same position in the stereo image as they do on the overheads. Careful listening and adjustments to pan positions will be rewarded by a realistic, three-dimensional drum sound with stable stereo imaging.

Once the drums are faded up and panned to the right positions, you can consider where corrective or creative effects, in the form of compression, gating, EQ and reverb, are required.

COMPRESSION

Compression serves a dual purpose when you're recording drums. It can be used firstly to even out the dynamic range of a signal, and secondly as a creative effect to alter the sound of the instrument.

The bass drum is the fundamental instrument in the kit, and it is imperative that it provides a steady, even beat. Compression is invariably used to help achieve this, by ironing out any inconsistencies in the playing. I generally use a fairly high ratio — between 4:1 and 10:1 — and adjust the threshold control to achieve the desired amount of compression. Compression can be used more heavily on drums than on melodic instruments, and 5dB or more of gain reduction is not excessive. As the amount of compression is increased, the character of the sound begins to change: a heavily compressed bass drum sounds tighter and more solid. It's also worth experimenting with different attack settings: a fast attack produces a 'thuddy' sound, whereas a slow attack lets the initial transient go through uncompressed, to give a click at the start of the beat. Compression can often also be used to good effect on the snare drum.

GATING

Most engineers encounter severe problems in achieving good separation between the hi-hat and other instruments: in fact it tends to bleed through onto virtually every microphone, no matter what efforts are made to reduce spill. A gate can be used where it is necessary to obtain greater separation between instruments — for example, if you want to process or add an effect to a specific instrument. The gate is set so that it opens to let signal through as soon as the instrument is hit, and closes again when the sound has finished or died away.

Great care must be taken when setting up gates. In particular, the trigger level must be set so that the gate opens on every beat of the instrument being gated, but is not triggered by any of the instruments which are spilling over.

Setting the trigger level can be problematic. To return to the example of spillage from the hi-hat into the snare microphone, it will be often be found that the level of the spill is as high, or almost as high, as the level of the sound from the snare, so a way must be found to get the gate to trigger from the snare beats only. This can be accomplished either by using a gate with a side-chain filter, or by means of an external key input.

A gate operates by splitting the input signal into two parts, one of which is called the side-chain signal. This is used to control the opening and closing of the gate and operates in conjunction with the threshold, attack, hold and release controls. The threshold determines the level of input signal required to open the gate; the attack control adjusts the speed at which the gate opens once the threshold has been reached; hold sets the length of time for which the gate remains open after the signal has fallen back below the threshold; and release determines how fast the gate closes. More sophisticated (but not necessarily expensive) gates include filters, generally a sweepable high-pass and a low-pass filter which operate on the side-chain signal only. These can be set so that they only allow a small band of audio frequencies, equating to the main frequencies of the sound you wish to trigger the gate, to pass through.

In our example the aim is to let through snare drum frequencies without allowing the hi-hat to ▶

Stand-alone gates like the 4-channel LA Audio 4G (above) and the dual-channel Drawmer MX30 (below) can be most useful in reducing spill between miked-up drums.

"It's desirable to maximise separation between signals from different sections of the kit. In practice, one must strike a compromise."

▶ open the gate. The filter must thus be set to let through a frequency band which is strong on the snare but weak on the hi-hat, such as frequencies below 3kHz. To do this, set the low-pass filter to this frequency. The hi-hat will not then trigger the gate, because most of its acoustic energy is above 5kHz.

Alternatively, an external signal can be fed to the key input of the gate, replacing the side-chain signal and controlling the opening and closing of the gate. I always derive such an external signal from a contact microphone gaffa-taped to the outside of the snare drum shell. My contact mic is an extremely cheap transducer (which can be bought from Maplin or Tandy) connected to a mic preamp via a piece of screened cable. A proprietary contact mic, such as a C-ducer, or even an accoustic guitar contact mic, will perform exactly the same function. Because the mic is in direct contact with the snare drum, it picks up the snare sound at a high level and does not suffer bleed from the other instruments.

In practice, gating drums to achieve separation is always a compromise. Although spill can be eliminated when the gate is closed, the spill will still be there when the gate is open and will affect the sound of other instruments, as each mic picks up all the instruments in the kit to a certain degree.

EQUALISATION

As with compression and gating, EQ may be applied either when recording or mixing. However, because the drums and percussion are only one element of the final track, and many of the decisions regarding EQ can only be taken in context, when the drums are heard alongside the other instruments, it's generally more advantageous to record a flat (unequalised) signal to tape, so that at mixdown you will not have to remedy any bad decisions taken at the recording stage.

There are times when it's desirable or even necessary to EQ at the recording stage: for example if you want to treat four different areas of the frequency spectrum and your mixer only has 2-band or 3-band equalisers, you could treat some areas while recording and the remainder in the mix.

The purpose of EQ is firstly to make the sound of each individual percussion instrument as good as possible, and secondly to make sure that all the instruments in the arangement sound good together. Whereas with most instruments and vocals I usually find subtractive EQ (cutting unwanted frequencies rather than boosting those that I want) preferable, with drums I regularly apply both boost and cut.

The frequency spectrum of percussive sounds can be divided into main areas of acoustic energy:

- Below 1kHz, but principally in the range from 75Hz to 300Hz, lies the main resonance of the instrument.
- From 1kHz to 3kHz is the 'bang' of the beat.
- From 5kHz to 10kHz is the 'click' as the stick impacts with the drum or cymbal.
- From 8kHz to 15kHz is the resonance of cymbals.

If the sound of any drum is blurred and the beats are indistinct because the drum's resonance does not decay between beats, an effective remedy can be to tune the equaliser to the resonant frequency, and cut. This technique is particularly applicable to fast songs.

Where drums have been recorded using a simple microphone setup — just overheads, or overheads supplemented by mics on the bass and snare drums, for example — there is nevertheless plenty of scope for creative equalisation.

- Boosting in the region between 8kHz and 10kHz will make the cymbals more prominent and sparkling.
- Boost applied in the 5-8kHz area will bring out the stick noise on both snare and hi-hat.
- The 'bang' of the bass and snare drums and the toms can be adjusted by boosting or cutting at around 1kHz to 3kHz.
- The body resonance of the drums can be augmented or reduced by EQ-ing from around 100Hz up to 300Hz.
- Be careful in boosting frequencies below 500Hz, because a confused, muddied sound can result. To improve clarity, cut frequencies between 200Hz and 400Hz.

These frequencies are given as a guide only, and should be used as a basis for experimentation: it is essential to listen carefully and sweep the frequency control on the equaliser to get the best sound. (See also the 'Accentuating The Positive' box on the left for drum-specific EQ tips.)

REVERB

Reverb is an important constituent of any modern drum sound, but it is equally important that the drums should not be swamped with a reverb which hangs on for too long and does not decay between drum beats, resulting in a muddy and indistinct sound. It's best to use a reverb with a short decay time (generally no more than 1.5

ACCENTUATING THE POSITIVE: EQ'ING THE KIT

• BASS DRUM

For a modern sound, boost slightly in the 6kHz to 12kHz region, to accentuate the transient click as the beater hits the skin. The thump of the beat can be brought out by boosting between 2kHz and 3kHz. To give a deep, powerful 'thud' to the sound, boost between 75Hz and 100Hz. If the sound has a tendency to boom or resonate, try cutting between 200Hz and 400Hz.

• SNARE DRUM

To accentuate the stick impact and rim shots, boost at about 5kHz. The rattle of the snares lies mostly between 5kHz and 10kHz. The 'bang' of the drum is in the region of 1-3kHz. The body resonance of the drum can be found at 100-250Hz.

• TOM-TOMS

The tom-tom sound can be made more dynamic by boosting at around 6-8kHz for the stick impact and 3kHz for the 'thwack'. The body of the sound generally lies between 100Hz and 500Hz depending on the size of the drum. Depending on context, you may wish to boost the lower registers to add power and coloration, or cut these frequencies to emphasise the impact rather than the body and decay of the sound.

• HI-HAT

The major components of the hi-hat sound are the ring, from 7-10kHz, the stick noise, at about 5kHz, and a clang in the region of 500Hz to 1kHz.

seconds), and to cut some of the low-frequency content from the reverb.

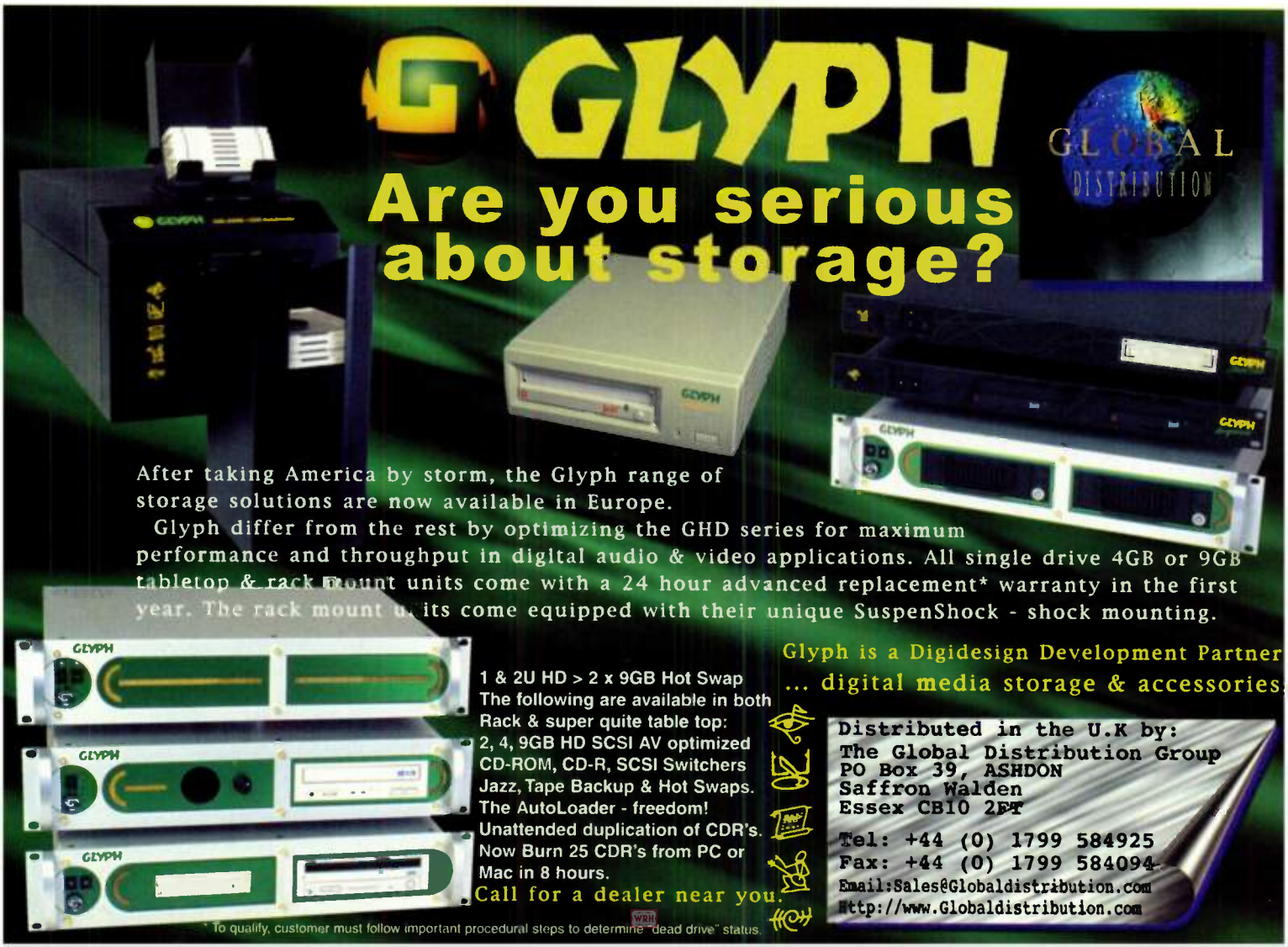
I normally assign the toms, snare and hi-hat a short, crisp plate program, with a reverb time of 1.2 seconds. A reverb with a longer decay time can be used on the overheads: cymbals, particularly, can be enhanced by a longer reverb. I often assign the overheads to my main reverb, using a hall programme with a decay of about 1.5 seconds. But these reverb times are a guide only, and you should set your effects to suit the particular track. Generally, fast songs require a shorter reverb time, to allow the reverb to decay between beats and thus avoid blurring the sound.

I rarely use reverb on the bass drum, because it tends to make the sound muddy and ponderous rather than punchy and dynamic. The exception is gated reverb, which can work well as a special effect, but should be used sparingly. This type of reverb continues to be popular, although the clichéd Phil Collins snare sound must surely have had its day. The easiest way to achieve this kind of sound is by using a dedicated preset on a multi-effects processor. Alternatively, the output of a digital reverb set to an ordinary reverb programme can be fed to a noise gate, and the attack, hold and release controls set to envelope-shape the output, to give the characteristic 'burst' of reverb abruptly cut off. If you are recording in a large, live space with a pleasant natural reverb, it's worth putting up mics at a distance from the kit to capture the ambience, and feeding the signal from these to a gate in order to envelope-shape it.

So there you have it! I hope you've enjoyed reading about the way a drum kit works and the factors which influence how it's miked and recorded. And if you're ever called upon to mic or record a kit, perhaps you'll approach it with less trepidation after having read this short series. SOS

BONUS DRUM TIPS

- Make the drum sound more interesting by using different reverb settings on different parts of the kit. Use longer decay times on crash and ride cymbals, and a shorter setting on the snare. Use reverb sparingly (or not at all) on the drums to avoid a boomy sound.
- If you don't have space to record a whole drum kit, and you're using programmed drums or a drum machine, you can get a much more realistic feel by programming the main kick/snare backbeat, then adding real cymbals, hi-hats and maybe tom fills.
- MIDI drums often sound better when played from pads by a real drummer, as quantising a keyed-in drum part usually kills the feel of the performance.
- Try heavy compression on the overhead mics only. This can really open up the room sound and adds a sense of life and power.
- If you use both close mics and overhead mics, the overall kit sound can be completely changed by varying the balance between the close mics and the overheads. If the room sounds too dead, set the kit up on a sheet of lino or a piece of board to reflect some sound. Digital reverb can then be used to fine-tune the ambience.
- A noise gate can be employed as an envelope shaper and used to tailor the attack and decay of a signal. Generally a very fast attack (opening) time should be selected when processing percussion instruments, so that the transient is not cut off.



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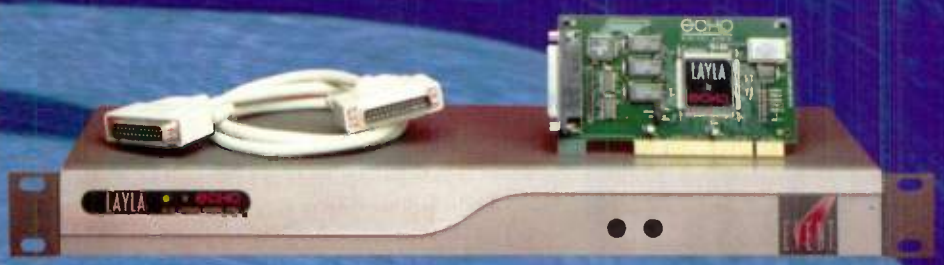

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Key audio systems

Spanish Prize?

PAUL WHITE tries out a new range of European software plug-ins with stylish interfaces and innovative features.

DUY DIGITAL AUDIO PLUG-INS

Plug-ins are becoming an increasingly significant part of working with digital audio, and it's nice to see a new company making an appearance in this important area. DUY (don't ask me how you pronounce that!) are a Spanish company producing plug-ins for Digidesign's TDM and Audiosuite plug-in architectures, Adobe *Premier* and Steinberg's *Cubase VST*. Though some of their plug-ins cover ground already trodden by the likes of Waves, Spatializer, QSound and Steinberg, they do offer a different approach, with some genuinely innovative twists and wrinkles.

THE BASICS

The five plug-ins reviewed here are TDM versions and comprise *DaD Valve*, *DaD Tape*, *Max DUY*, *Wide DUY* and *Shape DUY*. All conform to Digidesign's overall plug-in layout guidelines, but the visual presentation is a little more adventurous than say, Waves, who tend to value clarity of interface above showmanship. Within Pro Tools 4, any of the plug-ins reviewed here may be automated, while Pro Tools III allows only static processing.

All these TDM plug-ins come on a single Mac-format floppy disk with the usual limited-install protection system. There are two installs per disk, with a de-authorisation procedure for removing a plug-in when you need to change hard drives or upgrade your computer. I hate these things with a vengeance, but until a better copy-protection system comes along, I guess we're stuck with them. Installation on my Mac was straightforward, and once the plug-ins were placed inside the DAE plug-ins folder, I only had to reboot and I was ready to try them out.

DUY Valve.

DaD VALVE

Valve emulation in software is nothing new, but DUY have modelled a whole range of triode, pentode and tetrode valves at different bias and drive levels, to create a very flexible plug-in. Their system deals with the dynamic and spectral aspects of valves separately, because although it's well known that valves compress signal peaks when they're overdriven, the resulting harmonic structure varies with the valve type and biasing arrangement.

The Spectrum part of the process simulates the frequency and transient response of the valve, while the Dynamic part emulates the distortion caused by the valve's non-linearities. In addition to the input level slider, there's also a drive control called the Pusher, arranged as a horizontal fader, but there's no output level control, so it's not always possible to balance the processed and direct levels for comparison. A further control, called Lobe Flip, inverts the effect of the valve, to reverse the positive and negative-going characteristics, which may be quite different in a typical valve circuit. With symmetrical input material this will make no difference, but where the material being processed is very asymmetrical (brass waveforms are very asymmetrical, for example), the subjective difference can be quite noticeable.

The various valve characteristics are arranged as a matrix of 40 presets for the Spectrum processing and 40 for the Dynamic processing, each set being laid out as a drop-down 5 x 8 menu of instrument icons, to provide some idea as to which types work best with which sounds (the same icons are present in both sections). A Link button forces the same preset to be chosen from both Spectrum and Dynamic settings, but unlinking it allows any preset from one group to be combined with any preset from the other. This may all sound a bit anorakish until you listen to the effect, but it's an easily verifiable fact that some kinds of non-linearity sound great on some instruments or voices and awful on others.

In either case, mono or stereo signals may be treated, though for some reason I could get no sound out of this plug-in, or the *DaD Tape* plug-in, with my Pro Tools III system unless it was used in stereo. As this type of plug-in goes, the effect is both authentic and controllable, and used with care it can add a little welcome character back to an all-digital recording.

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DUY Tape.

DaD TAPE

As you can work out from its name, this is quite obviously a tape saturation emulator, but rather than simply approximating tape compression, it is actually based on physical models of five industry-standard machines, to include noise, non-linearities, frequency response ripples and so forth. There's also an idealised noiseless tape mode, just in case the thought of analogue hiss throws you into a panic. What's more, you can dial in the side-effects of two popular noise reduction systems, and the virtual tape speed can be set to 7.5ips, 15ips or 30ips.

The user can select the required tape characteristics via buttons, but otherwise has control only over input and output level (stereo metering is provided). Just as with tape, the effect is only obvious at high signal levels, but sonically *DaD Tape* seems very authentic — although, just like real tape, the effects are more subtle than you might expect. Having the different simulations helps match the treatment to the sound being processed, but I feel the control system could be better. For example, I'd like to see a separate control for setting up the tape drive to allow saturation at lower input levels, and proper tape-style metering to show how much the virtual tape is being pushed into the virtual red [*DUY say that DaD Tape uses plasma meters instead of VU meters because they are more exact than a good VU meter emulation*]. Though this plug-in does exactly what it says on the tin — and then some — I think if I already had the *DaD Valve* plug-in, I could get close enough to a tape sound not to need both.

DUY MAX

You guessed it — a level-maximisation processor using what DUY describe as Intelligent Level Optimisation. Unlike analogue limiters, this plug-in updates its parameters on a sample-by-sample basis, to restrict the dynamic range of signal peaks in a very unobtrusive way. In addition to the input gain slider, there's a Max slider to set the threshold above which processing takes place. The manual states that if the input signal comes close to 0dB, the Max slider range is limited to around 6dB, and above this point unwanted artifacts may appear. An output slider sets the maximum peak value of the processed signal and meters show the levels of the input and output signals simultaneously. *DUY Max* may be used in mono or stereo.

DUY Max is a very easy plug-in to use, and providing you don't push the processing too far, the effect of limiting is largely invisible. However, as a long-time user of Waves' *L1* limiter, I feel that Waves provide a better set of controls and more meaningful metering.

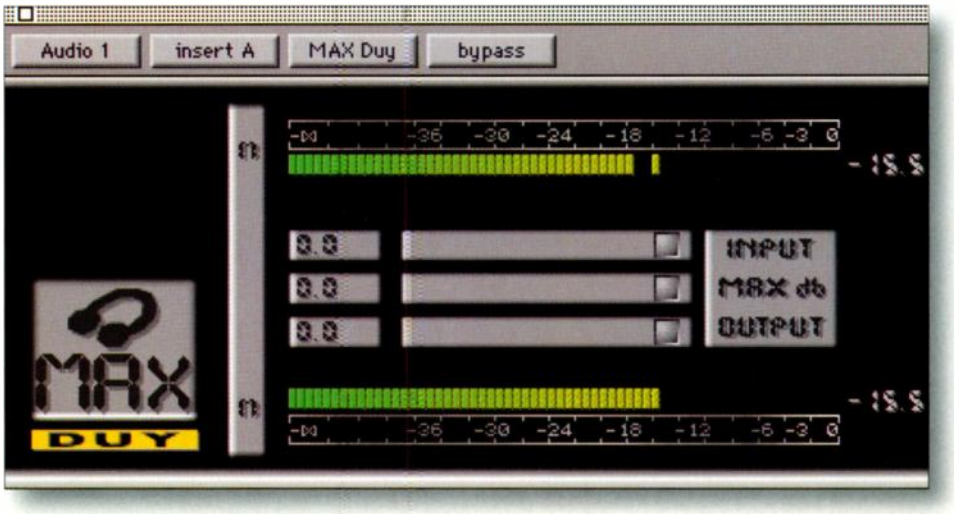
DUY WIDE

Not a virtual cockney used-car salesman, but a stereo width enhancing plug-in, *DUY Wide* is designed to work with stereo inputs only, and its aim is to make the sound-stage appear wider than the speaker spacing. In addition to a stereo enhancement amount slider, there's an input gain slider and a variable frequency boost equaliser to help compensate for any spectral change that might result from the processing. QSound use a similar EQ system with their plug-in, as spectral change often occurs when processing is used to widen the stereo image, and just in case the source material turns up with one channel out of phase, there are also separate phase-invert buttons for each channel.

The EQ boost can be switched in and out, but on my Pro Tools III system I couldn't get the boost controls

THE NEURONIUM CONNECTION

Keen readers of *SOS*, and fans of electronic musician Michel Huygen, also known as Neuronium (interviewed in *SOS* way back in June 1993), may have spotted that DUY the software company share their name with Huygen's studio DUY. We wondered if they were related, and made enquiries. It turns out that they are — though we're told that the software department has no connection with Michel Huygen. Anyone interested in some company background should check out the DUY web site, at http://www.duy.es



DUY Max.

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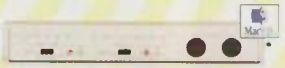

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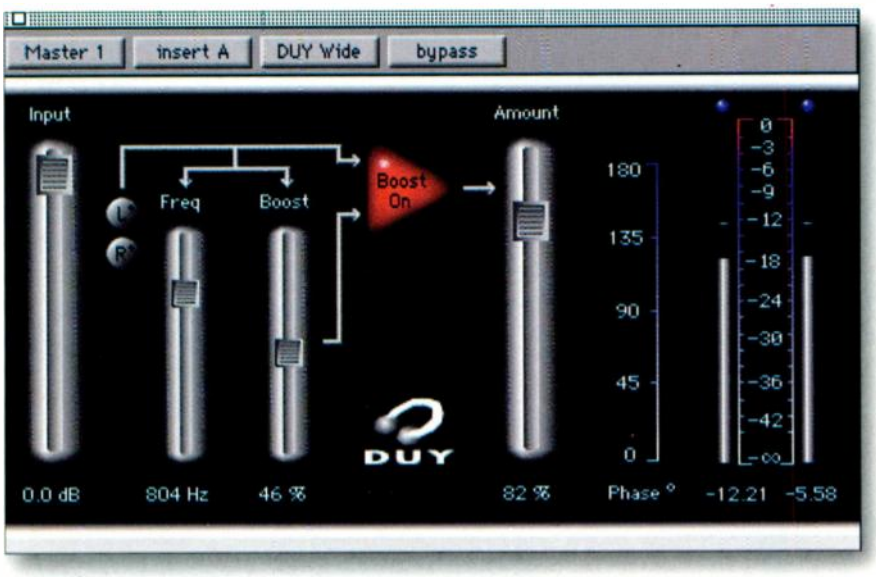


DUY Wide.

▶ to work at all. Switching in Boost increased the overall level, but neither the Frequency or Boost control had any effect. I'm prepared to believe this was due to some foible of my own system, but if you're looking at this plug-in, it would still be advisable to check everything works properly on your system.

Phase meters show how much processing is taking place, and they also provide an indication of how the process might affect mono compatibility. Up to 40% should be fine, but above that you need to check more carefully. (Perhaps a mono check button on the plug-in would have been a good idea?) Stereo level meters continuously monitor the processed output.

How effective the process is depends on the material being treated, and in my experience that applies to all the competing products too. On most mixes, the apparent spaciousness of the sound is increased at the cost of a little 'up-frontness'. Any tonal change should be small enough to compensate for by using the Boost control. The effect isn't always as dramatic as you might wish, and I've found much the same with the competing systems — a lot depends on the characteristics of the source material. It's usually best to process just elements of the mix rather than the whole thing — then you can use more intense processing on reverb, delay and sound effects, for example.

DUY SHAPE

It might sound like a slimming biscuit, but *DUY Shape* is actually the most original and most interesting of all the DUY plug-ins. It's not an EQ, it's not a compressor and it's not an enhancer, yet it combines elements of all three and more. Again operable in mono or stereo, *DUY Shape* splits the audio spectrum into three bands, which the user can vary via two adjustable crossover frequency sliders. Representing each band is a graph showing input against output, rather like a compressor, and these are the Shapers. The default condition is a diagonal line on each graph, depicting that the input and output are linearly related.

Grabbing the top point of the line and pulling it down reduces the level in that frequency band, but that's all, hence the ability to equalise. Any shape other than a straight line (you can add as many points as you like by clicking), will cause the input/output relationship to be non-linear, but rather than simply affecting gain, as is the case with a compressor, this process affects the shape of the waveform being processed. In other words, it introduces a degree of level-related distortion under precisely controlled conditions. The type of waveshaping depends on the shape of the input/output line, and this may be bent into any shape you like by adding points and then dragging them. It's also possible to define different curves according to cosine or six logarithmic rules, and these all produce subjectively different results.

The outputs from all three bands are summed in a mixer; repeated clicking on the mixer icon lets you solo any band or hear the the full mix. A few preset curves are provided so you can load them in and hear what the plug-in can do straight away, but coming to grips with making your own patches takes a little while, as it's not always obvious what actions will produce what results. A little dabbling confirms

PRICING

TDM versions:

DaD Valve	£586.32
DaD Tape	£374.82
DUY Max	£292.57
DUY Wide	£292.57
DUY Shape	£527.57

Audiosuite versions:

DaD Valve	£323.12
DaD Tape	£233.82
DUY Max	£186.82
DUY Wide	£186.82
DUY Shape	£276.12

Adobe *Premier* versions:

DaD Valve	135.12
DaD Tape	£99.87
DUY Max	£88.12
DUY Wide	£88.12
DUY Shape	£104.57

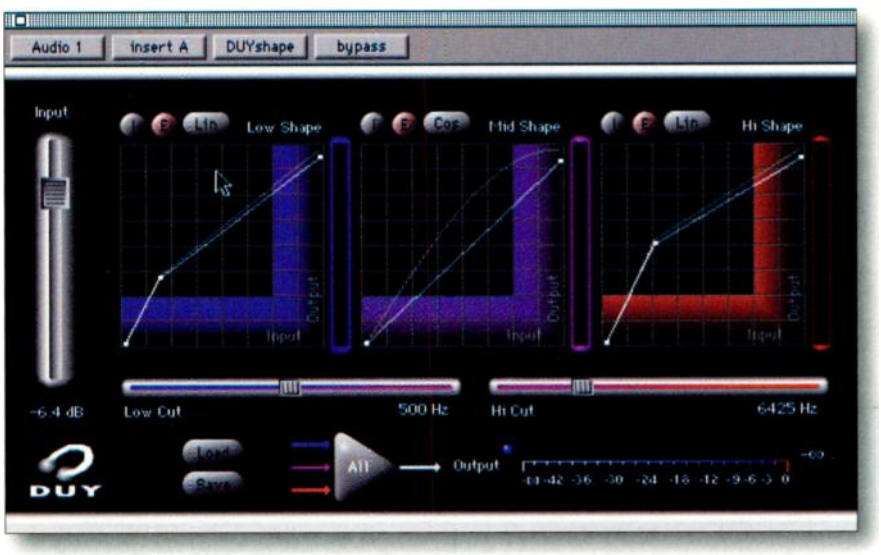
***Cubase VST* versions:**

DaD Valve	£323.12
DaD Tape	£233.82
DUY Max	£186.82
DUY Wide	£186.82
DUY Shape	£276.12

***Sound Designer II* versions:**

DaD Valve	£351.32
DaD Tape	£252.62
DUY Max	£222.00
DUY Wide	£229.12
DUY Shape	£327.82

Bundles are also available: for example, a bundle containing all five plug-ins for the TDM platform costs £1279.57. All prices include VAT. *DUY Max*, *DUY Shape*, *DUY Wide* and *DaD Valve* are also now available for the MOTU audio system. Contact Syco for prices.



DUY Shape.

that this plug-in is incredibly flexible, but I didn't find it particularly intuitive. For example, the leaflet hints that you can create frequency-dependent compression effects, but from what I can make out, the only compression that occurs is as a result of waves being squashed at the top by means of the shaping process. Similarly, you can expand the waveforms to make the peaks higher still, but this isn't the same thing as conventional expansion. There's no explanation given of what to expect from the different curve types, so you really have to 'suck it and see'. Even so, the results can be intriguing. You could shape only the top band to emulate a traditional enhancer, shape just the bottom band to get a nice analogue saturation effect, or shape everything, and alter the relative levels of the three bands, to totally change the sound of a mix or instrument.

Of the five plug-ins, this is definitely the most intriguing, and I feel that a little perseverance would be well rewarded. There's potential for enhancing individual sounds as well as full mixes, and some of the non-linear effects sound very 'analogue', especially when applied to the bass end of the spectrum.

SUMMARY

These are very sophisticated plug-ins from a company with a strong reputation in innovative software design, and, aside from a couple of odd foibles that are most likely to be associated with my specific audio system, they worked exceptionally well. If anything, I feel the designers have tried to make the user interface too graphically interesting, and the time might have been better spent on making the products more intuitive to use, but it really doesn't take long to get familiar with them. I feel Waves have done a far better job on the interface front, but there's no denying that DUY have added some features and processes that are quite unlike anything anybody else is doing. The *Shape* and *Valve* processors are my two favourites, but all do what they claim, and with very high audio resolution. I have no doubt that we'll be hearing a lot more from DUY as the plug-in market continues to expand. SOS

£ See pricing box.
A Syco Systems, Kimberley Road, London NW6 7SF.
T 0171 625 6070.
F 0171 372 7660.
E sales@syco.com
W www.syco.com

pros & cons

DUY PLUG-INS

pros

- Ingenious added-value features.
- Good audio performance.
- *DUY Shape* is particularly flexible.

cons

- User interface not always as intuitive or clearly set out as it could be.

summary

Though some of these plug-in have obvious counterparts from other manufacturers, the feature sets are sufficiently different to make them well worth trying out, and they all offer high audio resolution and work very well.

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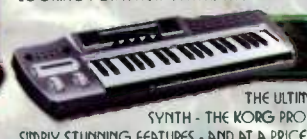

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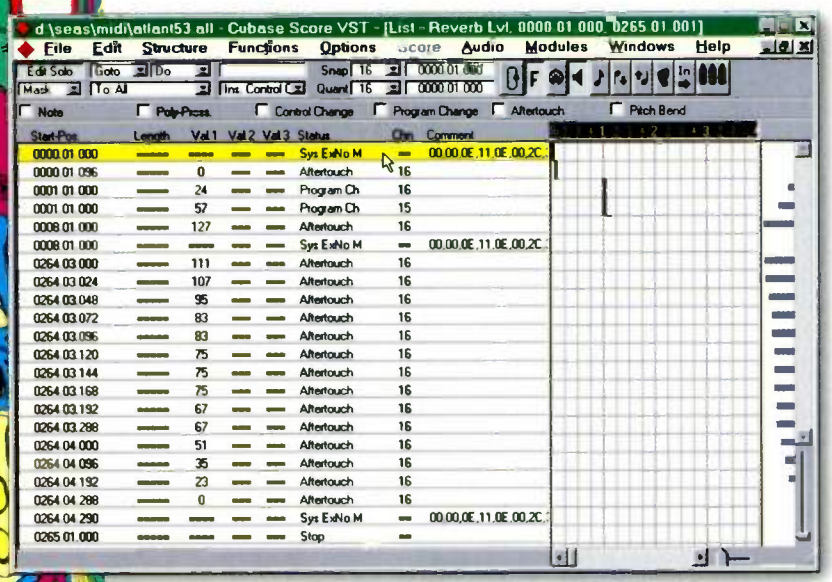

Looking at the contents of the effect track using Cubase's List edit, you can see how simple it is to automate your effects. Here there are two effect units, one each on MIDI channels 15 and 16. Notice the program change messages at the start of the song. The SysEx messages are used by my Midiverb 4 to control output volume, and my Boss SE70 has its output level mapped to aftertouch, which allows me to draw in a short effect volume fade at the end.

repeat performance

RECREATING YOUR MIXES

Have you ever been faced with recreating a mix that you haven't worked on for weeks? MARTIN WALKER explains how he manages to do just that, without the benefit of expensive automated mixers or a tape-op with a notebook!

Unless you have a fully automated studio, or a mixer along the lines of the desirable Yamaha digital series, it can be difficult to work on more than one piece of music at a time, simply because most of us can't remember — and find it tedious to note down — every setting of every control, when moving from one project to another. Ideally, there would be a way to remove some of the variables and automate some of the others, and all without spending any more money. Read on...

THE 'BEFORE' SCENARIO

If you're working on an album's worth of music, it can often be tricky moving between individual tracks. Recreating the same mixer levels, EQ, and the settings of every effects unit, as well as making sure you have all the same sounds available in your synths, can become a nightmare. Consequently, many people tend to work on a single track until it's finished, and then mix it down before moving on to the next one. This sometimes results in a selection of tracks that don't sit together as well in context, since the last mix may occur several months after the first. If you take on commercial projects, as well as working on your own music, once again you may be faced with the prospect of losing all your current settings suddenly, when a customer wants a quick remix of a track that you thought was finished a week ago.

If you have a huge outboard rack, a mixer that crosses several timezones, and a patchbay that would make BT green with envy, you'll probably be able to afford full automation anyway, but if you're not in that fortunate position, there are still many things you can do to make your life easier, as well as providing some simple automation if your setup is mainly MIDI based. These techniques are not new; neither are they revolutionary, and a bit of effort will be required to set everything up. But once this is done, it should be possible (depending on how you work) to move between tracks in a small project studio (of, say, up to 24 mixer channels and half a dozen synths) in under five minutes, and achieve a high level of 'repeatability'.

SOUNDS EASY

The MIDI side of this is simplicity itself, and I'm sure everyone will already know the basic approach. For each of your synths and effect units, you need to ensure that the required sound data for a particular track is exactly as it was the last time you ran the sequence. If you leave a favourite bank of sounds permanently installed in a particular device, you simply have to insert the appropriate MIDI program change message (and Bank Select, if required) at the start of your sequence data. At the very least, this saves you from having to remember which sound you used last time you worked on the track. If you have a vast collection of sounds, and a computer librarian/editor, you can either set up a system as I described in 'Patch Work' (see the November 1997 issue of *SOS*), to download the data associated with each track, or make a text note somewhere within the sequence to remind you which sounds in which bank you used.

If, like me, you rarely use a standard bank of sounds, but load in a new batch for each track, it's also a good insurance policy to name each track of your song with the actual program or sample name in full (most sequencers allow a sensible track title length to be entered). This may seem ▶

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tedious, but could prove invaluable. After managing to corrupt a 270Mb Syquest cartridge full of Akai samples, I had to reformat the cartridge, and recreate its contents from backups on several hundred floppy disks, but because each track of the album I was working on had the exact name of the sample used, I managed to match the sounds exactly. If I'd simply had track names like 'Guitar' or 'Strings', I'd never have managed to do this. See the 'File Facts' box for other ways to make your life easier with names.

PROBLEM SOURCES

Once you have a sensible system to keep your sounds under control, the main obstacle to a repeatable mix is recreating the settings of the mixer itself, along with any stray knobs on effects units, synths and so on, that may alter from time to time. This may seem totally impractical at first, until you start to think about it a little more. On your synths, the only front panel knob or slider not remembered by MIDI will probably be the master volume control, and this is best always left at maximum (for best noise performance), with the overall track levels controlled by a combination of mixer gain/fader settings, and MIDI volume and velocity values. To get off to a flying start, push your synth master volume knobs up to maximum, and you can normally forget all about the other physical synth controls, as their values will be recorded as part of the MIDI performance.

Although having the correct sounds and mixer settings is vital for recreating a mix, effects can also play a very important part in the proceedings. Fortunately, most of the information required can be incorporated into a sequencer track (providing your effects units have MIDI, as the vast majority of modern ones do), along with a few additional notes, and a little bit of initial setting up.

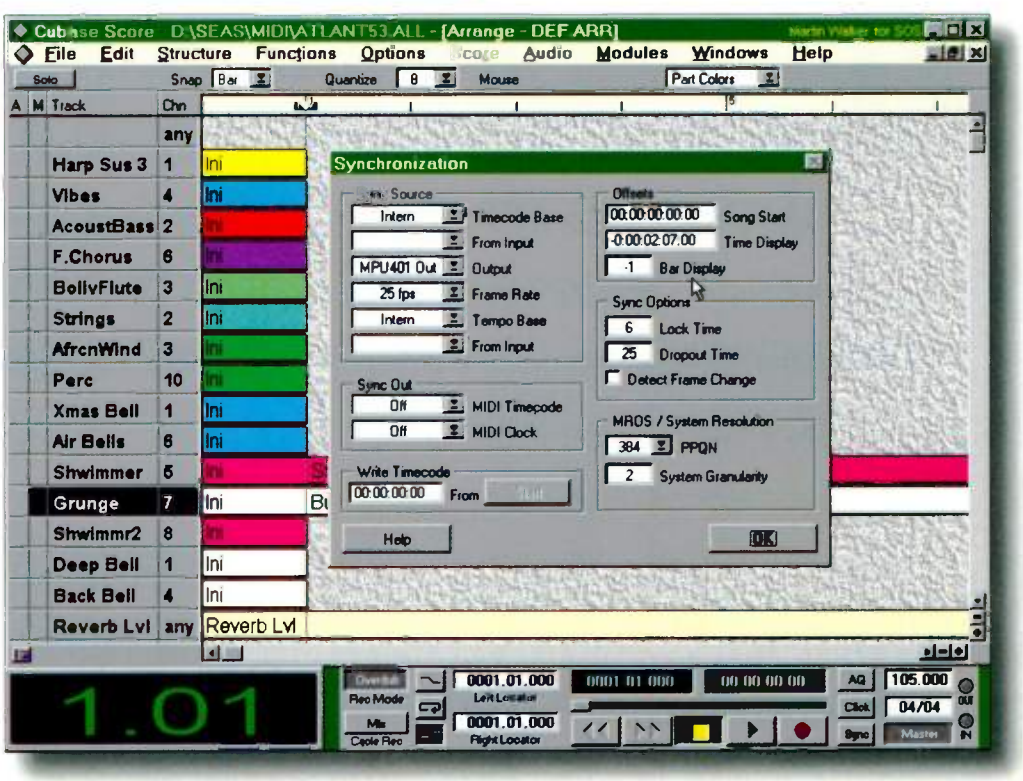
I've found the easiest way to do this is to create an extra sequencer track just for effect settings. Since changing any MIDI parameters on an effect unit can result in audio glitches if an audio signal is passing through at the time, I normally add an extra bar before the actual music starts (see screenshot below). This effect track contains initial MIDI program changes, and since the MIDI channel has been set to 'Any' you can include information in this one track for sending to several units, each on

Putting an extra bar before the music data starts alows you to enter extra MIDI data so that each track is properly initialised. In Cubase, the Synchronisation options allow you to enter an offset for the Time and Bar displays, so you can still start your music at bar one, beat one as before, and with the time correctly shown starting at 00:00:00:00. Notice the extra track for setting up effect units.

FILE FACTS

It can save a lot of hassle if you stick to a consistent system for naming sequence and sound banks. Using a working sequence title (for instance Moody01.MID), with data banks containing the same name (Moody01.BNK, Moody01.SYX and so on) is a great help. I normally use filenames that end in a two-digit number, so that every time I make a significant change to the track, I can increment this number by one when I save the new version. Using a two-digit number at the end (03, for example), ensures that all of your 'takes' stay in chronological order in the 'Open File' dialogue. In the same way, whenever you change sounds in a synth, save them in line with the current song name, so you won't end up wondering which of the dozens of 'In progress' files was actually the one that goes with a particular take.

I always keep at least two previous versions of each set of files on my hard drive, as well as a daily backup to a different drive in case of accidents. So, for instance, if you're currently working on the track 'Ambient17.MID', your synth sounds will be 'Ambient17.BNK' (or whatever), and you still have 'Ambient15' and 'Ambient16' versions, while you wipe all 'Ambient14' files and before. This way, you get great insurance just in case any file gets corrupted, and you can also always find which sound banks went with which sequence data. Even if you find that you prefer the version you saved yesterday, you can simply revert to this version, along with its sound banks, without having to remember whether you changed any of the sounds in the meantime — the patches and other settings will stay 'in sync'.



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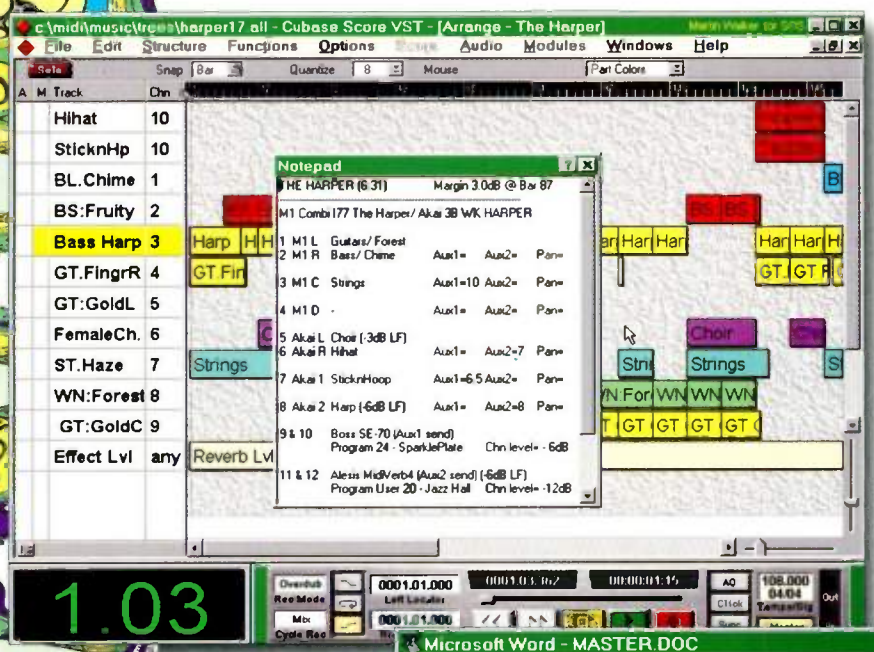
a different MIDI channel. I also use this extra track to add short SysEx commands, which initially set the output volume of each effect unit to zero. Many units allow volume to be mapped to something like a MIDI controller, for real-time level manipulation. Initially setting output volume to zero normally makes the effect noise level plummet, and by adding a further command to increase it to maximum as soon as the music starts, you get a much cleaner start to the track, since in my experience it's the effects units that produce the most noise in many mixes. In the same way you can fade out or cut the effect volume at the end of the track too.

Here's one way to format the required mixer settings, when adding them to your MIDI sequence. The size of the Cubase Notepad window used in this example is fixed (although it can be scrolled vertically), which restricts your options, but obviously, the less information you need to type for each sequence the better. One useful hint is to use the normal text Copy and Paste facilities to quickly move a empty 'dummy' layout between sequences, to save having to type in the whole thing each time.

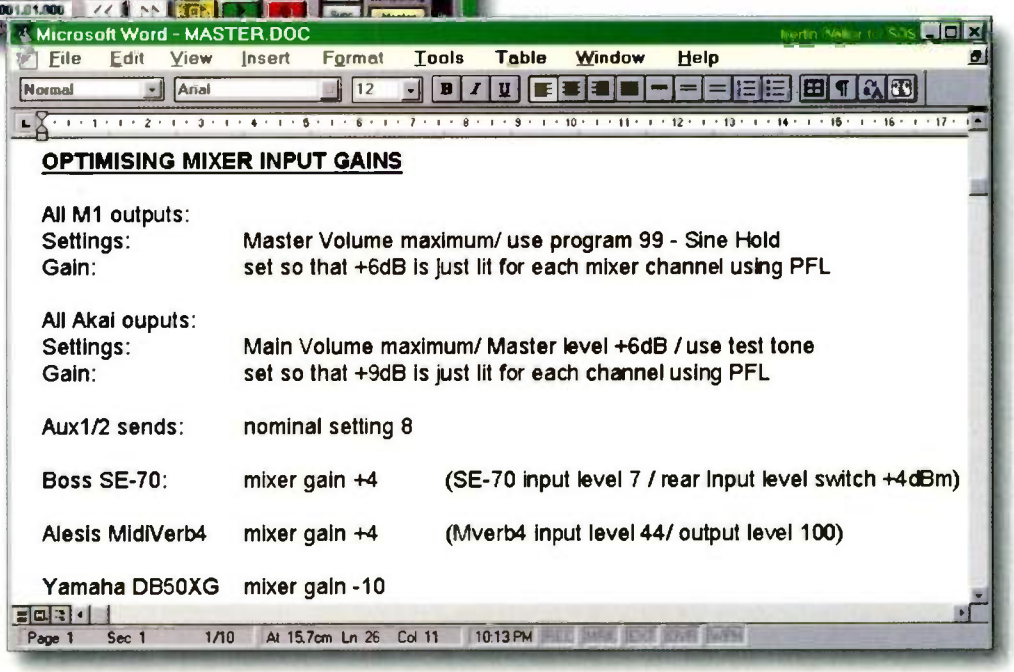


During track playback you'll probably find that effects patched in via aux sends or inserts always receive similar input levels, so once you find the best input level setting on your effects unit (occasional flashes of the clip LED is normally optimum), note it down in your Master Document (see 'Mastering the Settings' box), just in case the knob ever gets moved by accident. Most mixers are designed such that nominal aux levels are at around 7 or 8 on the mixer send knobs, and this still gives you the opportunity to whack it up to 10, if you need a bit more effect to make one sound stand out.

MIX AND MATCH

Having dealt with sound sources and effects, we only have mixer settings to consider, and although there are a huge number of these, the only ones that concern us are those that are being used creatively. Those that are at '0' (either a nominal central setting in the case of EQ, or an 'off' setting for levels) don't need remembering; only those that have an intermediate value depending on the particular piece of music. If, like me, you try to select the most suitable sounds for the mix in the first place, rather than bullying the wrong sound into submission by EQing it savagely, you'll have even less to note down, as EQ settings will mostly be confined to a few gentle rolloffs, a bit of subsonic rumble removal, or some subtle shelving to improve the way everything sits in the mix. So, in reality, each mixer channel may only have a few controls whose settings need to be remembered, and you now approach a more manageable number of variables.

Instead of reaching for a notepad and biro at this point, I suggest you exploit your sequencer. Most modern sequencers have some sort of text input facility: Steinberg's *Cubase* has the Notepad shown in the example screenshots (see left and below), because this is what I most regularly use; Emagic's *Logic Audio* has Marker Text Windows,



A mockup Master Document, showing the sort of data you need to note down.

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and *Cakewalk* has the Lyrics View. All you need is the facility to type in a small amount of text alongside each sequence, so that it is permanently attached to the music data. If your sequencer does not have any of these options, you can use a simple text editor, but of course you lose the advantage of storing your settings in the same file as the MIDI data.

WITH KNOBS ON

Individual mixer settings come in two types: those that can be easily restored, and those with a wide range that are more difficult to return to the previous setting, and thus need a different approach. The bulk of the controls have a clearly defined range, such as 0 to 10 for Aux Sends, and -15 to +15 for EQ levels. These are easy to restore: simply ignore any mix setting that is at '0', and note down a repeatable setting for the rest.

For instance, aux sends can easily be noted down as 0, 0.5, 1, 1.5 and so on, right up to 10 — a total of 21 unique settings, each of which is easy to recreate. In your sequencer Notepad (or Lyrics View, or whatever) note down, for each channel, any settings that are not '0', from top to bottom on the channel strip. For instance, a typical entry might read Channel 1, HF +4, LF -3.5, Aux 6.5, 8, Pan R2. This means that the HF knob was set to +4dB, the mid control (not noted) was still at 0dB, LF was at -3.5dB, Aux 1 send was 6.5, Aux 2 Send at 8, and the Pan control was at '2' towards the right hand side. Once you have a simple text system like this embedded in your sequence, it is easy to run through each channel in turn, updating each control that is not at '0'. The only EQ controls with too wide a sweep to be easily repositioned are any providing mid-frequency sweep, as these tend to have a much wider range, and it is difficult to accurately recreate exactly the same frequency setting. Even so, most mixers provide sensible marking around their rotary controls, and you should be able to home in fairly accurately in most cases (see the channel strip on page 222).

The main problem with mix recreation is restoring levels accurately, as the balance between sounds is arguably far more important than slight changes in EQ setting. There are two mixer controls associated with channel level settings: the input gain control at the top of each channel strip, and the fader at the bottom of it. Coming up with a system for repeatable gain and fader settings takes rather more thought, and mine evolved from noticing the typical settings I was making during a mix, using a range of synth keyboards, samplers and rackmount modules. The channel fader is very easy to set to a particular value, since it has a fairly long throw (even on mini-mixers with 60mm travel), and there are normally plenty of numerical markings: +10, +5, 0, -5, -10 and so on, so that you can return a fader to a setting of -6dB, for instance, with few problems. On the other hand, the input gain control has a typical total range of something like 40dB, and it would be extremely difficult to accurately reset this on the basis of the average markings found on mixer front panels. On mine, for instance, the gain control is marked '10', U (unity gain), 25, and then 54dB right at the top.

LINING UP

There is no substitute for lining up a mixer to set the gain structure correctly. Adjusting the input gain for each channel to get the optimum signal level passing through the circuitry means that noise and distortion figures are optimised, and performance will be as good as the mixer designer intended. The basics of gain structure have been mentioned many times before in these pages, but the beauty of using mainly MIDI sources is that noise is normally low enough to allow you to try out a slightly different technique. The classic procedure is to use the PFL (Pre-Fade Listen) button to monitor the input level to each channel in turn, and adjust its input gain so that the mixer meter is peaking at around 0dB VU. However, doing this for each song would obviously give different gain settings every time, depending on the sounds used, and it would be difficult to accurately recreate the same setting in the future. Since the level from a synth or sampler tends to be quite similar from song to song, I found myself leaving the gain at the same fairly optimum setting each time, and relying on MIDI data to set the relative levels of instruments. I also found myself leaving the majority of channel faders at 0dB. Neither of these compromises to the gain structure will affect noise levels significantly, as long as the signal levels are in the right ballpark and the synths have low noise levels anyway.

You can set the overall instrument levels using a combination of MIDI volume commands and MIDI velocity values, and create fades and swells with MIDI expression controllers. As long as you set up the input gain control correctly in the first place for each synth, you can leave it alone entirely, as well as the channel faders, reserving these for what they do best — fading at the ends of tracks. Unless you simply must grab handfuls of faders during a performance, to mix 'on the fly', transferring this function to MIDI performance data will give you a good deal of built-in automation in your music, while simultaneously allowing much more repeatable mixes. The secret is in the setting of the input gain control.

MASTERING THE SETTINGS

Although the techniques I've described are designed to minimise the amount of data you need to write down, it is very important to create one 'Master Document' using a word processor. In this, note the level settings you decide on for lining up each of your synths and samplers, and any settings of their controls that may get changed, either deliberately or accidentally. There is nothing more frustrating than finding that, despite setting up the mixer controls perfectly, something still doesn't sound right — it might be, for instance, because of a +10/-4 switch setting on an effect unit back panel, or the position of a rotary control on the front panel.

The beauty of the system described in the main text is that once you get a good working set of levels, even the levels sent to your effect units will be much more consistent, so that you can normally leave the knobs alone. The importance of keeping a Master Document is that once you become used to working in this way, if someone comes along, twirls a control and says 'What's this do?', you can relax in the knowledge that you can look up exactly the way you set this control up, and can thus return it to its correct system position.

GETTING UP THE LADDER

Nearly all modern mixers have LED ladder arrays for level display, and between each 'segment' there is normally a gap of three or four dBs of level. There is a technique for setting levels that allows you to get much more accurate settings for line-up purposes. The secret is to rely on the transition point between each segment. For instance, to achieve an accurate +6dB VU setting, edge up your channel gain control from a lower level, until the +6 LED segment is just lit — if you want to be finicky, you can even manage to get it to be dimly lit, just on the verge of full brightness. This should allow you to achieve gain settings certainly within a dB or less of the previous value every time. Incidentally, the centre detent on pan and EQ rotary controls may typically be +/- 0.5dB of the actual central value, due simply to the manufacturing tolerances of the control itself, so our repeat settings are about as close as you will get.

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Recreating Your Mixes

Most typical mixer controls, even though they only have a few markings, can have their settings easily noted.

Although leaving the gain control in the same position is the essence of this repeat performance technique, you have to come up with a way to set it up accurately in the first place, and this method must be repeatable, to cope both with changing synths, patchbay connections, and accidental movements of the controls. Imagine what would happen if any gain control was accidentally moved in a month's time — recreating any of your carefully tweaked mix levels would then be very hit and miss. The answer is to adapt the classic mixer line-up procedure: but instead of using a built-in 1kHz mixer oscillator as a source, you create a patch in each synth that mimics this — in effect, a built-in line-up oscillator for each of your regularly used MIDI devices. You can then simply select this patch, use the PFL button on the appropriate mixer channel, and accurately line up your mixer gain control to within a dB or less of the same setting every time. Even if the synth in question hasn't been plugged into the mixer for six months, it only takes a few seconds to accurately recreate exactly the same levels as before.

SINE OF THE TIMES

Don't panic at the thought of programming your own sine wave line-up patch for each and every synth. The beauty of this sound is that everything must be in its pure 'vanilla' state — no fancy envelopes or LFO settings to create. Many synths and samplers have a basic sine wave which can be pressed into service: if not, find the nearest pure sound. A piccolo is good, as is a flute, as long as the sound has no vibrato, which will make its output level wobble about. Any filters should have their frequency set wide open, and resonance to minimum. Set the output level to the maximum available, and use a basic organ-like on-off envelope to keep the level absolutely steady. Once you have a basic sine wave sound, you need to ensure that its output level stays constant. If you can, reduce velocity response to zero to ensure this, but if this is not possible, use a sequencer or MIDI utility program to generate the same MIDI velocity each time — a value of 127 (maximum) is probably most useful. A 1kHz frequency is normally used for lining up, and the closest note to this on a MIDI keyboard is B5 (MIDI note number 83, and nearly two octaves above middle C).

The actual lining-up procedure will depend somewhat on how you use your MIDI sources. I tend to use anywhere between one and half a dozen sounds simultaneously on each of my synths (one on each MIDI channel), and have found that using a steady 1kHz 'flat out' sine wave patch needs the input gain control setting at something like +6dB VU on the mixer, and the input gain setting will probably be at something like unity (this will be 20dB if your line input has a 20dB pad — see your mixer manual). This should ensure that, when a more typical percussive sound is used, with lower mean levels, you get a healthy overall mix level emerging from the mixer's main outputs. The secret is to find a suitable setting for your synths, and then stick to it.

- First, set up a typical mix using an existing song, but with the channel faders all set to 0dB.
- Adjust the mix using the input gain controls until it is about right, and then stop the sequence.
- Now, on each of your synths, play the sine wave patch at 1kHz, and using the channel PFL button, adjust the input gain control to achieve the nearest exact reading to one of the LEDs on the mixer output meter (see 'Getting up the Ladder' box). This should only take a few seconds.
- Note down in your Master Document the LED value used for the synth.

THE FINAL MIX

You have now lined up your synth levels in a very repeatable way, and can fine-tune them using your sequencer, either through MIDI volume commands, or simply by adding an offset to MIDI velocity values for the whole track. If you regularly use multiple outputs on a particular device, it's even easier. My Akai S2800i sampler has L and R stereo outputs, as well as two mono ones labelled 1 and 2. Akai have thoughtfully provided a line-up oscillator on this instrument (found on the Tune/Level page). I simply switch this on, and for each of the four mixer channels used, line up the appropriate mixer channel accordingly. The oscillator only emerges on the L and R outputs, so it's necessary to temporarily plug either the L or R output into the mixer channel used by outputs 1 and 2, to set these two up as well. However, all four mixer channels can be set using this single supplied tone.

The only exceptions to this technique are stereo mixer channels, since these mostly employ a +10/-4 gain switch, rather than a fully adjustable gain control. In this case, find the most appropriate setting for your synth (or effects unit), note it down in your Master Document, and then also make a note of the position of the channel fader for each track. I find that stereo mixer channels are often used for effects units, and in my experience these can be the noisiest devices in the mix. The further down the channel fader can be, the less noise these units will contribute to the mix. It's best to get as much level into the effect as possible (without distortion), and then pull down the channel fader to set output levels exactly.

You may be thinking that this all sounds a bit involved, but the majority of the work is in initially setting up the system, and this should only take a few hours. Many people leave most of their synths permanently connected to the same set of mixer channels, and if you're one of these once you have your sine wave 1kHz patches, and the Master Document, all the levels can be automated through MIDI, and the only things that change from mix to mix are the EQ, aux send and pan settings. Once you've tried it, and found that even mixes created last year still sound exactly the same, I'm sure you'll agree that it was worth the effort! SOS

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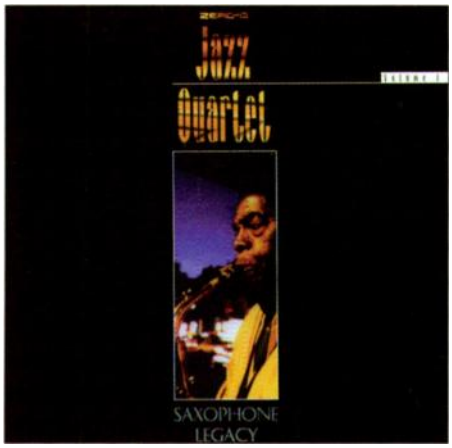

JAZZ QUARTET VOLUME 1: SAXOPHONE LEGACY

(AUDIO CD)

Sonny Simmons is from the old school of American jazz musicians, and his sax-playing talents have, in the past, been called upon by a number of big names, including Tito Puente, Leadbelly and Jefferson Airplane. This 70-minute CD has been put together almost outside the usual remit of most sample CDs. There are no short riff sections in several keys and tempos, no multitracking, no effects, and little formal structure. Not that this is a bad thing: indeed, it's refreshing to see such an unfussy approach to what is an in-depth study of one man and his developing styles throughout the years.

The 43 tracks are divided into 11 categories, such as Latin, Folk, Blues, Reggae, Funk and Jazz. Each category starts with a brief chatty vocal introduction from the man himself, shamelessly name-dropping in a gravelly Southern drawl that's almost as compelling and samplable as the sax riffs that follow. Listed with their bpms and key signatures, the tracks last anywhere between one and four minutes and feature a mixture of song lines, riffs and improvisation.

For the most part, the sounds drift from the speakers more as a stream of jazz consciousness than a set of bite-sized chunks of sound ready to sample. Some samplists may find it a challenge sifting through all the performances, looking for something perfectly suited to the middle eight of a pop song, but the producers' decision to leave plenty of disc space for some of Sonny's experimentation is, I think, totally right. After all, if ever there was a genre of music that refuses to be classified and defined, it's jazz. Having said that, the performances never wander into the unusable, and no matter what you're working on there will almost certainly be something you can extract to spice up your track. Recording quality is good, and, as I mentioned earlier, there are no effects on the samples, leaving you with almost endless sonic possibilities when it comes to the mix.

Confident and mature use of tenor and alto sax makes this a highly authentic and musical release, with the only real criticism being that whilst a number of different styles are developed and presented, to the non-expert jazzer (most of us) it's often difficult to tell the difference between, for instance, a Latin Jazz performance and a Blues Jazz performance. Or maybe that doesn't matter. As Louis Armstrong once said: "If you have to ask, you'll never know." A truly classy product that oozes cool from every laid-back note. Smokin'! *Paul Farrer*

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GUITARRAS ATOMICAS

(AUDIO CD)

The sleeve notes of this disc perhaps set new standards for paucity. No bpms are given — "Be creative. Grab what sounds good" advises the sleeve. Personally, I've got better uses for my creativity than working out sample bpms! (Here's a head start: the first several tracks seem to hover around 129.2bpm).

The immediate impression of this CD is exquisitely controlled energy. Yes, the guitar is distorted, but not overly. Yes, there are rockist overtones, but they are never cliché-ridden. Some samples are in stereo, but not much will be lost if you stick to mono sampling (except for the obviously wide atmospheric tracks).

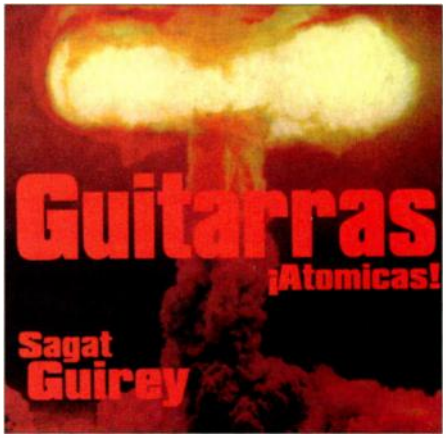
Samples are grouped approximately 10 per track, and vary in length, with some several bars long. Tracks 1-15 feature wah-wah heavily, with a few surprises, such as gates, thrown in for good measure. Here, melody is seldom allowed to get in the way of a good rhythm, and many of the samples are of the 'will fit into a tune' variety, if you're prepared to do the odd bit of time-stretching and/or retuning.

The next few tracks are completely out of the ordinary: heavily distorted tones and eerie slow melodies; huge and complex sci-fi atmospheres, which, because they originated from somebody's fingertips and not the usual cold box of electronics, have a life and movement about them that I've not heard before from a sample CD. Think Ravi Shankar meets System 7. Two 'Acoustic FX' pieces sound more like percussion licks from a gamelan player.

The next section is grunge meets HM but, again, the genres are interpreted rather than echoed. Sagat seems to have absorbed, not merely gleaned, style from a wide variety of influences. Top man.

Tracks 24-31 yield plenty of ultra-cool chords to chill out to, from simple majors and minors to diminished umpteenths that would seem to require more than six strings to negotiate. These would sound great over any hip-hop or jungle beat, or could form the backdrop for an arhythmic film score. Next up come funk licks, often with a slight jazz or rock tendency. You can hear a rare intellect at work, piecing together accessible licks with warm precision.

The rock fifths of track 44 are top class. However, the rock licks that follow make up the weakest section on the CD — they are merely



good. I guess even Sagat could not inject serious verve into such a derelict life form...

Of the beautiful acoustic chords and lines, the most inspiring are the fast rhythmic patterns, which have a funky Eastern edge to them. On the other hand, there are plenty of folksy arpeggios for dowdy doom merchants to intone over. Sagat couldn't resist the temptation to include a few show-offy blues and Leo Kottke-esque licks. The latter I particularly liked for their droning quality — think didgeridoo.

Every couple of years I come across an

essential guitar sample CD. Sagat Guirey, like Vlad Naslas, is undoubtedly a class act. Technique, tone and timing are exemplary throughout, as is Lee Groves' engineering. However, it is his ability to be a true original while covering a wealth of styles that really marks out this CD. I auditioned some of *Guitarras* while simultaneously playing one of my own half-finished tunes. I could immediately hear how well samples might work in context. So well, in fact, that I was persuaded to turn on the trusty S770. It's amazing how a few well-placed licks and rhythms can immediately bring a promising but perhaps too-sterile keyboard composition to life. Fantastico! *Wilf Smarties*

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OLD SCHOOL FLAVOURS VOLUME 2: VINTAGE SOUL

(AUDIO CD)

A solid slice of the '70s is served up in volume 2 of this short but interesting series of audio CDs from Zero-G. As the name suggests, *Vintage Soul* focuses on the drumming styles that held together a huge number of classic soul, disco and funk tracks from the end of the '60s all the way up to the early '80s. This 99-track CD is packed with a varied selection of 4-bar drum loops reflecting upon and realistically recreating the kind of rhythm tracks you can hear in countless Motown, R&B and early disco hits.

The drum loops are organised according to tempo and style, within nine main categories. In each there are five basic song patterns (at a number of different tempos) and each of the 4-bar loops comes with three variations at that tempo. It sounds a bit long-winded, but it isn't, and once you've found a loop that works well, you're given the full version plus a 'slimmed-down' mix (to use, for instance, in a verse) and another variation that would work as an intro or fill. In practice, picking out a loop and slotting it into an existing track is both fun and easy to do.

The loops themselves are superbly performed by the library's creator MJ Dunne and have clearly been inspired by a vast back-catalogue of classic '70s material. Clever use of drum types and recording techniques gives a real and believable feel to any track looking for a retro sound, and this release will provide instant gratification for any would-be Sam and Daves, Marvin Gayes, Four Tops, or even (gulp!) Village Peoples.

Tagged onto the end of the CD are seven tracks of the individual drum samples used in all the loops. Their layout is intuitive and very easy to follow, so programming new variations of loops is not as much of a chore as it could be. As before, these sounds are highly authentic, with just the right mixture of vinyl grot and sonic depth.

To tempt you to look at the other discs in the series, Zero-G have also included an interactive track which, when loaded into a PC or Mac, gives you an excellent demo of the kind of material on your disc, as well as a look through the kind of sounds featured on the rest of the series.

On the downside, it does occasionally feel as if this release is a tiny bit too retro for its own good, and as a result the loops don't always have as much in the way of a stereo spread or modern effects processing as you might expect. Also, where other similar releases offer you a few bass, guitar and keyboard riffs thrown in, *Vintage Soul* concentrates only on drumming. If you can live with that, and don't mind the fact that all the discs in this series are currently only available in audio CD format, prepare to be transported back to the decade that fashion forgot, for a festival of soulful precision drumming. In a word: Lava-lamp-tastic. *Paul Farrer*

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SCORING TOOLS

(AKAI/ROLAND CD-ROM)

For those of us who dream of the cinema being the perfect medium to support our compositional greatness, the cost of arranging and recording a full-blown orchestra can be a real downer. Unless you've got around a quarter of a million dollars/pounds/loadsamoney lying about, there's no way to indulge your fantasies. Or is there?

First the good news: *Scoring Tools* is packed full of beautifully composed and orchestrated underscores by Lisa Bloom Cohen, which sound every bit as good (if not more diverse) than the film music of the most successful box office composer of all time, John Williams. Put together as a series of templates for you to add your own melodies, this CD is totally usable as your one-stop sample shop for high-quality stereophonic orchestral beds.

Of the 50 different moods, lasting between two and 24 bars in length, all but a couple are available in many different intelligently layered structures and sympathetic music changes. In fact, I reckon if you simply played every one of the near 400 samples end to end and told Barry Norman it was the soundtrack to the next Spielberg film, he would herald it a classic.

There's some bad news, though; about half of the looped samples glitched or were simply out of time. Which is most tiresome, as every one I re-edited worked fine, but on a product of this quality you shouldn't have to correct lazy looping. Also, some of the fadeouts contain slightly more analogue hiss than is comfortable for a product that's available only on CD-ROM.

My final gripe is that the sample names bear little or no resemblance to the track listing printed in the CD booklet.

But at a thousandth of the cost of producing the soundtrack to a Hollywood blockbuster, you too can have your own fantasy world of lavish orchestration in your sampler, as long as you've got a CD-ROM drive. Although whether the license you pay to obtain this CD would allow a film or TV company to use a composition of yours which included material from this CD is uncertain.

The sleeve says that this is volume one: a few more volumes of this calibre and there will be no need for orchestras at all. I'd be surprised if Ms Cohen didn't find herself a regular job composing soundtracks in the Hollywood movie music scene. *Big George*

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YAMAHA VL70M BREATH-CONTROLLER SEQUENCING WORKSHOP

PAUL WHITE finds a few ways around the restricted breath-control facilities of the Yamaha VL70m.

Some instruments you swear by, while others you swear at, but with Yamaha's VL70m it boils down to a bit of each. By combining the VL70's physical modelling with breath control you can create some of the most realistic and musically articulate synthetic wind sounds available at any price, but there's a serious fly in the ointment. For some reason that even Yamaha UK can't figure out, the Japanese designers of the VL70m optimised it for live use, but it never seems to have crossed their minds that anyone would use it with a sequencer. Of course, the VL70m is a pretty regular MIDI module in most respects, so using it with a sequencer is straightforward enough — unless you want to use the breath controller.

THE PROBLEM

The problem is that the breath controller is built into the module itself, and any breath control data is merged with any note data present at the output. If you put the VL70m on your sequencer output with all your other modules, the breath controller data isn't recorded, whereas if you connect your VL70m between your master keyboard and your sequencer input, the breath controller data is recorded, but now there's no way to play the sequence back via the module. Try as you might to get around this problem, the outcome is that you can't have the VL70m connected so that it allows you to both record breath controller data and play back sequences without setting up a MIDI loop — with the usual consequences. Those lateral thinkers with programmable MIDI patchbays that also include selective data filtering can probably dig their way out of this problem, but for the rest of us there are a couple of simple alternatives.

THE SOLUTIONS

Solution one is to abandon the internal breath controller and either use a master keyboard with a dedicated breath-control input, or buy a separate MIDI breath controller and merge its output with that of your master keyboard. A few of Yamaha's BC2 breath controllers are still available direct from them at £40 including VAT, while their current model, the BC3, retails for £69 including VAT. The only other breath controller we know of, the Anatek wind machine, is now in very short supply.

A second, more inexpensive possibility is to use a MIDI switcher to change your VL70m's position in the MIDI chain between recording and playback. Sadly I don't know of anything cheap and cheerful that does the job, but I have worked out the wiring diagram if you want to build your own (see page 230). Essentially, the idea is to place the VL70m between the master keyboard and the sequencer input when recording, then flip a switch to connect it to the MIDI output of the sequencer (or to the end of an existing MIDI chain) when playing back. MIDI connections comprise two signal conductors plus a ground, but the ground can be left connected at all times, so you only need to switch two conductors. Ground is the centre pin on a MIDI DIN socket, and all five sockets on the switcher should have their grounds linked together.

The switch in question may either be a wafer switch or a push-button, but it needs at least six pairs of changeover contacts to do the job. Numerous suitable switches are available via companies such as Maplin Electronics (you can pick up a copy of their catalogue in WH Smith), so I'll leave the actual choice of switch up to you. The two small diagrams at the bottom of Figure 1 show the MIDI signal flow in both the Record and Playback switch positions. The VL70m must be set to the same MIDI channel as your master keyboard so that you can hear it while recording, but as most sequencers automatically re-channelise MIDI data, this is usually a matter of setting up the keyboard to match the VL70m. Because the master keyboard's MIDI Out is passed through the VL70m, it is automatically merged with any breath data before being recorded by the sequencer.

For playback, the switch automatically routes the master keyboard directly to your sequencer, allowing you to record sequenced parts using other modules, and the VL70m is connected onto the end of an existing MIDI Thru chain or to its ▶

QUICK TIP

One other tip is to unplug the breath controller before you play back a sequence, otherwise any audio picked up by the mouthpiece will merge with the existing breath data and track playback will be disrupted.

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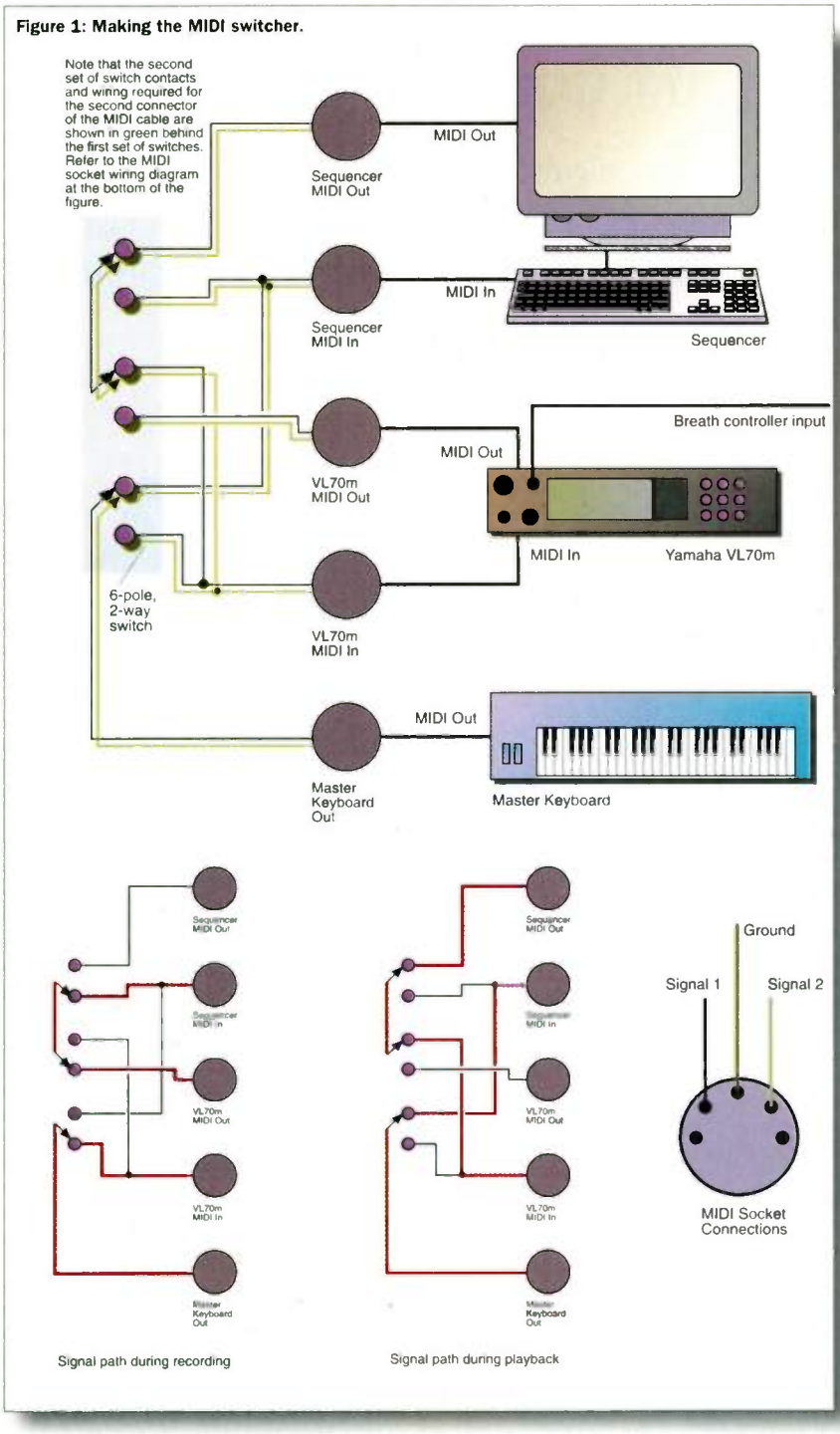
Figure 1: Making the MIDI switcher.



▶ own sequencer MIDI Out. The VL70m can thus play back the recorded data, including any breath controller parts, without causing a MIDI feedback loop.

SUMMARY

Using a VL70m without breath control is like using a synth with no pitch-bend, vibrato or aftertouch, but 10 times worse. If you're not going to use the breath controller, you either have to get very nifty at using other MIDI controllers instead, or resign yourself to the fact that it's going to sound rather flat. Even though Yamaha don't make it easy to rig up the breath control, it's worth persevering because the VL70m really is a fabulous instrument with it, and if you don't like the idea of soldering up switch boxes, you can always pay a local electronics enthusiast to do it for you. All you need are five 5-pin, 180-degree DIN sockets, a suitable 6-way changeover switch, a plastic project box and some wire. The whole thing shouldn't cost more than around £15, and it'll make using your VL70m so much easier. If anybody else has come up with a novel solution to this problem, please let us know and we'll print it. SOS

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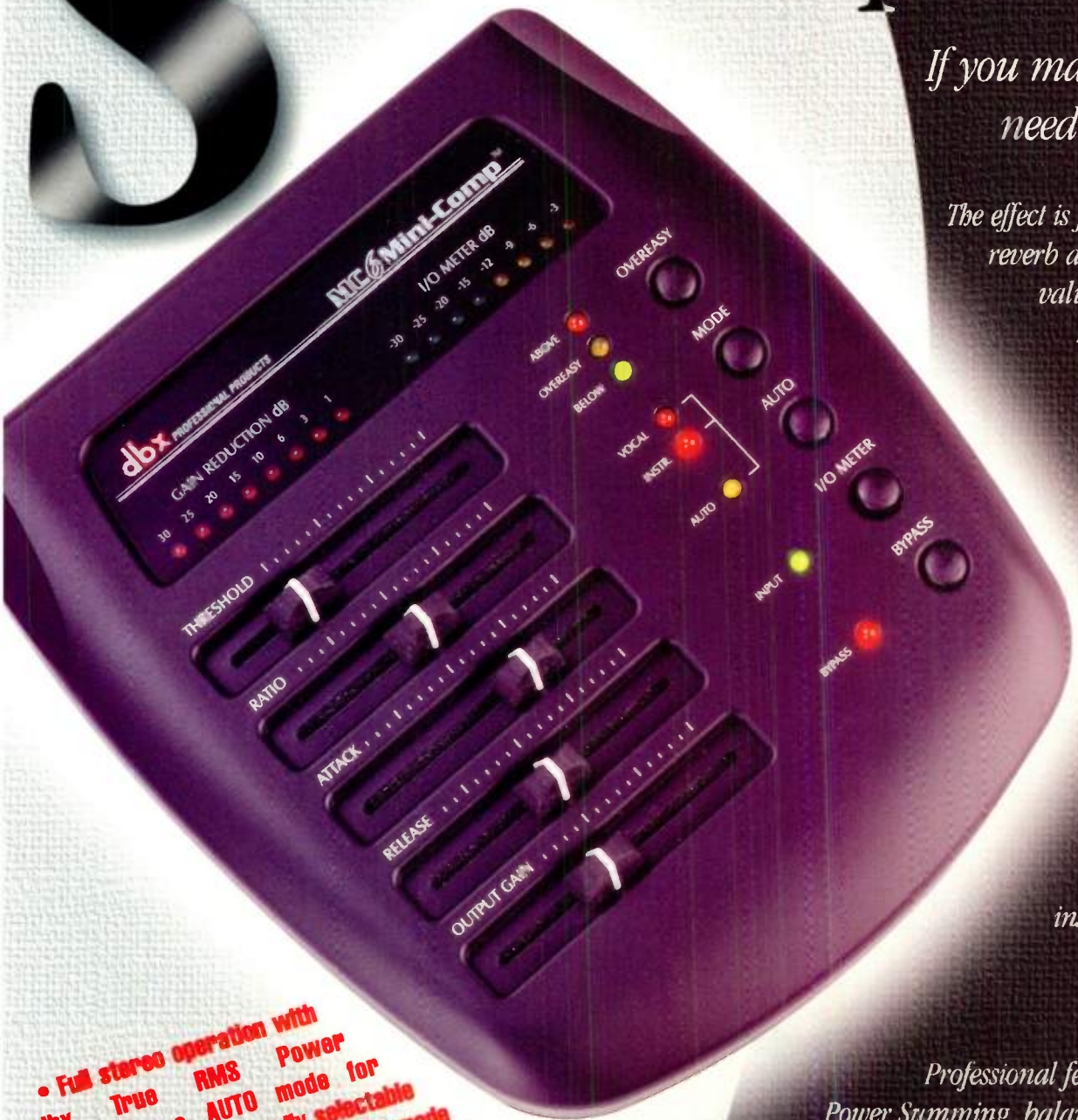

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Economic Policy

VISCOUNT EFX100 MULTI-EFFECTS PROCESSOR

Viscount were there from the very beginning of the budget effects revolution, and with the EFX100 they hope to give the cash-starved masses a further option. CHRISTOPHER HOLDER finds out whether the EFX100 holds its own in a bustling budget marketplace.

Things are beginning to get ridiculous. Apparently in The States when you're pouring out the contents of a specially marked pack of Kelloggs Blueberry Pops, along with all the goodness of reconstituted corn starch (fortified with five vitamins and iron) you're likely to find a Zoom 1201 or Nanoverb multi-effects unit splashing into your semi-skimmed. But the days are gone when you could instantly condemn a budget effects unit for a shoddy sound. In fact, after you've dried off the unit with a tea towel, far from hearing a reverb that sounds like tin cans being dragged behind a Flymo, you'll probably enjoy quality spatial effects, as well as clean delays and dynamic chorusing.

Viscount were there at the beginning of the budget effects revolution, standard-bearers for affordability, banging on the palace gates of Czar Lexicon, the Archduke Yamaha, et al (I know it's a difficult analogy to maintain, but the aristocratic name of Viscount makes me persist — bear with me). The EFX1 and EFX2, released in 1993, were strong performers for the money but never seriously looked like bringing down the more established big names. Last year, their EFX10 got it right in many more respects: price, features and flexibility were all there in spades. But by this stage Viscount couldn't lay claim to being the cheapest of the cheap, for as fast as Silicon Valley could spit chips, anyone with a soldering iron and a bit of technical know-how was throwing together decent effects units. Zoom, ART, Yamaha, Alesis, Peavey, Digitech, and even the revered reverb institution, Lexicon, had weighed in with down-market contributions. So in this rather altered (and cluttered) multi-effects landscape, can Viscount compete against the more famous names?

CALL ME AL-UMINIUM

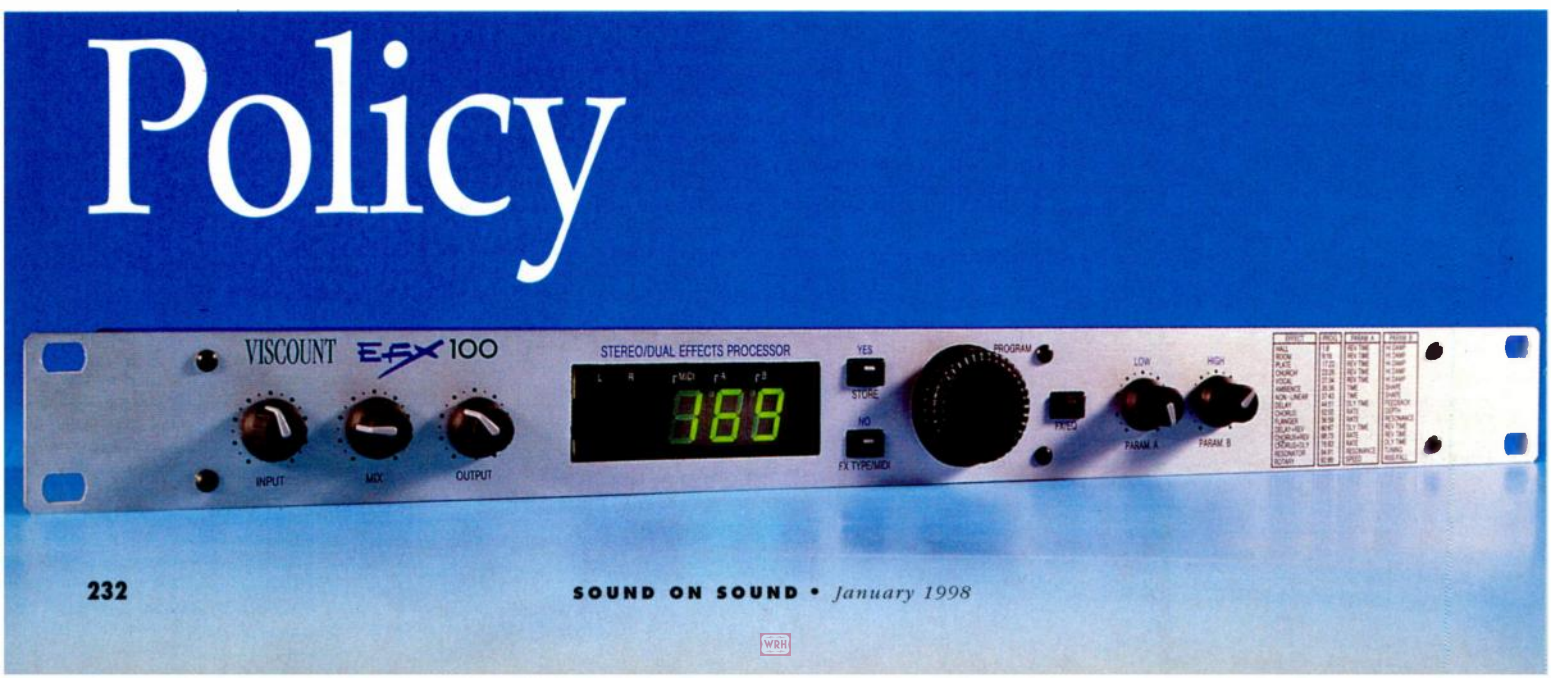
Out of the box the EFX100 looks pretty classy; indeed, it bears more than a passing physical resemblance to the Alesis Microverb 4. I guess you would describe the appearance of the front panel as brushed aluminium, which is a nice change from the usual matt black, and also makes for good contrast when reading the information printed on the front panel. Looking left to right along the full 1U rack width, there are three rotary pots controlling input level, effect mix and output level respectively; a 3-digit LED display that includes a four-segment level meter for both left and right inputs; two yes/no buttons; an alpha wheel; an FX/EQ button; and two parameter pots to do your fine tuning. Overall, build quality looks good: the data wheel clicks over comfortably and positively, the pots have a pleasing amount of resistance in their movement, and the chassis feels solid (nothing rattles when you shake it).

The back of the unit sports two unbalanced jack inputs, the same number of outputs, MIDI In, Out and Thru sockets, a footswitch input, and the input for the external PSU. Oh yeah, and it's got one of those neat cable doo-dahs to maintain... erm, cable and power integrity (sorry) when you fall over the power cord.

USER IN-YER-FACE

So what exactly are we dealing with here? The EFX100 is a 2-input/2-output effects processor, with some 100 presets and 100 user patches. Each effects patch has two pre-defined parameters you can tweak with the two designated pots. In addition to the effects, Viscount offer 2-band EQ (low and high), accessed via the FX/EQ button and the two parameter pots — a neat and useful inclusion, although adjusting the pots will momentarily cut off any outgoing signal.

The EFX100 is well versed in the ways of MIDI too: it recognises program change messages and bank select messages to access all 200 patches. Various controller messages can be used to dictate the action of the footswitch, and four further controller numbers work on the parameter/EQ pots. The EFX100 does have a MIDI Out, and you might be forgiven for hoping that the parameter encoders will send out controller messages, but they don't. The unit *will* send and receive SysEx data, though, which Viscount recommend you utilise (bulk dumping) to insure against data loss. ▶



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Viscount EFX100

pros & cons

VISCOUNT EFX100 £190

pros

- Low noise in the output stage.
- Very easy to operate.
- Resonator.
- Useful combination effects.

cons

- Quite easy to drive input stage into distortion.
- Effects, even for the price, can lack class and imagination.

summary

A worthwhile addition to a small setup needing its first multi-effects unit. The actual algorithms are workmanlike rather than sparkling, but a creditable MIDI spec, a useful array of effects and combination effects, and a 'reach out and grab it' user interface make the EFX100 worth a look.

SOUND ON SOUND

BUDGET BOXES

The sub-£200 market has a few more players in it than you might have thought. Recommended retail prices start from £90, with the market competitive enough for those prices to be a little flexible on the street, I should imagine. Worth a mention is Viscount's own EFX10 which, at £199.99, has got to be worth a second look.

- Alesis Nanoverb (reviewed August 1996)
- ART FX1 (reviewed December 1996)
- DOD 512 (reviewed October 1996)
- Peavey Deltafex (reviewed January 1997)
- Viscount EFX10 (reviewed September 1996)
- Viscount Gammaverb (as yet unreviewed)
- Zoom 1201 (reviewed September 1997)
- Zoom 1204 (reviewed October 1996)

ON THE LEVEL

Setting up the EFX100 is a doddle. Locating the patch you're after is easy enough, as there's a legend printed on the front panel, with a further indication of what parameters are assigned to the two editing pots.

What is first evident is how temperamental the input stage is. It's a pity to start on a sour note, but this will be the first thing you'll encounter when you plug in, and you need to take a few moments to set your levels optimally or you're going to run into some unpleasant results. When setting the input and output levels, set the input and output level pots to about 3 o'clock, and adjust the effect send on your desk accordingly. Don't just crank up the aux send level and hope to adjust the input level on the unit, as the level from the desk will invariably be too hot and cause the Viscount to violently spew digital detritus... undesirable. This is the sort of common-sense approach to gain structures you should apply in any send and return situation, but it's perhaps even more crucial here. If your signal finds its way into the red on the EFX100's PPM, it's not a suggestion to back off a little — it's a fair indication that you'll be hearing distortion. In fact, certain signals, specifically at lower frequencies, can force the EFX100 into distortion despite the level meter showing something to the contrary. This is all by no means disastrous, and probably not such an uncommon characteristic in budget processors. I found that once I had the unit registering two bars on the meter and peaking into the third everything was tickety-boo. This in no way seemed to reduce the efficiency of the machine; in fact one of the best points of the EFX is how clean its output signal is.

AYE AYE PATCH

Once you've got your levels sorted, you'll be keen to hear what's on offer:

- **Reverbs:** First up is a medium-sized bright hall with a shortish pre-delay. The decays are pleasantly clean and transparent. Personally, I think that the pre-delay component of the algorithm, combined with the level of early reflections, is given too much prominence and is a little too dense. This shows itself in the early part of the reverb, which carries a ghostly repeat of the signal, sounding a little like the distant rattle of a remotely vibrated snare drum. It gives the effect a cluttered feel which it needn't have. The hall patches pre-programmed with longer pre-delay benefit from that tweak, making for a more usable effect, in my view. The room reverbs also suffer a little from the aforementioned pre-delay clutter. I compared the EFX rooms to the equivalent algorithms on my five-year-old Wavestation SR and my Boss SE70, and I'm afraid Viscount's effort sounded a little more ragged than I would have expected in comparison, even bearing in mind its modest price tag. The Plate algorithms, on the other hand, do the trick, and are by far my favourite EFX reverb patches — great for percussion and acoustic sounds, or pretty much anything else that I stuck through them. Thumbs up.
- **Delays:** These are clear and well executed. Adjusting delay parameters in real time on any effects unit is bound to produce some nasty digital crap, although the EFX is perhaps a little more unsociable in this department than most.
- **Flange & Chorus:** I thought more could be made of these, since there's not too much in the way of stereo movement, and you have to give all the presets a tweak to get something really interesting or peculiar going on.
- **Resonator:** It's not on every multi-effects unit that you see a resonator, and this algorithm should be a selling point. The resonator is like a tuned DDL and comes in very handy for sound creation. If you're trying to emulate the favourite bits of a sound track from your Eastern European animation collection, the resonator is well worth investigating. You hit a snare and the results are like someone falling into a grand piano. There are enough resonator patches to be able to switch between them via MIDI, to keep the resonator in tune with your music.
- **Rotary:** The rotary effects are perfectly serviceable, and you can switch between two speeds using the footswitch or a controller message.
- **Combination Effects:** Patches 60-83 are combination effects arranged either in series or parallel (hit the FX Type key to find out the status). Delay/Reverb, Chorus/Reverb and Chorus/Delay are the pairings on offer, and are a great way for effects-starved studios to make the most of their resources.

FRILLS AND SPILLS

I love effects units: I firmly believe that you can never have enough of them, so I approached the EFX100 with an upbeat attitude. I'd heard many good reports about Viscount's previous efforts — sure, they were budget, no-frills machines, but they had been hailed as good value for the money. Times change, though, and I feel that the budget effects market is crowded enough for a sub-£200 price tag not to be as much of a selling point in itself as it used to be (see 'Budget Boxes' panel). For me the clean signal path, parameter adjusters, the novelty of the resonator and the 100 user patches give the EFX allure, but I would hesitate to recommend it as a second effects unit to a studio owner accustomed to a higher level of editing and a more robust input stage, as the limitations of a budget unit such as this may be a little frustrating after a short period of time. However, I *wouldn't* hesitate to recommend the EFX100 to a first-time effects buyer, for its many useful patches, ease of use, and tidy MIDI spec. SOS

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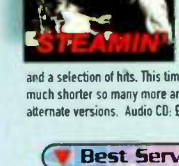
A.M.G. (England)

STEVE WHITE: "ON THE BEATEN TRACK"
NEW FROM AMG! Steve's worked with Difford & Tilbrook, The Style Council, Galliano, James Taylor Quartet, Young Disciples, Working Week, Carleen Anderson, and Paul Weller. His work has been a major influence on the embryonic London Acid Jazz, and British R&B and Jazz scenes. Everything about this CD - the grooves, samples, and production - illustrates why Steve White won 'Making Music' magazine's Best Drummer poll and, of the 8 categories available in the prestigious 'Rhythm' magazine's poll for 1997, he won two and came 2nd in two. The release of Paul Weller's latest LP 'Heavy Soul' will ensure Steve retains his position amongst the foremost drummers in the UK. Audio CD: £59.95



TONY MASON - STEAMIN'
NEW From AMG!
Tony Mason's sequel to his extremely popular "Smokin" CD is equally funky! - however this time it features not only live drums but triggered loops with sampled sounds, hat and brush loops, fills and a selection of hits. This time however the grooves are generally much shorter so many more are included, often with several alternate versions. Audio CD: £59.95

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NEW in the 'Altered States' series from Zero-G, produced by IAN BODDY, & featuring: •Rhythm Loops •FX Loops •Synth Percussion Loops & Arpeggios •One-shot Percussion FX •Synth FX •Ambiences & Ethereal Textures •Bell FX •Drones •Weird Voices. There are lots of great unique loops on Malice In Wonderland! They're weird & interesting, & the 'lighter' ones provide great backdrops to put main drum sounds around. Many loops have the 'Cuckooland' organic quality about them but sound cleaner. Textures range from menacing low drones & Spacey FX, to really beautiful ambiences & arpeggios. All bpms & keys are provided where appropriate. Audio CD: £59.95

Spectrasonics (USA)

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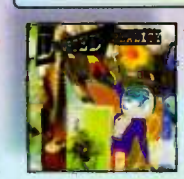
From acclaimed developer SPECTRASONICS comes an epic production - the most extensive collection of voices ever assembled on CD-ROM. This massive FOUR CD-ROM SET produced by Eric Persing includes a breathtaking variety of multisamples, phrases & FX from some of the world's most prestigious singers. An invaluable tool for the serious composer and producer, & designed to be inspiring for years to come. Disc 1 is devoted to richly-detailed samples of the 80-voice London Chorale, recorded in a large cathedral in England - the first sampled choirs ever presented without heavy vibrato (more playable and useful in any musical contexts). Performance variations include multiple dynamics of multisampled oohs, ohs, aahs, ees, humming, intense staccato stabs, Major, Minor and Suspended Chords with high & low chord voicings, thick clusters, 12-Tone & Ligeti FX, natural Crescendo/de-crescendos, whispering, murmuring, whistling, accents, falls, Avante garde glides, Vertigo fx, octaves, moving vowels, swoops, chattering, guttural groans, shouts, ethereal phrases and more! Disc 2 brings the beauty and power of Classical Soloists - a wide variety of license-free Operatic Tenor & Soprano phrases (both with words and melismatic), & multisamples of each singer. This disc also has more of the London choir samples. Disc 3 focuses on an authentic English Boys' Choir and a Gregorian Mens Choir. Many of the sounds on this disc have never before been available to the electronic musician. The Boys' Choir features multisampled phrases (Kyrie, Alleluiah, Amen, Agnus Dei, etc.) plus the soft and loud multisampled static vowels (oos, ahs, ees, mms) and moving vowels (Oh-Eh-Ah and Ah-Eh-Ee-Oo). Also includes Solo Boy phrases and multisamples. The Gregorian Mens Choir is provided with multisampled soft and loud Ohs, Mms, Ees, Fifth Drones, Intervals (Half and Whole Step Up/Down), and ancient Gregorian Chants! Disc 4 offers an overwhelming variety of Lush Multitracked Pop Stacks, created from over 10,000 perfect vocal performances! These "Enya-esque" pads are a must-have for Pop, R&B and New Age music. This disc has the most comprehensive multisampled vowels in the collection including Oos, Ahs, Ehs, Ees, Ohs, Mms, Vvs and Zzs, Moving vowels, Washes and "Scooped" notes. Gorgeous male and female textures that will add that smooth silk to your next hit!
FOUR CD-ROM SET: £299.00. (Choose either Roland, Akai/Emu, Kurzweil, or SampleCell). Call to check availability - there will be a rush!!!!



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NEW! Volumes 2 & 3! If you need Jungle these 3 CDs from ZERO-G are simply unmissable. Each CD features a MASSIVE set of: • Loops • Rolls & fills • Perc Kits • Pads & Chords • Bass • FX • Vocals. Volume 1 is one of our all time best selling sample CDs. Vols. 2 & 3 are even BETTER! REVIEWS of Volume1: *"Excellent fidelity, balance & punch, & variation in feel & sound... there's no serious competition. Rated 5 stars out of 5* ☆☆☆☆☆ (Sound on Sound). *"Kicking grooves... a wide range of styles... highly useful... AS UP-FRONT AS YOU CAN GET."* (The Mix). *"Jungle Warfare gives you just about everything you need to survive in the remix rain forest."* (KEYBOARD, USA). CD-Audio: £59.95 each. Special offer for limited period only: Get Vols 2 & 3 together for only £99.00 - AVAILABLE NOW!

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Keith's previous CD's have all received 5 star reviews all around the world. This is his finest work to date - there's nothing to touch it. In fact, drum legend Keith LeBlanc sets new standards for the whole industry with this sample collection. Some of the hottest loops you'll find anywhere - you're going to love it! *"This CD was produced with programmers in mind. There are many dubs on this CD to choose from. I have also included lots of combinations of the beats and always the striped down drums themselves. This volume is like having a funky drummer with his own varied sound library plus a DJ at your disposal. I HAVE USED THIS PRODUCT IN PRODUCTION AND IT HAS ALREADY SAVED MY BUTT MANY TIMES."* (Keith LeBlanc). £59.95.

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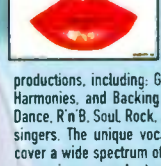
Vol.3 in 'Altered States' Series (Zero-G) is a stunningly innovative CD that utilises raw and organic sources to create rhythms and soundscapes with a creative edge. Loops come with individual components allowing infinite variation, plus lots of exciting single hits and ambiences. All material is 100% original, & came from theme parks, factories and industrial sites etc etc. CD+ROM VERSION COMES WITH AUDIO VERSION BUNDLED FREE!! *"A truly unique product which takes a brave & successful step towards providing a good fusion of dance and industrial styles... the selection of usable sample material will keep even the sampling die hards busy... fantastic range and depth... innovative & unusual... new and exciting sonic sculptures... a rich seam of dance floor and jungle influence... a scorching collection of "happening" dance loops... layout couldn't be more logical... will provide that elusive sparkle to your tracks... In short: Pure metallic, steam-driven wonderment. ***** Five Stars"* (Sound on Sound). Audio CD: £59.95.
Akai S-1000 CD-ROM 2-disc set (includes audio CD): £119.00.



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Brand NEW and EXTREMELY HOT dance vocal sample collection from ZERO-G (UK), performed by some of the hottest session singers from the UK! Totally original and professional vocal samples for all your music productions, including: Gospel choir, Ad-Libs, Melodies, Harmonies, and Backing Vocals. Styles featurd include: Dance, R'n'B, Soul, Rock, and Indie. Both Male and Female singers. The unique vocals on this Brand New release cover a wide spectrum of application and are destined to appear in many a chart record in the near future. Release date: August 1997. CD-Audio: £59.95

Best Service (Germany)

TERRAPAC
TerraPac contains the most comprehensive library of dance sounds for the Terratec EWS64 audio system. It's a 3-CD-Set with 7000 samples! All sounds are pre-looped and ready to use on all MIDI-Keyboards. Drum & percussion single hits (complete sets, acoustic & electronic) plus drum grooves for all different tempi. Pianos, synths, guitars, brass & kicks, basses. Orchestra, solo strings, string ensembles, dance vocals & classical choirs, symphony grooves. All you need for up-to-date dance production! CD-ROM for PC computers with Terratec EWS-64 Soundcard audio system: £ 79.95 (available Nov/Dec '97)

Big Fish Audio (USA)

LOOPZILLA 3
The third in the Loopzilla series from BIG FISH AUDIO (USA) is here! Again it's a huge 2-disc audio CD Set.
It's been twelve months in the making but the wait is over!
Now Loopzilla 3 busts out of the cage with 140 minutes of brand new drums, guitar, bass, rhodes, vocals, horns, turntable wizadry and much much more.
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VOLUME 1: "ESSENTIAL" covers Electric and Acoustic Guitars, Electric Pianos, Synths, and Drums & Percussion.
VOLUME 2: "ORCHESTRAL" covers Strings, Harp, Brass and Woodwinds, Grand Piano, Orchestral Percussion including Timpani, Bells, Chimes, Gongs and more! Accompanying manual gives loop points for every sample so it's extremely easy to loop samples quickly and effectively. Each Audio CD: £69.95. (See also our Catalogue, or call us, for full details of CD-ROM versions).

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Zero-G (England)

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THE VIDEO CREATIVE ESSENTIALS SERIES

(ZERO-G) *Yes, VIDEO!* NOW YOU HAVE ALL THE MATERIAL YOU NEED to create STUNNING futuristic visuals to accompany your music. The state-of-the-art video clips on each CD-ROM in this pioneering series will open in a variety of programs and applications that are compatible with QUICKTIME movies. For example: Use them with Adobe Premiere, Real Video, Media Studio, Steinberg Cubase, Logic Audio, Steinberg X-POSE, Pro Tools, After Effects, Cinema 4D etc.

FREE video editing software is included (Adobe Premiere® Tryout Version for Mac or PC). Also you get a FREE Audio Creative Essentials Sampler Disc included in the package! (includes 300 pro audio samples). All video clips are at a resolution of 320 x 240 pixels and use Apple Video CODEC which will give excellent results on Mac or PC. These video samples have an incredible variety of uses - e.g. Demo videos, Textures in 3D Rendering Programs, Clips for Web sites etc. **The first FIVE titles to be released are: 1. Bio-Feedback, 2. Flow Motion, 3. Fruit Salad Daze, 4. Spaced Out, 5. Trance Spotting.** This series will grow and grow and the video samples are of the highest quality and originality. So pack some visual punch into your productions NOW and be at the leading edge of sampling technology in VIDEO as well as in audio. **Each volume (2 CD-ROM Set) is only £29.95** (Mac or PC Compatible).

Zero-G (England)

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A High Calibre 4-CD series of loops/samples from ZERO-G produced with a retro authentic feel. Each of 9 vintage kits plays 5 AUTHENTIC song patterns, each at 2 different speeds, 10 BPM apart, for maximum flexibility. Each song performance is divided into 3x4 bars of groove: •Main groove (chorus) •Simpler version (verse) •Full on Syncopated Breakdown, with each section ending with it's own fill. Grooves are accurate in both playing style and the sound of the kits. Over 1000 bars of grooves on each CD. Each kit is also presented as individual hits.

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Music Mind (Denmark)

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The Ultimate Sound-Blaster Companion, the CD-ROM that all SoundBlaster users have been waiting for. Following up on the acclaimed MicroWavelt, Wavelt Gold takes your SoundBlaster SB-32/AWE-32/AWE-64 or compatible soundcard to new heights. Features: •Hundreds of SoundFont compatible soundbanks, ready to load into your soundcards RAM, covering all major instrument groups •All the 512kb soundbanks from MicroWavelt. •Larger versions of all sounds giving you even greater realism, and expression •Tons of groovy drumloops, to give your songs that extra edge •Brand new sequencer program from Emagic •SoundFont editor, with power-features like global editing, automatic pitch recognition, WAV-export and much more. Wavelt Gold is truly the Ultimate SoundBlaster Companion, no [illegible] PC-musician should be without it. £59.95

Best Service (Germany)

JAMBOX ELEMENTS

(CD-ROM for PC). The jungle house trip - sounds from the personal library of producer, DJ and remix-workaholic Mousse T. (e.g. Backstreet Boys, Quincy Jones, Ann Nesby, Ruffneck, Bootsy Collins). Everything you need to create a complete house-, jungle- or trip hop song. Drum- and Percussion-Loops, Vocals , Adlibs, Shouts, Bass-, Guitar-, Brass- and Sax-Licks, Pianos, Organs, Rhodes, Synthesizers, Chords, Strings, Effects, Breaks, Special 3-D-Vocals, 3-D-Percussion-Loops/Samples, Drum- & Percussion-Samples. CD-ROM for PC: Only £19.95

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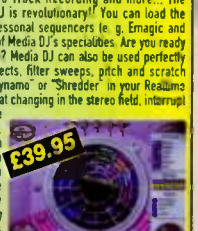
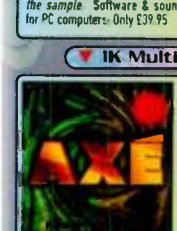
Fast real-time Song Construction! Includes 2000 brand new WAV-Samples on 2 CD-ROMs (PC-WAV & AIF-format, 16 bit stereo), 8 Track Recording and more... The concept of Media DJ is revolutionary!! You can load the sequences in all other professional sequencers (e. g. Emagic and Steinberg). Fast arranging is one of Media DJ's specialities. Are you ready for the ultimate sound experience? Media DJ can also be used perfectly for stunning stack and multi effects, filter sweeps, pitch and scratch figures to control by using the "Dynamo" or "Shredder" in your Realtime Song! You can make e. g. the hi-hat changing in the stereo field, interrupt with rhythmic breaks, rearrange your drum groove, voice line, synth sequence or brass shot in a completely new way. Apart from choosing your song tempo, Media DJ offers an automatic Time Stretch Tempo Adaption to any chosen tempo *as you are loading the sample*. Software & sounds for PC computers: Only £39.95



IK Multimedia (Italy)



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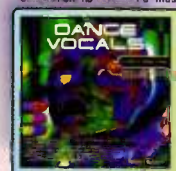
Zero-G (UK)



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CREATIVE ESSENTIALS SAMPLER DISC FREE!*

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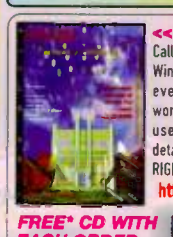

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e-Lab (Sweden)

COMING SOON FROM e-LAB:

• VINYLISTICS VOLUME 3

The latest in the HOT Vinylistics series - "THE FINAL CHAPTER" - Ruff-style Hiphop & Funk Breaks. Audio CD: £59.95

• X-STATIC GOLDMINE 5

Also due for release soon - the long awaited X-Static Goldmine Volume 5 - call for details! Audio CD: £59.95

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Coming soon - Another in the new X-Files series from E-LAB in Sweden (makers of the X-Static Goldmine series). X-FILES of JUNGLE features Drum'N'Bass & Jungle LOOPS & SAMPLES.

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Welcome to FUNALOG and SYNTHASIA ONE. Analog dance / Remix sounds & samples (no drum loops, only samples). The perfect complement to all E-Lab's dance loop CD's. Analog dance samples made for Dance Producers by Dance Producers. Many dance/loop CDs lack good clean, solid & deep synth sounds. This CD will solve your problem of finding the right fun & inspiring analogue synth sample. •Tones •FX •Basslines •Arpeggios •Chords & lots more, from new (like the Nordlead) to vintage (the phat Prophet 5). Also, TB 303, TR 909, JUNO 106, JUPITER 8, KORG POLY 6, OBERHEIM M6, & many more. Over 1100 CLUB samples! Audio CD: £59.95

X-FILES OF HOUSE

This one's a Goldmine of Deep & Progressive House loops & samples. To give you an idea, the loops and samples are in the style and mood of Armand van Helden, Tod Terry, or Deep Dish. These loops & samples will make your Hair Stand Out - pure joy! You won't be able to stop moving your feet when you hear this one. All samples provided with variations so you can create your own deep house tune instantly - perfect for injecting The new York club sound into your music - the sound of people like "Masters at Work". OVER 1000 PHAT LOOPS AND SAMPLES. Audio CD: £59.95

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STRICTLY 12-INCH

This classic from E-Lab features Dance/Remix/House LOOPS & DRUMS. WHAT VINYLISTICS IS FOR HIPHOP, THIS CD IS FOR DANCE.

The Idea is similar. Loops, with variations, together with separate hits. This is a Remix CD for anyone in the need for good STOMPING House & Garage Loops. Very much 'DJ sounding', & produced by a Remix/DJ team. If You want the sound of the dancefloor - get this one. All Loops have been tested for reaction on the floor! Audio CD: £59.95

STRICTLY R'n'B

NEW! Prepare yourself & NU Classic Soulbreaks. 800+ X-Clusive Swing & Soul loops & samples (no instruments - only loops & hits). Black traxx from the sons of Soul. Swingbeat & Hiphop loops all with variations plus the component drum samples. A very black-sounding CD, perfect for anyone in need of phat/slow Rumpshaker beats. Like 'Vinylistics', but with a more slick R'n'B touch. Styles range from Hiphop's rougher side to the slicker sound of 90's soul. From the same DJ who produced "Strictly 12-inch", this loop CD must be on top of your list! A great mixture of slo & groovy loops (60-100 BPM). Are you ready 2 make some slick blakk traxx?! Audio CD: £59.95

VINYLISTICS 1

From DJ/Producer PHAT FABE (Neneh Cherry, Shaba Ranks, Cherno, Tityo etc). HOT Loops & samples from Jungle, breakbeat/techno to R&B and hiphop. Extended variations of many loops make this CD great for club DJs, and provide the opportunity to create smaller custom loops. The loops have a vinyl quality about them. An optional floppy disk is also available featuring the MIDI-files of the loops (specify Atari/PC or Mac). REVIEW: *"A real bargain... a CD that any r&b/ hiphop/ soul producer will be pleased to own."* (The Mix, UK). Audio CD: £59.95. Akai CD-ROM: £99.00

VINYLISTICS 2

The best-selling sequel from DJ/Producer PHAT FABE (Neneh Cherry, Shaba Ranks, Cherno, Tityo etc). Incredible loops and samples in styles ranging from Jungle, breakbeat/techno to R & B and hiphop. Once again, the extended variations of many of the loops make this CD superb for club DJs as they provide the opportunity to create custom loops by cutting out small portions of the main loop. Phat Fabe has put together another stunning collection. REVIEW: *"A real bargain... the range in kit sounds can't be faulted... everything from squeaky clean to rough and raw."* (The Mix). Audio CD: £59.95

X-STATIC GOLDMINE 1

The original dance production mega-collection, re-released by popular demand & completely reworked by creator Erik Svatin. FEATURES OVER 4000 SAMPLES & LOOPS! - an unbelievable resource. One of the most raved about & largest collections of dance samples & loops ever released. And the MAS1000 CD-ROM version is the same price! REVIEW: *"One of the most astonishing value-for-money purchases in recent years... This is a great purchase for the first-time sample CD buyer... In the 'pound per sample' challenge, nothing else comes close."* (Sound on Sound, UK). Audio CD: £59.95. Akai CD-ROM: £59.95

X-STATIC GOLDMINE 2

A journey into the JB's to Snoop, from East Coast to West Coast, a steady stream of phat loops, Grooves & ol' Skool Funk Samples. Deep Bass Tones & Grooves. Funky Guitar Riffs, old Clavinets, Dusty Rhodes & Organs. Horny Horns & Saxes, Cheesy Synths, Jazzy Flutes, Vinyl FX, Rolls, Fills, Drums & Perc. - OVER 1500 KICKIN' SAMPLES. (over 3000 on the Akai CD-ROM). •Optional MIDI-file floppy disk (specify Atari/PC or Mac). *"One of the most complete funk/hip-hop sample discs you can buy."* (Futurra Music). *"Well composed and exciting... a wonderful resource... Buy this one for its loops - they're tough to beat."* (Keyboard, USA). *"As phat and funky as they come and incredibly phlexible."* (The Mix, UK). Audio CD: £59.95, Akai CD-ROM: £99.00

X-STATIC GOLDMINE 3

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X-STATIC GOLDMINE 4

E-LAB have done it again! Over 1500 Ambient and Chill Out Loops & Samples from the dark side of the Moon. TRIPHOP & CHILL-OUT LOOPS, SPEEDY JUNGLE BEATS & SMOOKIN BASS BOOSTERS, ETHNIC CHANTS & BUBBLE BATH DIDGERIDOOS, WET CHILL OUT CHORDS & XPERI-*MENTAL* SYNTH VIBES, ANALOGUE SEQ FX & END-STATE VECTOR LOOPS, PSYCHADELIC DELAYS & DUB-ECHOES, AMBIENT BIRDS & JUNGLE WEATHER, SPOOK FX AND LOTS MORE! *"I will say this just once: GO OUT & BUY THIS ONE!... Absolutely brilliant."* (Musiker Magazine, Sweden). Audio CD: £59.95

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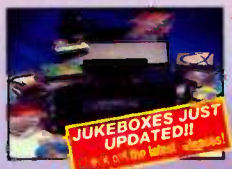

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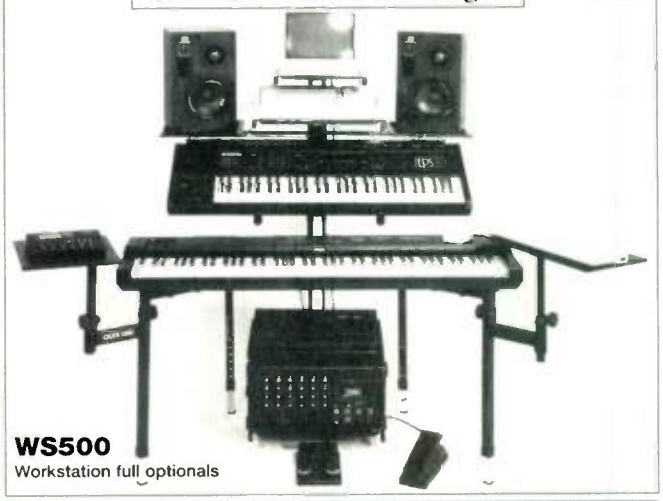

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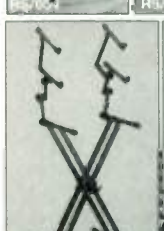
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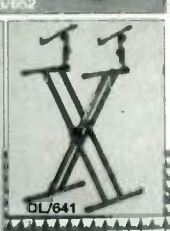
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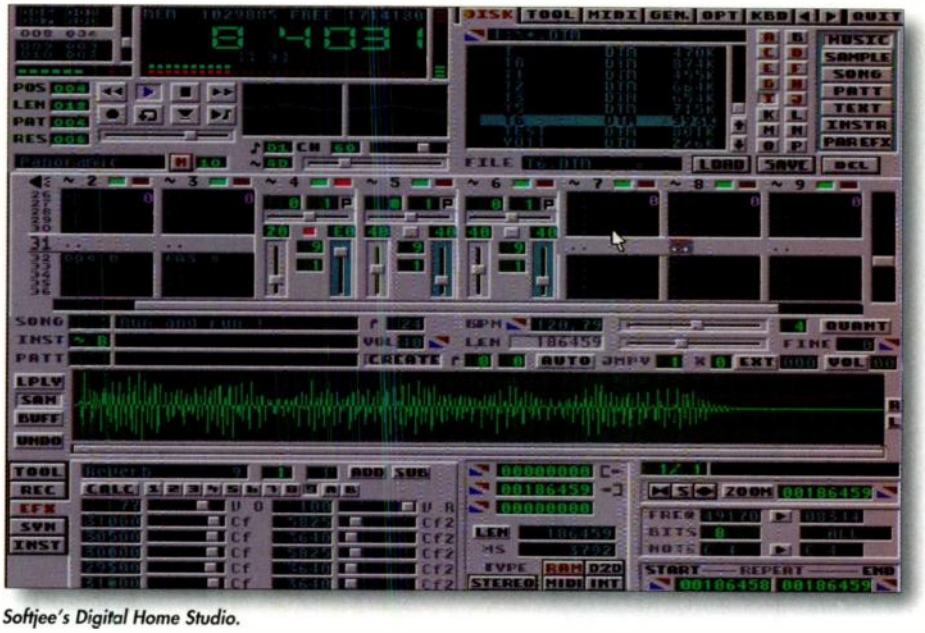


Softjee's Digital Home Studio.

Homebrew software comes to the fore this month, as a Manchester studio decide to make the most of their vintage Atari —by producing their own programs. DEREK JOHNSON gives them a big hand..

Even as a dedicated MIDI-orientated Atari user, it comes as a pleasant surprise to me when I see that people are still supporting the platform with new software — and this month is a particularly good one. Manchester studio Perfect Music have produced a piece of software that solves two problems: what to do with their old Atari now that they're using Macs, and how to save the really large System Exclusive dumps produced by the latest synths. *MIDI Filer* arose from the frustration produced by the slowness of Mac and PC MIDI interfaces when it came to receiving SysEx dumps, not to mention frequent errors. The software will reliably receive and store to disk MIDI data from any MIDI source, including the newest breed of sound module which produce particularly large amounts of data.

The same team have also come up with something for Yamaha 02R owners. An Atari running Perfect's mapper software is patched between your main sequencer and the 02R, resulting in the ability to control the mixer entirely from the software. An attached MIDI keyboard can be used to mute and unmute channels, and MIDI controllers can be used to change EQ, pan pots, and so on. Encouraged by friends who found the software useful, Perfect have unleashed both packages on the world; they will run on any Atari ST with 1Mb of RAM or more, and cost just £12 each. Contact Perfect Music, PO Box 6, Cheadle, Cheshire SK9 3DX.

THE FRENCH CONNECTION

More new software is coming from France, home of an enthusiastic Atari underground and the occasional pretty big Atari show. First up is Parx *Quincy*, an 8-track digital recording system for the Falcon. The software provides a comprehensive set of audio editing features, including copy and paste, import and export (AVR, AIFF, and AIFF-C formats supported), sample analyse, volume parameters and fade-in and fade-out. An on-screen mixer provides control over level, pan, two effects and EQ, and *Quincy* can load MIDI files, for playback simultaneously with the audio. Interestingly, it would appear that it will be possible to quantise audio with relation to MIDI events. Recording, via the on-board hardware or a Line Audio Jam8 interface box, comes with punch-in and punch-out options, and can be non-destructive.

Quincy is being distributed in the UK by 16/32 Systems (173 High Street, Strood, Kent ME2 4TW. Tel: 01634 710788. Fax: 01634 295895. Email 16-32@premier.co.uk). A demo can be downloaded from the French web site (www.parx.fr/PARX/Music.html#MUSIC), and the UK price is yet to be set.

Also from France is Softjee's *Digital Home Studio*, again for the Falcon. This software offers up to 12 audio and 32 MIDI tracks, and each audio track has level, pan and effect parameters. Audio can be recorded direct to disk, so RAM limitations won't always be a problem, and the software can be used pretty much as a sampler (an auto-loop function is available), with on-board effects (echo, reverb, flanger, equaliser and so on). Softjee claim that *DHS* is especially suited to remixers or people working in dance idioms.

Also from Softjee is *Midplay*, which turns your Falcon into a 24-voice polyphonic MIDI File player — no external hardware required. Polyphony is dynamically assigned, most MIDI messages are recognised, there are solo and mute functions, and you have control over tempo and each track's volume. There's no UK distribution yet, so contact Softjee, F-47200 Longueville, France. They can be emailed at softjee@hol.fr, and their web site is wwwperso.hol.fr/~softjee/ (I know that's a strange URL, but it is correct!).

THE ATARI YEAR

Anyone in any doubt as to whether they should be hanging on to their Atari might like to take a look at the following list. All these pro musicians, who've been interviewed in *SOS* over the last year, still have and use Ataris in their studios.

- **Morcheeba, *SOS* December 1997: Atari 1040STFM running Steinberg *Cubase*.**
- **N-Trance, *SOS* December 1997: Atari 1040ST, running Steinberg *Cubase*.**
- **Jakko Jakszyk (who has played with Level 42, amongst other famous names, and has just released his own album project), *SOS* October 1997: Atari 1040ST running Emagic *Notator*.**
- **Eliot Kennedy (Spice Girls and Take That producer, and co-owner of Sheffield's Steelworks studio), *SOS* September 1997: Atari Megafile 30 running *Creator* 3.1.**
- **David Baynton-Power (of James), *SOS* August 1997: used an Atari running *Cubase* during the making of James' recent album *Whiplash*.**
- **Morphonic Productions, *SOS* July 1997: Atari 1040 running *Cubase*, with a Steinberg Midex.**
- **Flood and Howie B (U2), *SOS* July 1997: used an Atari running *Creator* during the making of U2's *Pop*.**
- **Paul Farrer, *SOS* April 1997: used his Atari 1040STFM running Emagic *Notator*, with Unitor and Export add-ons, while writing the score for the cinema release *Macbeth*, starring Jason Connery.**
- **Colin Towns (prolific TV and film music composer), *SOS* April 1997: Atari 1040ST running Emagic *Notator*.**
- **Eat Static, *SOS* January 1997: Atari 1040ST running Steinberg *Cubase*.**

Apple NOTES

MARTIN RUSS indulges in some post-Expo analysis after a visit to the Apple event of the year, and takes a look at a new Mac-compatible operating system, BeOS.

Early in November every year, some of the most committed and evangelistic computer users in the UK converge on Olympia in London. The Apple Expo exhibition is a strange bubble of Apple-ness in an increasingly Windowed world, where the normal rules of 'C:\' computing don't seem to apply. As usual, I was there to see what's new, to scour the place for anything musical or MIDI-related, and to see how many Apple Notes readers said "Hello". This year, for the first time, I was flabbergasted when a reader did indeed say: "Mr Russ, I believe!" Unfortunately there's no prize for spotting me: sorry, Paul.

Most years there's a vague sort of theme to the show, although this year the vagueness was thicker than usual. The Internet applications and large-format, colour ink-jet printers of previous years were in evidence, but I think 3D software was perhaps the nearest thing to a consistent theme. Many of the top-end pieces of software now offer slightly cut-down versions designed for people whose budgets do not run to four-figure prices. The other interesting trend was the number of machines which appeared to be running MacOS 8, but which were in fact, running the *Kaleidoscope* shareware utility, which includes a MacOS 8 lookalike amongst its many alternative guises! *Kaleidoscope* is one of those utilities which serves very little purpose in a serious music production environment, but which is great fun to play with.

FREE FOR THE ZEE

Hidden away at the back of the *MacUser* magazine stand was a quiet haven of music and MIDI, where Paul Wiffen of Korg fame was busy with a Mac, Korg Z1, and some of the now ubiquitous direct-to-disk digital audio hardware and software for the Mac. One piece of software which was very interesting was a Z1 editor for the Mac, which provides a detailed overview of exactly what's happening — great for serious editing and making the most out of a rather deep product. Programming polyphonic arpeggios is not much fun without a piece of software like this, and it also made a very nice librarian for sounds too. Paul said that this was freeware, which must make it one of the bargains of the century. (Try Korg US's web site, www.korg.com, where the software should be available for download, or if you have problems with that, call Korg UK on 01908 857100).

TO BE OR NOT TO BE

Before Apple bought NeXT and the word Rhapsody suddenly meant a forthcoming Operating System (OS) instead of a piece of music, one of the much-fancied alternatives to the abandoned in-house Copland OS was BeOS. Be was founded by ex-Apple R&D President Jean-Louis Gassee in 1990, and has produced a very powerful, multimedia-focused OS which incorporates the latest ideas in software. It's probably worth pointing out that although MacOS 8 is also very new, it is held back somewhat by the legacy of previous versions. In contrast, BeOS has no need to worry about anything other than producing clean, fast code. As a result, BeOS simply flies along, as well as offering features now that will

APPLE NEWS IN BRIEF

• PRO TOOLS 24?

Digidesign's new Pro Tools 4 now provides 24-bit audio file capability with its latest hardware and software (see preview starting page 30). Each time I look at Pro Tools, I seem to discover powerful new features — like being able to automate the controls in plug-ins, and then edit them using the usual graphical tools.

T Digidesign 01753 653322.

• EMAGIC *LOGIC AUDIO* 24?

Emagic's *Logic Audio* now has support for Digidesign's new 24-bit hardware. A new version of *Logic Audio* was shown at the recent AES New York show. Emagic also announced a special bundle consisting of the Audiowerk8 PCI digital audio card, *Logic Audio Discovery* v3, and the *ZAP* audio file compression/archiving utility. The whole lot is available for £499 including VAT.

T Sound Technology 01462 480000.

• YAMAHA CD-ROM

Continuing their tradition of free software support, Yamaha have released a stand-alone CD-ROM which avoids the need to download any software from the web site — you merely visit your nearest Yamaha dealer instead. The CD-ROM contains audio demos of the current product range, freeware voice editing software for the AN1x, CS1x and VL70m, lots of sounds, and even A3000 sample data.

T Your Yamaha Hi-Tech main dealer.

WHAT HAPPENS NEXT?

We've all had a bit of a roller-coaster ride from Apple over the last couple of years, and the changes continue. Since they seem to happen faster than the time delay in publishing each issue of this magazine, I've not felt very happy trying to document all the goings-on...

But as this is the beginning of a new year, I reckon that a little prediction is called for, based on what has happened for the last few years. Here's a rough guide to what you might expect to happen over the next few months.

- January 1998: Faint rumours of a takeover. Change of management looms.
- February 1998: More insistent rumours of a takeover. Some new faces in Apple management hierarchy.
- March 1998: Warnings about forthcoming losses. MacOS 8.1 released.
- April 1998: Losses not as bad as predicted. Takeover rumours evaporate. Demand for some of the new hardware is under-estimated, and over-estimated for the remainder.
- May 1998: MacOS 8.1.1 released. Rhapsody launch date is revised.

"BeOS simply flies along, as well as offering features now that will probably appear on the Mac some time next year or so."

probably appear on the Mac some time in the next year or so — such as full pre-emptive multitasking and protected memory. On a PowerMac (it also runs on Intel processors — look out Windows!) you really can see just how powerful a PowerPC chip is when freed from the restraint of more than 10 years of ongoing revisions.

SON OF TURBO?

Do you remember *Turbosynth*, from Digidesign? From the days when the Mac had a tiny 9-inch monochrome screen and a 20Mb hard disk was considered huge, *Turbosynth* was a software synthesizer (a close relation to the 'new' crop of software synthesizers which have reappeared recently) which allowed you to patch together some quite complicated sounds using standard analogue modules such as oscillators, filters, envelopes, and so on. But you could also manipulate audio samples and send the results to a sampler for replay. An 8-bit resolution at 16 or 32kHz isn't so breathtaking these days, of course.

What I'm leading up to is a rather neat program, which runs under BeOS, called *Audio Elements*, from a company called Adamation. It's a modern software synthesizer, using the same paradigm of modules connected together by patch-cords — but this time it's multitimbral, MIDI-triggerable, has complex DSP functions, is extensible using C++ with a developer's toolkit, *and* it works in real time!

The short demo I saw was impressive, and I took away a review copy, all ready for a brief synopsis here, with a full review to follow..

GREMLINS

After several stable weeks, my PowerMac was looking good at last. In order to run *Audio Elements*, all I needed to do was install the freeware preview release of BeOS, reboot the Mac so that it ran BeOS instead of MacOS, and then drag *Audio Elements* across from its CD-ROM. Now because BeOS has a different filing system (amongst other things) to the Mac, you need to install it on either a separate, specially reformatted hard disk, or a partition on your main disk. I acquired a spare 400Mb drive for just this purpose, and attempted to install BeOS on it, but unfortunately there was some sort of problem, and the BeOS installer refused to reformat the drive. So I tried to install it into a partition on my main 2Gb drive instead. But this time it installed some of the files and then stopped, refusing to proceed any further. Re-installs either installed less files or a few more, but not all of the files. After having read all the FAQs, troubleshooting guides, recommendations and other material, and having got precisely nowhere, I gave up and tried to reformat the partition back to MacOS. After four reformats and three sessions in *Norton Utilities*, I finally got back the partition I started with!

Once bitten, twice shy. I ordered the full release of BeOS over the Internet (only about fifty quid!) and I'll get back to you when it's all running properly. Installs don't always run completely smoothly, even for magazine column writers... Which brings me to this month's checklist:

- When did you last do a backup of your important files?
- Have you defragged your hard disk recently?
- Do you ever read installation instructions? ('Read Me' files!)
- Have you checked your hard drives for viruses in the last month?

ON THE NET

Last month's Apple Notes implored you to throw away almost all of your bookmarks and to use a search engine instead. So, instead of the usual lists of URLs with all those 'BBC announcer'-confounding slashes and colons, this and future Apple Notes will include suitable search sequences. Which means that, instead of listing my favourite sources of Mac freeware and shareware, and facing up to the fact that some of the URL's will almost certainly be embarrassingly out-of-date (or evaporated!), you will now see something like:

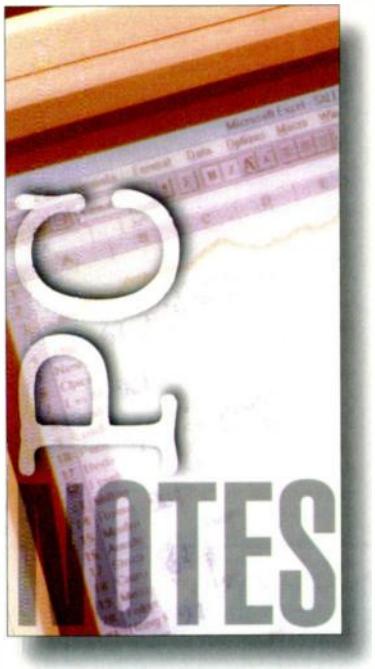
mac +midi +freeware +shareware

And naturally you can always add a reassuring '-win' at the end to prevent any Windows-related links. A few search sequences you might like to use this month are:

- **mac +quicktime +3**
- **beos +mac**
- **beos +adamation +audio +elements**

Of course, there may still be some times when there's no substitute for a URL:

- **http://www.altavista.digital.com**



MARTIN WALKER customises his display, makes more noises with soundcards, and gets a bit physical with Yamaha.

Back in October I had a couple of weeks of holiday, to recharge my batteries. Rather than returning to a backlog of writing to meet the next *SOS* copy date, I decided to borrow a laptop PC, so that I could tap a little in the evenings if the mood took me. After a week of 'chilling out' I felt the urge come upon me, and switched it on to find one very obvious thing — different people customise their machines in hugely different ways.

Although the word processor was exactly the same as the one I normally use (Microsoft Word 6), the settings and screen colours were completely different. The LCD display colours were reversed (black screen with white letters) to save battery power, the default font was huge, and there were so many strips of buttons at the top that the actual writing area only occupied about three-quarters of the screen. I spent the first hour or so just creating an environment that felt more familiar, and was more easy on my eyes. Since I was using the laptop plugged into the mains supply, I could reverse the screen colours back to the more usual black lettering on a white background, remove the majority of buttons that I don't normally use anyway (you can still access any option through the menus), and create a different default document with more familiar-looking font choice and size.

We all tend to do much the same with our PCs, and it's easy to feel 'alien', even when using someone else's sequencer, since so many options can have their default settings permanently changed. However, for anyone working for long periods staring at a screen, there are various things you can do to make your work less fatiguing, as well as more productive.

CUSTOM SERVICE

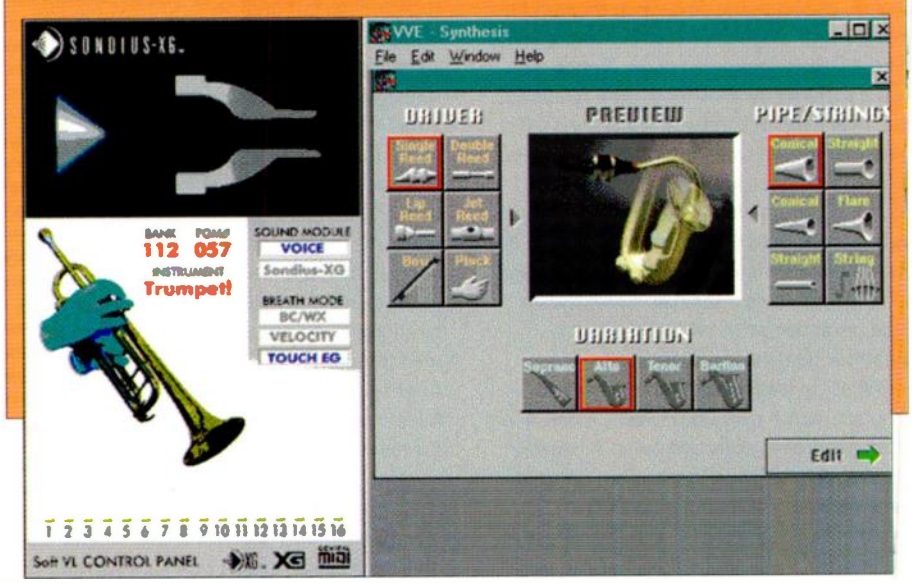
Although I try to produce colourful screenshots that look attractive on the page for *SOS*, which presents new software in all its glory, my default screen colours are somewhat different. You can alter your Display characteristics from Control Panel/Display/Appearance, and there are loads of colours, sizes and other options to try. Rather than using bright colours everywhere, I tend to use the minimum of colour for the main parts of the screen, to make the data stand out more. I make the Active Title bar (the top strip of the application that changes colour when it is 'on top') a pale green, and the inactive one dark grey. This way, only the active application has a coloured strip, which makes it very easy to see at a glance, and the inactive ones are effectively 'greyed out'. I reserve the bright colours for the bits that do need to be noticed — the Parts and Notes in *Cubase*, for instance — so that they stand out from the rest of the screen. As for font sizes and colours, once again I try to ensure that my data stands out more, by using muted colours and unadorned fonts like Arial. On the other hand, a highlighted menu option needs to be obvious, using a bright colour, so that even from a distance your eyes will be drawn to it. When you've customised your colour scheme, don't forget to save it using the 'Save As' option. You can also use this option to create several default schemes, depending on which screen resolution you're using. A screen resolution of 1024 x 768 is normally the most suitable setting for a 17-inch monitor, and an 800 x 600 resolution for a 14- or 15-inch monitor.

MOUSE WORK

Something else that can make using your PC a pleasure or a pain is mouse response. There are two main adjustments you can make here. Firstly, slackening off Double Click speed can mean that your mouse hand stays more relaxed. Secondly, as I read somewhere a long time ago, setting your pointer speed to maximum is also useful. At first the faster response is likely to feel wild and uncontrollable, but you soon adjust, and then your hand movements will be much smaller — I can now move the pointer from one side of the screen to the other without moving my wrist at all, merely using finger movements.

GOING SOFT

Yamaha have ambitious plans for PC software synthesis. From the earliest beginnings of their SYG20 (a 32-note polyphonic preset synth), they have progressed to the current SYXG50 synth. This provides users of Pentium 166MHz MMX processors with 128-note polyphony and the fully programmable software equivalent of a DB50XG daughterboard. Although it has 500ms latency, this can be corrected by moving the sequenced track back by the same 500ms, so that it is perfectly in sync with the rest of your MIDI hardware. The good news is that the full version is available via the Yamaha on-line shop for just £20! However, the best is yet to come. In conjunction with Sondius (who also provided some of the technology behind the low-latency *Reality* software synth I reviewed last month), Yamaha have plans to release the Sondius XG software synth, which adds 256 preset VL voices to the SYXG50 soft synth (using the SVA physical modelling techniques of Yamaha's VL1, VL7 and VL70m synths), along with the programmability of the VL70m. This is currently running on Pentium II systems in Yamaha's R&D department, but the word is that the release version should run by itself using a Pentium 166, be available in January, and cost £30. And no, I didn't miss any noughts off that. Go and take a peek at www.yamaha.co.uk.



A preview screen grabbed from the Yamaha web site, showing the forthcoming Sondius XG from Yamaha, complete with physical modelling.

SAVE & PROSPER

When it comes to the Preference settings in your applications, it's well worth reading the Help file options to see what each does, and why. Many programs now feature context-sensitive help, so that you can click on the '?' button in the top right-hand corner of the window, and then click on an option box for more details on this topic. If you read these you may find you can change some aspect of the program that has always niggled you — something that happens automatically that you don't normally need, or something you're currently doing often by hand, that can be made automatic. In WAV editors, if you have a partition or separate hard drive devoted to audio use, for maximum performance make sure that the preference settings point to this for your temporary file folder. If you normally edit small files, the most effective buffer settings may vary from those for people who nearly always work on audio in 10-minute chunks. It can significantly speed up your file accesses if you alter to more suitable defaults.

When you exit the program, you may have an option to save your preferences, and this ensures that whatever settings you have changed during the current session will still be in place the next time you run the application. An option to save the window layout on exit will ensure that the same files are automatically opened, and placed in the same-sized windows in the same position on the screen as when you last left them. This can save loads of time if you are in the middle of a particular long-term project.

NOISES OFF

Yet another peril of using someone else's PC is that it is easy to assume things about it that are true of yours. In my 'Card Tricks' feature in the November issue of *SOS* I mentioned noise figures for soundcards that I had measured in my machine, and in particular for the AWE64 Gold, along with a much better figure for this model of card in Paul White's PC. I said that I would further investigate the possible reasons. Unfortunately, when I next visited for some further tests (bringing my AWE64 Gold for comparison), I discovered that the soundcard I had measured was actually an Audiomedia III (by Digidesign), which Paul had installed alongside his AWE64 in his PC. This accounts for the rather better results. In fact, the peak noise level of Paul's AWE64 Gold measured -65dB in his machine, which was exactly the same as the second model that Creative Labs sent me for tests.

I have now received some additional information from Sonic Foundry (the designers of *Sound Forge*), who have explained that there is a way to measure noise performance, using *Sound Forge*, that is more in line with the method soundcard manufacturers use. Strictly speaking, signal-to-noise ratio is defined as the RMS (Root Mean Square) level of the noise with no signal applied, expressed in dB below the level of the maximum RMS signal. Most WAV editors actually measure peak noise levels, which is far quicker and less processor-intensive than converting to RMS power levels. In analogue circuitry, noise tends to be much better behaved, so RMS figures are always used, but when dealing with digital noise, and particularly inside PCs, you can sometimes get regular 'ticking' sounds which make the peak reading just as useful for evaluation.

However, if you want to more accurately measure signal/noise ratio, *Sound Forge* provides RMS measurements as part of its Statistics option, which you will find on the Tools menu. The best procedure is to disable the DC Adjust option in Record mode, record a few seconds of quiescent noise (with the soundcard correctly set up), and then run the resulting soundfile through the DC Offset option in the Process menu. Then run Statistics, and you'll find the RMS power as shown below on the left. *Sound Forge* sets the value of 0dB RMS to a maximum-amplitude square, not sine, wave. A maximum-value sine wave will therefore read -3.0dB, so since signal-to-noise measurements are normally quoted relative to a 1kHz sinewave, you should subtract 3dB from your RMS noise figure, to convert it to a signal-to-noise ratio.

Using this more accurate method, measured signal-to-noise ratios were as follows:

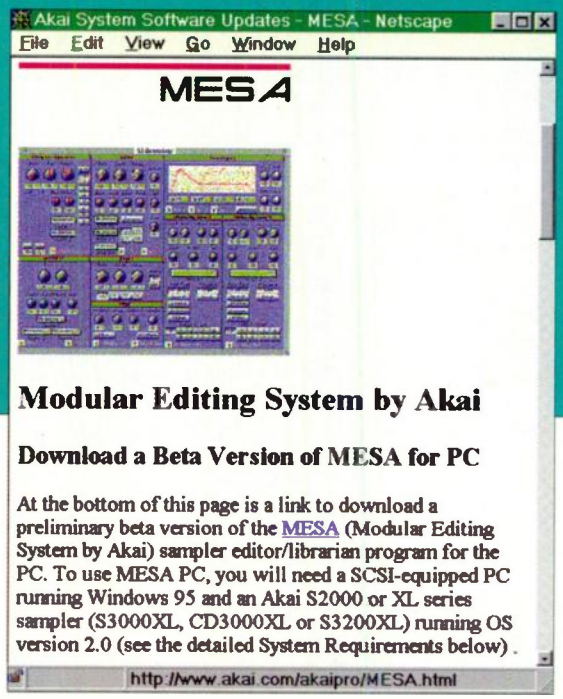
- Event Gina: 89dB
- Digidesign Audiomedia III: 87dB
- Metalithic Digital Wings Audio: 77dB
- Creative Labs AWE64 Gold cards (x2): 75dB

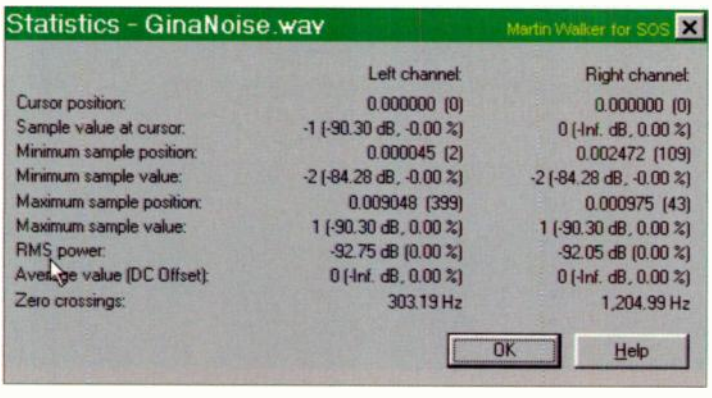
Since the human ear is more sensitive to some frequencies than others, manufacturers' figures are normally 'A-weighted' using a special filter response which takes this into account. This normally improves the noise measurement slightly, and enables you to correlate the 'annoyance factor' of differently sounding noise much better. Many thanks to both Caleb Pourchot and John Feith of Sonic Foundry for these details.

PC *MESA* UPDATE

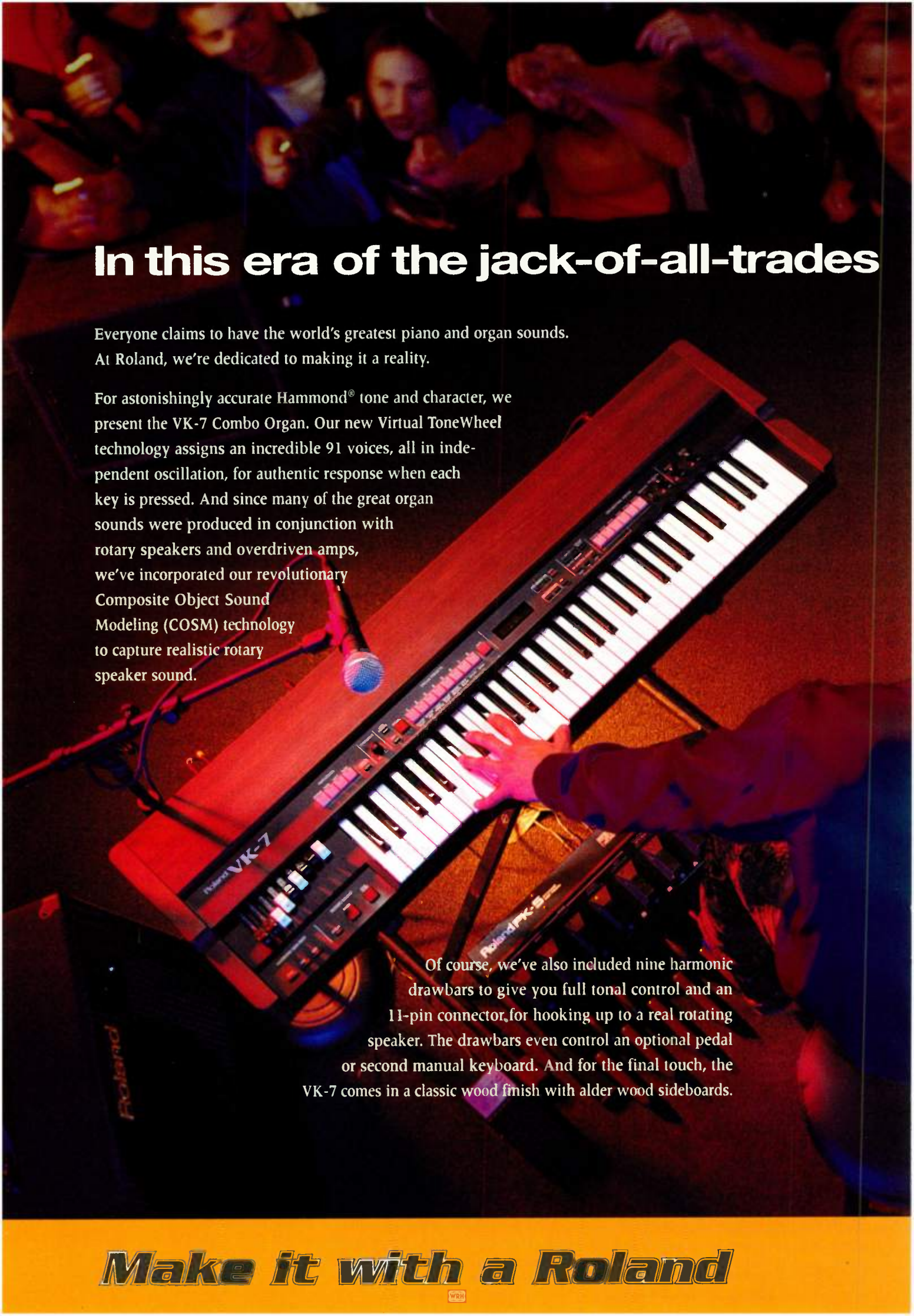
Anyone who has been following the long-running saga of Akai's *MESA* sample editing software for PC will be pleased to hear that a Beta version is now available for download from www.akai.com/akaipro, as well as an updated operating system for version 2.0 for the S2000, S3000XL, CD3000XL and S3200XL samplers, which adds support for SCSI sample transfers to and from PCs using Windows 95. The full download is over 4Mb, and only works with the samplers mentioned above. There are also dire warnings that this is an incomplete Beta version, which is not representative of the final program, now due next year, but as Akai themselves say, it's better than nothing.

Until the official release version of PC MESA is here, you can download this preliminary version from the Akai web site.





Here are the results for the more accurate signal-to-noise ratio using the Sound Forge Statistics option. You can see the excellent noise level of -92dB achieved by the Event Gina soundcard, with the largest peak reading being about 84dB below the 0dB clipping point. This gives a signal-to-noise ratio of 89dB.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Learning process

WHERE TO USE PROCESSORS AND WHY

Chorus, phasing and flanging are very common processes, but they don't always achieve the effect you hoped for. PAUL WHITE offers a few tips.

As followers of this series have probably gathered, rather than just explaining what effects do and where they might be usefully deployed, I'm looking at commonly used effects to see where they might cause problems. For example, we all think of chorus as a fairly harmless little effect that wouldn't say a cross word to anybody, but that doesn't mean to say that you can use it anywhere and be guaranteed a good result.

HALLELUJAH, CHORUS!

Chorus is created by adding a slightly delayed, pitch-modulated version of a sound to the original sound, in roughly equal proportions. The intention is to create the illusion that two or more instruments are playing the same part at the same time. (Figure 1, on page 248, shows block diagrams of all the effects discussed here.) The problem is that the illusion is only approximate, because if two or more people are playing together, any beat frequencies caused by tuning disparities will vary from note to note, whereas a chorus is modulated from an LFO, which produces a definite cyclic beating. Because of this giveaway cyclic pulsing, chorus has become an effect in its own right rather than an especially successful means of emulating ensemble playing, though if you pull an early string machine apart you'll probably find it contains three or more chorus sections, all running at different speeds to produce a richer, smoother ensemble sound.

Today, chorus is used extensively on guitars (thank Andy Summers for that, back in his Police days!) and occasionally on fretless bass, not to mention on keyboard pads. It creates a sense of movement and stereo width, but those very attributes also tend to push a sound further back in a mix. If you want a sound to stand out, it should be fairly dry (in terms of added reverb), and it should be positioned close to the front of the mix. Chorus, however, has the effect of 'de-localising' a sound — it sounds rich and wide, but you don't really know where it's coming from, and the psycho-acoustic outcome is that it sits further back in the mix. If you pull up the sound's level to try to get it to the front again, it may become too loud, so the most sensible way to use chorus is to apply it mainly to those sounds that are supposed to be part of the backdrop. This is only a general rule and it can be thrown out of the window when you've got a fairly sparse mix — which is why chorused fretless bass works well in slow, moody music and chorused guitar helps fill out the sound in a small band.

VARIATIONS ON A THEME

If you want to add life to a keyboard sound, alternatives to chorus include pitch detuning and Leslie (or simulations), as well as layering sounds and then detuning one of them slightly. Where some chorus effect is desired to add interest to a sound, but you don't want to the sound to recede in the mix, try a very shallow, slow chorus where the cyclic effect isn't too obvious. I've also found that panning a mono chorus to one side of a mix and the dry sound to the other often produces a more spatial effect than a dedicated stereo chorus unit, and without making the sound seem so disembodied. Watch out for early stereo chorus units that achieve their effect by phase inverting one of the outputs. As soon as you play your mix back in mono, the effect will disappear completely! Test for this using the mono button on your desk, and if you find you have such a unit, use just one output panned hard to one side and the dry signal panned hard to the other, as just described.

Multitap chorus effects are less monotonous-

The TC Electronic 1210 is one of the very few dedicated studio chorus/flange units still on the market.

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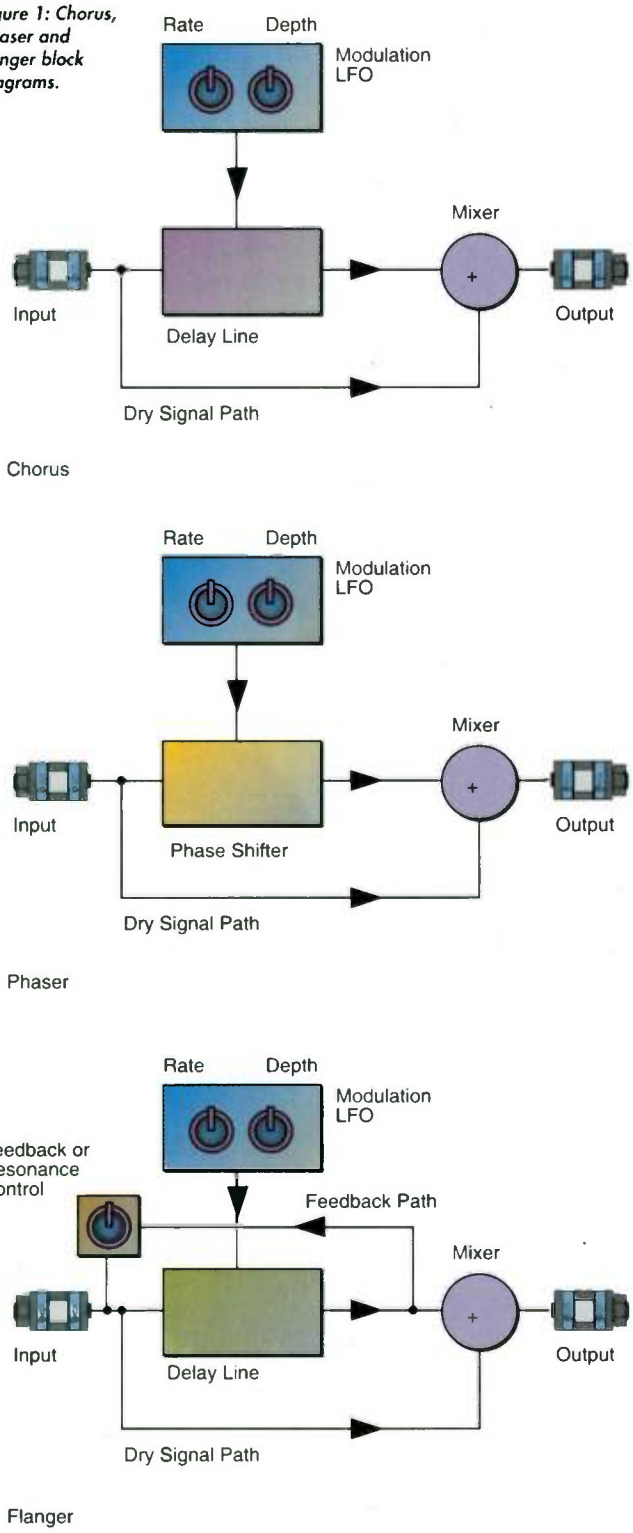
▶ sounding than simple chorus effects (though they can sound even more disembodied), and a useful alternative to the traditional way of working is to add chorus only to a track's reverb send, so that the dry sound stays solid and up-front, while the reverb takes on an attractive shimmer.

In situations where you specifically want an ensemble effect, try a pitch-shifter set to detune mode rather than a chorus effect, as this will avoid the regular beating effect. As a bonus, most pitch-shifters also include a variable delay time, to emulate the effect of two players not quite in perfect time with each other.

In my own experience, chorus doesn't work very well for thickening vocals, and it doesn't do much for percussion either. Vocals are better treated with a pitch detuner or a dedicated ADT (Automatic Double Tracking) effect, while drums can be put through with a flanger if a special treatment is needed.

Figure 1: Chorus, phaser and flanger block diagrams.



GOING THROUGH A PHASE

Phasing was the next purely electronic effect after the wah-wah and fuzz box, and it originally set out to emulate tape phasing (history has since called this flanging). In the phaser, a signal is again split onto two paths, one straight and the other diverted via a phase-shift network that can be varied under the control of a low-frequency oscillator. The result is a continuous tonal change based on the frequency cancellation that occurs when the phase-shifted signal path is out of phase with the straight signal path. Because the cancellation process is frequency dependent, the process creates a deep notch in the frequency response of the output, and under LFO control this notch moves across the audio spectrum, creating a tonal sweep. Subjectively, the sound is far less strong than flanging, as there's no significant delay between the two signal paths, but a number of guitar players latched onto the sound during the psychedelic era, and it became part of the guitar effect repertoire. Exponents include Jimi Hendrix (in his more laid-back songs) and Pink Floyd's David Gilmour.

> "Because the effect of flanging is so distinctive, it's unwise to over-use it."

As with chorus, phasing has the effect of taking away the immediacy of a sound, making it sound disembodied — indeed, that's why it became so popular for psychedelic music. The ethereal nature of the sound is emphasised by the addition of reverb or chorus, but to stand out properly the effect needs to be used in a sparse musical arrangement that has plenty of space. In a busy mix, the phased sound will slither around in the background unless it's mixed very high.

Phasing works best with harmonically rich sounds, so overdriven guitar is ideal — just remember to put the phaser after the overdrive. The effect may also be used on some synthesized sounds, to create movement, and even though it does tend to push a sound to the back of a mix, the ever-changing tone means that the listener is more likely to be aware of its presence than an instrument that has a constant sound. ▶

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STRANGE FLANGE

Chorus and phasing might be polite little effects, but flanging can have real attitude. It came onto the scene a while after phasing, and employed the then brand-new technology of the charge-coupled analogue delay line to produce the amount of delay necessary to emulate tape flanging more closely. As with phasing, two signal paths are used, one dry and one processed, but this time the processed sound is delayed by several milliseconds, as well as being modulated. The underlying technology is almost identical to that of chorus, except that chorus tends to use slightly longer delay times and doesn't feed any of the output signal back to the input. A flanger creates its deep, almost resonant whooshing effect by feeding some of the delay output signal back to the input, and although this has no counterpart in manual tape flanging, the effect is pretty dramatic. If you were to look at the spectral characteristics of the output signal, you'd see a whole series of strong peaks and notches in the response; these move across the audio spectrum under the control of the modulating LFO.

> "Chorus creates a sense of movement and stereo width, but those very attributes also tend to push a sound further back in a mix."

Flanging has no direct counterpart in nature — other than, possibly, the sound of a jet plane passing low above a city with lots of reflective concrete walls — and because the effect is so distinctive, it's unwise to over-use it. Like phasing, flanging works best on harmonically rich sounds, but it is also strong enough to show up clearly on clean guitar, drums, or even vocals. The real problem is that flanging is a cliché, so finding artistic justification for its use isn't always easy. One tip that might help is to put a flanger before a reverb or delay, as this can provide interest without making a sound seem over-effected.

On the technical front, many people also complain of unwanted distortion being caused by flangers, even though the input meters are reading OK. This happens because of the large amounts of internal feedback used, and because the input level is monitored before the feedback, there can be situations where the internal circuitry distorts at levels far below maximum on the input meter. The answer is to ignore the meter and keep reducing the signal level until the sound cleans up.

Another technical problem with flangers is noise — with all that feedback the flanger is perched on the edge of instability, so even when there's no signal you can still hear flanged background noise being produced. Where possible, the flanger output should be gated before being passed into delay or reverb effects, but in a multi-effects unit with a fixed internal routing structure, this may not always be possible. In mitigation, though, the flanger noise is itself flanged, so it's more likely to be perceived as part of the desired effect, except during pauses. If you can arrange to mute the flanger during pauses, you can get away with even quite a noisy unit. As with chorus, check that older stereo units really are stereo and that they don't simply phase-invert one of the outputs.

Next month, I'll be looking at some of the trouble you can get into with delay and echo effects. SOS

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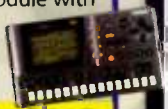

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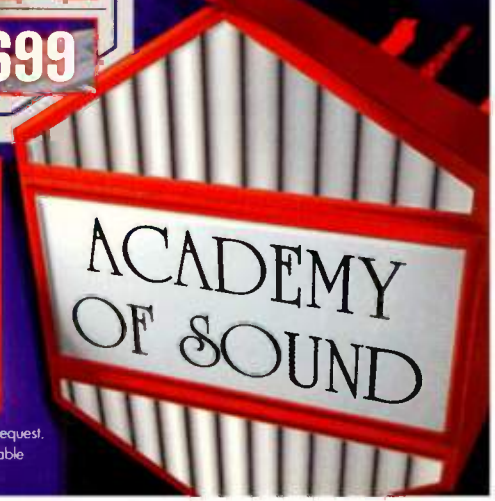

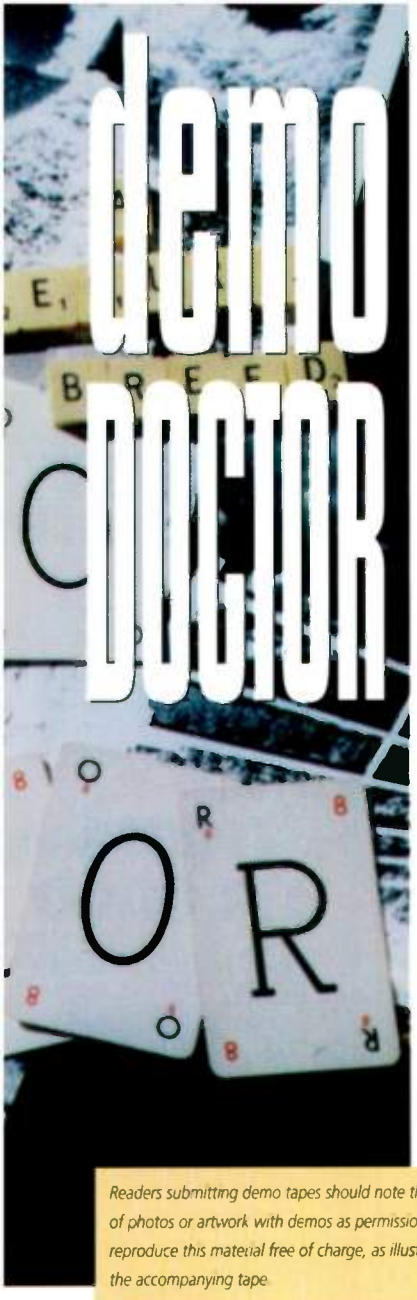

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SHUNT

Recording Venue: Home and Anglia Polytechnic University's keyboard lab.
Recording Equipment: Cassette 4-track, Apple Mac computer running *Cubase*.

Side one of this demo is a collaboration by one G. Morris with other musicians in Cambridge from a band called Pipe. Side two contains his own compositions. The pieces have intriguing titles, such as 'Tinnitus' and 'Tweaker's Dream', which describe Mr Morris's interest in sound synthesis quite well, I think.

It's interesting to hear that the producer is not afraid to play around with the sound by reducing bandwidth, particularly on vocals, which are often portrayed tonally as disembodied and telephonic. This works well against the heavy groove and basslines of tracks like 'Black pants, black bra, blackmail'. The only thing to watch out for is the sibilance on the voice, which is accentuated by this EQ, especially when reverb with a high bandwidth is added. It would certainly be worth reducing the low-pass filter on the reverb to about 8kHz for the vocals.

Although the band collaboration mixes are long, two out of three manage to hold the interest. This is mainly down to the unusual use of vocals as an instrument, and the various reverb and delay treatments added to the voice. It also makes a refreshing change to hear repetition that is not sampled. Where this rarely seems to work in the case of a completely triggered backing, it can be successful in the context of mixed samples and real instruments.

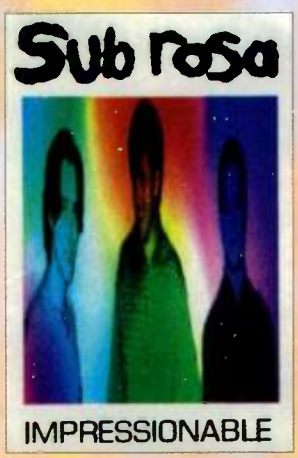
It seems hardly worthwhile including a jam on a demo, and not only is the one on track three pretty boring but the sound quality is awful! Moving quickly to side two, the sound quality makes an amazing recovery, revealing just how good these cassette multitracks can be. The idea of slowing down a breakbeat to half speed and then treating it so heavily that it's unrecognisable is appealing. However, the ambient track it anchors doesn't really develop into anything remarkable, even though it's a pleasant enough listen. Ditto for the instrumental which follows, which is a little too subtle even for students of the electro-acoustic! ❑

SUB ROSA

Recording Venue: Home.
Recording Equipment: Soundcraft Spirit Studio 24 mixer, Roland DM800 digital recorder, Alesis Quadraverb and Microverb effects, Alesis Micro Limiter, Sony DTC750 DAT, Behringer Dualfex effects, Genelec 1031 monitors, Atari running *Cubase Score*.

I last reviewed Sub Rosa just over a year ago when their demo contained two quite different styles of production. This latest demo tightens up on the continuity, sticking to the pop guitar style they prefer.

The first song uses some familiar chord progressions, dished up with plenty of energy in a live-sounding production. I notice that the mix sounds hard in the lower-mid region over my speakers, and a cut of 2-3dB at 300Hz seems to sort this out. The mix also seems lacking in bass-end warmth, and I could easily attribute this to mixing down onto two ADAT tracks. It seems that the 60-80Hz area of the mix needs some help, and I agree with bass player Chris Wang that a decent analogue 2-track would be a nice thing to own in this case! Post-production EQ using some of the new valve equipment is an alternative way to fatten up the sound.



Chris wasn't as happy with the drum sound on these demos as the last ones, where he had better equipment to play with. However, I feel this is partly to do with the balance of the kit mix. The overheads and cymbals are too loud in the mix, and this exposes an acoustic room that sounds quite peaky in the lower mids, even though an attempt is made to disguise the room acoustic with artificial reverb. I would certainly have mixed the kick drum louder — it's not really audible, so the mixes lack punch. I'd also have been tempted to compress the kick and the snare to add punch. I notice that there is no compressor in the equipment list, and this is quite a serious omission for a pop/rock band! I would suggest killing two birds with one stone and going for one of the new budget range of valve compressors when finances allow.

Musically, the production falls into the live rather than studio sound, and has a garage-band quality to it. Whether this is enough for the hi-fi conscious public in the '90s I'm not sure. ❑

JON TURNER & CATHY CROWE

Recording Venue: Home.
Recording Equipment: Alesis ADAT digital 8-track, Mackie 1604 VLZ mixer, Rode NT2 mic, Akai CD3000XL sampler with EB16 effects board, Pentium PC running *Cubase Score* 3.0, Turtle Beach Tahiti soundcard and DB50XG daughterboard, Midiman 2x2 interface, ACI sync, Behringer Composer compressor, Alesis Midiverb and Zoom effects, Panasonic SV3800 DAT, HHB CDR800 recorder, Alesis Monitor Ones, Sennheiser headphones.

Jon writes that he's never managed to get a good sound onto cassette and so he's invested in a CD recorder. The result is a four-track CD of songs by singer Cathy Crowe, which Jon has produced. The overall quality is excellent, and once again proves that you can turn out a good-quality product from a home studio.

Of course, it helps that Cathy has a fine voice, which is captured using a Rode NT2 microphone. Even so, Jon feels that he doesn't quite achieve that professional sheen on the vocal and asks if an enhancer or parametric would do the trick. At this point it really becomes a question of taste, because I quite like the natural sound of the recorded voice without the sibilance that the increased presence adds to a lot of recordings — including professional releases. Yet it's true that a good enhancer could give the voice the glassy, transparent top end that I think Jon is after. Experimenting with EQ on the CD produced some interesting and valuable results. It seemed to me that some extra presence, whether applied via desk or outboard HF EQ, or via an enhancer improved the general sound, giving what is quite a laid-back MOR production a touch more energy and vitality. Yet this is something that you need to be careful with, because it's so easy to go over the top. A little was all that was needed in this particular case, because the mix is 99% there already.

On the actual voice track itself, I would suggest using a quality wide-band EQ, looking at the upper-mids at around 5-6kHz for boost, but also at the 900Hz-2kHz range for some cut if necessary. If you've got some money to spend, it's not a bad idea to invest in one of the newer range of voice processors on the market, by companies like TL Audio, Joe Meek, and others. Parametrics can be useful, but again it's easy to go over the top and actually end up with something worse than you had in the first place, unless you're confident with the EQ.

Finally, a word about the programmed backings, where Jon has done a fine job. The drums, in particular, are well thought out and the drum samples excellent — 'Dream On' is a case in point, where the crisp but full-bodied snare suits the vaguely jazz feel perfectly. I do miss the movement that 'real' instruments add to this style of music, and bass guitar would probably have made the most difference to the feel of the songs. Still, the fretless bass sample on 'Dream On' is well chosen and played from the keyboard. ❑

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MIKE HOPKINS

Recording Venue: Home.
Recording Equipment: Atari STe running *Sequencer One Plus*, Fostex DMT8 digital 8-track, Alesis Microverb and 3630 compressor, Yamaha EMP100 multi-effects, Audio Technica microphone, Sony Dolby S cassette deck.

Mike's recording attempts to fuse folk with technology, and is obviously influenced by producers and artists like Bill Wheelan and Donal Lunny. However, on the opening track he's got carried away with the expansive sound of the toms and forgotten to mix the instruments loud enough. The vocals are fine in terms of level, when they arrive, but it's the instrumental sections which struggle.

A slight boom at the bottom end of this mix is easily sorted out by some LF cut; the cause of this problem could be speaker size, location, or monitoring on headphones, but without more information it's hard to tell. Mike is also never sure how much compression to use, but the general mix doesn't sound over-compressed, so my guess is that he's using his ears and getting it about right. A bigger problem is over-use of reverb, especially noticeable on the second song, where everything is given a liberal helping and the room reverb on the vocal is inappropriate. A nice pre-delayed plate reverb would have been better for this light rock ballad.

Even so, the vocals are well performed and the songs are pretty good. Once again, on the second song, Mike is tending to the heavy-handed on the drums — especially the snare, which is far too loud. By far the best mix of all is the third, where the drum sounds aren't the best but are balanced well against the other instruments.❑

DE SOUZA

Recording Venue: Home.
Recording Equipment: Yamaha MT3X multitracker, Alesis Midiverb, Korg A5 and Art Multiverb effects, Electrovoice M/C100 microphone, Hitachi stereo cassette deck.

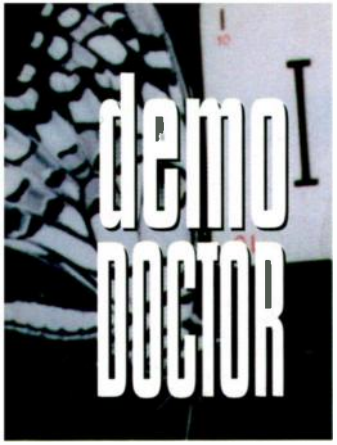
Mark Wheawill is involved in many musical projects and De Souza, a duo project with Paul Cunningham, is just one of them. The Manchester-based pair have produced a demo which Mark describes as "Easy Listening".

The first track is a sparse production relying on heavily modulated lead vocals over a basic drum, bass and chordal pad. The groove is everything here, and could have been developed with some other instrumentation in the arrangement. Use of the light percussion and backwards cymbal is good, but it's not quite enough for the whole piece.

A mark of De Souza's production is a laid-back understatement to the sound. Part of this is because of the sparse instrumentation, and part the lack of energy in the HF area. A boost of 4dB at 10kHz certainly added some vitality, without spoiling the general vibe.

Mark states in his letter that he loses the vocals when they are mixed in with the rest of the music. One of the main reasons for this is the amount of effect added to them, which I really must take issue with. The use of heavy phase on the singing completely obscures the clarity of the voice and makes it sink into the general mix. This is a shame, because the quality of the singing seems potentially very good — if only it could be heard!

As the demo progresses, there are some tracks with distinctly dodgy mixes, so a good yardstick is the instrumental balance of 'The Right Thing'. ❑



QUICKIES

All the way from Australia, **CALUM HAMMOND**'s DAT features two songs, one of which came seventh in the last Australian songwriters' competition. 'La la la (Not answer the phone)' may not seem like the most encouraging pop song title, but it works within the context of the production. Minimal synth and drum backing are the counterpoint to the block harmony vocal of the song's main line. Some neat synth loop panning improves the stereo interest, but tonally the mix sounds lightweight in the bass end, and some LF boost warmed it up. A little cut at 1kHz also helped to take some of the digital edge off the mix. In contrast, the second song is a frantic techno workout with a real-time sung vocal line that doesn't quite gel with the stricter tempo of the backing.

LIQUID AIR: From the opening two chords, the first song builds slowly into a four-on-the-floor rhythm. Looped arpeggios skip around in the stereo image, and echo is used in tempo to help build the groove. I also liked the panning of the string line — particularly at the start of the second instrumental composition — because it grabs the listener's attention. Yet this tape is all really backings crying out for some vocal involvement. Some closer scrutiny of the sonic depth would be necessary to bring the production standard up to scratch, but it's certainly close to the real thing.

EMPIRE MONKEY: 'Big Fish' is the first track on this demo and features a fine mix from the Cheshire-based Monkeys. I was pleased to note that they resisted the urge to add much in the way of reverb to a track which is essentially dance, and instead have mixed and matched their sound textures well. I especially liked the interweaving of pulse-wavey loops with glassy digital riffs and buzzing sawtooth-wave sounds. Improvement could only come from more boldness in the use of phase and flange, to warm up some of the more digital-sounding arpeggiator loops, and perhaps confuse the more obvious uses of filter modulation. 'Before the Rain' is the title of the second mix, and again there's good stereo placement of chordal sounds, which, coupled with the use of rhythmic delay, provide an arresting if unoriginal kick start to the song.

York based trio **BUBBLEWRAP** reluctantly used a drum machine for this recording when they would have preferred a real drummer. This makes a change for a lot of bands, but this story has a twist. Bubblewrap actually liked using the drum machine so much that they took it to gigs, with great success! And there's more. From what I can hear from this demo it's, the drum box has turned a modest guitar-led pop combo into a modern-sounding beat machine — especially on the jungle-orientated 'Crazy all because of you'. Add a dash of filter-swept synthesizer (which they have), and many will fail to notice that this is fairly standard fare with a dash of technology. Still, it's worked for a lot of bands, so why not for the aptly named Bubblewrap? Sonically, the mixes have too much low frequency, so a gently sloping high-pass filter at 80Hz would improve the mix without taking away its substance.

JAMES WYNESS: The first thing I noticed about the start of this demo was that the string sounds were quite harsh, and that a substantial cut of 6dB at 1kHz improved them immensely. Coupled with a mild HF boost those strings were beginning to sound classy. What's more, all this could be achieved with the small Spirit Folio being used for the mix. Covering so wide a sonic spectrum, synth strings nearly always respond to a bit of EQ tweaking. Yet these strings are soon left behind as James experiments with techno and drum & bass. The result is a little basic and cries out for some outboard effects, particularly to add spice to the chordal parts. On the upside, the kick drum and the bass synth end of the mix come off well, with some classic sounds, well balanced against the rest of the track. More concentration on the mid and upper-mid part of the frequency range would pay dividends.

A DELUXE BREED: This is another demo which falls into the 'too much reverb on the vocals' category. This is not very '90s if you listen to a lot of modern production, but is verging on the acceptable if you're going for that early '80s retro sound. And this is a band whose tape may indeed fall into that category, judging from the proudly dated equipment list, where Solina String machines sit alongside their more modern brethren. My favourite song was 'Can't do it', with a mono backing track (apart from a stereo percussion break, I notice) and the two vocals panned hard left and right respectively. With less emphasis on the vocal reverb, this mildly amusing little number also had the best and most interesting mix.

Using a fairly basic recording setup, **SIH DARYL** has gone for a simple production on this demo, consisting of just keyboard and lead and backing vocals. The result is a very clear recording. Some people might argue that you can't go wrong with such a simple recording (and they'd be sound engineers) but the truth is that you've still got to balance lead and backing vocals against the keyboard, think about the tonal considerations and choose the right effect. Sih seems to have got a lot of this right, using a short pre-delayed reverb on the vocal, occasionally double tracking and harmonising, and using a range of piano sounds across the demo from track to track. The arrangements could be tighter and this would give the songs more impact. There's also a tendency on some mixes to treat the vocal and piano to the same type of reverb — especially noticeable on 'Travelling Man'. This gives the impression that both vocal and piano are at the end of an empty hall, away from the listener, when a little intimacy on the vocal would have improved the production. This could be achieved by simply sending less of the vocal to the reverb, but leaving the same reverb mix for the piano.

CHERYL PARTINGTON is a newcomer to the world of demo recording and asks for advice on how to proceed in the music business. Listening to the music, it seems that she's concentrating on sugary pop verging on dance. On the technical side, I'd suggest listening to favourite artists, analysing some of their sounds and arrangements, and trying to develop an ear for what's going on within a mix. As it happens, the programming that Cheryl has done on her demos is pretty solid anyway, so it may be just a question of trying to simplify some of the mixes, which sound busy because they've got too much going on. Musically, I'd suggest a move towards the lighter end of the dance market, where Cheryl's voice — fairly undeveloped and lightweight at present — will work in a musical context. On the subject of the voice, Cheryl has fallen into the trap of trying to disguise a fairly weak-sounding vocal performance with too much effect — in this case lashings of reverb and echo. Record companies are keen to hear what you're really capable of vocally, so don't smother the singing. Another way to move forward would be collaboration with other friends and musicians on recording projects — the more practice you get at this early stage, the better the artist you'll become.

GREG PALMER is still at school, and his tape presents a range of music, from trance ambient to techno. 'Evolution' is the rather unoriginal title of the first mix, and I'm afraid he's overcooked the levels to cassette — so much so that there's a fair bit of not completely unpleasant distortion and audible compression pumping every time the kick drum sounds. This latter leads me to believe that the tape may have been recorded with noise reduction (no indication on the cassette itself) and indeed the compression is reduced when Dolby B is switched in. Compositionally, from what I can tell there are some nice ideas there, so maybe it's a pass for the music and a fail for the mastering. ❑

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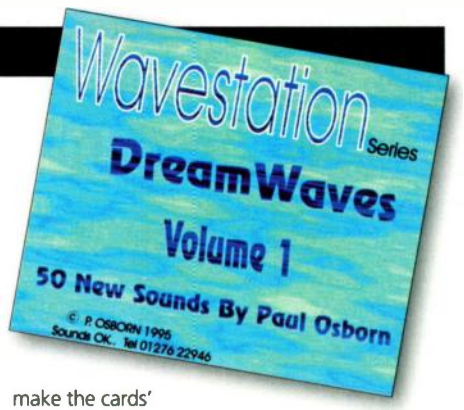
brief encounters

CONCISE REVIEWS OF ESSENTIAL ACCESSORIES

SOUNDS OK DREAMWAVES KORG WAVESTATION SOUND CARDS



Considering that the Wavestation first emerged in 1990, it's aged remarkably gracefully and, relative to some of its contemporaries, still remains quite desirable. Me? I'm a Wavestation SR owner, and I like the sounds enough to wish that I wasn't — the more inviting user interface of an A/D or keyboard version would be preferable. The oft-touted analogy about editing an SR is that it's like wallpapering the hall through the letter box, which would be rather amusing if it wasn't so true (I've tried both, by way of comparison, and can report that the results of my wallpapering were marginally more consistent than the SR editing). So with this in mind I was more than a little interested to check out the fruits of someone else's labour (Paul Osborn, the sound designer), as demonstrated by these two sound cards.

Let's do this systematically and look at Volume 1 first. *Dreamwaves* by name, *Dreamwaves* by nature, this card is full of fantastic pseudo-analogue pads, sweeps and atmospherics. Quite rightly, the first performance is 'Sensory Whorl', a wave-sequence of cascading electric keys, panning and modulating, with a dark sawtooth pad underneath. The sound demonstrates a slightly shrill characteristic, in common with some of the other performances on the cards. I guess as a bid to make the cards' sound on a par with the brightness of contemporary synths it's understandable. Anyway, it's easier to adjust a sound that's a tad bright than one that's too drab and dark — normally a tweak of the HF damp parameter in the reverb patch did the trick.

Other atmospherics of real note are 'Dream Time', 'Pluto', and one deliciously entitled 'Venus in Motion'. There's plenty in the way of polyphonic analogue emulation, an area in which the SR's factory presets are lacking a little. 'Lazy Faze', 'Soft Synth', 'Pulsar' and 'The Year 1975' may not be glamorous, but they're expressive and eminently useful. Overall, *Dreamwaves* Volume 1 is very impressive, with imaginitive use of the mod wheel and attack velocity for variation.

The second card isn't quite so arresting. There are plenty of guitar performances to investigate, but for my money they aren't sufficiently different to the Wavestation presets. There are some notable flashes of brilliance, however: some of the wave-sequence patches are outstanding, and 'Tribal Instinct', 'Gabriel's Drone' and 'Implosion' will have people asking "where the hell did that come from?", while 'Western Sunrise' teleports you to swaying cornfields and rolling in the hay with the Boston Pops.

Neither card is heavily reliant on chorusing effects to obtain head-turning treatments that are difficult to translate in multi mode, although stereo panning is much favoured for their left/right dynamics. As 'inspiration catalysts' these two cards do the job. Volume 1 is almost consistently excellent, while my personal preferences tended to steer away a little from Volume 2's guitars and ethnic clanging. Nevertheless, both are well conceived and classy. *Christopher Holder*

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ATACAMA PRO 10 SPEAKER STANDS

For some years, Sambell Engineering (who manufacture the Atacama range) have provided a 'bespoke' service, making one-off stands to order for recording studios. However, since no-one seemed to market an off-the-peg model tall enough for small studios, they have now put together a new product which addresses this need directly. The Pro 10 stands have a large top plate (width 170mm and depth 195mm) and a large base plate (305mm by 305mm), which makes them stable and safe with heavier nearfield monitor speakers.

Ideally, a speaker stand should provide a rigid mounting which will lift the tweeters up to ear height. When you're sitting in your chair at the mixing position, small nearfield speakers would thus be about one metre above the ground — which is exactly the height of these new Atacama models. As supplied, they ring like gongs, being largely welded together to give a rigid assembly, but they have a bolt-on baseplate (bolts and an allen key are supplied), and the idea is that you partially fill them with dry sand (using the supplied polythene bags). I bought some kiln-dried sand from a local builders' merchants — a 40kg sack cost me £3.60, and this was sufficient to fill both stands to well over half-height.

Once you have your stands filled, spiked and in position, you can sit back and hear the improvements to your monitor sound. You'll probably be surprised at just how much the sound of your monitors changes. The bass end tightens up, losing that boomy, uncontrolled bottom end, which is replaced with a tighter, faster, more weighty sound, whilst the mid-range and treble should gain more clarity and precision. You should be able to hear further into the mix, with previously submerged subtle details becoming more apparent, while the stereo image is sharper. The overall effect has been described as like 'turning a screwdriver to tighten up the sound'. I couldn't have put it better myself! To sum up, these stands are a worthwhile improvement to any studio setup, which should get the most out of existing speakers and won't break the bank. *Martin Walker*

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BCK FOOTPEDALS

Following my feature on MIDI controllers in the June '97 issue of *SOS*, distributors BCK sent me a sample of their VP3 volume pedal. This is designed so that the potentiometer inside operates over its full 270 degrees of travel (which you need to give a MIDI control swing from 0 to 127). The attached cable is wired to a stereo quarter-inch jack plug. This arrangement should work with most MIDI devices featuring a socket marked 'Expression' or 'Control', and the pedal is specifically designed also to work as a normal volume pedal with Roland products.

The pedal features a standard rack-and-pinion assembly, which is well greased to avoid creaks and squeaks, and the action is smooth over its full range of travel. It has enough mechanical resistance to 'stay' in any intermediate position, which can be useful if you use it to control MIDI volume levels, and need to take your foot off to do something else. The casing is a fairly lightweight plastic moulding, but it has a metal baseplate that adds some weight, and this, in conjunction with the rubber feet, stops it slipping about in use.

Other models in the range include the VP1, which is a stereo volume pedal with two mono jack inputs and two mono jack outputs. This is suitable for in-line use between stereo keyboards and mixers. The VP2 is similar, but only wired for mono use with a single mono jack input and output, and is more suitable for use with mono keyboards or guitars. Some guitar amps have built-in effects, including wah, and the VP2 could be just the job if you have a rear-panel socket for this purpose. For Technics keyboards there's a VP4 version available, similar in concept to the VP3 but wired in reverse.

Although the action is not quite as 'silky smooth' as the Korg EXP2 I tried out previously, the VP3 works perfectly well and, at £17.99, is about a third of the price. BCK say that you should be able to buy their pedals from your local music shop, but in case of difficulty you can ring them direct to find your nearest stockist. *Martin Walker*

£ VP1 Stereo Volume Pedal £22.99; VP2 Mono Volume Pedal and VP3 MIDI Controller Pedal £17.99 each; VP4 Technics Controller Pedal £19.99. Prices include VAT.

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The Full Stretch

OBERHEIM XPANDER ANALOGUE SYNTH MODULE

Not all analogue classics have keys. SIMON LOWTHER goes all gooey over an early module that packed in more features than its moderate size would lead you to expect, and left a legacy still discernible in modern synth design.

On its launch, at the USA NAMM music fair in 1984, the Oberheim Xpander was touted as the last word in analogue synthesizers. Its design team included such newcomers as Marcus Ryle and Michel Doidic working on the software, and Tom Oberheim himself keeping an eye on specs and hardware. This mix of talent built a synth with the kind of features that every player has dreamed about at one time or other.

A 'MODULAR' SYNTH

One surprise for many people was the lack of keys. The Xpander, as you might guess just from the name, is a module, and certainly not a rackmounting one, measuring a fairly hefty 33 x 12.5 x 6 inches. But then I suppose even keyboards were bigger in those days!

Reviewers at the time quickly noted that the £2950 Xpander was a very complete instrument, with little obvious cost-cutting or trimming of features. Oberheim aimed high. They were foresighted enough to put in a decent MIDI spec at a time when people were still trying to understand the implications of a computer interface, and also packed in features and a uniquely serious level of control. "A fantasy realised", as the advertising blurb said.

Being analogue in 1984 was not really a plus point for a synth. Everybody wanted digital, and Yamaha's DX7 was dominating the synth market like nothing else had before or since. But despite such competition, and a scary price tag of about the same as three DX7s, the Xpander flourished while other now-revered classics sank without trace.

THE XPANDER VOICE

At the time, much was made of the Xpander voice. Even today the module's complement is still undoubtedly special. Each of the six voices is made up of hardware for the audio path ▶

A FEW XPANDER FACTS

- **Launched 1984 and in production until 1988.**
- **Some patchy production from spare parts in the early 1990s by Gibson, who now own the name.**
- **Total unit production about 2000.**
- **On its launch, the Xpander cost £2950, rising to £3945 by 1986. Second-hand, they fetch around £1500.**

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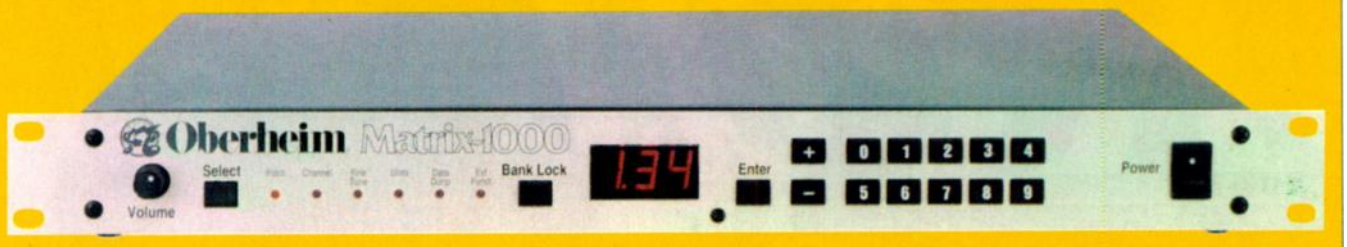

The Matrix 12, released nearly a year after the Xpander and costing a substantial £5980, is essentially the innards of two Xpanders plus a 5-octave keyboard. It has the same sounds and features. If you come across a Matrix 12 second-hand, don't be surprised at an asking price of £2000-£2500.

The Matrix 6 and 6r, and their cousin the Matrix 1000 (pictured above), are what the industry calls costdowns, featuring DCOs instead of VCOs, a low-pass filter, and fewer envelopes and LFOs. All this means a marked reduction in programming options, which could be a blessing, I suppose! Only the Matrix 1000 is a current instrument, with sound editing via software or with external hardware such as the Access programmers (see *SOS* September 1996 for a review).

and software for controllers. There were two VCOs — real ones, too — for a richer sound, a 15-mode filter and two audio VCAs, with software for the multitude of envelopes, LFOs, ramps, tracking generators and the like.

The VCOs have mixable Triangle, Sawtooth and variable pulse waves. Oscillator 2 has a sync setting and white noise, and you can also cross-modulate the oscillators for an analogue FM fuzziness: although the effect here is not as strong as on a Memorymoog or Prophet 5, it still produces some good bell sounds. One nice touch is that each VCO has its own VCA, so you can adjust the volume of an oscillator with any control source, useful for creating complex layered sounds without eating polyphony.

> "The Xpander's influence can be seen in most American designs, from the 80s to today"

Most synth users find the filter gives a synthesizer its character and uniqueness. On the Xpander, instead of the ubiquitous low-pass design, there are 15 filter modes — low-pass, high-pass and band-pass, notch (the reverse of band-pass), and phase-shifter — all in various rolloffs and combinations. And this was when high-pass filtering was seen as exotic! The range of sound options instantly available is huge. Just grabbing the filter mode knob and changing from a simple low-pass to a high-pass with phase shifter will transform any sound. The filter also has a three-pole low-pass mode of the kind favoured by the TB303 and its clones, for instant dance appeal, with weird resonance too.

For the sake of cost, reliability, and probably portability too, the envelopes and LFOs are software generated. Some pundits claim software gives a different (read lesser) quality, when compared to *real* hardware. I've compared my Xpander to an older OBXa and there seems a common sound identity to both Oberheims, so I'm not sure I'd agree in this case. One drawback of using computer generation, however, is that everything must be quantised. Envelope times and LFO frequencies on the Xpander are quantised to 64 steps. (Some other parameters have 128 steps). At first this sounds like a shortcut to disaster, but I'm pleased to be able to tell you that things work out well. Chosen values are concentrated in the ranges you need most, so you do seem to get the setting you want. Interestingly, zipper noise seems to be almost undetectable too.

LET'S ALL MODULATE

Say "Oberheim" and old analogue anoraks think modulation. Like virtually every commercial synthesiser since the Minimoog, the Xpander has some standard modulation connections hardwired (12, in this case). But buyers of the Xpander had access for the first time to the now-infamous Matrix Modulation system and, consequently, dynamic control of nearly every sound parameter — lots (and I mean lots) of sources, with loads of things to control. And where one LFO and a couple of envelopes were good enough before, the Xpander featured five of each. Per voice! These envelopes are no cut-down versions, either — they're DADSR (Delay, Attack, Decay, Sustain, Release) types, including a delay parameter and various trigger and run modes. The LFOs have a claimed 64 different waveforms, including noise and a sample setting for creating staircase effects and the like. There's also a global LFO for normal vibrato duties. In essence, the Xpander delivered modular synth flexibility in a commercially available, programmable analogue package.

The Xpander's software matrix lets an intrepid sound hound connect any of 27 sources to one or more of 47 destinations, with up to 20 connections per voice. Some options are obvious, others less so. Oberheim's design thoroughness means that hard-wired options are duplicated on the matrix, which is useful when further manipulation is needed. The result is not only limitless Joe 90 boffin appeal but also serious potential for sound creation, which can be used subtly or otherwise, depending on what you're after.

There are some unusual modules too — 5-position tracking generators, three per voice, which the manual says change a linear input, such as a keyboard, into a non-linear one. You may wonder why you'd want to do this. Well, perhaps you might want a low-pass filter

WHERE ARE THEY NOW?

Tom Oberheim has his own company, Marion Systems, which produced an Akai S900 upgrade and a couple of Matrix 6-type modules, but seems to have been quiet lately. Michel Doidic, credited with matrix modulation, and Marcus Ryle still design synths in the mainstream, going on to become involved in today's Alesis range. Anyone interested in further reading should check out the June 1993 issue of *SOS* for an interview with Marcus Ryle, and the March 1994 issue for a Tom Oberheim interview.

FAMOUS NAMES

Xpander/Matrix 12 users include:

- Vince Clarke
- Nine Inch Nails
- Technotronic
- Yello
- Stockhausen
- Steve Lipson
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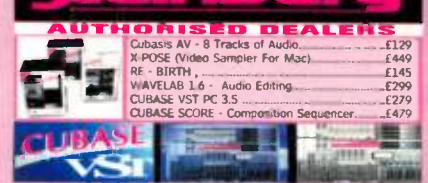

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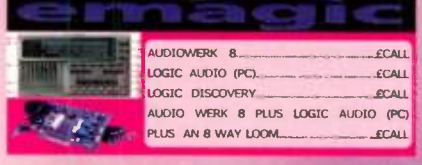

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to track the keyboard, so that the sound is dull across the middle two octaves but bright at both ends, or maybe you'd like to vary the amount of PWM across the keyboard, to lessen the mushiness at one end.

And the features don't stop there. Each voice has four ramp generators, often used for fades and sweeps, and a lag generator, which *slows down* voltage changes. This is ideal for portamento, but it can process anything from velocity response to LFO shapes and pedal inputs. I'm sure you get the idea by now.

THE FRONT PANEL

With all this going on, you need a clear control panel, and Oberheim did a pretty good job of providing one. There was no way that an Xpander with one knob for each parameter could fit onto a keyboard stand, so there had to be a compromise. They chose lots of buttons, and six click-stopped continuously rotatable knobs. The system works very well too — most of the parameters you'll want to twiddle can be adjusted quickly.

The panel is divided into easily digestible sections, which are called up in pages. A section's main parameters are then listed on one display for instant editing, with values listed on a second display below. In the case of an oscillator, for example, frequency, pulse width, volume and so on, are named, and each has its own dedicated knob. When you turn a knob clockwise it adds to the stored parameter value, while an anti-clockwise turn subtracts from it. If you wanted to modulate something, you'd simply press the soft button next to the chosen parameter displayed and jump straight to a page where envelopes and LFOs can be assigned and their amounts adjusted.

To be fair, there is quite a bit of leaping from page to page, and this can be a bit of a pain. The alternative, however, could have been editing with a single slider and small display. Not nice!

GOOD BUY?

As with all synths of this age, a second-hand Xpander should be bought with care. Xpanders I have been exposed to seem fairly well behaved. But look at the external condition, and see how it behaves when switched on. Don't be put off by this, but all Xpanders seem to go berserk occasionally. (It's in the software, you know!) Turning it off and back on again should clear the problem.

SOUNDS

As well as having loads of features, the Xpander sounds good — very good, in fact. Compared to earlier Oberheims, or Moogs and ARPs, the Xpander has a smoother, more sophisticated timbre. Put it next to a Moog or ARP and it sounds mellower, with a more polished '80s feel. Although this was possibly due to different Curtis chips used in the later synths, the Xpander's sound seems to continue a trend by Oberheim towards a less raw tone than their earlier machines. Tom Oberheim has since said that he now prefers the sound of his earlier instruments over the OB8, Xpander and Matrix series, but didn't comment on whether this was what he thought at the time. Don't get me wrong — there's still clout and class here, easily enough to see off the virtual analogue brigade. But the heavy-duty Van Halen patches are just not so convincing, and the Xpander's strengths lie in a slightly different area. What you get is a solid and much more expressive sound, helped, no doubt, by lots of controller possibilities, including touch response.

MULTITIMBRALITY & MIDI

The Xpander stores 100 single patches, and names for each of them. It's 6-part multitimbral, which was virtually unique in 1984, and (beating the Korg M1 by a few years) it has a zoned multitimbral performance mode too. There are 100 of these 3-zoned setups, which will seem very familiar to Korg and Kurzweil users! For each zone you can choose any MIDI channel and note range, for splits, layers or multi-channel operation. Volume, transposition, voice assignments, and panning or separate output selection can be set for each voice. You can even edit voices within a multi on-the-fly.

BACK PANEL

Some people are going to love this. Thoughtfully labelled on the back panel are stereo audio outs and six individual voice outs, plus individual CV and gate inputs, MIDI In, Out and Thru. Yes, folks, it's a MIDI-CV converter (except that CV has to be the controller). A Trigger In socket, three pedal inputs, including Program Advance, a cassette interface (though you are more likely to use SysEx today) and power complete the picture.

THE LEGACY

The Xpander is probably not going to be your only synth. It's analogue and only makes analogue synth noises. As I've already hinted, it lacks the raw punch of a Moog, and hard, percussive sounds are not its strongest suit. For modular analogue purists the fact that the signal path is fixed at VCO-VCF-VCA, and the knowledge that many parameters are quantised, could be a disappointment, although in reality it probably won't be. I could also reveal that setting up multis is a bit long-winded. But hey, we're getting picky.

Make no mistake, this is a very fine, important and influential instrument. Its influence can be seen in most American designs, from the 1986-vintage Ensoniq ESQ1 through to today's Alesis, Emu and Kurzweil machines, and matrix modulation is now widely available on instruments from a range of manufacturers, both American and Japanese.

For Oberheim, the Xpander was a very important instrument. They chose to stay with analogue. The Xpander and its offspring kept them in business when other purveyors of American analogue couldn't sell enough units to keep the doors open. People wanted new and interesting instruments, and the Casio CZ, Yamaha DX and sampling technology took the sales. Roland and Korg analogue-based synths also took a serious knock from this trend, but these companies had the muscle to diversify into effects processors, pianos and amps. Oberheim continued, though it changed hands in later years, and even today, nearly 14 years on, you can buy a direct descendant of the Xpander in the shape of the Matrix 1000. High praise indeed. SOS

X-RAY SPECS

• MODULATION SOURCES	• FILTER MODES
5 LFOs	1/2/3/4-pole low-pass
5 envelopes	1/2/3-pole high-pass
3 tracking generators	2- and 4-pole band-pass
4 ramp generators	2-pole notch
Lag processor	3-pole phase shifter
2 pedal inputs	3-pole phase + 1-pole low-pass
MIDI velocity	3-pole high-pass
MIDI release velocity	+ 1-pole low-pass
MIDI pressure	3-pole notch + 1-pole low-pass
2 MIDI levers	2-pole high-pass
	+ 1-pole low-pass
• MODULATION DESTINATIONS	
Oscillator 1 frequency, PWM	• THE VOICE
Oscillator 2 Frequency, PWM	2 VCO
15 VCAs	1 VCF (15 modes)
VCF frequency, resonance	15 VCAs (some in software)
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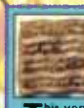

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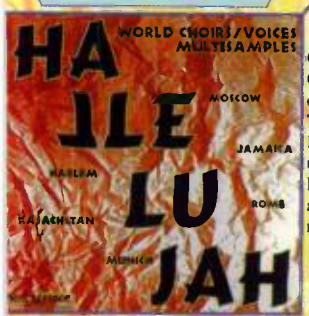

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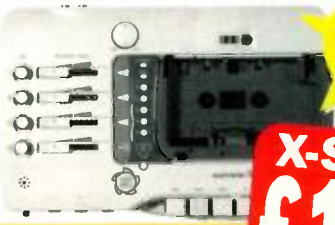

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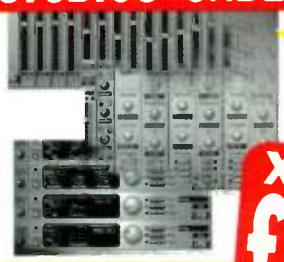

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MACKIE CR1604 16 inputs, two stereo outs, six auxiliary sends, great mic preamps, phantom power, rack mounting ears, Rotopod, flexible desk, £650 ☎ 01354 695239

MACKIE CR1604, 16-channel mixer, very good condition, home use only, boxed with manual, £540 ono ☎ 01629 813259

MACKIE CR1604 16-channel mic/line mixer, home use only, hence mint condition, boxed, manual, £625; Ensoniq DP/4 parallel effects processor, mint condition, boxed, manual, £875 ☎ Steve 01403 268292

MACKIE CR1604 mixer, 16-channels, 3-band EQ, buss facilities, 6 aux, 8 inserts for processing, clean quiet mixer, perfect condition with box and manual, home use only, £585, various other bits for sale ☎ 01858 575353

MICROTECH GEFELL UM92S valve mic, (Neumann M49 capsule!) sus-mount, flightcase, very clean, £1345 ono; Mackie 24-channel, 8 buss console, home use only, £1995 ☎ 0181 875 9712

OTARI MX70 16-track, 1-inch pro machine with remote, £1995; Fostex 4030 sync with 4035 remote, £395; 16-channels of DBX150x noise reduction in an 8U rack, £350 ☎ 0161 273 2404

PHILIPS DCC730 DCC recorder, perfect condition, extensive use, £170 ☎ Duncan 0171 444 2681

PHILIP REES TS1, tape sync unit, in very good condition, hardly used. Ideal for use with cassette multitrack, level controls, manual included. £75 ono ☎ Clive 01437 765242 (South Wales)

PMC AB1 transmission line studio monitors, as used by the BBC and many mastering houses, serious sounding, as new £1000 ☎ 0171 652 2125 or 0973 253186 (anytime)

ROLAND M480, 48 input/24 stereo line mixer, 4 aux, 2 effects sends, 6 unit rackmount, mint condition, manuals, sensible offers please ☎ Andrew 01376 512118

ROLAND SBX80 sync box, converts SMPTE to MIDI clock and SPP and sync 24, £150; White 4000 27 band vintage EQ, £150 ono ☎ 0181 211 8822

ROLAND VS880 with effects board, SCSI jaz drive, two 1Gb jaz disks, superb condition, boxed with all manuals, £1500 ☎ Paul 01926 316607

ROLAND VS880 8-track digital recorder with external hard drive and effects expansion board, hardly used, excellent condition, £1370 ono, Akai S2000 sampler with 10Mb, as new, boxed, £660 ono ☎ 01274 780263

ROLAND VS880 expanded 1.4Gb integral effects board, brand new, £1500 or part exchange for 8 buss desk or multitrack recorder, Tascam 34 quarter-inch deck, £400 ☎ 0191 384 8890/378 9703

SANSUI MR66 6-track cassette recorder, double speed, Dolby B, sync input, box, manual, recent Panic service, 50% more tracks than your average cassette multitrack, £365 ☎ 01354 695239

SECK 12:2 mixer, 4m loom, £155, 14 inputs, 3-band EQ, 4 aux sends, 44-way jack patchbays, £40, Yamaha RCX1 remote for SPX900, £55 ☎ 0181 670 6578

SECK 12:8:2 mixing desk, 3-band EQ, sweepable mid, 2 aux sends, mic and line inputs, £350, Washburn AB25 five-string electro acoustic bass, never gigged, £400 ☎

0121 359 5702.

SECK 18:8:2 MKII console £500; Furman LC2 Limiter/Compressor/De-esser £75; Accessit noise gate, panner and 2 exciters in Accessit rack with 2 PSUs £100. ☎ 0117 928 4359 (Bristol).

16-TRACK, 1-inch multitrack recorder with remote, just serviced, lots of tapes available, runs well, £950 ono. ☎ 0181 580 7092.

SIGNEX ISOPATCH 44-way patchbays, excellent condition, £35 each, quality patch leads. ☎ Simon 0958 680447.

SONY DAT recorder, 6 months old, records at all three band-widths, £430; Casio FZ10M sampler, 8 outs, analogue sounding filters, £500. ☎ John 0171 250 3572.

SONY DT1 DAT walkman with LCD display, remote, earphones, brand new bargain, £250; Sony RM D3K remote control and digital in/out unit for TCD D3, TCD D7, TCD D8 DATs, £140. ☎ 01494 792347.

SONY 55ES DAT machine, recently serviced, excellent condition, full sized machine, digital in/out, coax/optical, £300; Session 8 PC with Logic Audio, can be seen fully working , DSP, SCSI card, £1500; SPX900 Yamaha effects, £300. ☎ 01952 273862.

SOUNDCRAFT DELTA 200 series, 16:4:2 pro-quality desk, fabulous sound, excellent condition, 24-input, 16 mic line, 8-line, deluxe module with flightcase, must sell, £1545. ☎ John 01773 823805.

SOUNDCRAFT SPIRIT STUDIO, 16:8:2, excellent condition, £700 no offers. ☎0151 220 7308.

SOUNDTRACS PC-MIDI-24, effects returns, perfect small studio desk, £2200 ono; Seck 18:8:2, £550; BBE 422A enhancer, £180; mixer stand, bridge, £150; looms, DBX SNR, offers welcome. ☎ Carl 01223 236108.

SPIRIT FOLIO, 12:2 mixer, excellent condition, hi-fi quality, 3-band EQ with swept mid-band, 2-aux sends, phantom power, compact, £225. ☎ Phil 01582 834043.

SPL OPTIMIZER, 4-band parametric EQ with notch filter, cost £1000 new, will sell for £500. ☎ Keith 01245 264417/01376 513993 (days/evenings).

STUDIOMASTER PROLINE Gold Mixer, brand new, boxed, 16:4:8 model, £550. ☎ 0171 733 7402 (evening).

STUDIOMASTER SERIES III mixing console, 28:8:2, 6 aux sends, full EQ, studio use only, very good condition, £950 ono. Sequential six-track multi-timbral analogue synth programmable with MIDI, £290 ono. ☎ Jon 01255 220571.

TAC MATCHLESS, 26:24:8:2, superb condition, patchbay and stand, £5000; Soundcraft 760 MK2/3 with autolocate, £4200; various Drawmers. ☎ 0956 439202.

TANNOY GOLD, 15-inch dual concentric studio monitors, adjustable cross-overs, teak cabinets, spare driver, excellent condition, £450 ono, will consider part-exchange. ☎ 01952 414017.

TASCAM 38 8-track, 15 ips, home studio use only, loom, £800; Tascam DBX units, £350 the pair. ☎ James 0468 886487 (anytime).

TASCAM 38 half-inch 8-track recorder plus XRI SMPTE unit, excellent condition, £590. ☎ 0973 621705 or 01642 475765.

TASCAM 38 half-inch 8-track with remote, loom, Tascam 2 channel noise reduction unit, tapes, very good condition, £650 ono; Yamaha DX21 keyboard with manual, MIDI in/out, £150 ono. ☎ 0121 680 1608.

TASCAM 238 8-track recorder with RC88 remote control, SMPTE sync, punch-in with rehearsal, limited home use only £495. ☎ 01895 635202.

TASCAM 238S, Dolby S cassette based 8-track, mint condition, 19-inch rackmountable pro machine, £700; DAT Sony 77ES, home use only with remote, mint conditon, £400. ☎ 01209 713009.

TASCAM 424 4-track, 8 inputs, good condition, £275. ☎ John 0114 255 4129 (Sheffield).

TASCAM 488, immaculate, £450; Philip Rees TS1 sync, £45; Philips DCC1, £100; Yamaha MU10, £130; P120 Pentium PC, CD-ROM, £550 or £1100 for the lot; all immaculate. ☎ 01291 422907.

TASCAM 488MKI, 8-track portastudio, excellent condition with manual and box, home use only, £535 ono. ☎ John 01333 450495 (Scotland).

TASCAM 488MKII 8-track unused, £550. ☎ 01474 813535.

TASCAM 688 8-track MIDI studio, in mint condition, mixing board needs minor repair, £600. ☎ 01322 528053 (evenings).

TASCAM DA88, home use only, as new, £2000. ☎ 01543 253576/0585 341745.

TASCAM DA88 PLUS SY88, £2700; TAC B2 modular mixer, 16:4:2, £1500. ☎ Dick 01787 247243 (Suffolk).

TASCAM MM1, 20:2 rackmount keyboard mixer, four effects sends/returns, direct outs on all channels, good condition with manual, £250. ☎ Dave 01227 463373.

TASCAM MS16 absolutely perfect condition with trolley and all manuals, £1500. ☎ 0181 977 6509.

TASCAM MSR16, 16-track reel-to-reel, £2750; Allen & Heath 16:8:2 mixer with mute automation, £1950; Sony DTC750 DAT machine, £375; Roland D50, mint condition, £595. ☎ 01299 404991.

TASCAM M2516, mint, MIDI mutes, 4 sends, sweepable mids/bass, £750; Fostex R8, mint, 50 hours use, no MTC, £375; Quadraverb GT, in very good condition, separate analogue effects, £180. ☎ 0181 257 0172.

TASCAM PORTA-ONE porta-studio, £150 ono. ☎ 01555 662071.

TEAC 80-8, classic half-inch 8-track recorder, mint condition, DBX noise reduction, £700 ono. ☎ Tim 0956 106228.

TECHNICS SV-DA10 digital audio tape-deck, almost identical to industry standard Panasonic SV3700, perfect sound and fast, reliable transport, well featured with remote, £495. ☎ 01794 519659 (evening).

YAMAHA DMPII, automated mixer, 99 scene memory, MIDI 4U rackmount with manuals, £550; AKG D1200E mic wanted; Korg poly 800 synth, £140. ☎ Andrew 01376 512118.

YAMAHA DTR2 Pro DAT machine, very good condition, £650; 24-track 2-inch IEC tape, £25; Mic balancing transformers in cans, £15 each; Gale GS402 monitors, £250; ICDI audio patchbay, 4X24, £100; Mackie Rotopod, Mix-Mix, new, 1:1:2 audio balancing transformers, £10 each; Quad 33/303, £125; DECCA vintage PPMs, £100; 12U studio 19-inch cab. ☎ Alan 01379 676670.

YAMAHA MD4 digital recorder, as new, £500; RAM 10:4:8:2 desk, 3-band EQ, £150. ☎ Roger 01450 870763.

YAMAHA MD4 digital multitrack, brand new, £600; Sony TC WE405 twin cassette deck with dolby B&C, brand new, £100. ☎ 01225 834237.

YAMAHA MT100-II, superb condition, home use only, boxed with manuals, £200 ono. ☎ Andy 01582 626405.

YAMAHA MT120 4-track, DBX noise reduction, home use only, boxed as new, £165. ☎ Richard 0181 960 4466.

YAMAHA PROMIX 01, 16 channel digital mixer, £900; Emu procussion drum module with 6 outputs, £200; both home-studio used only, boxed with manuals. ☎ Chris 0117 914 4752.

YAMAHA PROMIX 01 automated mixer, mint, boxed, manual, loom, £999 no offers; JV1080, mint, boxed, manual, dance board, £895, both 2-months old. ☎ 0113 248 3728 (afternoon).

YAMAHA RY30, superb condition, home use only, boxed with manuals, Dance/Soul card, £225 ono. ☎ Andy 01582 626405.

ZOOM 40/40 guitar effects, £200. ☎ 01227 760522. email psychedelic@mcmail.com

SEQUENCERS

ARP SEQUENCER, black and orange, to sell with Odyssey 2821 and accessories, £1000. ☎ 01227 711628.

ROLAND MC202, with Kenton enhanced CV/gate and sequencer manual, £250. ☎ Neil 01388 731389 or email namorgan@nildram.co.uk.

ROLAND MC202, mint condition, manual, power supply, will deliver, £250. ☎ 0411 284423 (Sheffield).

ROLAND MC303, £350; JV2080, £895; Yamaha A3000, £895; Akai S2000, £595; all as new, open to swaps with analogue gear. ☎ 01353 663613.

ROLAND MC303, boxed, manual, £350. ☎ Chris 0966 372926/0181 749 3858.

ROLAND MC303 groovebox, £400; immaculate condition, boxed, classic 303, 808, 909 sounds and more. ☎ Adrian 01223 502475.

ROLAND MC4 micro composer, allows up to, 8-tracks of simultaneous CV/gate external controls, 5-DIN sync, £230, seller pays for shipping. ☎ 001 514 334 4405 or ZeFrogue@accent.net (Canada).

ROLAND MC50 in good condition with manuals and box, £350 ono. ☎ David 0141 883 8779.

ROLAND MC500 MkII very good condition with MRCII software and manuals, £300. ☎ Joe 0171 350 1756.

ROLAND TB303, excellent condition, with carry case and photocopied manual, offers or swap/part-exchange for AN1x, Nord Lead, Microwave I/II etc. ☎ Darren 01204 701674 (Bolton).

ROLAND TB303, £900; SH101, £250; D50, £350; Emu Proformance One, £130; MC50 MkII sequencer, £320; Tascam 244 4-track, £200; Casio FZ10M sampler, £425, D110, £150. ☎ 0181 905 5917.

ROLAND TB303, £650; SH101, £250; SH09, Korg MS10, £150; Jupiter 6, £650; Korg Poly 6 plus flightcase, £200; all bedroom use only, mint. ☎ 0114 248 4440 (evening).

YAMAHA QY20 music sequencer, perfect condition, boxed with manuals, £175. ☎ Dave 01723 354647.

YAMAHA QY20 carry case, manual, power supply, excellent condition. ☎ Jon 0121 681 0323.

YAMAHA QY22 music sequencer, mains adaptor, as new, hardly used, £205. ☎ Steve 0191 263 0402 (daytime).

SAMPLERS

AKAI CD3000I with 8Mb memory, includes built-in CD-ROM drive, one year old, excellent condition, £1000. ☎ 0181 640 5280.

AKAI CD3000I, 8Mb, immaculate, boxed, 10 outputs, 5 CD-ROMs, SCSI, manuals, £1250. ☎ Alec 0114 221 4981.

AKAI MPC2000 sampling drum machine, sequencer, brand new, never used, £800; JL Cooper Datamaster sync unit for ADAT, SMPTE, MTC, MMC, £250. ☎ 01224 713334.

AKAI SCSI BOARD, £40; IB104 Dig I/O DAT back up board with DAT library, £65 for S1000/S1100 samplers, Roland SH101, boxed, £295; Stucco flightcase, ungigged, 11U, £100. ☎ Mark 01226 206767.

AKAI SO1, expanded, home use only in very good condition, £280. ☎ 01379 853161.

AKAI S900 sampler, fully expanded, drum triggers, 100Mb of samples, box and manuals, studio use only, £350. ☎ Charlie 0181 852 7321.

AKAI S900 sampler, £300 ono, 8 putputs plus ADSR filters, new software upgrade, also Cubase for PC original CD-ROM. ☎ Steven 01223 846177/514675 (work/home).

AKAI S950 sampler, 2.25Mb, 8 outs, as new condition, £450 ono; Oberheim Matrix 1000, £250 ono; Cheetah MS6, £200 ono; Drawmer M500 compressor/processor, £350 ono. ☎ Patrick/Sean 0115 949 7604/985 6424 (Nottingham).

AKAI S950 SAMPLER, expanded to 2.25Mb, boxed, manuals, £500. ☎ Seamus 01208 813534 (evening).

AKAI S950 full memory, timestretch, £520; Novation, DrumStation, boxed, manuals, £290; Korg Poly 800, £90; Roland VS880, effects, hard drive, V2 software, £1250 ono. ☎ 01273 628703 (Brighton).

AKAI S950, disks, fully expanded, £675; Akai S700 with disks, £300; Akai VX90 analogue synth, £200; Peavey BX800 powered mixer and reverb, all in excellent condition. ☎ 01844 237916.

AKAI S1000 sampler, 10Mb SCSI, new screen, £1050, no offers; Roland MC303 groove box, as new, £300. ☎ 0151 228 0863.

AKAI S1100, 4Mb, mint condition, serious offers only. ☎ Jamie 0410 489316.

AKAI S2000, 6Mb, 8 output expansion board fitted, complete with manual and software, only £750. ☎ Robert 01895 443581.

AKAI S2800/S2000/S3200 memory board, 2Mb, £100 ono including postage. ☎ 0117 955 8521/939 5250 (Rob/Chris).

AKAI S3000XL, 32Mb, EB16 effects board, internal 0.5Gb, Akai hard drive, CD-ROM player with disks, V2.0 software, immaculate condition, complete system ready to go, £1450. ☎ Nigel 01361 890279.

CASIO FZ1 sampler, 8-outputs, 16-bit resonant filters, large LCD display, manual, over 150 library disks, £300; Yamaha TG33 vector synth, £150. ☎ Simon 0161 860 6139 (evening).

CASIO FZ1, 16-bit keyboard sampler with memory expanded to 2Mb, 50 disk library, extra editing software, sample CD, manual, £370. ☎ Martin 01244 376446.

CASIO FZ1 sampler with library, £350; Kawai K1M module, £200; Korg DW8000, £300; Roland MT32, £200; MT32 synthworks software, £35, all items mint. ☎ 01530 837029.

CASIO FZ10M Hohner clone, 2Mb memory, 8 outputs, with manuals and extra book, £400. ☎ Gordon 0802 425939 (anytime).

EMU EMAX II sampler, £550; Fostex X28H 4-track, £200; Atari 1040STE with SM124 monitor and Cubase, £200; all in very good condition, home use only. ☎ Mike 0113 260 6355.

EMU EMAX II, 2Mb, 8 outputs, SCSI, £500 ono; Roland SPD8 Octopad with built-in sounds, £220 ono; Tascam MM1 20:2 mixer, MIDI muting, £350 ono. ☎ Dave 01249 713204 (Wilts).

EMU ESI32 sampler, excellent condition, home use only, 32Mb includes sounds and manual, £1050. ☎ Dan 0117 924 3816 (Bristol).

EMU E64, 10Mb RAM, 540Mb internal hard drive, 2.5 software, Emu library, mint condition, £1450; Akai EWI 3020 wind synth, analogue module, hard case, £500. ☎ Alan 01989 780572.

EMU EMULATOR EIIIXP TURBO, rare home use only, perfect condition, £1500 ovno, Technics RSDC10 DCC deck, portable player RQDP7 with charger, hardly used, £420 ono; Technics SVDA10 DAT machine, £250 ono. ☎ Bracknell 01344 51616.

ENSONIQ EPS8 expanded memory, great entry-level sampler, loads of sounds, priced to clear, £250. ☎ Richard 0181 960 4466 (day).

YAMAHA A3000 professional sampler, 18Mb, boxed as new, £999. ☎ 01403 217037.

YAMAHA A3000, 3 weeks old, extra output board, 10 outs, digital SCSI internally fitted, £1100, Jaz, 1GB removable, 2 cartridges, £250, external SCSI. ☎ Mark 01952 273862.

YAMAHA SU10, mini-sampler, PSU, manuals and sample CDs included, sorry, no box, £150. ☎ Nick 0114 272 6433 or email nick@computertrading.com.

DRUM MACHINES

ALESIS SR16, £130. ☎ Gavin 0181 552 5124.

ALESIS SR16, £130; Lexicon Alex, £150; Fostex R8 Plus MTC1, £750. ☎ 01702 521570 (Southend).

BOSS DR660 drum machine, 255 sounds, reverb, chorus kits include 808 &909, in very good condition with manual & PSU, £225; Park G10R guitar combo, reverb, 3-band EQ, as new, £70. ☎ 01933 678608.

BOSS DR660 32 kits, editable, 4-outs, boxed with manual, in mint condition, £220. ☎ Alec 01204 888675.

KAWAI R100 drum machine, £125. ☎ Mark 0973 719650.

KORG S3 rythm workstation, 8-track, 8000 note sequencer, M1 type synthesis, samples, dance, rap on PCM card, twin effects units, 6 outs, twin MIDI outs, SMPTE, touch pads, cost, £1100 offers above £200. ☎ 0141 427 9395 (Glasgow).

KORG S3 rhythm workstation, £230 ono. ☎ Eddie 01482 897307.

MXR DRUM COMPUTER, early '80s digital drums, 12-sounds, with individual outputs, £150. ☎ John 01904 432417.

OBERHEIM DX drum machine, mint condition having been stored for eight years, manual, £350; Audio disco 10-channel mixer, stereo 5-band graphic, auto fade, very good condition, £85. ☎ 01222 553233 (Cardiff).

ROLAND CR8000 programmable, same analogue sounds as TR808, DIN-syncs to TB303, TR909, MC202, in very good condition with owners manual, £150; may be able to deliver to London. ☎ 01326 315121 (Cornwall).

ROLAND DDR30 drum module, 6 touch-sensitive multi-trig pads including bass drum, £230. ☎001 514 334 4405 or ZeFrogue@accent.net (Canada).

ROLAND R5, as new, power supply and manuals, £150. ☎ Gordon 0802 425939 (anytime).

ROLAND R8M module with extra ROM, £220; Alesis D4 Drum module £180; both immaculate. ☎ 01475 630181 or rickyd@globalnet.co.uk.

ROLAND R8M module, dance, electronic and 4 other cards, £250; Tascam MM1 desk £275 or £500 for both; Studiomaster Mixdown 16:8:16, £600; all in excellent condition. ☎ Ashley 01922 643023.

ROLAND R8 drum machine with 808 card and Jazz card, £275; Microverb, £100. ☎ 0113 275 1267.

ROLAND TR505 drum machine and Cubase video manual, any offers. ☎ Phil 0181 542 9940.

ROLAND TR626 drum machine, boxed with manuals, £90 ono. ☎ Howard 01252 341654, 0171 446 4111 SmithHA@Logica.com.

ROLAND TR707 & TR727 rhythm composers, both in perfect working order, very good condition prefer to sell as a pair for £250. ☎ 01952 260064 (Telford).

ROLAND TR909, as new, £700; TB303, £400; MKS80, £650; MPG80, £400; Oberheim Xpander, £750; OB1, £300; Matrix 6R, £450; EMU SP12, £750; Sequential Pro1 plus MIDI, £400; Studio 440, £550; will deliver anywhere. ☎ 0956 617045.

SOUNDMASTER SR88 analogue drums, very similar to Boss DR55, complete with original box and manual, £70. ☎ John 01904 432417.

YAMAHA RX5, £250; Rev 50 multi-effects, £125; Pro 24 software, £35; Atari with monitor, £70; 6 Ampex tapes, £35; all mint. ☎ 01530 837029.

YAMAHA RY30, home use only, boxed with manuals, dance and soul card, £225. ☎ Andy 01582 626405.

PERSONNEL

BASSIST WANTED, early twenties, to join next Embrace, Travis, Zeppelin, whatever, good gear, transport and GSOH welcome, 24 hour rehearsal available, epic songs, 100% commitment. ☎ 01536 760926 (Northants).

GUITARIST, experienced, with taste and feel, many influences from Nile Rodgers to Dave Gilmour, seeks musician/s to collaborate in long term project, must be obsessively keen, will move. ☎ 01387 255403.

GUITARIST, 18, wanting to join or form a serious metal band in South Yorkshire area, commitment essential. ☎ Neil 01226 734058.

GUITARIST, does your project need a bit of a lift in the form of some real guitars instead of boring samples, theme tunes are my speciality. ☎ Kenny 01434 685358.

I HAVE AUDITIONED three female vocalists so far, I'm still looking for someone who can sing accurately with original input and a versatile voice. ☎ 04325 270082.

INNOVATIVE GUITARIST wanted to join Christian band, no cringe factors, original material. ☎ Michelle 0171 240 7696 (Day).

KEYBOARD PLAYER REQUIRED, must have a good range of R&B songs, will be involved with gigs in and around the West End. ☎ Douglas 0181 314 0878.

LONDON BASED D&B trio seek exposure and deal, chilled out and jazzy breakbeats and creative songs. Check out our website at www.geocities.com/SoHo/2611/

MULTISAVER HAVE killer songs, need bassist and drummer for gigs, CD ready to release, plans for Reading '98, likes Iggy to Flying Saucer Attack. ☎ 01488 683855 (Berks).

MUSICIAN/PROGRAMMER REQUIRED to collaborate, interest in Kraut/space-rock, experimental, Neu!, Harmonia, Cluster, Can, Kraftwerk, Suicide, Stooges, VU, Cope; ideas, South Manchester. ☎ Tony 0161 448 9302.

REGGAE MUSICIAN, drummer, guitarist, keyboardist wanted by bassist for covers and original vibes, dedication and commitement very important. ☎ 0181 852 5324.

TALENTED BASSIST, drummer sought to join others with great original material for recording and gigging ASAP, west country area, no time wasters. ☎ Mark 0171 323 5269/01225 460520.

COMPUTERS/SOFTWARE

AMIGA 500, 1Mb, Mega I sound sampler with software, MIDI interface, OCtamed, Protracker, still boxed including hundreds of games, £120 ono. ☎ 0151 339 4404.

AMIGA 1200 100Mb hard drive, monitor, 6Mb RAM accelerator, Squirrel SCSI interface, MIDI interface, Musicx X V2, Bars & pipes Mk II sample wrench SCSI sample dump, £250. ☎ Darren 01203 717791.

APPLE MAC LCII, 12Mb RAM, 80Mb HDD, Apple colour monitor, 2-Midiquest (1-in/3-out) MIDI strips, Cubase 2.5 with manuals and disks and reg card, System 7, MS Word, £425. ☎ Steve 01475 521844.

APPLE POWERBOOK 1400C, 48Mb, 750 hard drive, modem, Emagic Logic, Steinberg Recycle, Rebirth, MOTU MIDI interface, as new condition, £2000. ☎ Andy 01442 878370.

APPLE POWER MAC 8200/120 PCI 1.2G, 6XCD, 32 Mb, 4 Mb VRAM, keyboard, mouse, £800; Cubase Audio 3.05XT with Audio VST 3.5, £400; Steinberg Recycle 1.6, £100; Steinberg Timebandit 2.52, £160. ☎ 0181 900 1715.

APPLE QUADRA 800 32Mb RAM, 230 hard drive CD300e CD-ROM, Audiomedia II card, sound designer & Materialist software, Logic Audio Discovery 3, no monitor or keyboard, £850 ono; Yamaha drum sound cards for RY30/RM50 or SY/TG synths; dance/percussion/ effects drums, £15 each. ☎ Dave 0115 950 7033.

ATARI 2Mb, hi-res monitor, 42Mb hard drive, E-Magic Notator V3.16, dongle, manual, lots of other software, £250. ☎ 01425 274422 (Oliver).

ATARI 4Mb Cubase setup with brand-new 14-inch unused high-resolution monitor, complete with manuals, MIDI leads, tutorial video and more, £325 ono. ☎ 01628 637891.

ATARI 520ST, 4Mb plus SM124 monitor software, will deliver, £150; Korg Poly 800, mint condition, will deliver, £100. ☎ 0411 284423.

ATARI 520 STFM, high resolution monitor, boxed with manuals, as new, easily upgraded with more memory, only £120 ono. ☎ 01484 647210 or 01484 472690.

ATARI 520STE, upgraded to 4Mb with SM124 monitor, £225 ono. ☎ Mark 0973 719650.

ATARI 1040STE, 4Mb upgrade, hi-res monitor, Cubase V2 software, £250; Yamaha MU10XG sound module, £99, all items in perfect condition. ☎ Steve 01553 674076.

ATARI 1040STE, 4Mb, SM145 monitor, Cubase 3.1, Pro 24, stereo master, still in original box, manual, dongle, excellent condition, £300. ☎ Jason 01206 545714 (evening).

ATARI 1040STE with Tatung high res monitor, C-Lab Creator, manuals, C-Lab Unitor 2 in/out (32 midi channels) & SMPTE £300. ☎ Gavin 0181 552 5124/0171 359 9141 (days/evenings).

ATARI 1040STE 1Mb with SM144 monitor plus Cubase V3 and disks with 2 sampling CDs, £200 ono; the lot. ☎ Tim 01543 682947 or 0411 453 222.

ATARI 1040STFM, Cubase, 3 Midex 2 MIDI-in 4 MIDI-out with SMPTE, monitor & trackball, offers around £250. ☎ James 0468 886487 (anytime).

ATARI 1040STE, 4Mb, 2nd drive software, Cubase, mouse, good condition, £230 ono; DJ decks, two Technics SL1210MkII with Stanton cartridges, £500. ☎ Phil 0131 228 2015.

ATARI HIGH RESOLUTION emulator, converts any TV or colour monitor into hi-resolution, complete with instructions, £10. ☎ George 0181 785 9862.

ATARI HI-RES monitors, 14-inch screen with sound (metronome) suitable for Cubase/Notator, in very good condition with carton so can despatch, two for sale at £75 each; Roland Colour monitor, 14-inch screen, complete with special RGB cable, suitable for S770/S760/S750/S550/S330, in good condition, £85. ☎ 0181 668 6077.

ATARI MEGA ST4, 4Mb RAM, hi-res monitor, £200; Casio C25000 with 8-track sequencer with manuals, £300; Roland U220, £300. ☎ 0976 220461.

ATARI ST,1Mb, colour monitor, printer and software, £190; Boss SE50 multi-effects, £200; Mackie 1202, £200; Korg 05RW, £240. ☎ 01827 53220.

ATARI STE, 4Mb RAM, with hi-res monitor, complete with Cubase, mint condition, £225 ono. ☎.Glenn 0973 733767 or 01925 721903.

ATARI STE, 4Mb, monitor, Replay 16, Breakthru V2.0, £125. ☎ Sheffield 0421 828898.

ATARI STE 1Mb with monitor and extra disk drive, Replay, Cubase, £150 ono. ☎ Sean 01371 876625.

ATARI STE, 2Mb including C-Lab Notator sequencing software with dongle, manual, Arnor word-processor, database and Power Pack Games; all in excellent condition, £150; printer also available. ☎ 01202 690447.

ATARI STFM, 2mb, 20M hard disk, 3.5-inch disk, SM125 monitor, Cubase Score, boxed as new, Steinberg Midex. £350. ☎ Gordon 0802 425939 (anytime).

ATARI STFM 1040, SM124 mono monitor, keyboard and mouse, Cubase VS.3.0 and Canon BJ-10ex bubble-jet printer, £350 ono. ☎ 01555 662071.

ATARI STFM, 2.5Mb,SM124 monitor, Cubase, KCS software, £130; Cheetah MD16R drums with display, £90; Kawai MDK61 masterkeys, £120; good condition with manuals. ☎ Tony 0973 714059.

ATARI STFM, 1Mb with hi-res monitor SM125, also E-Magic Notator, SL3.21 plus dongle, manual, training video, £220 ono. ☎ 01189 470761.

ATARI ST520FM, 1Mb, double sided drive, mouse, with DR.T's Omega 64-channel MIDI sequencing software, DR.T's Caged Artist, Roland D110 editor with over 700 sounds; Harlekin organiser, and database program, runs in any screen resolution, £175 ono. ☎ 01305 772708.

CREAMWARE TRIPLEDAT version 2.4, masterport and software, £600. ☎ Darren 0973 387715.

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PENTIUM 200 MHZ system with 32Mb RAM, Audiowerk 8, AdB Multiwav, Sound Forge 4.0 & Logic Audio 2.6.9. SCSI, Matrox Mystique. ☎ 0467 77 0963.

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STEINBERG ADAT CONTROL interface, controls ADAT using Cubase's transport controls, reads ADAT code, PC/Mac/Atari, cost £295, sell for £125; Denon DAT DTR2000, full size pro DAT optical and coaxial ins/outs, 6 months old, boxed, cost £995, sell for £395 ono. ☎ 0966 463429.

STEINBERG AVALON V2.1 universal sampie edition/librarian, plus the Avalon 16-bit D/A stereo convertor, all for Atari ST/STE, cost £700, will sell for £295. ☎ 0181 883 4329 or 0956 339577.

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TURTLE BEACH TAHITI and Maui soundcards (including 8Mb sample RAM) manuals and software, turns your PC into a high quality sampler, £200 ono. Jeff 0161 4642438.

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EMS SYNTHI A or AKS; email iwasse@anet.ne.jp ☎ Kaz +81 3 3795 3571 (Tokyo, Japan).

EPSILON IN Malaysian Pale by E. Froese, on CD. ☎ 01297 316608.

FM SOUND EDITING SOFTWARE for Commodore 64 FM sound module, also Synergy by Larry Fast. Please write to Mr M.J Gammon, 56 Packley Way, Sutton-In-Ashfield, Notts NG17 3HT.

KORG 800DV, must be in excellent condition, cash waiting. ☎ 01274 878626/0802 853020.

KORG SDD 3000 delay. ☎ Tracy 0181 348 6280/859 5125 (day/evenings).

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ROLAND MSQ100 user manual required, also for Korg Poly 800. ☎ Blair 07258 451552 (evenings).

ROLAND SPD11, in good condition. ☎ Greg 01223 214962.

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YAMAHA QS300 workstation wanted, in very good condition, with manual, will pay £600; Roland Juno 60 in mint condition with box and manual £295. ☎ 01527 521268 (evening).

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MISCELLANEOUS

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TIE-BREAKER

This Allen & Heath WZ14:4:2 could make your New Year's resolution a reality. In no more than 30 words, tell us about a previous resolution you didn't manage to keep, and why?

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Post your completed entry to: *SOS* Allen & Heath Competition, *Sound On Sound*, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ.

A&H Wizard Competition

Christmas is great, innit? It brings the family together... so they can then rip each other's throats out — more an annual riot with sage and onion stuffing than a religious festival. Allen & Heath, in conjunction with *Sound On Sound*, invite you to put all that behind you with this New Year competition. On offer is A&H's latest addition to their popular Mix Wizard Series, the versatile WZ14:4:2.

From the release of the first Mix Wizard, the WZ16:2, it became obvious that the series would stand for plenty of input channels, plenty of EQ power, lots of auxiliaries, and silky-smooth 100mm faders, all in a 10U-high rackmountable chassis, with a sub-£1000 price tag. The newest member of the family, and the mixer on offer here, is the four-group WZ14:4:2, worth £960. It could be seen as a happy union of the features of the previous two models, and continues to utilise MSP (Minimum Signal Path) technology to ensure low noise. Features include 10 mono mic/line inputs, each with 4-band EQ (two swept mids), EQ switching, high-pass filter, six aux sends (a pre/post switch for aux 1-4 and another for aux 5-6), mute switch and latching PFL button.

Two stereo channels, with a few neat features, are also on offer. There are two sets of inputs (A and B), with the A set having phono connectors and the B set using quarter-inch jack inputs. Both A and B inputs have individual gain control and on/off switching, and they share 4-band EQ (without the swept mids of the mono channels). Add a further four stereo effects returns and two track return inputs and the WZ14:4:2 offers a generous total of 26 inputs to the mix.

The WZ14:4:2 is not only generous — it's clever too. A natty REV switch provides group/aux reverse functions, so you can fine-tune the aux send levels using the more tactile long-throw faders of the master section — particularly handy if you think your desk might be pressed into service for live sound front-of-house or monitoring duties.

If one of your New Year's resolutions was "get out more often and make some friends", sorry pal — we can't help you. But if it was "get more gear and spend more time in the studio", we couldn't be happier to oblige. All you need to do is cast a discerning eye over the questions listed on the left, answer them correctly, make us smirk with your carefully crafted tie-breaker, and bingo! You could be a winner. Just make sure your entry is with us no later than **Friday, February 6th.**

the small print

1. Only one entry per person is permitted. 2. Employees of SOS Publications Ltd and Allen & Heath, and their immediate families are ineligible for entry. 3. No cash alternative is available in lieu of this stated prize. 4. The competition organisers reserve the right to change the specification of the prize offered. 5. The judges' decision is final and legally binding, and no correspondence will be entered into. 6. No other correspondence is to be included with competition entries. 7. Please ensure that you give your DAYTIME telephone number on your entry form. 8. Prizewinners must be prepared to make themselves available in the event that the competition organisers wish to make a personal presentation.

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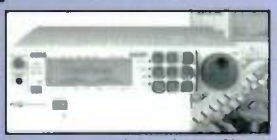

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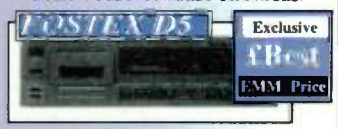

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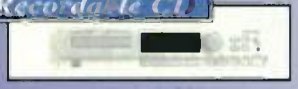

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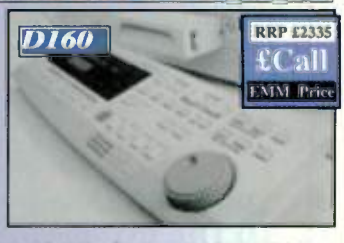

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Weighty, up-to-date textbook that address all the areas of the project studio recording market - digital recording, MIDI, mic placement, signal processing and the business side of things are all covered - there's even a comprehensive glossary. While approachable enough for the home recordist, more experienced recordists should find this to be a helpful book.

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PRACTICAL RECORDING TECHNIQUES

by Bruce & Jenny Bartlettt

Another recording textbook that offers a mine of information in one volume. Mic placement, recording spoken word, working with MIDI and digital audio are covered, and there are even sections on location recording and recording classical music.

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HOW TO SET UP A HOME RECORDING STUDIO

By David Mellor

If you are thinking of setting up a home studio, a project studio or a DJ studio, this book is the place to start. It takes a highly practical 'nuts and bolts' type of aproach to help you produce an efficient and productive studio. It covers soundproofing, keeping the sound in and the noise out, acoustics, studio layout, and studio equipment, and advice on the kit you are likely to need. The book ends with an invaluable questions and answers section, a glossary of terms and a list of contacts.

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MUSIC BUSINESS

THE STUDIO BUSINESS BOOK

by Jim Mandell

This is a rarity: a book dealing solely with the business side of the recording industry. No mic placement or working with MIDI, but simply good sound advice on running your studio as a going concern. While the bias is definitely American, much of the advice and tips can easily be translated into useable techniques on this side of the Atlantic.

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THE COMPOSER'S GUIDE TO MUSIC PUBLISHING (2nd Edition)

Written & compiled by Annie Gunning

This book has been produced by the Association of Professional Composers and examines the business of musical copyright and music publishing from the composer's point of view. It aims to educate composers of all kinds of music in the operation of the music publishing business to help them obtain, negotiate and benefit from publishing agreements and avoid expensive mistakes. Apart from publishing, the book also covers copyright legislation, performing and mechanical rights, the royalty administration societies, music in film, broadcasting, theatre and ballet and commissioning agreements. There is also advice for composers setting up their own publishing companies. An exhaustive and useful book.

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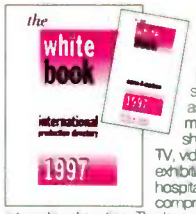

This is the latest edition of the essential source of contacts for artists, performers, venues, services and facilities associated with music, concerts, shows, festivals, film, TV, video, conferences, exhibitions and corporate hospitality - there's even a comprehensive international section. The layout is logical and an index makes fact finding an easy task - altogether an indispensable 864 pages. The new edition once again comes with a complementary copy of The Little White Book, which distils the contents of the larger volume to a pocket-sized list of names and phone numbers.

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RECORDING THE GUITAR

by John Harris

This book focuses specifically on all aspects of getting the sound of the guitar, electric or acoustic, onto tape, hard disk or into your sampler. Starting with, setting up, strings, intonation and playing techniques. Electric guitarists will learn when to mic up. Diagrams illustrate different mic positions. You'll find out how to use compression, reverb, delay, gation, flange, chorus and harmonisers. There is also a section on recording MIDI guitar and using sequencers.

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Joe & Pauly Ortiz

If you prefer the idea of programming your own drum parts to using sampled loops and breaks,but don't really know what makes a good drum pattern tick, this book is for you. It provides over 200 drum patterns in grid form, and so that you can hear how they work, there's an accompanying disk of MIDI files of the patterns. You can also read informative comments and analysis of the patterns you're programming, which are grouped into styles such as 50's & 60's, Soul & Dance, Jazz & World Rhythms. Price includes MIDI file, for PC, Mac, or Atari.

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THE ART OF RECORD PRODUCTION

Richard Burgess

This is the most comprehensive guide to record production ever published. It is an insiders guide to the mysteries of the recording studio and the problems faced by the modern day record producer. It includes a rundown on the different types of producers available, what they are likely to earn and the relationships they have with artists and record labels. A must for everyone interested in the world of record production.

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SOUND ASSISTANCE

by Michael Talbot-Smith

This book has been designed to be readable and easy to understand. Aimed at anyone wishing to work for a sound assistant, but who lacks a thorough grounding in maths and physics.It starts from basic electrical principles, going on to cover electronic devices, sound and hearing, basic acoustics, mics, speakers, analogue and digital recording, TV sound and PA. There's even a section on safety, plus a glossary and a further reading list. The author is a former trainer of audio engineers at the BBC's Wood Norton facility.

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Gary Hustwit

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HOW TO SUCCEED IN THE MUSIC BUSINESS

Allan Dann and John Underwood

Completely updated and revised from the original edition, this has become the classic guide to avoiding the pitfalls that can beset a newcomer in the music industry. The book contains sections on songwriting, recording and artist management, as well as sample contracts and a general guide to the kind of terms offered by publishers, record labels, managers and agents.

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ALL YOU NEED TO KNOW ABOUT THE MUSIC BUSINESS

by Donald S Passman

This book is a must: the author manages a portfolio of high profile clients and teaches music business law at the University of Southern California, and has produced a clear overview of the music business. He starts at the beginning of your career, with advice on choosing a manager, lawyer and agent, and moves through getting a record deal, songwriting and music publishing and finishes with details of copyright, mechanical royalties, songwriter deals, films and more. An exhaustive and entertaining read. 415 Pages.

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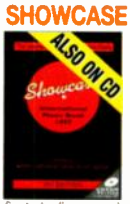

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by Jon F Eiche

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THE MIDI COMPANION

by Jeffrey Rona

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THE MIDI FILES

By Rob Young

This book comes from Prentice Hall and aims to help you get the most out of your MIDI system, by providing loads of tips on programming realistic instrument and rhythm parts, using sequencers to create advanced effects. Basic MIDI concepts are covered, along with advice on setting up a MIDI-based home studio. More advanced discussions cover specific types of MIDI messages and what you can achieve with them. All the techniques in the book are illustrated on a supplied floppy disk.

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MUSIC TECHNOLOGY REFERENCE BOOK

by Peter Buick & Vic Lennard

Written by Peter Buick and Vic Lennard (author of SOS's Atari Notes column), this book offers information at your fingertips and is an indispensable reference source for the musician or sound professional in the recording, broadcast, live, video, computer, multimedia, post production and theatre industries. It includes comprehensive MIDI spec, General MIDI, MTC, MSC, and SysEx information. It also includes charts, check lists, useful hints, tips, and ideas, plus a glossary, list of contacts and a comprehensive indexed, it is also organised into convenient sections. 150 Pages.

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This is a MIDI book unlike any other. It explains the fundamentals of MIDI and MIDI sequencing for the beginner, and it goes much further, dealing with issues that will be of help to more established users. Advice on MIDI fault finding, help for musicians using sequencers with live bands, MIDI messages and MIDI files, plus programming material. So if you are a keen first time user or a MIDI veteran, there will be something in this book to interest you.

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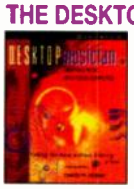

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EMAGIC

THE EMAGIC LOGIC TUTORIAL VIDEO

Produced by Emagic themselves, this video once again sees Tim Walker in the tutor's chair. This takes you through the first steps of getting the software up and running, and covers virtually all the controls you'll need. This video is valid for all versions of Logic, whether being run on an ST, Mac or PC. Presentation is rather intriguing, with a mobile camera that helps to hold the interest more than the average training video and some interesting graphics that aid comprehension and help to quickly find specific tutorials and bits inside tutorials. Contents as follows:

- Tutorial 1: The Arrange window and basic sequencing
- Tutorial 2: Playback parameters & Toolbox
- Tutorial 3: Controlling MIDI data flow
- Tutorial 4: Manipulating sequence data
- Tutorial 5: Moving around in Logic
- Tutorial 6: Windows and key commands
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RECORDING

THE V-XPANDED VS 880

In association with Roland UK & Roland Corp USA

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CUBASE

STEINBERG CUBASE

This manual is presented by Chris West, Steinberg expert. It's very much a practical, "get up and running" video, showing the novice user exactly how to install and begin using Cubase, whether they're running the program on an ST, Mac or PC computer — there's even a basic background on using the computers themselves! All of Cubase's controls are shown, explained and demonstrated in depth. Once you're familiar with the basic controls, Chris takes you slowly through recording your first session, followed by overviews of the various edit screens. It's rather like having an expert tutorial that you can run again and again in the comfort of your home, until you can use Cubase like a true pro.
Topics covered include: the main screen, customising names and outputs, copying and pasting between arrangements, MIDI filter, cycle mode recording, the tool box, all edit screens.

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SYNTHESIZERS

ROLAND XP-80

In association with Roland UK & Roland Corp USA

You will have the knowledge of an experienced Product Specialist permanently available in your own home when you purchase this essential video. It enables you to quickly grasp the knowledge of the many functions, and how to use your newly acquired knowledge. The video also incorporates Labyrinths unique Video Index System.VIS TM, which uses a combination of permanently on screen Time Code together with a Contents Listing.

CODE V073 **£24.99**

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ROLAND XP-50

This XP-50 video owners manual is produced by Roland Corporation US and covers all the major features of the instrument in detail. This is an application based video that provides many examples of how your new found knowledge can be applied. Just a few of the 30 separate topic areas covered are: Effects, Choosing Sounds, Loading a Song, Loop Recording, Copying a Track to Pattern, Making an RPS Set, Track Editing, Multitrack Recording, Patch Editing, Creating Splits & Layers in a Patch.

CODE V063 **£24.99**

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ROLAND JV-1080 VIDEO MANUAL

Roland's amazing JV-1080 synthesizer module is covered in detail in this informative video. Presented by Tim Walker the video guides you through the basics, and leads you painlessly onto the advanced features. The video even shows you how to fit the expansion boards & gives demonstrations of some of the wonderful sounds they contain. Once again this video has been produced in association with Roland UK & USA to ensure that everything it contains is accurate, and relevant to the new and more experienced users alike.

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VOICE TRAINING

VOCAL WORKOUT Video

by Sam West

Singers of varying abilities will find this video a great aid in assisting their vocal efforts. It begins by explaining the principles of voice production. Breath control exercises plus general vocal techniques are all explained and visually demonstrated. All the exercises are written out in an accompanying booklet, with piano accompaniment.

VIDEO CODE V067 **£22.95**

Running time approx 59 minutes
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VOICE BUILDING

Cassette/CD

by Sam West

Although geared towards singers of varying abilities, voices and styles, the contents of this recording are often challenging even to the professional singer! The video (code V067) goes into more technical detail, whereas the CD or Cassette concentrate on more intensive practising. First of all the exercises are sung, in various keys and then with musical accompaniment and melody line, so you can concentrate more on your voice while practising (karaoke style). Vocal exercises can be boring, but this studio recording has been produced and presented to a very high standard, with interesting musical accompaniments to the exercises.

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Running time: 1 hour 10 minutes

LEVEL TWO

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CODE V006 **£24.95**
Running time: 1 hour 45 minutes

LEVEL THREE

This video is packed with information and professional tips on advanced MIDI applications in the home studio, including interfacing with sequencers, which sync code is best for which application and why. Hit producer Martyn Phillips (Erasure, London Beat) discusses modern recording techniques, and top programmer Paul Wilton examines
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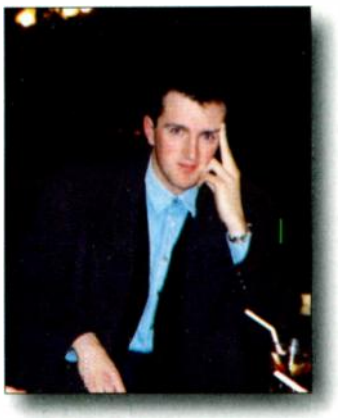


sounding Off

Did you spot the rather unlikely recording setup in a recent sci-fi blockbuster? PAUL FARRER did...

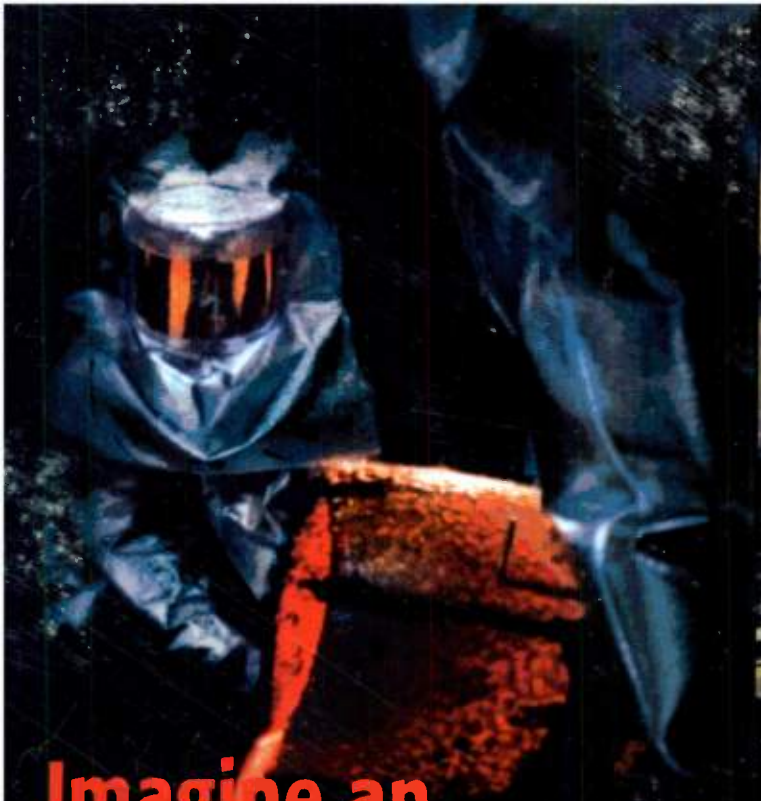
Not long ago, I was sitting in my local cinema enjoying the excellent Jodie Foster film *Contact*. I was merrily suspending all layers of disbelief as the ingenious plot twisted and turned from decoded alien messages through to pan-dimensional deep-space travelling devices. I was dazzled and dazed by the special effects and in quiet awe at the sheer spectacle of the film — until the scene when we got to sneak a peek at the recording medium onto which Ms Foster and her astronomical team first captured the message sent from the farthest reaches of the Universe. Time-travel I can live with, dinosaurs reconstructed from dried-up DNA millions of years old, OK — but any movie that dares to insult my intelligence by suggesting that the best recording setup is a pair of Tascam DA88s perfectly sync'd up to two ADAT XTs really is pushing it a little too far. Clearly the production designer picked this curious combination of formats because they looked good on screen, or perhaps the film's director was somehow obliged under some strange US law not to show any on-screen favouritism towards a particular recording format. Whatever the reason, it provoked a series of mind-expanding questions, and very few answers... Imagine a world where man's only goal was the pursuit of excellence, in all walks of life. The recording studio would be no exception and all of our equipment would be designed with that specific aim in mind. Glib phrases like 'Limited Design Life' and 'Customer Beta Testing' would be things of the past, software would work first time, hard drives would not corrupt at the first sniff of a SCSI cable with a slightly different build spec than the ones it was used to, and we'd all have the same recording format.

OK, in today's studio there are certain constants already (such as DAT) and we all have the same size of MIDI sockets, but it looks as if the bitter war between Philips' DCC and Sony's MiniDisc has resumed once again, and once again consumers are confronted with the age-old "will it be VHS, Betamax or Video 2000?" dilemma. It seems that, as we move further and further down the inevitable digital road, with all the benefits that it brings, we've sacrificed a good deal of invaluable cross-compatibility to the ravages of corporate marketing men. I love my digital studio, and I can now do work in an hour that would have taken weeks less than 10 years ago, but ask another engineer to drive the studio, or ask me to move to another studio for additional recording, and it is a serious headache. Why? Because my studio is tailored to fit my needs exclusively, and any other studio I move to might not have the same MIDI gear I use, the same samplers, hard drives, or even the same recording format. According to Darwin (the Victorian biologist, not the Emu multitrack), there is a law which dictates the 'survival of the fittest', and in studio terms this would mean inferior formats being left to survive without mass attention, but is that really the case? Is VHS really the best domestic video format or did it beat off the competition because a large electronics company did a deal with the film distribution companies and managed to get their models into the shops at a great price just in time for Christmas 1982?

Like it or not, we live in non-compatible times. If you disagree, just ask anyone who has ever tried to go about putting a decent soundcard, hard drive and multiple-MIDI-output device into a PC, and then tried to find a piece of software that will not only recognise all the constituent parts within its designated computer host, but will actually do what it was originally supposed to do! Lists are circulated on photocopied pieces of paper about which software programs 'like and dislike' which drives and soundcards, and we hardly bat an eyelid when a major piece of recording software or hardware is shipped six months too early, with a host of operational problems and shortfalls that you just know will be fixed and sorted out by the time version 2.01 is in the shops. Music stores have even given up worrying about it all, and some are practically admitting the whole situation stinks by offering the only safe advice under the circumstances — "Look, just buy everything from us because we know what works with what." So much for technology empowering the small studio owner.

Where does all this leave us? For a start, a little more 'glasnost' or — dare I say it — collaboration between manufacturers might help to oil the wheels of cross-compatibility and make for better products. No-one wants to be buying into exciting new technology only to find it redundant in a matter of months, and I would imagine that consumer worries and jitters are a major cause of concern for manufacturers. Jodie Foster has her sights set on the heavens and she uses both ADATs and DA88s. Homer Simpson, on the other hand, has a Betamax video. I rest my case. SOS

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, Cambs CB3 8SQ. 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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CD Architect includes native versions for Windows 95, Windows NT-compatible (x86, Pentium, Alpha systems) on a single CD-ROM.

CD Architect

SONIC FOUNDRY

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SCV LONDON

INTRODUCING THE KORG 1212 I/O PCI CARD

A visionary approach to simultaneous digital multi-tracking.

1. Stereo analog output –10/+4 switchable – gives total dynamic range of 94db; massive dynamic range.
2. 20-bit A/D Converters – professional sound quality.
3. Stereo in/out possible on all interfaces with any Sound Manager or Win 95 compatible programme "Future-Proof".
4. ADAT optical I/O sends 8 channels of 20-bit digital audio down one fibre optic cable, allowing simultaneous 8- channel recording from a digital mixing desk OR any digital recording device fitted with the optional interface. Separate external mix-down of those 8 channels outside the computer, now or at any point in the future.
5. SP-dif I/O – additional 2 channels of digital audio to be recorded or externally mixed, plus direct connection to CD's and DAT players.
6. ADAT 9-pin sync connector – in conjunction with ADAT optical I/O, this allows full synchronised editing of ADAT recordings (using Deck 2.6 or Cubase VST software) complete with chase lock.

OTHER FEATURES & BENEFITS

- Compatibility of platform – Because it's PCI, you can use it on both Mac and PC.
- Software Support – Fully "open ended" – the card is already supported by the 3 big software houses Steinberg, Emagic and Mark of the Unicorn; and many others recognise the KORG 1212 card as the probable industry standard and will be announcing their support for it in the future.
- World Clock Sync I/O – 1212 can be the world clock master in a small system, or slave in a big system; regardless of interfaces being used. Making it "Future-Proof".
- Multiple 1212's can be used simultaneously in one machine – for applications when 24 or 36 in/outs are required.
- £599.00 – Unbeatable price for the level of performance in digital systems.
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- Deck II software available at £249.

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