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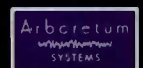
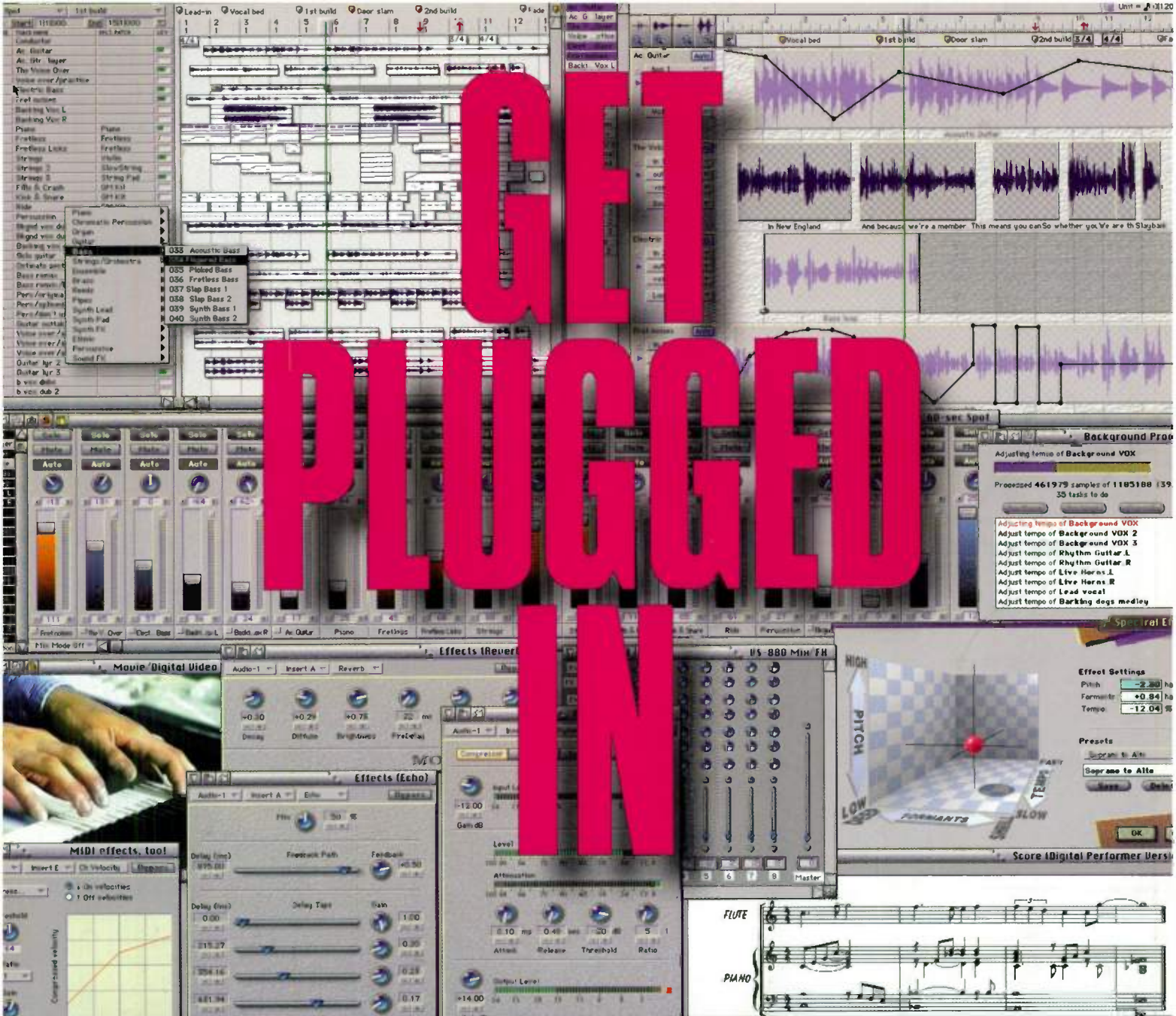
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TSC

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If you were to rely entirely on the advertising in *Sound On Sound* to give you a clear picture of the current state of home recording, you might reasonably come to the conclusion that everyone has a Mac or PC running a MIDI + Audio sequencer. Attached to this would be a bewildering array of MIDI samplers, exotic renaissance 'analogue' synths and digital mixers. The real world, however, is still largely based around Atari running old versions of *Cubase*, 8-track analogue tape machines, solitary ADATs, and analogue mixers with no automation. Even so, a lot of you seem to be on the verge of making the leap from tape to tapeless in the belief that it will help you make better-sounding recordings. It might, but we'd like to make sure you jump for the right reasons.

Because of the number of phone calls we take on this subject every day, we're in the process of putting together a short series to explore the different hard disk options, including their strengths and their weaknesses. You may have been seduced by the promise of non-destructive cut and paste editing, but I'd like you to think very hard about what you're giving up before you embrace the new technology. Whatever their faults, analogue tape

recorders are easy to use and relatively straightforward to maintain, and most sound better than their 16-bit soundcard equivalent. If a tape gets tangled, you only lose the tangled bit, and if you record the tracks in sync,

there's no way those tracks can go out of sync later. When the tape is full, you take it off, archive it, and use another. Not so with hard disk!

Tape recorders are machines, and as such they make some noise, but you'll find they sound very quiet



next to a computer full of fans and hard drives. As I've said on previous occasions, expect problems if you want to record vocals or quiet acoustic instruments in the same room as a computer, and before parting with any money at all, make sure that the system tugging at your credit card strings fits in with your way of working. For example, if you tend to do a lot of punching in and out, you're probably not going to take too kindly to a machine that will only handle punch-ins if you program them first. What's more, if you're a guitar player and you want to punch in and out with a footswitch, will the hard disk system let you? It's almost certain that your tape machine will do this, and various stand-alone hard disk recorders work this way, but computer-based systems may be less accommodating.

Of course, hard disks can do tricks that tape never can, but there are certain key functions that must be supported first if the additional bells and whistles are to make any sense. After all, technology is supposed to make life easier, but when it comes to computer workstations, how often can we honestly say that's really the case?

Paul White Editor



156
Fostex D160
Digital
Multitracker

REVIEWS

- 30** SPL Dynamaxx Compressor
- 32** DACS Headlite Headphone Amp
- 34** Bellari RP583 Tube Compressor
- 36** TL Audio Indigo Valve Overdrive
- 79** Doepfer MS404 Analogue Synth
- 88** Lexicon Vocal Fix PCM90 Card
- 92** FAR CR10A Studio Monitors
- 96** Midiman Digipatch Digital Patcher
- 118** Event Gina Multitrack PCI Card
- 138** Yamaha CDR400TX CD Writer
- 142** Quasimidi Rave-O-Lution 309 Expansion Options
- 156** Fostex D160 Hard Disk Recorder
- 166** Roland V-Drums System
- 182** Philips CDR870 CD Writer
- 186** Tascam DA98 Digital 8-Track
- 232** Empirical Lab Distressor Compressor
- 240** Symetrix 551E EQ

WIN XPRESSION MONITORS & SUB-BASS Pg 272

Computer notes
Apple Notes 250
PC Notes 252
Atari Notes 254

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in this issue

FEATURES

- 38** Dear Santa...
- 46** Writing A Channel 5 Theme Tune
- 128** N-Trance
- 146** Morcheeba
- 174** Equipping A Home Studio Pt 1
- 192** Tchad Blake
- 206** Buying A Voice Channel
- 284** Retrozone: ARP Odyssey

SOUND WORKSHOPS

- 54** Synth School Part 5: S&S Synthesis
- 214** Drum Miking Part 1
- 222** Budget Location DAT Recording
- 242** The Why & When of Processors Pt 3

REGULARS

- 4** Crosstalk
- 8** Shape Of Things To Come
- 236** Sample Shop
- 258** Demo Doctor
- 268** Free Ads
- 278** SOS Mail Order: Books, Videos, CDs
- 283** Classified Ads
- 304** Sounding Off



92
FAR CR10A
Monitors



46 Writing
A Channel 5
Theme Tune



166
Roland V-Drums

PC MUSICIAN
Large Project Recording & Storage p106



79
Doepfer
MS404
Monosynth



146
Morcheeba

WIN P&R AUDIO
PC SETUP Pg 276

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The SOS web site can be located at
<http://www.sospubs.co.uk>

We've Got A FZ Box And We're Gonna Use It

I recently bought a Casio FZ1 sampling keyboard, which, although getting on a bit now, is still a useful machine.

Unfortunately, there were no sample disks included with the sampler. Do you know of any source on the Internet for FZ1 samples? Also, I think there is a mod that can take the machine up to 4Mb (its normal limit is 2Mb): the details used to be on the Internet, but the URL is no longer active. Any idea where I can find these details again? Your help would be greatly appreciated.
Saul Hudson.
via email

I own an old but still very useful Casio FZ10M sampler and was wondering if there was any way of increasing the amount of RAM inside the machine from 2Mb to 4Mb. I think there was a version of the later FZ20M module which was equipped with 4Mb from the factory, so perhaps mine could be upgraded? Also, I'd like to set up a mixer map in Steinberg's Cubase,

but can't work out the System Exclusive codes needed for the FZ10M. Can you help?
Chris New
New Zealand

Derek Johnson replies: *If you want to locate sample disks for the FZ1, start with Big Time Productions (PO Box 520, Burslem, Stoke on Trent, Staffs ST6 5UR. Tel: 01782 810611). They have a large, varied catalogue of samples available in many formats, including disks for machines such as the FZ1, which are no longer manufactured. For the official Casio library, plus several more libraries besides, check out the UK Casio FZ1 Club (www.kave.demon.co.uk). They can provide loads of disks for just £3.50 each. I also found a library of FZ1/FZ10M/ FZ20M samples at the Kid Nepro web site (www.kidnepro.com); their entire FZ library can be bought for US\$500, if you like! I haven't been able to track down any downloadable, free, on-line FZ samples.*

Regarding the mythical 4Mb RAM upgrade, hard information is

scant, and seems to have originated with an FZ fanzine, Casio FZ World, a few years back. However, FZ-fanatic Stuart Robertson has placed details of the mod on the Internet; a small corner of his recently redesigned web site (www.netcomuk.co.uk/~stuart/FZ/index.htm) is given

over to the mod, along with a lot of other FZ-related info and links. Stuart has actually increased his FZ1's memory, using SIMMs rather than the D-RAM specified in the original article. The usual warning about opening your machine and doing non-standard things to it - apply: don't blame us (or the web site) if it all goes horribly wrong. Get professional help if you can't do it yourself. One thing to bear in mind, as Stuart notes, is that the 4Mb mod can only be done to an FZ1, because Casio changed the memory management chips on the modules, and it was an anomaly in the original device that allowed the surgery to work. Regarding Chris' idea of a factory-fitted 4Mb FZ20M, I don't think this was ever the case. The confusion could have arisen because the FZ1 was originally a 1Mb machine, expandable to 2Mb, while both the FZ10M and FZ20M were equipped with 2Mb straight from the factory - ie. double the capacity of the basic FZ1.

Further FZ data can be accessed on the Notelt FZ1 Page



The Kid Nepro site.

(www.geocities.com/soho/2163/fz.html), which provides links to PC sample editors and other resources. One particularly nifty site Notelt leads you to is actually based in New Zealand: Jeff McClintock (<http://users.iconz.co.nz/jeffmfzdump.htm>) has written a PC-based utility called FZDump, a basic, but freeware, sample transfer program for the Casio FZ-series samplers. The software, which is available for Windows 95 or DOS, supports voice, bank and full dumps and can send and receive WAV files. Jeff also recommends a piece of PC software called AWave! which converts between a huge number of different formats and platforms (including FZ format). Jeff's page has a link for this software. For the record, Sound On Sound reviewed the FZ1 back in June 1987 and the FZ20M in August 1989. □



Casio's FZ1 — gone but by no means forgotten.

Speed Pique

I'd like to report a strange phenomenon in Emagic's Logic Audio v2.6. When I import an audio file, everything seems fine in the Audio window, but as soon as I shift the file into the Arrange window and play it back, the sound plays too slowly and I get an error message — something like: "Logic cannot sync MIDI to audio. Sample rate of 40.1327 detected." The detected sample rate is different every time, but never 44.1kHz! After messing around, I noticed that sometimes, on closing the Transport window, the sound would suddenly play at the correct speed. My computer is a Pentium 200 with 32Mb RAM, 1.2Gb IDE hard

drive and 2.1Gb SCSI hard drive. I'd be extremely grateful if you could provide some help. Problems such as these can really take the fun out of recording and I'd rather get on with creating music! Thanks a lot: I'm a great fan of SOS.

Andy
via email

Martin Walker replies: *The fact that you get such strange (and variable) errors suggests that you are possibly using one of the new Audiowerk8 soundcards. If this is set up for a digital input, it will be expecting a wordclock signal. If this is missing, it*

will 'have a guess' at the correct sample rate, which could explain your problem. Double-check your soundcard settings. Incidentally, Sound Technology, UK distributors for Emagic software, have recently streamlined their telephone helpline system, which operates from 10am to 5pm Monday to Friday (01462 480500). If you're a registered user, they are already likely to hold details of your hardware setup, so are probably the best people to advise you. Don't worry if you get an engaged tone the first few times — once you're talking through your own problem, you'll be pleased that they don't cut you off quickly to take the next call! □

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Crosstalk

Clean Machine

In the November 1997 issue of *Sound on Sound*, you carried a review of Steinberg's *Cubase VST v.3.5* for PC. In the review Janet Harniman Cook points out some minor initial difficulties she had when running *VST* with the Creamware Triple card. May I point out that these problems were caused by drivers from other cards being installed on her machine? Despite Janet removing them, certain software elements such as DLLs, remained, upsetting the Creamware card. This is a lesson for us all, in that many present-day hard disk recording systems need a 'squeaky clean' system to work properly. Deleting drivers does not guarantee that all their components will be removed from the system. Our message for all users who want a trouble-free PC is to consider formatting your hard drive and installing just the software you need



when you get either a new audio card or music software. I know this takes time and we all just want to 'plug and play', but failure to do this can lead to many problems. Just for the record, we will shortly have a new *TripleDAT* software update (v2.5) which is free for registered users. Karl Brandt
MD, System Solutions
UK Creamware distributor

Janet Harniman Cook replies: I must admit to reading Karl's letter with a degree of wry fascination — he is obviously more

familiar with my PC than I am, despite the fact that he has never actually seen it — spooky!

However, I do endorse the general points that Karl makes regarding running a lean PC — and may I add that it is good practice to avoid installing games or demo software from magazine cover disks and especially 'ghost' software. Similarly, it is also a good idea to regularly sweep your PC of temporary files, especially after crashes. In fact, see my article on avoiding crashes in Windows 95, in November 1996's *SOS*.

Actually, the reference PC was in good shape at the time I researched and wrote the *Cubase VST* review — two weeks previously, I had installed Windows 95 Build B onto a pristine, reformatted hard disk, specifically to avoid the potential problems that Karl anticipated. The PC has four ISA cards (*Creamware Triple*, *TB Pinnacle*, *Digidesign Samplecell II* and *Adaptec 1505 SCSI*) and they have run without incident on the PC for several months. The only difficulty experienced in any application at any time before or after installing Build B was the *Triple card/Cubase VST* combination.

I found the problem very odd considering that the *Triple card* performed impeccably with *Cubase Audio XT v3.05*, but as long-term users will be aware, PCs can be extremely idiosyncratic, and occasionally an otherwise perfectly functioning system will refuse to entertain certain pieces of hardware or software which, in their turn, run perfectly on other PCs. This, I suspect, is the case here, but the problem could equally be a driver incompatibility with Windows 95 Build B, or a motherboard fault, or OS file corruption, or even a fault on the card itself.

I am a great fan of the *Triple card* (see my *Masterport* review — *SOS* October 97) and I spent a good deal of time attempting to solve this problem — including reinstalling *TripleDAT v2.4*, but to no avail. C'est la vie... □

One Of Our Opto-Isolators Is Missing...

Having purchased Craig Anderton's book, *Electronic Projects for Musicians*, I set about building the dual filter voicing unit and the super tone control, and both sound excellent. I'd now like to control them with the envelope follower circuit published in the same book.

Unfortunately, I have been unable to locate the CLM6000 chip specified for this circuit. Could you advise me if this chip is still available, or suggest a suitable alternative?

Andrew Lawrence
London

Derek Johnson replies: We can understand your problem: Craig's book was originally published back in 1975, and that's a very long time ago in electronic terms. Unfortunately, the book seems to be out of print... but no matter. I'm sure it'll return. The chip referred to, the CLM6000, is no longer manufactured, though it is possible to find small, but often pricey, stockpiles at various places on the planet, most of which appear to be in the USA. In looking around for alternatives, I found the CLM6000 in an old list published by PAiA Electronics, the noted American DIY synth company (www.paia.com). Coincidentally, PAiA have also produced commercial kits based on some of Craig's projects, so I had a word with the company's John Simonton. He was a great help, suggesting that, in the absence of the CLM6000, a device called an NSL32, manufactured by Silonex Inc (www.silonex.com), would be an excellent substitute. Further hunting turned up Silonex's UK office, and enquiries there revealed that the device is not only cheap, but available from a number of outlets. Chatting to Euan Davidson, Silonex UK's technical and sales manager, I discovered that the NSL32 opto-isolator is proving a popular part in the hi-fi and pro audio industry — it may actually be a part of your studio's mixing desk. Silonex's UK distributor, Plus Opto, are offering free samples to genuine manufacturers who can demonstrate a specific application, and will supply hobbyists with a pack of five devices plus a full 10-page data pack for just £5.50; send a cheque and SSAE to Plus Opto Ltd, Leigh Wharf, Canal Street, Leigh, Lancs WN7 4DB. □

Barking Up The Wrong Tree

Thanks for the positive review of *Pitbull Jungle Loops* in November 1997's *Sound On Sound*. I would like to point out that this product is distributed by us — EastWest — and not Time & Space as printed. Could you please rectify this in an upcoming issue?


Nick Wagstaff
EastWest Sound Warehouse

Derek Johnson replies: Glad to put the record straight,

Nick, and our apologies for any confusion caused by the error. Just to recap, reviewer Paul Farrer gave *Pitbull Jungle Loops* a credible four stars, and commented that "as a viable source of contemporary jungle drum loops and individual sounds Pitbull rates very highly indeed." The audio CD (Akai CD-ROM also available) costs £59.95, including VAT and p&p. Contact EastWest on 0800 393027, or point your browser at www.soundsonline.com. □



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Channel inserts	4	6
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Below: A few of the 400+ folks who work at Mackie Designs in Woodinville, WA, 20 miles north of Seattle.

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shape of things to come

by Derek Johnson



Korg raises the tone

Major label

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F 0181 932 0480.

W www.neato.com

Korg's Toneworks family of processors now includes two new rack devices, both priced at £469. Apart from the price, what's also common to both processors is 18-bit linear A/D and D/A conversion with a 48kHz sampling rate. The DL8000R digital multi-tap delay has four output taps, with adjustable level and pan for each of the left and right delay lines. Delay times of up to 4800ms are available; 10000ms is possible if pre-delay is used and the delay lines are connected in series. The large luminescent display provides a tempo display, alongside a conventional display in milliseconds. Other functions include tap tempo, audio trigger and MIDI trigger, and a range of modulation effects is also available.

The AM8000R ambience multi-effects processor can provide 40 ambience effects, including delay, echo, reverb and pitch-shifting, along with special

effects including ring modulation, "talking" modulation, and rotary speaker simulation. An internal mixer lets you use multiple effects, and it is also possible to control eight parameters at once, using expression pedals or the special WARP control on the front panel, or via MIDI.

Korg's 12/12 I/O digital audio PCI card has been available for Power Macs since March of this year, but PC users will be pleased to know that Windows 95 drivers will now allow the card to be used on their platform. The MME Device driver will allow most Windows software — including Steinberg's *Cubase VST for Windows* — to access any or all of the 12 ins and outs on the card simultaneously. Some software, such as Emagic's *Logic Audio v3*, will initially support stereo I/O, but direct support of Emagic's SL extension should eventually provide access to all 12 ins and outs from *Logic Audio*.

On the Mac front, the 12/12 will shortly have a Sound Manager-compatible driver. Previously, a basic Mac extension allowed the card to be used with *Cubase VST 3.5* and *Deck 2.6*, but with the availability of Sound Manager compatibility, software such as Adobe *Premiere* and *BIAS Peak* will be able to access any two of the 12 ins and outs.

The last news from Korg is that a 6-voice expansion option has been released for the Z1 physical modelling synth; for £399, this option doubles the synth's polyphony, giving it twice as many notes as any other modelling synth presently on the market.

A Korg UK Ltd, 9 Newmarket Road, Kingston, Milton Keynes MK10 0AU.

T Brochure line 01908 857150.

F 01908 857199.

E info@korg.co.uk

W www.korg.com

Novation's Star Performer

Novation's long-awaited Supernova polyphonic Analogue Sound Modelling synth (£1399) will be officially launched at the end of November — and the spec has been significantly enhanced since it was first announced earlier this year. Polyphony will now be 16 notes, and the effects structure will be particularly flexible, with each basic patch accessing six effects at once — distortion, EQ, pan, reverb, chorus and delay. When a patch is used in multitimbral mode — and the Supernova is 8-part multitimbral — you'd probably expect some compromises. Not at all: each patch in a multitimbral setup still accesses six effects, independently of all other multitimbral parts. That adds up to 48 effects in total

from where I'm standing. The Supernova will be equipped with eight audio outs, an arpeggiator (or eight arpeggiators in a multitimbral performance), a comprehensive modulation matrix and full MIDI control (with all knobs transmitting

MIDI data). And it doesn't stop there: the Supernova is expandable. A card available in January 1998, for £449, will double the polyphony and the number of programs (512 to 1024) and multitimbral performances (256 to 512) available. The Supernova Expansion will also offer additional synthesis possibilities, courtesy of the v2 operating system. Want your

Supernova ready-expanded? This will also be available in January, priced £1799.

A Novation, Westacott Business Centre (A4), Maidenhead Office Park, Westacott Way, Maidenhead, Berkshire SL6 3RT.

T 01628 828888.

F 01628 825599.

W www.novation.co.uk



Tascam's new disc-ography

Tascam have released a mid-priced and a lower-priced MiniDisc recorder/player to join their top-of-the-line MD801. The mid-range MD501R is a 2U rackmounting device with a host of pro features, including XLR balanced analogue ins and outs, digital interfaces, a connector for a PC keyboard (to name discs and tracks), digital connections, and an on-board sample-rate convertor. This latter facility converts all incoming digital data to 44.1kHz; 48kHz and 32kHz signals, from domestic DAT machines, for example, can thus be digitally transferred to MD. The MD501R offers a similar feature set at an even lower price point.

New from TEAC is the "world's fastest read/write CD-R drive": the CD-R55S is a 4x write/12x read device with a sustained transfer rate of 1200K per second, using



SCSI2, and a random average access time of 165ms. The drive can write 650Mb of data in about 15 minutes. Support for CD-ROM mode 1 and 2, CDI, multi-session Photo CD, Video CD and Enhanced CD is provided, and the recorder uses packet writing, which results in up to a 50% reduction in data-transfer time.

Lastly, following rigorous evaluation, TEAC UK now recommend Ampex's products for all their machines —

DTRS, DAT, cassette and Portastudios. The company will also begin packing sample Ampex tapes with its DA98, DA88 and DA38 Hi8-based digital multitracks. And wherever you buy TEAC products, you'll now also be able to buy Ampex.

A TEAC UK, 5 Marlin House, The Croxley Centre, Watford, Hertfordshire, WD1 5YA.

T 01923 819630.

F 01923 236290.

Herd it on the Bovine

Following the announcement of Midiman's curiously named Flying Cow digital-to-analogue converter in last month's news, you should be able to figure out what the same company's Flying Calf will be. Yes, it's a cut-down digital converter, and for just £129 the compact device provides an S/PDIF digital input, and two quarter-inch unbalanced analogue outs. The D/A circuitry automatically locks to the sample rate of the incoming digital audio, which means that any sample rate of 50kHz and under will be supported. Flying Calf could be used to provide a pair of high-quality audio outputs from your digital audio card or to bypass the analogue outs on your card entirely. This second option completely removes the D/A conversion process from the noisy environment inside your computer.

Unfortunately, a couple of errors crept into our Midiman news item last month. Let's set the record straight: the D-Man 2044 digital audio card costs £249 (not £299), and is a PCI card (not ISA), with no MIDI or on-board synth, and the DiO digital card costs £249, not £299.

A Midiman UK, Hubberts Bridge House, Hubberts Bridge, Boston, Lincs PE20 3QU.

T 01205 290680.

F 01205 290671.

E 106133.2372@compuserve.com

W www.midifarm.com/midiman

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

Our web site address is
www.sospubs.co.uk

Roland's groovy train

The first of two surprises from Roland this month is news of the forthcoming MC505, which, echoing the launch of the JP8000 physical modelling synth, came to us courtesy of the Internet. This more powerful follow-up to the MC303 Groovebox integrated sequencer and sound module (reviewed August 1996) will up the ante on a number of fronts. Polyphony is 64 notes (up from 28), two global and one insertion effect are offered (from a choice of 714 effects), and there are a total of 512 preset and 256 user sounds, and 26 preset (20 user) rhythm sets. One particularly nifty feature — and you won't see this on much hi-tech gear anytime soon — is the DBeam Controller, licensed from Interactive Light.

By passing your hand over the controller, you can create a variety of effects (with MIDI output): simulate record player rotation speed manipulation; alter filter cutoff and resonance; or improvise using one of 21 preset scales. The 8-track sequencer can hold 110,000 notes, and the arpeggiator offers 53 styles; Real-time Phrase Sequencing expands the sequencer's capabilities. With the Megamix function, you can create completely new patterns just by changing phrases for parts in real time, and remix your own patterns without having to record them from scratch. Expansion cards — of 2Mb and 4Mb capacity — greatly increase sequencer capacity, and add more user locations for sounds and drum kits. Audio outputs are also greatly increased: there are three pairs as standard.

Secondly, hot on the heels of Akai's launch of the 12-track DPS12 last month, we hear that Roland are moving into the market for truly affordable hard disk-based multitracks. Like the DPS12, Roland's VS840 comes ready-equipped with an iomega removable drive (100Mb Zip drive, offering up to 50 track minutes of compressed audio). Essentially an entry-level version of the VS880 and VS880 VExpanded hard disk recording systems, the new machine offers many of the facilities introduced by its predecessors, at a lower price point. Features of the 8-track recorder include recording on four tracks at once, 64 virtual tracks, and comprehensive non-destructive editing facilities. On the digital mixer front, there are 12 channels, 24 bands of parametric EQ, two aux sends, on-board effects (including COSM-based guitar effects) and inserts on the stereo output. A comprehensive range of analogue and digital connectors is provided, and external MIDI devices can be easily integrated, courtesy of MTC, MMC and SPP compatibility. SCSI will be an option, but this will be for backup only. The price is expected to be under £1100, and the VS840 should hit the UK in March of next year. More detail when we get it.

A Roland (UK), Atlantic Close, Swansea Enterprise Park, Swansea, West Glamorgan, SA7 9FJ.

T Brochure Hotline: 01792 515020.

F 01792 575020.

W www.roland.co.uk



A screen illustrating the MC505 from Computer Controlled, the unofficial TB303 web site; point your browser at <http://www.teknet.ch/tb303.htm>

shape of things to come

Beckmann crowned by Jools!



Beckmann Communications' *Music Makers* series of instructional videos has now been endorsed by Jools Holland. The current range includes tapes for keyboards, guitar, bass, drums, sax, flute, clarinet and violin, with more titles due next year. Each video, which also includes an instruction booklet, starts from the absolute beginning, including how to open the case! Music theory is covered, as is how to make a noise on your instrument of choice. The shortest tape in the series is 82 minutes long, and each costs just £16.99; tracking them down in your local video, book or music shop should be easy, but if you do have difficulty you can buy direct from Beckmann. Give them a call and ask for their free catalogue.

A Beckmann Communications,
Meadow Court, West Street, Ramsey,
Isle of Man IM8 1AE.

T 01624 816585.

F 01624 816589.

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

Shure things

A new range of entry-level mics has been launched by Shure: the PA Series replaces the established Prologue Series, and offers several new features with no difference in price over the equivalent Prologue models. The 10A instrument mic, 12A vocal mic and 14A vocal mic (with superior shockmount and black non-reflective handle) all feature neodymium magnets and improved shockmounts for lower handling noise. The 16, designed for studio use, comes in a slender package for low-profile applications and can be battery-powered, obviating the need for phantom power. The mics retail for £29.38, £44.65, £52.88 and £99.83 respectively.

A HW International, 167-171 Willoughby Lane, London N17 0SB.

T 0181 808 2222.

F 0181 808 5599.

The Win beneath his wings...

Way back in April of this year, we ran a competition with a prize of an MDMX4 MiniDisc digital multitrack, kindly donated by Sony Broadcast & Professional UK and HHB communications. We've drawn a lucky winner, by the name of Steve Singleton, of Leeds. That's him in the picture; he says this is the first competition he's ever won. Steve's also pleased with the MDMX4's sound quality: "It's great!" Well done, Steve, and thanks Sony and HHB.



Steve Singleton.

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EDINBURGH	Sound Control	0131-557 3986
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FAREHAM	The Audio Connection	01329-235566
GLASGOW	The Warehouse	0141-950 1757
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LIVERPOOL	Ad Lib	0151-486 2214
LONDON	Turnley	0171-379 5148
LONDON	London Microphone Centre (LMC)	0181-743 4680
LONDON	The Synthesizer Company (TSC)	0171-258 3454
LONDON	Gradys Theatre Services	0181-486 1300
LONDON	Raper and Wayman	0181-800 8288
LONDON	HHB Communications Ltd	0181-962 5000
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- 3 Auxiliaries [1 Pre-band Graphic EQ with bypass]
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Check out the Spirit Website: http://www.spirit-by-soundcraft.co.uk	



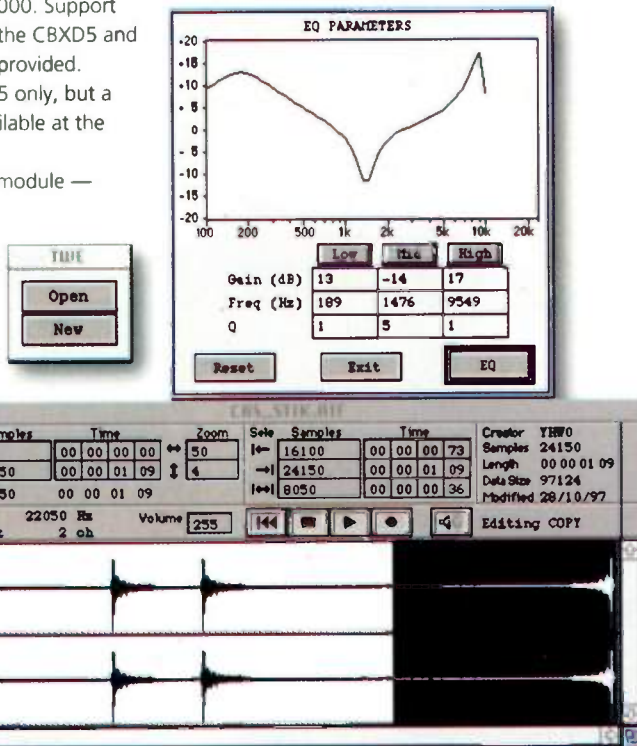
shape of things to come

Yamaha wave on

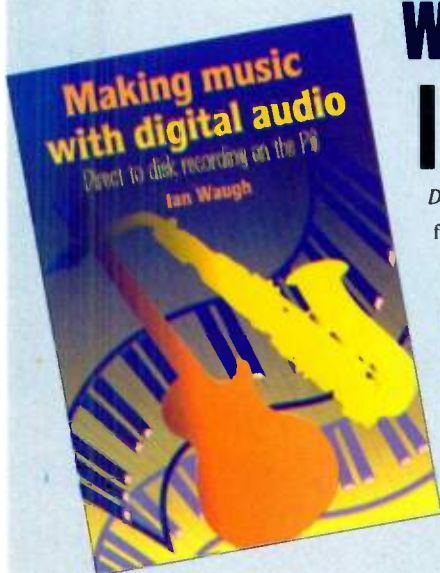
Yamaha's comprehensive product support continues with the Public Domain *Yamaha Wave Editor* for the A3000 sampler. Available from Yamaha's UK web site or A3000 dealers, the software nabs audio, via SCSI, from the sampler and allows you to edit, manipulate, and even translate samples. Once edited, you can transfer the sample back to the A3000. Support for other Yamaha devices, such as the CBXD5 and CBXD3 hard disk recorders, is also provided. The initial release is for Windows 95 only, but a Mac version (illustrated) will be available at the end of November.

Yamaha's brand new MU100R module — reviewed exclusively in last month's issue — has now been provided with a *Cakewalk*-based control surface for its harmoniser section. This free utility will make even lighter work of using the harmoniser for PC-based musicians. As with the wave editor, the control surface can be found on Yamaha's web site.

A Yamaha-Kemble,
Sherbourne Drive,
Tilbrook, Milton
Keynes MK7 8BL.
T 01908 369269.
F 01908 368872.
W www.yamaha.co.uk



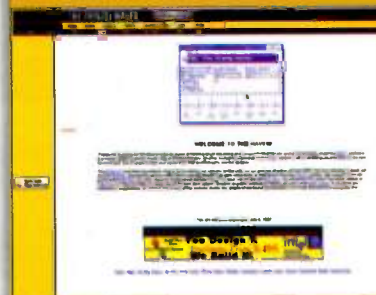
Yamaha Wave Editor.



Write once, read many

If you're using, or want to use, the digital audio capabilities of your PC, PC Publishing's latest book may be a worthwhile purchase; it's entitled, revealingly, *Making Music With Digital Audio: Direct to Disk Recording on the PC*, and is written by Ian Waugh. Everything from selecting your soundcard, setting up and optimising your computer, through to recording techniques, editing and mastering direct to CD is covered. Along the way, you'll be told about integrating MIDI with digital audio, backing up and troubleshooting. The book costs £14.95, and is available from SOS mail order; its order number is B364 and postage adds an extra £2.50 for the UK, £5.50 for Europe and £8.50 for the rest of the world.

A SOS Publications Ltd, Media House, Trafalgar Way,
Bar Hill, Cambridge CB3 8SQ.
T 01954 789888.
F 01954 789895.



Rick Schamberger is a Korg Trinity user who has said some nice things about our web site (www.sospubs.co.uk), and would like us to tell you about his web site. Glad to: it's dedicated, not surprisingly, to Korg's flagship workstation, in all its various shapes. The site offers FAQs and a buyers guide, plus more. Well worth a visit if you're a Trinity owner, or thinking of becoming one.
W www.wsnet.com/~trinity

Sound specialist Sound OK have acquired a small quantity of two JD800 PCM card sets: brass section and string ensemble. Both sets include a waveform and data card; the waveform contains specialised raw waveforms, while the data card offers 64 new patches. The sets are priced at £49 each, or £75 for the pair.
T 01276 682313.

The Harman Pro Group has announced the sale of its distribution division — Harman Audio — to Arbitr Group plc. Key Harman products such as Steinberg, AKG, C Audio and JBL will now be handled by Arbitr Pro Audio. In addition, all Harman staff have been retained, and they will continue to operate from Harman's Borehamwood premises.

A Arbitr Pro Audio, Unit 2,
Borehamwood Industrial Park,
Rowley Lane, Borehamwood, Herts
WD6 5PZ.
T 0181 207 5050.
F 0181 207 4572.

Back in November 1992, we ran a feature on ambient outfit Red Sun. Their self-titled album was also available through SOS's now-defunct Readers Tape Exchange service, and was actually the



group's best-selling CD at the time. In fact, such is demand for the CD even now that Harmony records have made it available again. Its price is £13, and it can be ordered direct from Harmony.

A Harmony Records, PO Box 8855,
London N10 2SF.



OK for writing letters



BRILLIANT | FOR | WRITING | NOTES

Practical, sure. Musical, er...well. For all its qualities, the QWERTY keyboard is not exactly a source of inspiration when creating music.

The new Yamaha QY700 on the other hand is designed from scratch to deliver instant and intuitive access to one of the most powerful composition engines ever devised.

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QY700

High resolution (1/480 quarter-notes)... 110,000 event battery backed sequencer memory... 48 track, 64 note polyphonic sequencer... MIDI in*2, MIDI out *2... 32 part multi-timbral sound generator... Full voice editing - Resonant filters - LFO and Mono mode... 3 independent effects processors... Database of 3876 phrases let you create 16 track loops (up to 256 bars in length) then apply 100 editable groove templates... MTC synchronisation... DD/HD floppy disk... Footswitch control...

YAMAHA

Yamaha-Kemble Music (UK) Ltd. Pro Music Division



South London studio The Sound Joint opened its doors a little over a year ago, with help from the Prince's Youth Business Trust. It is now a fully professional 24-track digital studio, based around eight tracks of Soundscape S6HDR1 hard-disk capability and 16 tracks of Tascam DA38s (the three units are sync'd by a Tascam MMC38) and a 32-channel Soundcraft Ghost desk. The new gear was purchased from Sound Control in Salford.

T The Sound Joint 0181 299 9800.
T Sound Control, Salford
 0161 877 6464.

Fans of Spain-based synth artist Michel Huguen (aka Neurotium) will be happy to hear of his new web site, where all sorts of news about his recent activities can be read. Surf on down to:

W www.neurotium.com

VDC Trading, cabling and connection specialists, have recently moved premises. For a catalogue detailing their range, drop them a line.

A VDC Trading Ltd, VDC House, 4
 Bromley Road, London N7 9AA.
T 0171 700 2777.
F 0171 700 1666.
E vdctrading@aol.com

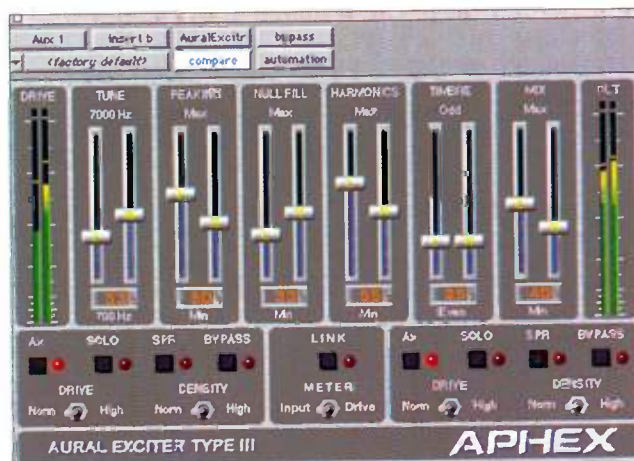
CLM Dynamics's DB4006 four-channel mic preamp is now being distributed worldwide by Serious Audio Ltd. The DB4006 was reviewed in August 1997, and additions to the range are currently being designed, with releases due in 1998.

T Serious Audio Ltd
 01923 442121.
F 01923 442441.
E serious@wildrom.co.uk

Phantom powering has been added to Barcus Berry's 4006N Planar Wave plane pickup system. The preamp, which is designed to stand the rigours of the road, can still be battery powered; it can run for up to 1000 hours on batteries. With phantom power, though, you never need to worry about the batteries running out.

T Strings & Things
 01273 440442.
F 01273 440276.

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



Plug-in Excitement

Apex Systems have made a move into the expanding plug-in market, with the launch of the *Aural Exciter Type III* plug-in for Mac-based TDM systems. Derived from the Model 250 Aural Exciter, a hardware unit, the *Type III* offers drive, tune, peaking, null fill, harmonics, timbre and mix parameters; a new feature dubbed 'harmonics density' has also been added. Apex president Marvin Caesar notes: "With the growing popularity

of digital audio workstations, we were bombarded with requests for an Aural Exciter plug-in. It took some time to develop algorithms which met the performance of the analogue model, but the end result is a powerful and flexible, but easy to use, software package."

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

1086 and all that!

The new 1086 single-channel mic preamp and dynamics processor from dbx offers two novel features: first of all, it's equipped with the company's new V2 VCA; and secondly, it can be optionally fitted with a digital output. The V2 VCA is claimed to provide the 1086 with "superb dynamic range characteristics, while maintaining very low distortion and almost immeasurable noise". The mic preamp section features a variable-frequency low-cut filter and

low- and high-detail EQ controls, plus 48V phantom power, a 20dB pad and a phase invert switch. Levels are visible on a backlit VU meter. The mic preamp can also be used independently of the dynamic processing section, via mic-pre out connections. The dynamics section features a compressor (with hard-knee or dbx's OverEasy characteristics), de-esser, expander/gate and limiter. The limiter offers dbx's new patent-pending PeakStopPlus technology, for

overall speaker protection.

As mentioned above, this 1U rackmount processor can also be upgraded to digital operation: add dbx's Type IV digital output, and take advantage of an output equivalent, so the company claim, to 27-bit. This mod makes the 1086 a good partner for digital multitracks, whether tape or hard-disk based.

A Arbiter Music Technology,
 Wilberforce Road, London,
 NW9 6AX.
T 0181 202 1199.
F 0181 202 7076.
E arbiter@cix.compulink.co.uk
W www.demon.co.uk/orbiter



Fair dues

Music Industry organisations MCPS (Mechanical Copyright Protection Society), PRS (Performing Right Society) and PPL (Phonographic Performance Ltd) are running a free dance music seminar on November 27. To be held at the Leisure Lounge in Holborn, London, the event is designed to get people involved in dance music together to discuss the current state of the industry and to learn how to collect any money they're due from the use of their music. Topics to be discussed include copyright and its role in dance music, music publishing, and issues such as sampling, DJ mix tapes and bootlegs. A panel of industry figures (including Radio 1's Judge Jules, Moving Shadow Records' Caroline Butler and V2 Music's Maria Forte) and collection agency representatives will be on hand to contribute to the discussions. The seminar runs from 6.30 to 11pm, and all you have to do is turn up, but if you want some extra information, call 0181 664 4700.

'code Fusion

Opcode are launching a range of cross-platform DSP plug-ins, under the series name of *Fusion*. The key feature of these plug-ins will be compatibility with a range of Mac and PC-based architectures, including (for the Power Mac) Adobe *Premiere*, Opcode *Vision* and *Studio Vision Pro*, Bias *Peak*, Macromedia *Deck II*, MOTU *Digital Performer*, Audiosuite and Digidesign *Pro Tools 4.0*; TDM compatibility is due soon. Pentium-equipped PC users will initially have *Direct X Media*, *Cakewalk 6.0* and Sonic Foundry *Sound Forge* compatibility. The first to be released is *Fusion: Vocode* (shown below), which brings classic vocoder effects — where one sound is modulated by another — to your digital audio system. *Vocode* lets



you easily warp sounds together, with real-time preview; it offers a retro 'lo-fi' mode, and comes equipped with an on-board synth for creating carrier waves, plus a collection of looped samples. You can save custom settings as presets, and there is a complete on-line help system.

Next in line will be *Fusion:*

Vinylise, which has as descriptive a name as you could ask for. *Vinylise* gives your audio files a scratchy, worn-record sound; you have complete control over the pops, dust, scratches, warp, rpm and more.

A SCV London, 6-24 Southgate Road, London N1 3JJ.
T 0171 923 1892.
F 0171 241 3644.
E info@scvlondon.co.uk
W www.scvlondon.co.uk

Spirit's power pack

Spirit's PowerStation stereo powered mixer has now blossomed into a family. The relaunched range has three options, with more mono mic/line inputs and more power as you go up the price scale. The cheapest option is the PowerStation 350 (£749), which offers six mono inputs and a 2 x 175W amp; the PowerStation 600 (£949) provides eight inputs and 300W-per-channel output; top of the line is the PowerStation 1200 (£1199), which has 16 inputs and 600W of power per channel. Features common to all the desks include a pair of stereo inputs, Spirit's UltraMic 60dB padless preamp, 48V phantom power, 3-band EQ (with swept mid) and a specially designed, fully editable Lexicon effects unit (offering chorus and reverb, chorus and delay, or reverb and



Spirit's new PowerStation family.

delay effects). In addition, there are three auxiliary sends (including one dedicated to the Lexicon effects processor), insert points on all mono inputs, a steep 18dB-per-octave high-pass filter, 2 x 7-band graphic EQ and a 40Hz subsonic filter for speaker protection. While the desks are freestanding as they come, the PowerStation 350 and 600 can be rackmounted with an optional kit.

We've heard that Wise Buddah, the studio run by Radio 1's Mark Goodier and his partner Bill Padley, has installed a pair of Spirit Absolute 4P powered monitors. Goodier is impressed: "The 4Ps are absolutely fantastic. Easily the best performance for the price." Padley adds simply: "They're very funky". Many of you will remember our feature on Wise Buddah, which appeared back in December 1994; the studio specialises in producing programming for Radio 1.

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



Wise Buddah.

Sonic Boom

Sonic Foundry have produced a special, streamlined version of their *Sound Forge* software optimised for multimedia and Internet users. Dubbed *Sound Forge XP 4.0*, with a retail price of £119, the software's applications of the software are listed as sales presentations, audio for web sites and computer games, adding audio to video at home or sending voice email messages. The company are also introducing a new series of plug-ins, compatible with any software that supports DirectX Audio Plug-Ins. The *AFX 1* CD-ROM plug-in pack (£199) is first in the so-called *AFX* series, and

includes native versions for Windows 95 and Windows NT systems. Six discrete plug-ins are provided:

- Reverb, with 19 different reverb types.
- Time compression/expansion, offering up to 50% compression and 500% expansion; adjusts tempo and audio

length without affecting pitch.

- Multi-tap delay: up to eight discrete taps can be set with variable amplitude, pan and delay time; use to create complex echo patterns and chorus effects.
- Chorus, with control over modulation depth, frequency and feedback; three chorus depths are available, and additional flexibility is provided by a low-pass filter and phase reversal.
- Pitch shift adjusts pitch by up to +/-15 semitones.
- Simple delay offers a range of echo effects, with a delay time of between 1ms and five-seconds, and feedback decay times of up to 20 seconds.



A SCV, 6-24 Southgate Road, London N1 3JJ.

T 0171 923 1892.

F 0171 241 3644.

E info@scvlondon.co.uk

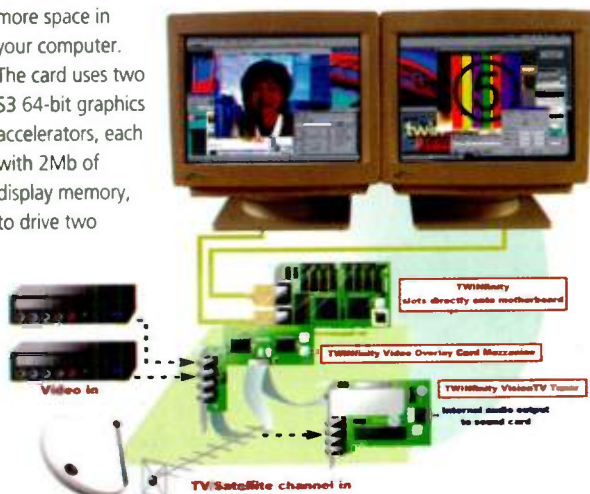
W www.scvlondon.co.uk

To TwinFinity and beyond!

If, as a PC clone user, you'd quite like the idea of using dual screens with your computer, Datapath now have a PCI-based solution for you. The TwinFinity card is particularly useful if you work with graphics or video, or simply want to keep your work screen separate from your system screen. Add the video and TV tuner options, and you can watch TV on your desktop — and adding this option doesn't even take any more space in your computer. The card uses two S3 64-bit graphics accelerators, each with 2Mb of display memory, to drive two

channels of high-resolution Windows desktop to any two suitable monitors. Options include a 4Mb-per-channel upgrade, and a four-channel version aimed at low-cost video presentation. Drivers are provided for Windows 95, NT3.51 and NT4.

- A** Datapath Ltd, Alfreton Road, Derby DE21 4AD.
- T** 01332 294441.
- F** 01332 290667.



The joy of Six

Heavenly Music is celebrating six years in business with the release of a limited-edition anniversary CD-ROM, called the *Ultimate MIDI Musician's Tool Kit*. The disk will contain MIDI building block file and groove collections *Dr. Beat* Volumes 1-6, *Beat 'n' Bass*, *Rhythm's Greatest* Volumes 1 and 2, *Hit Shot*, *The Techno Files*, *The Jungle Files*, *Pearly Gates & Effects* and *Bytes 'n' Pieces* song construction files, worth over £250. All files are GM/GS- and XG-compatible. The CD will also contain drum and percussion sample loops in WAV format, plus "other goodies", for just £59.99 (plus £3.60 UK postage or £5.60 for the rest of the world). The disc can be read by PCs, Macs and Ataris.

- A** Heavenly Music Productions, PO Box 3175, Clacton, Essex CO16 8GX.
- T** 01255 821039.
- F** 01255 821039.
- E** heavenly@ortiz.demon.co.uk
- W** www.ortiz.demon.co.uk



Mackie have just increased their presence at Peter Gabriel's Real World Studios, with the addition of eight MS1202 VLZ compact mixers, which will be providing monitor mixes in the main studio. Real World's Mackie 8-Buss and 24-channel expander have been at the heart of the mobile studio for some years; in the words of Peter Gabriel's engineer Dickie "...the Mackies sound just fantastic, compared to anything ... massive amounts of headroom... if only they had more busses and total recall, we'd use them for everything."

- T** Key Audio Systems 01245 344 001.

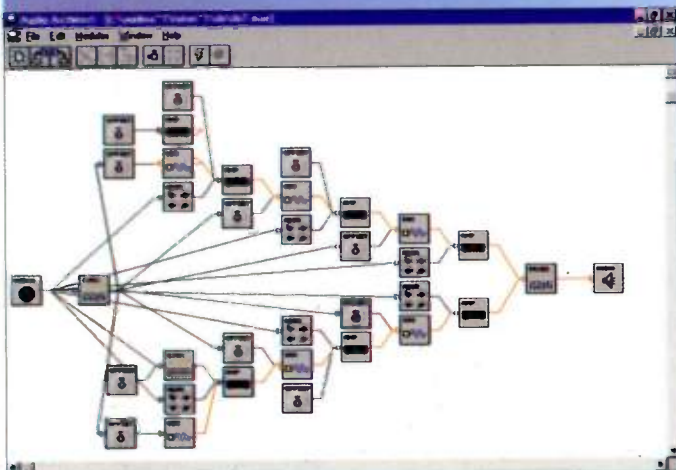
SPL, manufacturer of the Vitalizer, have expanded their range over the last year or so, and also recently adjusted their prices. It's now possible to buy a Stereo Vitalizer for £234, while the Stereo Vitalizer Mini, £351, is now the intermediate product in the range. The Classic Vitalizer offers individual processing for left and right channels for £704, while the flagship Tube Vitalizer now costs £2349.

- T** Bayerdynamic 01444 258258.

Building the perfect synth

The Karnataka Group's PC-based software modular synthesizer, *Audio Architect*, has now reached v3. This new

upgrade offers one significant enhancement: the software can now be played, in real time, from a connected MIDI controller.



This screen shows a Yamaha DX7 emulation network in Audio Architect.

Essentially, *Audio Architect* allows you to patch together modules (see right), based on those used by a real-world modular synth, with virtual patch cords, to create emulations of classic synths or completely new sounds. A library of digital and analogue instrument networks is provided, with choices including Roland's TB303 and Yamaha's DX7. Other enhancements offered by v3 include some new modules (a low-pass filter and a lag time processor), FM input, and more waveforms for oscillator modes.

You need a Pentium 133 or better, Windows 3.x, 4Mb RAM (8Mb recommended), Windows 95, NT 3.51 and 4.0, and any 16-bit (or better) soundcard. The software costs £120, and an evaluation version is available to download from the *Audio*



Architect web site; it becomes a full version after you've paid for an activation key. The web site also has loads of demo sounds (some of which are very impressive), plus synth

emulation tutorials. You can also get more info on the program from the first part of Dennis Miller's software synthesis mini-series that appeared back in April of this year.

- A** Karnataka Group, Blackfriars Foundry, 156 Blackfriars Road, London SE1 8EN.
- T** 0171 721 7021.
- F** 0171 721 7109.
- E** aa@karnataka.co.uk
- W** www.audioarchitect.com

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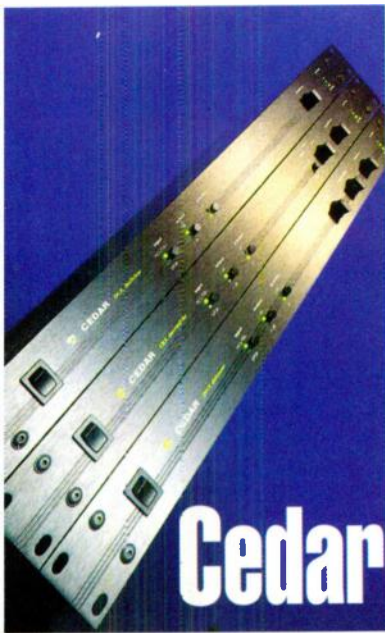
CREATIVE

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shape of things
to come



introducing unwanted side-effects, such as dullness or loss of transients. The three models are the DCX Declicker, CRX Decrackler and DHX Dehisser, and each has been designed not only to function in demanding professional environments, but to also be extremely easy to use. Controls are minimal; the DHX is the most complicated of the three, with just three buttons and three knobs.

Cedar have also recently announced that their distribution agreement with

branches out

Sound-restoration specialists Cedar Audio have made a move away from their core PC workstation-based products, with the launch of Series X. Each of these stand-alone units is based on 40-bit floating-point DSP hardware with true 24-bit AES/EBU and S/PDIF ins and outs, and features the latest Cedar audio processing algorithms. It's claimed that each unit does its job without

HHB Communications is being phased out. A new sales and support network is being set up; Cedar Audio USA started business back in September (001 207 828 0024).

A Cedar Audio Ltd, 9 Clifton Court, Cambridge CB1 4BN.
T 01223 414117.
F 01223 414118.
E sales@cedar-audio.com
W www.cedar-audio.com /cedar-audio

Frankly speaking

As a little postscript to Paul D Lehrman's recent article on performing live with manipulated Frank Zappa samples (SOS August 1997), we'd like to let you know that Zappa's elusive soundtrack to his *200 Motels* film project is now out on digitally re-mastered double CD. For Rykodisk, home of the exhaustive Zappa back-catalogue, the release is the first in a series of MGM-related soundtrack CDs. Many of the soundtracks in the *Deluxe MCM Soundtrack Series* have never been available on CD before, and the series also includes plenty of extras, in the shape of descriptive books, extra sounds and alternate takes from the films, not to mention CD-ROM tracks



featuring film clips and trailers. The *200 Motels* set includes radio jingles, trailer and poster; certain 'superlative' editions will add lobby cards, a video copy of the film and more. Some of the releases are odd — *Chitty Chitty Bang Bang* and *It's a Mad, Mad, Mad, Mad World*, for example — but titles such as *Octopussy*, *Ned Kelly*, *Lenny* and 1969 hippy documentary *Revolution* may find more of a cult-ish audience.

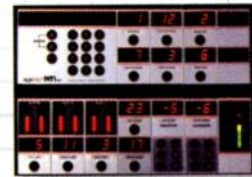
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dynaudio

lexicon

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

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

INDEX

- 3 Turnkey Professional
- 4 Multitrack Recording
- 5 Multitrack Recording
- 6 Outboard
- 7 Outboard

- 8 Computer Software/Hardware
- 9 Computer Hardware & Samplers
- 10 Synthesisers
- 11 Synthesisers & Drum Machines
- 12 Keyboards & Guitars
- 13 Mics, PA/DJ, Mixers & Monitors

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



One side of the switcher-equipped recording room.



Compare 6 mics. by recording simultaneously to ADAT.



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



Huge range across Mac, PC and Acorn platforms.

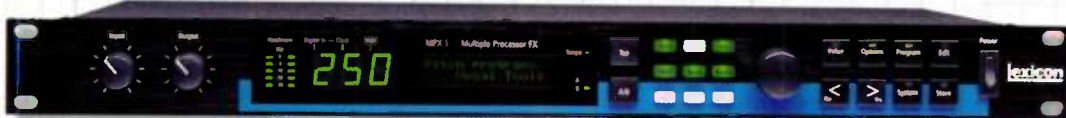
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IMPROVE YOUR PERSONAL SPACE!

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.

- Unrivalled Reverb Quality from the First Name in Digital Effects
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MPX1 MULTI EFFECTS PROCESSOR



PCM80 MULTI EFFECTS PROCESSOR



PCM90 REVERB 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 under £1200 inc VAT! 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
£999

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 Gershwin card.

RRP £2199
£1899

The PCM90 is dedicated to reverb and features two of the famous proprietary Lex2 chips (the PCM80 has one Lex2 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



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/A's, 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 **£4,468** and ProTools Project from £2,137 to **£1,879**.
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t.c. tools £775
Arguably the best reverb plug-in available, TC Tools uses algorithms developed from the US-life multi-frame reverb. Great user interface allows you to visualise the effects via the graphics, making it intuitive and easy to use.

Dolby Surround Tools

Produce Dolby Surround mixes entirely within the ProTools environment. Both Encoder & Decoder Plug-ins are available as a bundle providing digital implementation of encoding/decoding process.
£1339

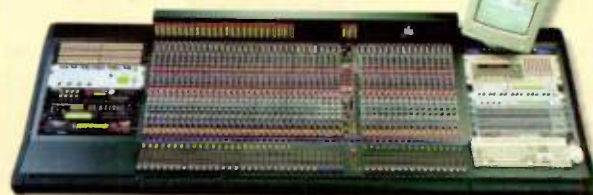
Focusrite D2

Based on the famed Focusrite Red 2 Dual EQ designed by Robert Firth, the D2 plug-in matches the high-quality expertise from the company, with down to the brushed aluminium front panel.
£880

Antares Auto-Tune

The plug-in that many professionals have but none will admit to! 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 TOM or VST plug-in.
£580

BIG by Langley



- 4 band EQ, 8 Auxiliaries
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- Virtual Dynamics on-screen editing
- Unique Rupert Neve Voice Recall
- 12 bus, 24 output
- Frame sizes from 28 to 44 inputs

this is a console that is packed with facilities, over and above what it offers as a fully featured inline console: 4 band EQ, 8 auxiliaries, 12 bus, 24 outputs available in frame sizes from 28 to 44 with or without bantam patchbay. **Call for an appointment.**

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EQ 4 band equaliser and sweep high and low Pass filters. Outputs are transformer-coupled to clean Neve style. In addition to standard controls, the mid-band includes sweep notch filters. The Stereo and Mono functions include the 'round' classic old Neve modules.
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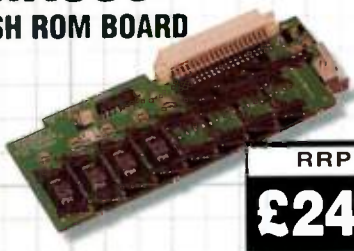
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New version of a classic portastudio. Improved styling and wiring.



RRP £229
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RRP £349
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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!

424 MkII A brand new version of the best selling 424 from Tascam. Inventory 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.

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Also available in the range:

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XR SERIES MULTITRACKS

XR3 High speed machine at £249. New auto-source facility and built in mic - ideal for 4 track recording on the move.

XR5 The new double speed Foster machine with 19" rackmount, 44.1 kHz, 2 inserts & 4 separate tape outputs allow recording into an external mixer.

XR7 The XR7 breaks new ground in price and performance - 8 inserts (2 mic), 2 separate aux sends, built-in sweep mid EQ. Records up to 4 tracks at once - double speed transport, Dolby C.

D5 DAT RECORDER Exclusive scoop purchase on a genuine professional machine brings quality within reach of the rest of us. Now that Sony's domestic 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 D206 timecode machine. Huge reduction.

RRP £1299
£739

DA20MkII DAT MACHINE

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!

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 £1299
£975

DTC-A6 DAT RECORDER

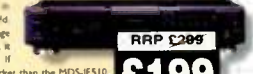
Turnkey have done it again! A pro, full spec, DAT machine at a bargain price! Just look at the list of features: SPDIF coaxial and optical ins and outs, digital and analog recording on all three sampling rates (32/44.1/48/96kHz), full 19" rackmount, as well as all the usual ID functions and a full function 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 £789
£499

MDS-JE510 MINIDISC RECORDER

Although DCC looks to have died as a format option, 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 CombiMix, Move, and Auto Cue, 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 £289
£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!



RRP £389
£199

SV3800 INDUSTRY STANDARD DAT RECORDER

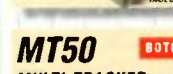
The Panasonic SV3700 has been the industry standard mastering DAT recorder, and is now superseded by the SV3800. Using 1 bit, 16x oversampled (equivalent to 20 bit), you can be sure of the highest possible sound quality. Records and plays back at all 3 sample rates via analog and digital inputs. Highly usable jog/shuttle wheel, AES/EBU and SPDIF digital connections, error counting and many other software features. In stock now!



RRP £1291
£895

DMT-8 VL INC '4 TRACK' PACK & SMS8 DIGITAL MULTITRACKER

The personal digital multi-track is here at last, and at a price you won't believe! 8 separate tracks of CD quality are recorded to floppy hard-disk (up to 12 minutes). Record 2 tracks simultaneously using stereo audio and sync to MIDI without losing a track. The 8 channel mixer accepts 4 mics, with a 2 band EQ and 2 aux sends. Separate outputs and SPDIF optical outputs. Why buy 4 tracks when you can have 8? INCLUDES FREE SMS8 mic. ONLY AT TURNKEY



RRP £1208
£879

MT50 MULTI-TRACKER

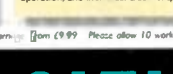
The MT50 can record on all four tracks simultaneously and works at double the normal speed for improved frequency response and reduced wow and flutter. Each channel has its own two band EQ, an auxiliary send for use with effects units, and DBX noise reduction is incorporated to keep background noise 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 sophistication to go with it. Logic controlled transport means that as well as two auto-locate 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 missing any of 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 £569
£339

*We are the best value anywhere - 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 delivery from £9.99. Please allow 10 working days for cheque orders. Errors & omissions excepted.

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PRICES GUARANTEED



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

HD-S200 PORTABLE DAT RECORDER

OVER ONE THIRD OFF!

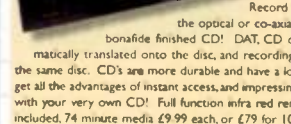
Turnkey's incredible buying team bring you the DAT exclusive of the year! This beautifully manufactured machine from AIWA, records at 32kHz (long play), 44.1kHz or 48kHz through either the analog or digital inputs. Digital input and output via optional optical cables (£29 each), backlit LCD display, full complement of ID buttons. Comes with lithium ion rechargeable 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

Why master to DAT when you can master to CD for the same price? For the price of a budget DAT machine, we bring you this incredible deal on the Pioneer PDR-04.



Record via either the analogue inputs, or the optical or co-axial digital inputs, and get yourself a bonafide finished CD! DAT, CD or Mini Disc ID codes are automatically translated onto the disc, and recording can be stopped and started on the same disc. 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! Full function infra red remote control included, 74 minute media £9.99 each, or £79 for 10.

These will sell out quickly - order now!
PDR-05 ALSO AVAILABLE with sample rate conversion ONLY £599

RRP £699
£499

MULTITRACKS NEW, USED & EX DEMO

Alkal DR4VR £700	Fostex XRS £259	Tascam DAP1 £399
Alkal DR8 £1795	Fostex XRT £309	Tascam DA38 £1999
Alesis ADAT £1179	Pioneer PDR04 £499	Tascam 414 £345
Alesis ADATXT £1650	Roland VS880 £999	Tascam 424MK2 £399
Fostex D6 £699	Roland VS880 Expanded £1699	Tascam 564 £1099
Fostex D160 £2631	Sony DTCAS £489	Tascam Portastudio MK2 £119
Fostex D80 £899	Sony DMMK4 £599	Yamaha M04 £399
Fostex D90 £1299	Tascam DA20 £499	Yamaha MT4X £349
Fostex DMT5VL £879	Tascam DA30MKII £799	Yamaha MT50 £249
Fostex XRS £169	Tascam DA88 £2300	

D80 HD RECORDER

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 cassetter 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.

INC 850 MEG HD

RRP £1499
£1099

D90 HD RECORDER

The D90 has all the features of the D80, but also has ADAT digital 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!

INC 1.3 GIG HD

RRP £1798
£1295

D160 HD RECORDER

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.

INC 2.5 GIG HD

RRP £2932

SOUNDLINK 168RC DIGITAL MIXING CONSOLE

The 168RC features 16 dig 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 converters 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 device, which can then be recalled at the touch of the button and in addition to the 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

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

DD8 HD MULTI-TRACK RECORDER

Alkal's new DD8 Records and/or plays back 8 tracks at a time directly onto hard drive or cassette. 2.6 gig magnetic optical cards. 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: TDR, ADAT, AES/EBU and analog I/O, digital I/O, Etc. Extensive SMP/E, MIDI, S/PDIF and Biphase synchronization - the list is endless! Call for a Turnkey Professional Brochure and a free trial.

PRICES FROM
£3199

DR-16 HD MULTI-TRACK RECORDER

First there was the DR4, then the DR11, and now Alkal bring you 16 tracks of real-time 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 £4189
£3599

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

EUROPE'S LOWEST



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 converters. 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.

RRP
£199

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

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

XR300 SYNCHRONISER

TURNKEY EXCLUSIVE

Long the specialist's choice in professional studios, we now make yours bring you the industry standard at an unbeatable price. Features include true SMPTE or all standard generators, MIDI clock, 5 pin MIDI for compatibility with all MIDI sequencers. Large LED time code display. Hinged MIDI input. Straightforward operating system. Full 19" rack unit.

RRP £299
£169

PROGRAMMER FOR MATRIX 1000 OR MICROWAVE

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 programmers have found it goes for other synths like the Minimoog and Oberheim. 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 digital synth using the time intuitive front panel, and better still, record every tweak of a parameter into your sequencer.

EXCLUSIVE
£329

COMPOSER WORKHORSE COMPRESSOR

A manual sounding and fully featured compressor at a give away price! Built-in gate removes any unwanted noise, built-in limiter means compression much less alternative, 'satur' makes great setup a doddle and view chain access means it can also be used for di-essing etc.

RRP £349
£169

STUDIO TWIN 2 CH. STUDIO FX PROCESSOR

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 separately. 5-DISC processing means that typical DigitalTech sound quality can be taken for granted - crystal clear reverb, spot on delays and the modulation effects (Sound On Sound and "audio 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, +48dB balanced connectors and LED level meters complete a thoroughly professional package at this bargain basement price! Buy now to avoid disappointment.

RRP £260
£149

MIDIVERB 4 PRO QUALITY FX UNIT

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

...that... effects as they should be! The new DigitalTech Studio Quad features not only their custom designed and ultra-powerful 5-DISC chip, but also 4 independent inputs and outputs, which using the built-in sub-mixer can be configured as 4 mono or 2 stereo 4 effects processors, feeding 4 stereo outputs. High precision and sensitive auto-ranging system make editing a breeze. 20 bit processing gives greater than 90 dB signal to noise ratio. Effects include reverb, delays, detuning, chorus, flanging etc. Hundreds of other features too numerous to mention.

RRP £529
£399

THC-00 RESINATOR

Freeform Analog Technologies FreeBass is already one of the most successful sound modules of the year, and now following hot on the heels 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 reversible 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.

NEW PRODUCT
£299

Order now and own an instant classic!

DIGITAL PROBLEM SOLVERS



In today's increasingly digital world, many people are still using their equipment's analogue ins and outs, because of the difficulty of inter-connection 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-COM: optical to co-axial and vice versa **£69**
 - PRO-COM: SPDIF to AES/EBU and vice versa with SCMS stripping **£129**
 - D-4-2 COPY CON: switcher with 1 optical & 3 co-ax in, 2 co-ax out and SCMS stripping **£99**
 - SM44-1: converts almost any incoming sample rate to 44.1kHz (ideal for ProTools) and non 44.1 (DATS) **£149**
 - SRC-M: sample rate conversion 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 synthesiser SPOF **£129**
 - ADAT Audio Clock: ADAT 9 Pin to word clock, Super Clock and SPDIF clock converter **£129**
 - ADAT Word Clock Synchroniser: ADAT 9 Pin to word clock and Super Clock converter with built-in MTC (synchronise your sequencer) with MIDI merge **£199**
 - ADAT SPDIF Synchroniser: as above but with converts only to SPDIF **£199**
 - ADAT MIDI Machine Control: MIDI to ADAT 9 Pin converter 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

The all new 2 channel VTP-1 takes mic amp! EQ looks like to take the market by storm. It combines four bands of semi parametric EQ with a high definition mic amp based around a proprietary vnae design. Phase reversal, high gain 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 variable gain auto range mic amp! EQ looks like to take the market by storm. It combines four bands of semi parametric EQ with a high definition mic amp based around a proprietary vnae design. Phase reversal, high gain 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 PRODUCT
£799

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

PRICES GUARANTEED



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!



PREMIUM QUALITY VALVE OUTBOARD EQUIPMENT

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

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!



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, input and output pads, separate gain and output level controls, true 48V phantom power, jack and XLR outputs and dual VU meters. Bypass you desks mic amps and feel the quality!

NEW PRODUCT
£499
FACTORY DIRECT

Processor. The all tube 2u box, features a premium quality transformer balanced mic pre amp with switchable 30dB pad, phase reverse, input and output pads, separate gain and output level controls, true 48V phantom power, jack and XLR outputs and dual VU meters. Bypass you desks mic amps and feel the quality!



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 outputs and dual VU meters. Bypass you desks mic amps and feel the quality!

NEW PRODUCT
£399
FACTORY DIRECT

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 outputs and dual VU meters. Bypass you desks mic amps and feel the quality!



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

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.

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

FINALIZER MASTERING PROCESSOR

Brings the punch and clarity missing from the greatest music. 5 band stereo EQ, De-esser, Digital Reverb, Compressor, Normalizer, and Dynamics. All with highly flexible settings, or the option to let TC's Wizard do the work for you by using the 'magic' auto-mastering algorithm and 'Auto' and 'Expert' modes. An auto-mastering guarantee to improve your CD/MP3!

RRP £1999
£1499

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

362 SONIC MAXIMIZER

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

RRP £199
£149

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

4 POLE FILTER

The 4 Pole is the legendary Microwave Wave 24 dB lowpass filter. You use it to apply this filter to any audio signal that you pass into the Filter. So if your favourite synthesizer or sample player fails due to some quality, you can give it a sonic boost by the 4 Pole Filter. It is the most powerful (and quite possibly the only) mixing 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 give it up? The all new X-Pole! Minimising all of the 4 Pole's great sound, MIDI and control, the X-Pole allows you to treat two mixed signals independently, or the two channels can be linked together for a stereo signal. 2x rack design makes for easy integration into your studio. Bypass your mixed signal - your lungs need never be the same again!



NEW PRODUCT
£439

MODEL 316 SEMI-PARAMETRIC EQ

The Model 316 is a 3U rack offering 16 channels of 3 band semi-parametric EQ and was originally designed for their high end and sub-main the Xorams CX. Each band features up to 15.5% of boost or cut and frequencies of 50Hz-500Hz (low), 500Hz-5kHz (mid), and 5kHz-15kHz (high). This is a unique opportunity to upgrade the EQ on your main to standard this is not found on many professional consoles, or add EQ to monitor sections of in-line desks.

RRP £799
£349

SRV-330 REVERB UNIT

This incredible unit from Roland uses the cutting edge technology developed for their £24,000 RS5 system. As well as being an ultra high quality reverb unit (300 processing is employed), the 3D technology allows early reflections to be realistically placed and surround you in a 360 degree circle. Full MIDI control, true stereo processing, +4-20 dB in & out, a wealth of editing features and an equally wide range of options make this an invaluable buy. Very limited quantities at this bargain price!

RRP £859
£429

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 1 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 £999
£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

REFLEX 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!

VORTEX MULTI EFFECTS PROCESSOR



The Lexicon Vortex breathes the effects mould 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 as 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 Lexicon quality and cost of course, be taken for granted. First come first served!

RRP £429
£199

OUTBOARD NEW, USED & EX DEMO

Alexis 3630	£195	Behringer Dualtra	£119	LA MX2	£240
Alexis MICROVERB4	£199	Behringer Ultratrac	£99	Lexicon ALEX	£199
Alexis Manoverb	£280	BOSS SX700	£369	Lexicon LXPIII	£599
Alexis Manoverb	£145	Joe Meek VC3	£169	Lexicon REFLX	£299
Alexis Manoverb	£249	Joe Meek VC4	£379	SPL Vtaller Stereo	£299
ALEX QUAD2	£499	LA 4G2	£229	Yamaha PROSR	£999
APHEX-104	£199	LA 4G2	£229	Yamaha REV100	£159
APHEX-107	£349	LA 4X4	£199	Yamaha REV500	£299
BBE 302	£219	LA 09	£379	Yamaha SPX1000	£1199
Behringer Compressor	£169	LA G2	£149	Yamaha SPX900	£729

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Ringin' 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!



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 PnP 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	£1,019	£1,349	£1,379	£1,299	£1,379
Steinberg Cubase VST	£1,149	£1,479	£1,499	£1,549	£1,619
E-magic Logic Discovery	£1,149	£1,499	£1,519	£1,579	£1,649
E-magic Logic Audio	£1,249	£1,579	£1,599	£1,649	£1,749

*Add £229 for deluxe 17" monitor *Add £129 for Sony powered speaker system with subwoofer *Add £99 for MIDI interface with 4 separate MIDI outs.

THE TURNKEY PRO TECH PENTIUM: A TOWER OF STRENGTH

RRP £1791
£1149

CUBASE VST STARTER PACK

- Intel Pentium 166mmx (opt. 200, 266)
- 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
£969

P166 PC PACKAGE AS ABOVE BUT WITH CAKEWALK V5.0

MU10 OUT OF THIS WORLD MEGADEAL! GM SOUND MODULE

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 in. The MU10 comes with the CD-ROM version of Steinberg's famous Cubasis XgEditing 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!

RRP £199
£169 **£115**

CAKEWALK PRO



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 £109
£79

SIBELIUS-7 TOP-END NOTATION V3.0



Why do so many music academies use a program which doesn't work on the PC or Mac? Because for professional notation typesetting, nothing else comes close. "In a totally different league from anything else" - Paul Pastoor, Royal Academy of Music, Future Music Platinum award. We are now an Acorn Authorised Dealer, we stock and demonstrate the existing new RiscPC computer, running RiscOS3 powered by the 200 MHz ARM Processor, and with optional 486 or 586 board for running Microsoft Windows software.

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 would wish to go as far as buying it. Now we present you with the new version, many features were put off until Finale 97 now recall for just £499 (£249 for Academic Users) and now sports a radically redesigned interface and rewritten manuals. If you're looking for a "vintage" Finale, the "Finale" or "Steinberg's" "GroupWise" Finale config is the feature you'll need!

RRP £699
£499

MUSIC AT PASSPORT NOTATION / COMPOSITION

Musixtime 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 "MusixTime" facility which allows notes to be sung or played into the program using a microphone. A "score" program" such as this offers the clearest 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 level!

RRP £129
£99

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

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

#1 SELLER
£89

MIDI INTERFACES FOR PC COMPATIBLES

Great bundle prices with easy software!

Interface	Price
16-bit 2 channel MIDI interface for Windows	£55
16-bit 2 channel MIDI interface for Windows	£55
16-bit 2 channel MIDI interface for Windows	£55
16-bit 2 channel MIDI interface for Windows	£55
16-bit 2 channel MIDI interface for Windows	£55

16 BIT DUPLEX DIGITAL AUDIO RECORDING

The 16 bit card has much lower noise levels than similarly priced cards, and allows full duplex recording 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 10 seconds! It's bit longer if you already have a sound card. Buy with Cubase - £399, with Digital Orchestrator - £275.

RRP £249
£149

CUBASE

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 format! Get £50 off Score version at only £449

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

RRP £329
£279

MIDIQUEST 6.0 UNIVERSAL PC EDITOR LIBRARIAN

MIDIQUEST is the most powerful, flexible and comprehensive editor/librarian module, with support for the widest range of MIDI devices including XP50, V1000, Arnie, Morphax, UltraProces, MU50, MUB8, Quadriver Plus / GT, Classic Key, TE7, K76, K78, Korg X5, DM13 and many others. Driver updates are generally free of charge. MIDIQUEST will list, or as long as MIDI is around! It's a really good investment. New version comes on CD-ROM and a fully Windows 95 native (32 bit).

RRP £235
£199

SOUND FORGE 4 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, playback, external samplers and sync to MIDI and SMPTE Time Code. Plus! Window allows more than 50 sound files to be open at one time. Supports WAV, AIF, Creative VOC, VOX, and Sound Designer SDF 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 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

PRICES GUARANTEED*



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 proprietary Hurricane architecture. Basically, it gives you more tracks than DMA on the same PC hardware, and leads to less driver conflicts.

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 converters on both record and playback, 64x oversampling, and Delta/Sigma converters. 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 break-beats 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

 £649 PACKAGE WITH FIJI	 £699 PACKAGE WITH FIJI	 £599 PACKAGE WITH FIJI
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ADD £100 FOR PINNACLE INSTEAD OF FIJI
ADD £100 FOR S/PDIF DIGITAL I/O



PINNACLE
£449
INC. FREE DIGITAL ORCHESTRATOR PLUS

FIJI
£349
A PINNACLE BUT WITHOUT SYNTH & SAMPLESTORE

ZIP REMOVABLE DRIVE **OMEGA**
INC DISK & 25 PIN SCSI CABLE
RRP £249
£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...
RRP £299
£299

PROTECH 12x CD-ROM DRIVE **turnkey**
If you want access to large amounts of sample library in a CD-ROM, there's no better way to do it than via CD-ROM...
NEW PRODUCT
RRP £299
£169

SU10 SAMPLING UNIT **YAMAHA**
INC 2 FREE TIME & SPACE CDS
Yamaha's SU10 is a ground breaking unit, making professional quality stereo sampling available to everyone...
RRP £299
£249
ALSO AVAILABLE WITH 3 OCTAVE MIDI KEYBOARD only £339

COMPUTER NEW USED & EX DEMO

Caleware Audio	£199	Turtle Beach TROPEZ	£199	Yamaha SW20	£129
MOTU MTPAY	£349	Yamaha DB50XG	£99		
Turtle Beach Fiji	£329	Yamaha MDF2	£249		

SAMPLE LIBRARIES
We have two 100 CD jewelboxes in store holding the digitalised Time & Space range of sample CDs...
PRICES FROM
£19
Check one out today!

SAMPLING NEW, USED & EX DEMO

Akai CD3000 XL	£1799	Akai S3200XL	£2399	Kurzweil K2500	£2199
Akai MPC 2000	£999	Emu E6400	£1999	yamaha SU10	£175
Akai S2000	£799	Emu E532	£599		
Akai S3000XL	£1499	Emu E54000	£799		

S3000XL WORKHORSE SAMPLER **AKAI**
INC FREE ZIP DRIVE & 32 MEG
Akai continues its tradition of supplying workhorse samplers to the studio market with this sturdy offering...
RRP £1799
£1399

S2000 SAMPLER
Akai's entry level studio sampler, the S2000 doesn't skimp on features...
RRP £999
£799

S20 SAMPLER
All new sampler from the makers of the industry standard...
RRP £499
£399

MPC 2000 SAMPLING DRUM MACHINE
Ever since the launch of the Roger Linn MPC40, Akai have led the way in sampling drum machines...
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...
RRP £1199
£699

GALAMARI ESI-32 TURBO EXPANSION BOARD
The upgrade all ESI32 owners have been waiting for!...
RRP £369
£299
*RRP includes 16MB RAM

A3000 SAMPLER **YAMAHA**
Arriving any time now, Yamaha's A3000 is their first entry into the sampling market...
NEW PRODUCT
RRP £1299
£1299

ESI4000 NEW SAMPLER **EMU**
The ESI4000 has all the features of the ESI32...
NEW PRODUCT
RRP £1199
£1199

*We will list any genuine items 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.

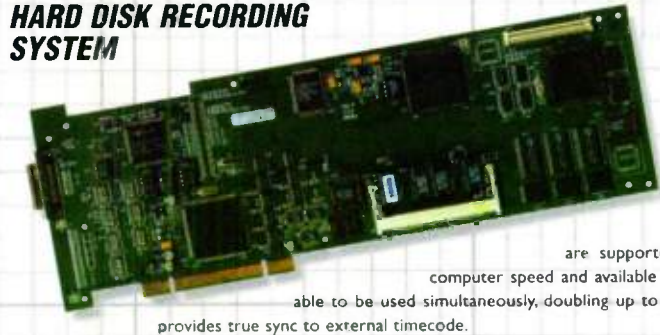
EUROPE'S LOWEST



THE PROFESSIONAL SOLUTION FOR CUBASE VST

Lexicon have long been known as the world leaders in digital signal processing, particularly for their universally acclaimed reverb devices. Now they are applying that expertise to the field of hard disk recording, and with stunning results.

LEXICON STUDIO HARD DISK RECORDING SYSTEM



The Lexicon Studio system comprises three main parts:

The **Core 32** PCI card for PC or Mac (initially PC compatible only) uses full 24 bit processing with onboard DSP and RAM, to tremendously increase the power of your computer and give superb audio quality. Up to 24 tracks of audio

are supported from a single card depending on computer speed and available RAM, and in future, two cards will be able to be used simultaneously, doubling up to 48! The on board variable oscillator provides true sync to external timecode.



The **PC-90** effects card and software gives you Lexichip power (as used in the PCM90) from within Cubase VST, giving you true master quality recording and reverb processing from your desktop.

What's more, two completely independent stereo effects can be used simultaneously, allowing different groups of signals to be treated separately.



Finally, the 19" rackmount **LDI-12T** interface takes all connections and D/A, A/D conversion away from the computer thus avoiding any interference. Balanced XLR stereo analog ins and

outs are provided, together with SPDIF optical and co-axial i/o, and 8 channel ADAT format digi i/o. As if all that wasn't enough, LTC (SMPTB), ADAT and Sony 9-pin synchronisation are all included as well, making the Lexicon Studio easy to integrate into the heart of your studio.

Check out the Lexicon Studio on demo at Turnkey - the desktop studio has come of age!

- Professional Cubase VST Compatible Solution
- Comprehensive Audio I/O & Synchronisation
- Superb Lexicon Professional Quality Reverb
- 24 Bit Processing Gives Pristine Audio Throughout

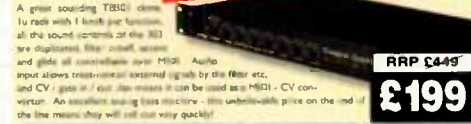
SYNTH MODULES



EMU have taken their wealth of experience in making modules... as the 'classic' Vintage Keys and Morphos combined... with the filters from the incredible Emulator 4... and then 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 jazz specialities. The inclusion of the Em 14 different types of 6 gate filters mean that these modules have more (space) filling 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 'kick' hits, and mean their usual 'cool' V2 software now gives a present bass module and other enhancements. Orbit upgrade available for only £69.

RRP £869
£699

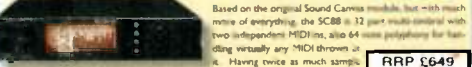
DEEP BASS 9 TB303 CLONE



A great sounding TB303 clone. To rack with 1 bank per function, all the sound elements of the TB303 are duplicated, filter, cutoff, resonance and glide all controlled via MIDI. Audio input allows traditional external signals by the filter etc, and CV / gate in / out. Also means it can be used as a MIDI - CV converter. An excellent sounding bass machine - this unbelievable price on the mid of the line means they will sell out very quickly!

RRP £449
£199

SC88-VL SOUND MODULE



Based on the original Sound Canvas module, but with much more of everything, the SC88 is 12 part multi-entire with two independent MIDI ins, also 64 note polyphony for handling virtually any MIDI thrown at it. Having twice as much sampling ROM too, the SC88 is really like two SC55s, except with 18 bit D/A converters delivering the same audio quality as the JV1080 synth. Choose from a GS / GII compatible sound palette of 654 individual sounds, and 24 drum kits. The built in interface for Mac or fast PC makes it even better!

NEW PRODUCT
£2799
RRP £649
£369

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 ends send out controllers in real-time. Synthesis facilities are unparalleled - 64 oscillator waveforms (2 per voice), 3 LFOs, 2 multi-mode filters per voice, oscillator synth, filter, overdrive, built in FX - you name it, it's got it. 12 note polyphony, 16 part multibrillability, 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

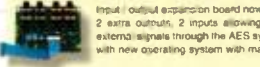


The Rave-O-Lution 309 is undoubtedly Quasimidi's best and most innovative product to date. Imagine the raw powerful sound quality of Roland's TR909 and TB303, give them 50 times as many sounds, add resonant filters to the drums, and you've still only got half the instrument that is the Quasimidi 309! 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
£649

RACK EARS ALSO AVAILABLE only £65

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 SYNTHESIZER

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.

FACTORY DIRECT
£599

Circuitry is analog throughout - right down to the oscillators, and the sound is needless to say, superb. There are 2 LFOs (one syncs to MIDI), three envelopes, and virtually all parameters can be controlled via MIDI. The ATC-1 is supplied with the Mini Moog filter, and can also be fitted your choice of a TB303, ARP 2600 or Character Harmonic filter (only £69 each), and for the filter facilities amongst you, the filter Selector (only £199) takes 14 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!

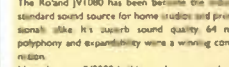
JV1080 SYNTH MODULE



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 its 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 professional alike. It's superb sound quality, 64 note polyphony and expandability wins 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 expansion 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
£900

PRICES GUARANTEED



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

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

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.



RRP £1999
£1499

03D Digital Console



INCLUDES FREE SONY DTC-A6 (RRP £799!)

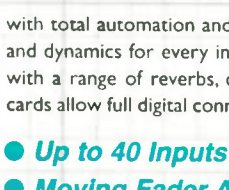
- Ultra Compact Format
- Moving Fader Automation
- Surround Sound Capabilities
- Takes ADAT, TDIF or AESEBU Digital Board

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.

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

RRP
£2999

02R Digital Console



INCLUDES FREE SONY DTC-A6 (RRP £799!)

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

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.



RRP £6999
£5999

XM1 & XMc1 ORGAN MODULES

A vibrant sounding all new organ module with remote drawbar controller. Based on the guts of the £8000 XE3, there's nothing as realistic as this on the market. Built in Leslie simulator and overdrive. Up to 3 registrations and continuously variable reverb, arpeggiator, percussion and too many more features to list here. Exclusively supplied by Turnkey.



RRP £1089
£999

BASS STATION BUDGET MONO SYNTH

EDW OF LINE CLEARANCE EXCLUSIVE TO TURKEY. If you need to get into analog synthesis on a budget, then the Bass Station keyboard is for you. But this is no mere toy. Two oscillators, pulse width modulation, two LFOs and more than 3200 out MIDI information, make this a versatile sound creation tool, capable of a wide range of bass sounds and effects. An ideal addition to any MIDI setup!



RRP £349
£219

DR-660 DR. RHYTHM DRUM MACHINE

BOSS has been making Dr. Rhythm drum machines since the early 1970s, combining value for money and ease-of-use with the best rhythm and percussion sounds. The DR-660 builds on the success of the DR-550 Mk2, but offers 16 full velocity and 16-velocity sensitive pads. 4 separate outputs (unheard-of in this price) and 255 drum sounds including the best of TR-909 / 909. The 660 also boasts the human feel circuit first manufactured on the RB which allows velocity to control a real-time brake between several velocities. Posing your options with on-board digital reverb and chorus - fully editable with individual effect control for each drum sound.



RRP £469
£299

PULSE MONO SYNTH

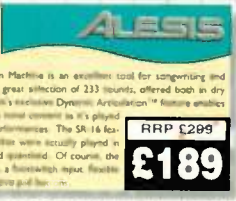
Waldorf quality at a previously unheard of price! This first venture into the burgeoning monosynth market has been universally acclaimed and rightfully so. The Pulse's three oscillators provide some of the best sounds around and it's modulation matrix allows it to be used for a higher degree of programming complexity than anything else in its range. Add to that the fact that adding any program sends out a MIDI controller and you have a complete sound performer.



RRP
£499

SR-16 DRUM MACHINE

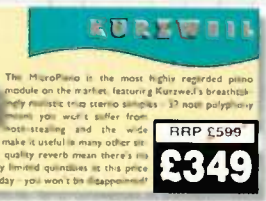
The SR-16™ Serrano Drum Machine is an excellent tool for songwriting and performance. It features a great selection of 233 sounds, offered both in dry form and with reverb. Alesis's exclusive Dynamic Articulation™ feature enables a multi-timbral to change its sound content as it's played. Another feature is real-time performance. 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 synchronization, a fast-high input, flexible programming and editing features and reliability-ensuring gold-plated contacts.



RRP £299
£189

MICRO PIANO PIANO MODULE

The MicroPiano is the most highly regarded piano module on the market, featuring Kurzweil's breathtakingly realistic triple stereo samples - 37 non polyphonic samples you won't suffer from 'mush-tailing' 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 mean that stocks won't last long. Order today - you won't be disappointed!



RRP £599
£349

MEGADEAL ALERT NEW LOW PRICE! FAT

FREEBASS TB303 CLONE

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!



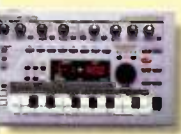
It's the only authentic sounding TB303™ clone on the market, and it's got MIDI! I/O rack with 1 knob per function, all the sound controls of the 303 are duplicated. Cutoff, Resonance, Envelope Mod, Accent, Tune and Decay. Waveform is continuously variable from square wave to sawtooth, and an auto tune 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



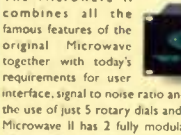
The enduring popularity of the TB303, MC202 and TR909 has just refused to go away but increasing rarity has meant that secondhand prices have been driven up to ridiculous levels. Roland, the creators of these machines, now bring you the MC303 Groovebox which combines all their classic drum machine sounds, 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 SYNTHESIZER



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

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 mix, instrument or line level signals, which are balanced and mixed with its own sound.

RRP £785
£299

SOUND MODULES NEW, USED & EX DEMO

Yamaha RY8	£119	Kurzweil K2000R	£1499	Waldorf PULSE o	£429
Alesis DMS	£269	Kurzweil KMP1	£359	Yamaha MU5	£179
Alesis QS8	£599	Novation Drumstation	£399	Yamaha MU50	£299
Alesis SR16	£125	Novation Super BStation	£399	Yamaha MU80	£799
Boss DR5	£240	Roland JV1080	£880	Yamaha P50	£230
Emu MORPHEUS	£500	Roland MC303	£399	Yamaha OY700	£899
Emu UltraProteus	£399	WALDORF MICROWAVE 2	£849	Yamaha RY20	£199
Korg XDR	£380	Waldorf PULSE	£349		

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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 mod! 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 £999

K5000s ADDITIVE SYNTH

KAWAI

In this age of many 'soundalike' sample + 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 introduced 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.

NEW PRODUCT £1199

RACK VERSION ALSO AVAILABLE only £999

X5D KEYBOARD SYNTHESIZER

KORG

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 five 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 unwell 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

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 sound - 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 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

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 3 octave keyboard and 2 outputs, also available in its bigger brother the XP80 with a 7 octave keyboard, 4 outputs and the long size display as featured in the new JV2080. We have limited stocks only at staggering prices - don't delay - order today!

RRP £1499 £999

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!

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

RRP £2345 £1499

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 clutch function.

RRP £249 £169

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, split patch & bank change memories.

Check out our unique package prices with these modules:

01900 - PC200	£249
01901 - PC200	£349
01902 - PC200	£349
01903 - PC200	£399

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

DTR-2 RACK-MOUNT DIGITAL TUNER

KORG

• 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

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!

WK-1500 76 NOTE MIDI WORKSTATION KEYBOARD

CASIO

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

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 that includes a full padded gig bag.

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

RRP £399 £249

CS1X SYNTHESIZER

YAMAHA

Not only does the CS1X look great, it sounds great too! As well as 480 XG format voices and 11 different drum kits the CS1X also has 120 special performance sounds, especially designed for dance and techno music. From panel knobs, dual sliders, access to crucial editing parameters like the filter, and 2 ans assignable to anything you like. Behind the off with top quality effects and an arpeggiator, this you have what has to be the best value keyboard of the world!

RRP £899 £725

BUY WITH VL70M VIRTUAL LEAD MODULE for only £799

MK149 MIDI CONTROLLER KEYBOARD

Evolution

Compact touch sensitive master keyboard offering full control over pitch bend and a mod. wheel 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:

SC895L - MK149	£399
MIDI+ - MK149	£319
MIDI+ - MK149	£319
DR - MK149	£289

RRP £119 £99

GI-10P GUITAR MIDI INTERFACE

Roland

The Roland GI-10 opens the world of MIDI and computer sequencing to any 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, there will be sold on a first come, first served 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 Synclavier, has probably become the first action available. 88-note wooden weighted keyboard (imported from Japan). 2 sustain pedals, 2 continuous controller pedals (one of each is included), breath controller, 2 wheels, 4 buttons, 5 momentary switches, 2 toggle switches and aftertouch. Apart from talking artists off to play in your studio, the KX88 can be considered a collector's item and with no sounds to go out of date, it's a very worthy master copy!

RRP £1649 £849

KEYBOARDS NEW, USED & EX DEMO

Alesis OS6	£549	Korg Trinity PLUS	£1795	Roland RD500	£1249
Alesis OS7	£779	Korg X5D	£399	Roland VK7	£1099
Alesis OS8	£1299	Korg Z1	£1699	Roland XP10	£299
Korg N364	£799	Roland A33	£335	Roland XP50	£849
Korg PROPHECY	£549	Roland A90	£1099	Roland XP80	£1199
Korg SGP90X	£1799	Roland A90EX	£1399	Yamaha AN1x	£849
Korg Trinity	£999	Roland AX1	£249	Yamaha P150	£1099

GX-700 GUITAR EFFECTS PROCESSOR

BOSS

The GX-700 features a huge array of digital and analogue effects enabling you to use up to 13 individual effects 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 (RCP £119) MIDI floor controller giving you total access to the GX-700 from its designated floor switch. Hurry, limited stocks available.

RRP £769 £449

*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. Delivery within 10 working days for cheque clearance. Errors & omissions excepted.

SPL DynaMaxx

Compressor/Decompressor/Limiter/Gate

SPL claim to have come up with a completely new type of compressor.

PAUL WHITE puts their assertions to the test.

Those of you who read the review of the SPL De-esser back in the January '97 issue of *SOS* may recall that I was particularly impressed by the simplicity of its user interface — traditional de-essers can be tricky to set up properly, yet the SPL model achieved excellent results with almost no experience required of the user. It now looks as though the company have applied the same philosophy to compressors, and though compressors with auto functions have been around for a while now, few are as easy to drive as this one. The DynaMaxx is a two-channel, analogue compressor with balanced inputs and outputs on both XLRs and jacks (which may be used unbalanced without any signal level loss). Laser-trimmed resistors are used in the input stage to provide the best possible Common Mode Rejection, which is quoted as 100dB at 1kHz and 80dB at 10kHz.

THAT FRONT PANEL IN FULL

The control system is extremely simple, with rotary controls provided only for Compress, Gain and the on-board Noise Gate. Other than that, there are just four illuminated-when-active buttons per channel, to select Soft Limit, Effect Compression on/off, Decompression on/off and bypass (Active). A further button links the two channels for stereo operation, and each channel has its own bargraph display to show the amount of gain reduction (or gain increase in De-compress mode). Power comes in via an EC cable, and there's an illuminated mains rocker switch to the right of the front panel.

The Compress control sets the amount of compression taking place by combining the functions of threshold and ratio, although these also respond to the programme dynamics rather than remaining fixed. The outcome is that peak signals are processed with a higher ratio setting than lower level signals, and I imagine this has a similar effect to including a peak limiter. There are no separate attack or release controls, as these parameters are determined by the automatic circuitry and the dynamics of the input signal. Up to 20dB of make-up gain is available from the Gain control, and Soft Limit brings in what SPL describe as a soft-knee

pros & cons

SPL DYNAMAXX £586

pros

- High-quality signal path.
- Simple control layout.
- Wide range of compression processes and effects available, including decompression.

cons

- 'Active' button clicks when operated.
- The metering, while clever, could be confusing to those used to more conventional systems.

summary

The DynaMaxx sums up what we have come to expect from SPL of late — a combination of cleverly applied technology and deceptively flexible features, combined with an easy-to-use interface.

SOUND ON SOUND

manual also suggest that this setting is useful for adding life to the sound samples used in synths and drum machines, as these are often heavily compressed. The Peak Limiter function also reverses in this mode to provide peak expansion, so switching in the Limiter will actually make the peaks louder!

The noise gate has just one control and one



and the overall signal path is very clean. There's a ground lift button on the rear panel, and each channel has an external side-chain insert point on a TRS jack.

The gain control part of the circuit uses a pair of the new THAT 2181 VCA chips in a differential drive mode configuration to provide a very low-distortion signal path, and there's also an unusual Decompress mode to help repair the damage done through over-compression by using upward expansion. SPL claim that the way this compressor works means that high-frequency detail isn't lost when compressing with high ratios.

limiter to provide maximum control with the minimum of side effects.

Most people tend to use compressors in one of two ways: they either want transparent gain control, or they want to hear compression as an effect. The DynaMaxx gives you the choice by means of its Effect Compression button, which switches between the two alternatives. For an even stronger effect, Soft Limit can be used at the same time. The Decompress button turns the DynaMaxx into an intelligent upwards expander that can be used to increase the dynamic range of previously compressed signals in a subjectively natural way. The

LED, labelled Close, but even this is smarter than it seems. Auto-release circuitry matches the release time to the programme material, and the circuitry is claimed not to click. Finally, there's a green signal LED that comes on when the input signal exceeds -40dBu.

USING THE DYNAMAXX

As expected, using the DynaMaxx turned out to be exceptionally easy, but it still held one or two surprises. For example, when you go into Decompress mode, all the controls seem to reverse, including the make-up gain, which becomes a make-down gain. Although this is

logical when you think about it, it's still odd when you first encounter it. There was also a noticeable click when the compressors were switched in and out of Active mode, though, to be fair, you're unlikely to want to change this switch setting during a mix.

In the straightforward compression mode, you can apply a surprising amount of gain reduction without seeming to change the sound at all, though your desk meters tell you that compression really is taking place. The meter works a little differently to most compressors I've tried, as the display comprises a moving block rather than a moving bar, and the dot's normal resting place in the absence of compression is determined by the output gain control. When compression is applied, the gain reduction is displayed relative to this position, not relative to zero.

Switching in 'Effect' compression produced a thicker, more obviously compressed sound, but still very well behaved. You can make this setting pump if you apply a lot of compression, but at sensible settings, it just produces a denser, more even sound. If you really want to see pumping, switch in the limiter, and then hit it hard. At moderate settings, where the limiter is acting only as peak protection, the sound is reasonably transparent, but there's plenty of scope for creative abuse by applying enough compression to make the limiter work all the time. The limit action is relatively smooth, but the pumping that can be achieved through deliberate misuse has to be heard to be believed. By using these three buttons in conjunction with different Compress control settings, it's possible to produce a huge range of compression effects, from virtually invisible to seriously blatant.

I've never had much luck using expanders on programme material before — they all seem to sound like noise reduction circuits that have gone wrong — but this one is remarkably usable. The signal gains more presence and more dynamic range, and it's only when you get silly with the controls that low-level signals start to vanish and high-level peaks hit you in the face. I don't know how often I'd use something like this, but it's nice to know that when you do need it, it's going to work smoothly and in a controllable fashion.

Finally there's the gate, which works so smoothly it's really quite boring. Providing you set the threshold sensibly, it will close down during pauses, quietly and unobtrusively, without chopping the ends off your decays. Even slow decays seem to get through unscathed. In a mastering situation, the gate is both fast and smooth enough to be used to clean up the starts and finishes of your songs, while the limiter can be used to keep peak levels from trashing your digital recording chain.

SUMMARY

Once again, SPL have come up with something that's both effective and simple to use, yet just a little bit quirky to keep things interesting. I have never heard a compressor yet that can sound like any compressor you want it to, and this one certainly isn't going to change that situation, but by careful use of the deceptively small number of controls, you can approximate most types of compression used in track laying, mixing or mastering. I particularly like the ease of use, the smoothness of the processing, and the overall high quality of the signal path. My only technical criticism is the audible click when 'Active' is operated. There's obviously a lot of processing going on inside the box to make the end user's job so easy, but because of its high-quality signal path and overall flexibility, I think the DynaMaxx is going to appeal to a far wider range of buyers than those inexperienced users looking for a 'point-and-click' compressor.

SOS

£ £586.32 including VAT.

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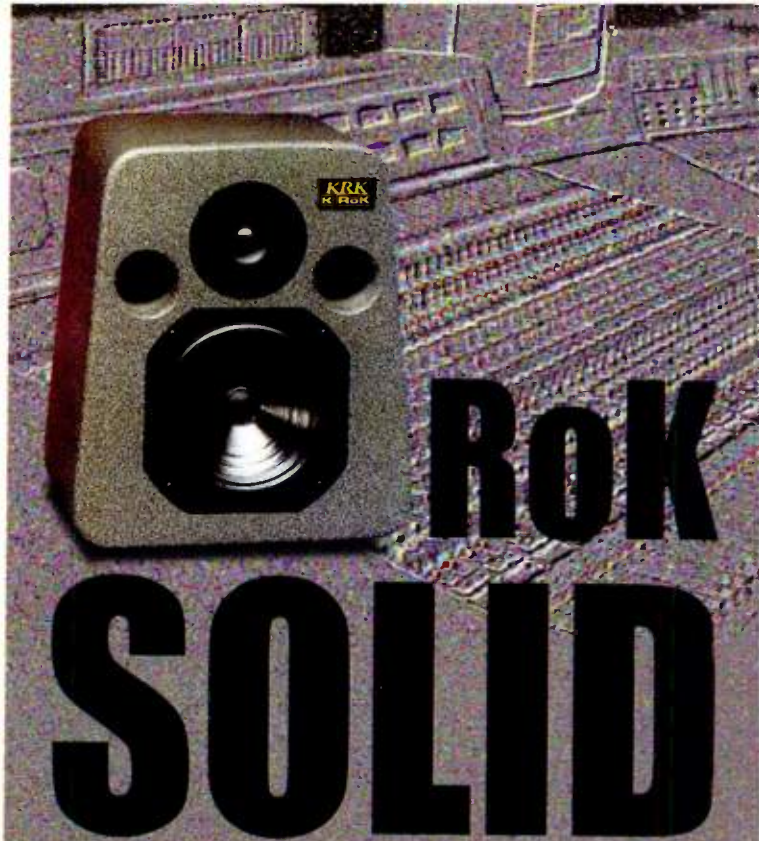
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DACS Headlite

Headphone Amplifier

PAUL WHITE listens in on the new headphone amplifier from DACS.

Unless you're working entirely on your own, there's a likelihood that you'll need a more sophisticated performer foldback system than the solitary headphone outlet jack your mixing console provides. In the smaller studio, the ideal solution is to use a headphone amplifier that can be driven directly from the pre-fade aux sends of the console. To provide the users with a degree of choice over what they hear, it's desirable to be able to take two or more aux sends, and then offer some way of combining them. There are numerous ways of doing this, but in the headphone amp under review here, DACS have opted for a relatively simple system based on up to four different input signals.

Housed in a 1U rack case with a rather dubious lilac front panel, the Headlite is mains powered and has four independent stereo headphone outputs, each with its own level and source select controls. Each headphone is driven by a 500mW amplifier, which is powerful enough to drive most headphones to their limit, but if more power is necessary, for whatever

doubled up on stereo jacks located on the rear panel as well as on the front. There's also a large ground terminal for earthing the case.

At the right of the front panel is a huge illuminated power button, and to the left are the four identical output stages. The phones output jacks and level controls are fairly self-explanatory, but the source selector deserves further explanation. This is a six-position rotary switch offering the choices AB, AA, BB, CD, CC and DD where the letters represent the four input sources. For example, AB places input A in one phone and input B in the other, while AA selects A as the source for both ears giving a mono signal. This arrangement means you can monitor the possible mono and stereo permutations of pairs AB or CD, but you can't opt to combine either A or B with either C or D. There's also no way to vary the relative volumes of the two selected signals without changing the send level on the console.

IN USE

Providing the source selection system is flexible enough for your requirements, the sound quality and technical performance of the device is fine. There's no apparent added noise, the switching is clean, and the sound remains undistorted up to the point where your phones start to complain. It's

pros & cons

DACS HEADLITE £335

pros

- Good mechanical and electrical design.
- Clean sound quality with adequate power.
- Simple to set up and use.

cons

- Source selection could be more flexible.

summary

A cost-effective, sonically fine-sounding headphone monitoring system for the smaller studio.

SOUND ON SOUND

be plugged into the mixer first and brought up to level that way.

SUMMARY

On quality and price, this headphone amp competes on fairly even terms with some of the better existing models at the low to middling end of the price scale, though I'm not convinced the lilac front panel design does it any favours. Though there are similarly priced units with more flexible source selection systems, the Headlite has the advantage of being simple to set up and simple to use. Being fair, most project studio requirements won't stretch its capabilities too far, and the build quality suggests a long and reliable life. I'm certainly in favour of being able to put a headphone amp where the performers can make



reason, there is an output stage called LOUD (Line Output Upgrade Device) which is fitted to one of the output channels as standard, and may be fitted to the rest later if required. The LOUD option also has an integral limiter to save headphones (and presumably ears!) from frying.

The four inputs would normally be taken from the console's pre-fade aux sends, though any line level source can be used, and of course you can use fewer than four inputs if you want to. The headphone amps themselves have a fixed gain of 20dB, and the signal level is controlled by attenuating the signal before it reaches the amplifier. Though there are only four headphone outputs, it's usually possible to connect two pairs in parallel to be driven by one output, but they must be of the same type and impedance, otherwise the output levels may be very different. All four headphone outlets are

possible to run out of level if the input source is low, or if the headphones have a particularly high impedance, but most studio phones give adequate volume. For those wanting more, the additional LOUD options may be the answer, though I always worry about the possibility of hearing damage when monitoring loudly over cans for any length of time. As the manual sensibly points out, if you cut down on sound leakage from the outside, using good enclosed phones, you'll be able to monitor at more sensible levels.

The input stage is sensitive enough to deal with signal levels between -10dBV and +4dBu, but I found that when plugging in a portable CD player with a nominal -20dBV output, I couldn't get enough gain for studio level monitoring — although it was loud enough for more general listening. This is fair enough, as in the studio, all sound sources would probably

their own adjustments, and this one fits the bill nicely. On the other hand, it will also drive long headphone cables if that's required. Because this market is so competitive, there's no clear leader — it's mainly down to the facilities you need and to price, but this one is certainly worth a closer look — and listen.

SOS

£ Headlite £334.88; LOUD option (per channel) £20, (3 channels at once) £50. Prices include VAT.

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Bellari RP583

Dual Tube Studio Compressor

PAUL WHITE finds out whether a blend of valves and photocells really can deliver the ultimate vintage compressor sound.

It never ceases to amaze me that the recording market can support so many different brands and types of compressor, yet every month new ones continue to appear, each one claiming some kind of sonic advantage over its rivals. Bellari produce moderately priced valve processors, or, to be more precise, valve/solid-state hybrid devices, like the RP583 reviewed here. In addition to valves, however, this particular compressor also features a photo-electric gain element. Many early compressors used photo-electric gain cells, and the latest Joemeek products are probably the most famous for bringing that technology up to date, but, as with any electronic design, it's not the components that matter as much as the circuit in which you use them.

THE TOUR

Housed in a 2U-high case with a brushed gold-effect front panel, the RP583 is a mains-powered, dual-channel compressor with conventional controls, a choice of balanced and unbalanced inputs and outputs,

and side-chain access via input/output insert points on separate unbalanced jack connectors. The balanced audio ins and outs are on XLRs, while the unbalanced connections are on regular quarter-inch jacks. Having the choice of unbalanced ins and outs is always a good idea, as the majority of mid-price consoles have unbalanced insert points, and using balanced to unbalanced cables with such equipment generally leads to a 6dB level loss.

The feature set of the RP583 is absolutely conventional, with the two identical channels sporting Threshold, Ratio (2:1 up to hard limiting), Attack (0.5 to 100mS), Release (0.1 to 2S), and Output Level controls, though, unusually, the Output Level control is placed first rather than last in the row of controls. Each channel has its own bypass button with red Active LED, and there are two backlit moving-coil meters that can be switched to show either the amount of gain reduction taking place or the output level (referenced to +4dBu). A further button switches the two channels to Stereo Link mode, whereupon channel 2 (the lower set of controls) becomes the master. There's no auto mode, no peak/RMS switching and no choice of 'knees' — the basic controls are what you get.

Internally, there's only one twin-triode valve per channel to provide buffering either side of the photo-electric gain cell. The principle of operation is that when a signal above the threshold is detected, an LED adjacent to a photo-resistor illuminates, causing its electrical resistance to change. This, in turn, attenuates the signal, causing it to be compressed.

pros & cons

BELLARI RP583 £499

pros

- Powerful opto-compressor sound.
- Musically interesting side effects when worked hard.
- Works exceptionally well on vocals.

cons

- Threshold control is too sensitive.

summary

A great compressor for adding character to vocals, though it can be used to good effect on a number of different instruments, including drums.

SOUND ON SOUND

ON TEST

Because photocells don't have an infinitely fast response time, and because their characteristics may not be exactly linear, compressors built using these devices tend to exhibit a characteristic sound that people relate to as being warm or musical. Having worked with a good number of compressors over the years, I had a fair idea what to expect from this model, and it didn't disappoint. My first test was to compare the sound with the compressor switched in and then out, but with the threshold set so high that no compression was taking place. This is always a good test — it's surprising how much damage some processors do to your sound when they're not supposed to be doing anything at all. Fortunately, the RP583 made very little difference to the sound — I'd expected the valve characteristics to be hyped



up a little, but the designers have shown admirable restraint. Such subjective differences as there are might best be described as very slight benign valve coloration, but there's no loss of clarity or top end.

Winding in some compression demonstrates the typical opto gain-cell sound, which has a smoothing effect on the programme material, but doesn't destroy transient information in the way that some of the less well-designed VCA compressors can. This type of compression is very good at levelling vocals, and though the compression isn't exactly transparent, the gentle pumping effects are very musical and flattering. One aspect of this particular compressor I wasn't quite comfortable with was the severity of the Threshold control. Even with a modest compression ratio of around 4:1, moving the knob by around 5mm could make the difference between no compression at all and the gain reduction meter hitting the end stop. I was able to get around this with careful setting up, but the control law was too fierce for my liking.

The RP583 also sounds nice on acoustic guitars, but it can be equally effective on drums, or even whole mixes, depending on the effect you're looking for. When it's used with drums, the result is a tight, full sound with plenty of attack, and if you compress hard it's possible to recreate a vintage pumping effect reminiscent of '60s pop and



rock records. Complete mixes can pump rather obviously unless you pay close attention to release time, but with careful setting up the RP583 can add a lot of power and energy to a mix without stamping on the transient detail.

SUMMARY

Opto compressors have a very distinctive sound that works especially well on vocals, and this model manages to capture the effect nicely. Setting up is very easy (with the exception of the rather fierce Threshold control), and the resulting sound strikes a good artistic balance between neutrality and musically useful coloration. I'm not convinced that the valves play a huge part in the sound of this unit, but at least they don't do any harm by squashing the top end or adding undue noise. For my money,

the Joemeek range of compressors is more predictable in operation, but every compressor design has some unique element, and in the case of the RP583, there's a lot to like. If you already have a general-purpose VCA compressor and you'd like to add something with a bit of attitude, you'll almost certainly find the RP583 worth listening to.

SOS

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TL Audio 02031

Indigo Valve Overdrive

PAUL WHITE goes into overdrive with TLA's latest valve processor.

TL Audio are well established as producers of down-to-earth valve-hybrid and all-solid-state studio equipment that delivers a high level of performance at an affordable price. Most of their signal processors have obvious counterparts from other manufacturers — compressors, equalisers, mic amps and so on — but the latest addition to their Indigo range is slightly unusual. Whereas other hybrid products incorporate valves as a means to another end, the Valve Overdrive unit is designed solely to provide valve coloration to signals, though additional equalisation and filtering is also included.

The Indigo Valve Overdrive is a mains-powered 2-channel processor equipped with balanced line inputs on XLRs (+4dBu), unbalanced line inputs on jacks (-10dBV), and instrument inputs on unbalanced jacks. The instrument inputs have integral speaker simulators, though how well these work,

may be switched in or out as needed. This second stage adds a variable amount of gain boost, up to a maximum of 20dB, and is used to create more obvious overdrive effects. In all, there are four dual-triode valves in the unit. In addition to the front panel Boost button, there's also a rear-panel footswitch jack for each channel, to bring in the boost for live performance.

After leaving the Boost stage, the signal passes through a variable-frequency, 12dB/octave high-cut filter that can be swept from 500Hz to 10kHz. The filter may be bypassed when not required, but it's included to enable the user to 'trim' off any harsh higher harmonics created by high levels of overdrive. It has a similar response to the low-pass side-chain filter of a Drawmer gate, and is useful in attenuating unwanted high end without seriously affecting frequencies below its cutoff point.

Further equalisation is available via a 3-band stereo equaliser positioned in the centre of the front panel. This comprises an 80Hz shelving high-pass filter, a fairly gentle 800Hz mid peaking filter with a Q of 1, and a 5kHz shelving low-pass filter. All three sections have a +/-10dB range, but because the controls are stereo, both channels have to share the same

pros & cons

TL AUDIO 02031 OVERDRIVE £489

pros

- Nicely engineered, with clear controls.
- Sweet-sounding EQ with useful variable low-pass filter.
- Inputs to handle all levels, from guitar to +4dBu line.

cons

- Heavy overdrive sounds are unpleasant and are not helped by the speaker simulator being on the instrument input stage.
- Modest overdrive sounds are very subtle, but increasing the gain soon brings on audible clipping.

summary

Though useful for general mix warming and keyboard sound treatment, I feel the poor speaker simulator performance, combined with the rather sharp transition from very little coloration to audible clipping, limits the usefulness of this unit.

SOUND ON SOUND

adding a second boost stage, the designers have given the Valve Overdrive plenty of scope for both subtle warming and heavy overdrive, so applications range from stereo mastering to adding real dirt to a guitar or



coming before the tube overdrive rather than after it, remains to be seen. Dual gain settings are available on the instrument input to accommodate low-level sources such as electric guitars, or higher level sources such as electronic keyboards. Both XLR and jack outputs are fitted, the XLRs balanced at +4dBu and the jacks unbalanced at -10dBV. Of course, it's what goes on between the input and output jacks that's really interesting.

All three inputs are active all the time, so it is possible to mix three sources if required, though there's no way to balance the three levels unless the sources themselves have gain controls. Each channel has a variable-gain valve preamp (up to 20dB) permanently in circuit, followed by a second valve stage that

settings. However, it is possible to bypass the EQ independently on the two channels.

Finally comes an output gain control accompanied by a green 'signal present' LED (-22dB), a yellow peak LED (+10dB), and a red clip LED (+16dB).

APPLICATIONS

In some ways, you can view the Valve Overdrive as a musical instrument equivalent of a voice channel, as it contains a means of adjusting gain, equalisation and coloration. However, it may also be used via channel insert points to add colour to a vocal sound, or via group or master insert points to warm up a whole mix or subgroup within a mix. By

organ sound. It's also possible to use the overdrive and EQ to radically transform synthesizer sounds — something that the hat-on-backwards white lab-coat brigade will probably go for in a big way.

My first test was to DI an electric guitar via the unit to see if the speaker simulator, augmented by the filtering and EQ, could really produce a plausible rock guitar sound. Without the EQ or filter switched in, boosting the sound past the point where the clip LED came in produced an obviously clipped and rather unpleasant sound, as you might reasonably expect. Using the variable low-pass filter, it's possible to filter the rasp out of the sound, but by the time the result is smooth enough to be usable, the filter frequency is

somewhere around 700Hz, which produces a very mellow tone indeed, with no bite at all to speak of. Though usable in certain applications, this isn't a solution to creating ready-to-record rock guitar sounds, and even frantic use of the 3-band EQ failed to save the day. However, I produced some nice analogue-style fat tones from digital synth sources by using the overdrive to roughen them up, and then EQ'ing the roughness out of the end result.

Producing clean guitar sounds is a different matter entirely; as long as you only drive the signal hard enough to light the yellow LED, it's possible to use the EQ to create a convincing guitar voicing that records nicely. The same technique can also be used to record bass to good effect, though I'd usually add a compressor to the signal path when

“In some ways, you can view the Valve Overdrive as a musical instrument equivalent of a voice channel.”

recording bass. Similarly, low to medium overdrive settings work fine on complete mixes, though I have to confess that there's a very fine line between having no apparent effect and going into audible clipping. The SPL 2-channel Charisma I've had for review (for publication in a future *SOS*) seems far more controllable in this application, and the conceptually simpler Ridge Farm Gas Cooker (reviewed back in *SOS* June '95) behaves more predictably.

CONCLUSIONS

While the Valve Overdrive succeeds in providing gentle valve coloration combined with EQ, a variety of input options and low background noise, I feel it is rather less successful at producing true overdrive sounds, mainly because of the odd decision to place the speaker simulator before the overdrive stages. Speaker simulators normally come at the end of the chain to filter out the harsher distortion products, so putting it before the distortion stage makes little sense to me.

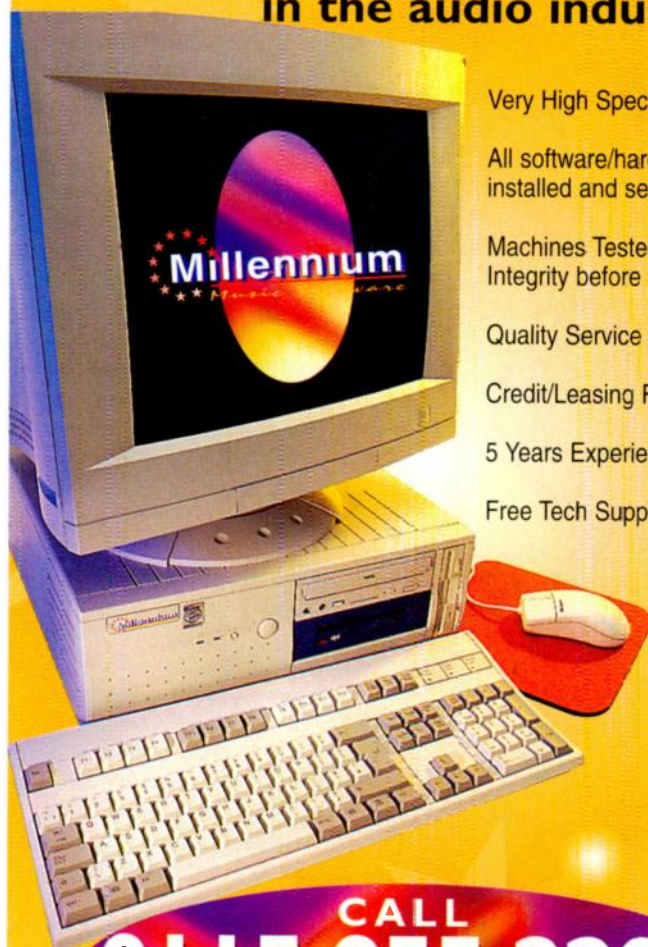
The most successful applications of this little box are stereo mix sweetening with modest amounts of coloration, keyboard sound-shaping and the production of clean guitar tones with just a hint of warmth. Even so, there are less costly ways of doing both jobs rather better, so, much as I love the rest of the TL Audio range, I have to say that I think this one has rather lost the plot.

SOS

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dear Santa...

WHAT SOS WRITERS
WANT FOR CHRISTMAS

We all know that when we rip the brightly-coloured wrapping paper from our pressies in a frenzy we'll probably be rewarded by a couple of pairs of socks, a furry steering-wheel cover, and a Hai-Karate gift set. SOS writers tell you what they'd really like to find under the tree...

Apart from peace on Earth, what I would like in my Christmas pair of tights (well, two legs are always better than one, and please make sure they're not fishnets as I don't want everything falling out) is a Brain-to-MIDI convertor, as the music I hear in my head takes so long to programme into my Apple Mac that by the time it's finished it doesn't sound anywhere near as exciting as I thought it would. All it would take is a MIDI connection at the back of my head, which would go into my *Logic Audio* and hey presto! I think of a tune and watch it fill up the screen. Then if I want a different sound for the bassline, just imagining what it should sound like would make it so...

Also can I have an Automatic bpm/pitch-change gismo, so that I can instantly put any sample I've nicked from one record on top of another sample I've pinched from another record, and they'll be perfectly in tune and totally locked in sync, without me needing to work out a harder equation than $E = MC^2$.

And one last thing, Santa: could you make sure that independent local radio supports local music makers, instead of just playing a diet of safe, sad established artists. Playing the best bands in the area during peak-time listening and using the top local producers to make their jingles would be a good start. Thank you so very much, and have a nice rest until next year. **Bis George**

What I'd really like is for Roland Inc of Japan to make me a System 700 modular synth, the whole thing — modules, keyboard and sequencer — a brand-new, one-off special edition just for me. If not — and I know this is a long shot — can you make a software version? Propellerhead managed to do *ReBirth*. So maybe? Eh? please? Eh? Maybe...? **Chris Carter**

Iwant a microphone that can cope with whispering, screaming, shouting, sibilance, popping and dropping, and still not pick up the cat crying or the fridge clicking. *And* I want another monitor and mouse connected to our Mac (his 'n' hers) to satisfy my twitching frustrated fingers. My laser pointer is *not* enough! Happy Christmas! Love From **Cosey**

Abit predictable, this, if you've read the review in this issue — but it has to be a complete V-Drums system, along with rub-it-all-over essence of Steve Gadd to give me the virtual skills



to make the most of this brilliant technology. Oh, yeah... and, like, world peace, man... the cessation of hostilities in the Middle East... freedom of political prisoners in Chile... a stress-free life for battery chickens... and a ban on Spice Girl hunting.

Nicholas Rowland

My studio is in the tropics — well, OK, it just seems that way sometimes. The 20-inch monitor I use generates enough heat to warm a small planet, and it seems so stupid to waste more of the world's precious resources (OK — and my money) on a noisy air-conditioning unit to keep me cool. So what I'd like Santa, please, is a holiday in Iceland. With Sandra Bullock.

Sorry — just went one note short of a symphony there — what I want (what I really, really want) is a widescreen, *flatscreen* monitor, ooooh — about four feet wide, which uses no power and generates no heat. And while you're at it, could it be connected to the Internet permanently, for free, so I can read my mail, use the videophone (great for showing TV execs my lovely showreel), download movies and TV,

browse the net, and have a nice soothing image of Sandra — I mean the seaside — on it when I'm musing upon the lateness of my current project) OK, I know there's more chance of me *dating* Sandra Bullock than getting all of this for Christmas — but then I don't celebrate Christmas. No, not because it offends my religious beliefs or lack thereof — but because I'm a miserable bugger. Humbug!! **Stephen Bennet**



I'd like a pair of ATC SCM20A Pro active monitor speakers, which I heard while Paul White had them in for review. Going back to your old speakers is a sobering experience, since the ATCs give you a totally honest version of your music — the truth is out there! I'd also like a mixer with a lot more stereo inputs — with virtually all synths nowadays featuring more versatile internal EQ and stereo effects, many people end up using pairs of mono channels, and duplicating their settings (apart from the position of the pan controls). I'm not talking about a cut-down, non-fader, rackmount unit either — what about eight mono channels, eight stereo channels, and a further four simpler stereo returns for effects (a total of 32 channels)? Eight mono channels should be enough for 'solo' instruments, allowing more exotic treatments to be added if necessary.

Finally, I make a Christmas wish that all marketing people who 'embroider' the truth in product ads should have all telephone calls from disappointed purchasers automatically routed to their office phones during the day, and to their home number out of office hours. Merry Christmas, one and all! **Martin Walker**

Technologically speaking, Christmas has already come twice for me this year, once in June when the Korg Z1 prototype turned up out of the blue (complete with the unexpected bonus of a Macintosh editor) and again last week when the nice guys at Apple Europe decided to extend the 3-day loan of an 8600/250 for a French Trade show to two full months to cover some forthcoming UK shows. This means that I can finally do the simultaneous audio and video editing in VST and Adobe *Premiere* which I have been dreaming of for about five years now, thanks to its massive power and 100MHz data buss. However, as this loan will be up on December 21st, perhaps Father Christmas could bring a permanent replacement. I think I'd better ask for the 9600 series, as the 8600's three PCI slots are already full of 1212 I/O and Miro DC20s. I keep seeing PCI cards from Adaptec and Radius which will let me interface my new Sony DV camera via FireWire. Perhaps the 9600 could arrive with one of these already fitted (the Adaptec, I think, because it includes Ultra Wide SCSI for all those taxing hard disk transfers). Needless to say, I'll want to add loads of DSP plug-ins, so we'd better make it the 350MHz 9600, Santa. Unless there's a faster one by then, of course! **Paul Wiffen**

Actually, since I now have room for one, I wouldn't mind a Studer A820 analogue 24-track recorder, but it's a bit out of Santa's price

bracket I suspect. I don't suppose there's much point in asking for a vintage Neve mixing console either. Realistically, at the top of the list of equipment I pine for at the moment is the Clavia Nord Lead 2, which takes analogue synthesis, by virtue of its digital physical modelling architecture, to new and dizzy heights. It's a classic of the future.

I don't think I need a new computer this year but it would be lovely if Santa's elves could spend their time off (between Christmases) persuading software designers that they desperately need to sort out the bugs in their existing products before starting on the next round of integer version upgrades.

Another hypothetical wish is definitely a digital multitrack recorder which (like the Studer A820) can record 24 tracks on one piece of affordable removable media rather than having to sync several machines together, which sooner or later results in putting a tape in the wrong machine and erasing valuable work.

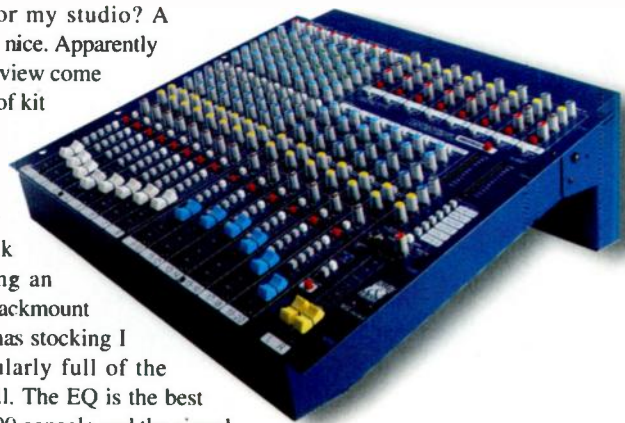
Funnily enough, last time *Sound On Sound* asked me what I wanted for Christmas I said that I would like someone to invent a MIDI-controlled filter module, which didn't then exist. Who says wishes don't come true? **David Mellor**

What do I want for my studio? A window would be nice. Apparently fresh air, sunlight, and a view come as standard with this bit of kit (although subject to seasonal variation, of course...).

As for the latest gear I've seen this year, I think if I saw Santa squeezing an Allen & Heath WZ20:2 rackmount console into my Christmas stocking I would wake up particularly full of the festive season's goodwill. The EQ is the best I've heard for a sub-£1000 console and the signal path cleaner than the cast of a fabric softener advertisement. **Chris Holder**

Well, they say you shouldn't be beguiled by the hype, but I'm afraid I've swallowed it hook, line, and sync device. Despite the Editor's continuous rumblings about how digital recording can curdle milk, be held responsible for the Balkan Crisis of 1877-78, and be shown to exhibit much less impressive all-round audio recording ability than a well-maintained wax cylinder engraver, I'd like a hard disk recorder. Please.

Specifically, I'd like a Fostex D160, as I have



WHAT SOS WRITERS WANT FOR CHRISTMAS

► been faffing about on a 4-track Portastudio for five years now, and whilst I love my Tascam 414 dearly, editing and mixing would be made a whole lot easier with a judicious dollop of sauce from the bottle marked 'Random Access'. And, of course, there'd be 16 tracks instead of four... so I could record four times as much crap as I do now. Those who point out that for "very little cost" I could be running a computer-based multitrack digital recording system can naff *right* off, as (a) "very little cost" in digital audio recording terms invariably translates to "at least five pounds under a grand" (b) my computer, monitor, keyboard, optional PCI I/O expander card (etc. etc — you get the idea) doesn't lend itself well to being lugged round to my mate's house to record some acoustic guitar, and finally, (c) my Portastudio has never printed a picture of a bomb on its tape counter, ceased operation for 10 minutes while it restarted, and then brought up a dialogue box saying "This cassette recorder may not have been shut down properly last time. Please use that big switch marked 'Off' next time".

Merry Christmas!
Matt Bell

Santa and I have a binding legal agreement which prohibits us from believing in each other, so there's no point me expecting the following to come crashing down my chimney: a Tascam DA38. In my opinion, the DA88 sounds better than ADAT, and this cheaper model offers unrestricted internal

duplication just for the samples you want. I want MiniDisc to become an industry standard, analogue cassette tapes to be ruled illegal, and *Last of the Summer Wine* banned from TV. Last but not least I would like for it to be discovered that Bill Gates is the love child of Elvis Presley and Marilyn Monroe, and Sandra Bullock to come to my studio and adjust my faders. [You'll have to fight with Paul Ward and Stephen Bennett over that last one — Production Ed.] **Paul Farrer**

Iwould really like a piece of PC software that could analyse a short piece of music (maybe a MIDI file?), analyse its structure (meter, length of notes, pitch intervals between notes, and so on) and generate more music in the same vein. There is a Windows program called *Jammer Pro* that will generate music from a basic series of around 20 parameters that you give it, but nothing that will start from an existing piece of music... yet.

I'd also like a cheaper MIDI guitar, as I play decent guitar but am not such a keyboard whizz, and would really like a means of musical data entry into my computer that is more intuitive than the (to me) relatively unfamiliar interface of black and white keys. At the moment, the cheapest option available costs around £600, which means it always falls into the category of "something I'll buy when I have a few pounds to spare mysteriously"... and you know how often that happens.

While we're on the subject of existing things at cheaper prices, I'd like a cheaper MIDI theremin (another non-keyboard means of MIDI data entry), as the existing ones are all over £500! Then again, as this is supposed to be Christmas, I should be able to have all these things for free anyway, shouldn't I? **Panicos Georgiades**

If it could be swung, I'd quite appreciate an end to world hunger, war and persecution, plus computers and hard drives that don't make any noise, and a studio without a central heating boiler in the corner. Gear-wise, it would be too easy to get materialistic, but now that I've become a Korg Trinity Pro user, I'm reasonably content... although a Doepfer modular synth system wouldn't go amiss! **Derek Johnson**

A Christmas wish list is a great idea, but it's a more depressing reality to find that there are so many things I actually want! Like most people, I suspect, I've always got a list of recording equipment needs which I carry around in my head, some of which are obtainable, some a mere dream.

At the moment, my chief one is not to do with actual gear but space to put it in and record. The problem is that my gear is outgrowing the house (again!). I have 10 or more years of accumulated amps, keyboards, outboard, boxes of demo tapes, leads and accessories, which I doggedly hang onto. The result is that it's all getting a bit cramped. So what I'd really like is a bigger house, preferably with one largish room with a wooden floor, for



digital track routing and frame-accurate automated drop-ins — excellent for complicated vocal comps. Actually, since these fantasies cost nothing, make that two. **Dave Stewart**

The first thing I want is for Santa to scoot down my chimney bearing an Akai-compatible sampler with 1Gb of RAM, an inordinately huge hard drive, lots of outputs, a great big touch-sensitive screen, digital on-board mixing, and no SCSI problems. Another thing I'd like is an automated-fader, 48-channel desk with lots of stereo channels, for under £2000. And I'd like all the sample CD manufacturers, as a New Year's resolution, to offer complete one-off CD

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WHAT SOS WRITERS WANT FOR CHRISTMAS

► acoustic as well as aesthetic reasons.

On a more realistic level I fancy a pair of Elacin ER15 earplugs, an essential element in any modern musician's armoury, and one which I hope will preserve my hearing for gigs to come. Then there's the long-overdue MIDI retrofit I've been promising for my old Korg Polysix. Naturally, there's hard disk recording too, but perhaps what I really wish for in that department is some sort of standardisation. **JOHN HARRIS**

I want a mind link directly into *Cubase* and *Logic*, so that I don't have to key things in and



move a mouse about. I also want an SSL9000 desk, a really good vocal processor, preferably a Focusrite Red, and an Emu Planet Phatt sound module. And, of course, peace and goodwill on earth! **DOMINIC RAWKEN**



If it's not too much trouble, could you get me a Rode Classic microphone and a Focusrite Green Voicebox, so I can sound absolutely super-duper? A Philips CDR870 CD writer would be nice too, to make a CD to impress my Mum with. And can you please not chuck them down the chimney with the other stuff in your sack, because I want them in good shape for playing with on Christmas Day. Failing that, a lot of chocolate would do. Thanks very much! **REBBIE POYSER**

Since I hate studios —miles of trailing cables and ghastly quasi-industrial racking systems — firstly this Christmas, I would like to receive the latest in intangible hyper-spatial leads. You know the ones: you insert the mains plug into a wall socket and the IEC end into a piece of gear, but the cable bit lies deep in hyperspace, where you're unlikely to trip over it. The only inconvenience would be the need to keep a close eye on the routing of all my MIDI leads and audio signal cables, since there would be no tangible connections between any of the equipment.

Secondly, I'd like a spatially warped keyboard-racking system, so that I could store an infinite number of synths on a single 3-tier stand, accessing any combination of instruments whenever I desired.

And finally (although I accept that this may have to wait until the next leap in n-dimensional quantum synth technology) I could really make use of a *Star Trek* style replicator. "Computer... give me an 88-note velocity-sensitive Mellotron with 2000 patches and digital outputs... and tea, Earl Grey, hot." **GORDON REID**



Heading my Christmas wish list is a 48-track Digidesign Pro Tools 4 system, with a comprehensive set of plug-ins and a mega Power Mac computer to run it on. While I am amazed at the pace of pro audio development on the PC, Pro Tools is still way out front when it comes to hard disk audio multitracking and virtual effects processing. And there are many top-quality TDM plug-ins that have not made it across to the PC as yet, including the TC Electronic *TC Tools* Reverb/Chorus, the Focusrite *D2* equaliser, Q-Sound Lab *QSys* spatial imager and the Antares *Auto-Tune* pitch corrector. Alternatively (or additionally), I would love to have the soon-to-be-released Lexicon Studio hard disk recording system with *Cubase VST* running on my PC — I have been a Lexicon fan for years and the prospect of Lexicon DACs and a virtual PCM90 in *VST* has me quivering with anticipation! Perhaps it's also a pointer for future trends that the PC version of Lexicon Studio has been laughed before that for the Macintosh. Finally, if there is any room left in my Christmas stocking, I would like an HHB CDR800 stand-alone CD recorder. This is a lovely machine, and it would complement the functions of my PC CD burner and wave editing software. **JANEY HARRIMAN COOK**

For Christmas, I would like: the bugs fixed in the sequencer I had three years ago. No new features, just a stable sequencer; MIDI over Firewire (IEEE 1394) — sort of SMDI with go-faster stripes; a new synthesizer that doesn't have any distorted guitar, blown bottle, jangly harpsichord or electric piano sounds — just some new synthetic sounds, please; Apple to survive for another year; an audio DVD standard to be agreed; peace and goodwill to all men (and women!). Thanks! **MARTIN RUSS**

I began to experiment with recording when I first bought a 4-track tape recorder. I incorporated recorded samples from the radio, distorted vocals and keyboards with the aid of the pitch control, used reversed tracks for backing, and experimented with layered guitar effects. The problem was that all the effects were achieved through the recording process and were not easily reproduced live. Today, for the most part, my sequencer-run sound modules provide me with enough effects to play with. However, I'm still limited when it comes to the guitar. There are many songs in which I originally double-tracked the guitar, using one track for effects, ambience, acoustic or noise whilst the other guitar-track knocked out the chords.

Santa's picking up the bill, so the first thing on my list this year is a high-spec sampler. One with shed-loads of RAM, plenty of editing features, time-stretch, LFOs and many outputs. Any in



the Emu E4X range would do nicely. I would use it primarily to loop guitar lines, short riffs and ambient feedback sounds.

Or alternatively I could, like Dolly the sheep, clone myself and pass on guitar-effect duties to Tom Flint Mark II. **Tom Flint**

I've been particularly good this year, so how's about that Neve Capricorn desk I've been waiting for? I'll obviously need a new wiring loom to go with it, but I understand the elves are pretty hot with a soldering iron. I've also been blessed with a new PC this year, so could you please bring me a copy of *Stop Crashing You Evil Little Bastard Lite* for Windows 95? I've made space in my rack for a fully expanded Emu E4X Turbo and a Lexicon PCM90 too — what are my chances?

PS: The Ferrari and Sandra Bullock must have gone astray last year... **Paul Ward**

Those of you who have read the Philips CD-R recorder review in this issue, you'll know that I already have one of those on my Christmas list, but I'd also like a Korg Wavestation SR or AD rack module, as here in Malvern hippy music is very much alive and well, and the Wavestation is great for meandering pad sounds. I'd also swap all my existing monitors and hi-fi speakers for one pair of ATC SCM20As.

Getting a little more surreal, I'd like a self-cleaning patchbay, a case of self-tidying signal cables and a PC that actually tells me why it isn't working rather than sitting there smugly refusing to



make any sound or informing me that a vital part of the operating system has just quit due to a fatal error! I could also use a packet of dehydrated time pills — I could pop one in a glass of water when needed and get a few hours of free time to play in my studio. Finally, something to stick onto computers and hard drives to make them silent would make a very welcome stocking filler. Happy Christmas! **Paul White**

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WHAT SOS WRITERS WANT FOR CHRISTMAS

► **B**ecause I've been very good all year (well, apart from that little incident with the cheerleaders and the whipped cream), I'd very much like a Lexicon PCM90 reverb. It'll fit nicely in my stocking. No need to gift-wrap it. For my BIG present, if you can stretch to it, I'd also like my studio floor strengthened and a Yamaha CS80 installed, along with a team of engineers to keep it running.

To end my gear cravings forever I *could* ask for a bright green Waldorf Wave, but then life would be dull, with nothing left to lust after. (OK, there's clotted cream, ice cream, yoghurt...)

One thing I definitely *don't* want is to be forced to upgrade my PC so it runs at 300 bloody MHz just so I can run a simple MIDI program that used to be rock-solid on my little 8Mhz Atari ST! Nor

do I want a synthesizer that you have to plug into a free slot on said PC. Nor yet again do I want an effects box that resides in that same evil location. So just the Lexicon and the CS80 will be fine, thanks. The rum and mince pies are in the usual place. Me. *Paul Nagle*

The past year has been a real treat for synth lovers like me, with many strong new models coming onto the market. Hopefully it's a trend that will continue! Korg's Z1 has emerged for me as the most exciting of the new breed, and an 18-voice model is at the top of my Christmas wish list. Following that would have to be Roland's JV2080, complete with the plug-in boards to take advantage of its eight internal slots — surely the ultimate sample-based synthesis module (unless there's a JV3080 waiting in the wings!). Kawai's K5000 has reintroduced the intriguing sounds of additive synthesis, and the non-workstation K5000S version is also on my list. Meanwhile, I've long had a soft spot for the warm ensemble

sound of Yamaha's MU series XG MIDI modules, and as the most sophisticated 'GM plus' box yet, the new MU100R is another of my choices. On a more historical note, an Oberheim Matrix 12 would be like manna from Heaven. Oh, and if I could just squeeze in an Akai S3200XL, a Kurzweil K2500R, a Philips CDR870, and, last but not least, a brand new high-spec PowerPC Mac... No wait, there's more... *drat!* *Simon Trask*

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5 goes mad with George!

PITCHING & WRITING A CHANNEL 5 THEME TUNE

When Channel 5 decided to re-do the music for their daily magazine show, Exclusive, BIG GEORGE was asked to pitch for the job, and went about it in his usual idiosyncratic way...

Throughout 1997 I've had the privilege to pen a number of articles for this most excellent magazine. These have included pieces about writing jingles for TV, and the constraints of working to completed animated title sequences. This month I'm going to tell you the history of one particular job I completed recently, from start to finish. What follows is not a typical story of getting a job composing music for the industry, but the truth is that there *is* no standard way of getting a job in film, TV or radio.

As a commercial composer by trade, much of my restful life (sic) is spent looking at the

telephone and willing it to ring with offers of lucrative work. Of course, I do send out at least 25 CVs, showreels, begging letters and blackmail demands every month. I've given up going down to London to wait in reception for up to an hour after the arranged appointment time in order to agree with everything an egocentric TV producer says.

It's an indisputable fact that there are more self-obsessed know-alls in TV and advertising than any other industry (including the record industry) — and they all reside in London. But if you're just starting in the business and you live hundreds of miles away from London, you've either got to think about moving nearer (I live 50 miles away on a good train line) or be prepared to spend at least a couple of days a month going in to meet these people. And don't forget: smile while you agree with everything they say.

WHAT ABOUT THE JOB?

A couple of weeks before the hugely successful launch of Channel 5, I got a call (completely out of the blue) from a producer at the highly respected and giant independent TV production company Mentorn Films. She invited me down for a chat to see if I would be interested in writing the theme and incidentals for their forthcoming weekday magazine programme, *Exclusive*.

I played it cool and arranged to meet her first thing the next day. On arrival at her office, I was horrified to find that a piece of music had been approved by the head of the company an hour before our meeting. Rather than going ballistic about having my chain pulled, I decided to remain calm, put it down to experience and chat about how good the show was going to be — all essential aspects of networking. (NB: Networking = finding out who does what, who works for who



George plays it cool, with *Exclusive* Editors Julian Philips (left) and Paul Gibbs (right).



Big George tackles Channel 5, armed only with his trusty guitar and pink kazoo.

and how you can get in on whatever's happening.)

A few months later, long after Channel 5 had begun broadcasting to dozens of viewers, I received another call from Mentorn, this time from the current editors Paul Gibbs and Julian Philips (who just happen to be good blokes. See — there are some about). They had been brought in to boost ratings by re-launching the show, very successfully, and had already changed the format of the show and the opening animated title sequence. The music had also been changed (though this was nothing to do with them), to a piece that was on file with Mentorn Films' publishing company Golden Break Music Limited. Frankly, no-one was happy with it — hence their call to me, I guess. I was asked to go down to Mentorn for another meeting about composing the music for *Exclusive*.

They showed me the new title sequence, which was pretty smart but didn't fit with the new music that had been stuck over it. Then they asked if I could go away and demo an upbeat theme in my crash-bang-wallop style (in other words "Can we have something that sounds like *Have I Got News For You*?"). I said "No". "What d'you mean, no?!" was their shocked reply.

Well, the problem is that I've been burnt a number of times through doing cassette demos for TV producers who believe, in their chemical confusion, that the world revolves around their every memo — when in reality the pinnacle of

their career was working on a game show where third-rate celebrity guests and members of the public answer stupid questions, while canned laughter props up the host's comic talents. Bitter? Of course I am — these people steal your ideas, and there's nothing you can do about it. (See the 'True Story' box.)

SO WHAT DID THEY SAY?

"But how are we going to know how it will sound?" Paul and Julian asked, quite reasonably. I responded that if they wanted a theme with the feel and sound of *Have I Got News For You* they could hear it the same way the producers of that programme heard it for the first time: down the phone, performed on guitar and kazoo.

They pointed out that other people — such as the head of Channel 5 entertainment, Alan Nixon — also needed to hear the tune. "Well, let's go to his office, so I can play it to him at the same time as playing it to you and anyone else who needs to hear it." I replied, without a note ready to play. They said that they would see if he would go for it, and I said that I'd go away and compose the best theme on Channel 5.

About a week later, I got a call to say that it was on. All that remained for me to do was write the tune — always the easiest part of the process. I'd taken away a video of the opening graphics, with the current (but to be replaced) music, which I simply turned down on my TV. ▶

WRITING A CHANNEL 5 THEME TUNE

A TRUE STORY

Once upon a time there was (and still is) a popular BBC2 series produced by a leading independent production company. This company asked me to submit a demo for a show they were making. I'd worked for them a couple of times before, and both shows were extremely successful. I thought I was bound to get the job, so I gave them seven different ideas to choose from, and to separate the pieces on the tape I used an effected voice. I didn't get the job, but when the series started the music was a combination of two of my ideas, with an effected voice pronouncing the name of the show on top, just as my demo had. Coincidence? I'd like to think so. But I felt it was such a blatant theft of my ideas that I decided to stop providing demo cassettes and never to work for that producer again.

► SHOW US WHAT IT'S MADE OF

My first job was to work out a convenient bpm template which would hit all the major points of action in the opening graphic sequence. I eventually decided on 150bpm (I thought it should have a '5' in it somewhere). The next job was barring out a chord sequence. I toyed with the idea of writing the theme tune in 5/4 but decided against it. For a TV programme you want a tune the milkman can whistle — although I did come up with a killer 5/4 Channel 5 logo sting that bears only a passing resemblance to the *Mission Impossible* theme. Maybe I ought to call them about it...

Now it was time to come up with a chord structure and top line. I decided that, as *Exclusive* is an upbeat, positive show, the best way of reflecting this was to have the chords (all major) moving up. Kicking off with an E (for *Exclusive*) the sequence is E/G/A/CD/E/G/AC/DG/, ending on a ball-busting top E. As for the drum part, I used my favourite beat, fours on the snare (aka the 'F beat' — can you guess why?), which would perfectly lead into the big drum fill on the sixth bar (a graphics hit-point) that sets off the piano glissando (another hit point) in the next bar, before the big ending. Fantastic!

Apart from the first beat, which is on the downbeat, every bar is pushed (hitting a quaver before the downbeat), as this gives a sense of urgency to



George winning over Channel 5's Commissioning Editor, Alan Nixon.

the music. It also helped to reinforce graphic hit-points. The version of the theme that runs with the end credits (which are slightly longer and have no graphics) is on the beat. This gives the piece more consolidation — good for rolling the credits over. There's a production graphic (the bit that tells you who made the show) to hit at the end of the piece, but that was easy to do — a one-bar shllanging hold with a piano flurry, finished off with a huge 'Splatt'! So far, all this existed only on paper.

FIRST THINGS FIRST

With my acoustic guitar under my arm, a kazoo in my gob, and one of those tiny Marshall pocket battery amps to plug the SR16 drum box into (just for timing, you understand — a good drummer will make a session, and I always use the best) I went off with Mr Gibbs and Mr Philips to the Channel 5 head office in Covent Garden. We waited much less than an hour in order to play my masterpiece to Channel 5's entertainment head-honcho, Alan Nixon. I set up in his office, explained to him why I don't do demo cassettes, and then put the video of the show in the machine, muted the sound and played my tune.

At first I got the impression that he thought this was one of those Noel Edmunds pranks, but after I'd explained that with a kick-arse horn section and a spanking drummer the tune would sound the total business, he saw I meant it. After a couple more plays and a cup of tea, he went for it — or, to be more accurate, said he loved the idea, thought the approach was right for the show and would give his final decision next week at their monthly get-together.

PANIC STATIONS

I went home quite happy with my morning's work and decided I wouldn't do any of the other 30 or so cues which the show needed until I got the green

BAND AID

This (below) is the band for the *Exclusive* session and the new recording of the *Have I Got News For You* theme, a two-and-a-half-minute version featured on the BBC 75th anniversary CD. Apart from the young Twig who, at 15 years old, is at the beginning of his session career, these are the best of the best musicians in Great Britain, playing with artists as diverse as Madonna, Henry Mancini, Chaka Khan, Count Basie, Tom Jones, Cliff Richards, Boyzone, Barry Manilow, Pet Shop Boys, George Shearing, the Monkees, Royal Philharmonic Orchestra, Brand New Heavies, Blues Traveler and thousands more.

- Phil Todd: Tenor Sax
- Alan Wetton: Alto Sax
- Noel Langley: Trumpet
- Andy Bush: Trumpet
- Pete Adams: Piano

- Twig the Wonder Kid: Guitar
- Slammin' Ralph Salmains: Drums
- Big George Whatsname: Bass and Tambourine

The *Exclusive* session was a total buy-out and the Musicians' Union minimum fee is £343 for a three-hour session, recording not more than 20 minutes of music. This means that no matter how many times the music is used, in whatever way, the musicians are paid no more money whatsoever. As for the *Have I Got News For You?* session, this paid a standard fee of £93 for three hours, but if the record is used for anything else, like a conference or video for *Top of the Pops* (one can hope), the musicians are paid a varying percentage of the fee again, sometimes 100%. As a matter of good manners, I always pay more than the going rate. These rates are negotiated on behalf of musicians by the Musicians' Union. In the past, the Musicians' Union has been thought of as a bunch of cloth-capped second-rate tuba players who have no idea what's going on in the real world. That may have been the case 10 or 15 years ago, but not today. Whatever sphere of music you are currently working in, the Musicians' Union is there to protect your interests, so join.



The *Exclusive* session band (l-r): Twig the Wonder Kid, Phil Todd, Alan Wetton, Noel Langley, Pete Adams, Andy Bush, Big George. To the left of George at the front, Ralph Salmains.

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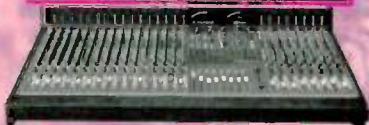
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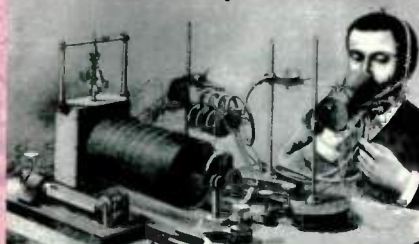
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WRITING A CHANNEL 5 THEME TUNE



The Exclusive session in progress (l-r): Ian the cameraman, Alan Welton, Phil Todd, Noel Langley, and Andy Bush.

► light. The green light duly came, a week later, from one of the producers. Channel 5 had had their meeting and were prepared to finance the recording, which was to take place as soon as possible.

Composing and scoring the parts is one thing, but booking the right band and studio requires major juggling of who's available, when, and where. To complicate things even further, *Exclusive* wanted to film the recording session as an item for the show, so accommodating everything was a nightmare of logistics.

When I'm doing TV and radio work, I use a live band wherever possible. For one thing, all the best TV signature tunes are played by people, not machines. And even though there's so much work involved in actually preparing for the job, when a

live recording session is finished the job is finished — no tweaking this bit on the sequencer and changing that patch setting in the studio upstairs.

Just when I had finally got my favourite players booked, and confirmed a date with the studio which was also convenient with the film crew, I received a phone call. It was a lawyer, saying that before I could go ahead with the session the chief executive of Mentorn Films wanted to hear the piece, and could I send a demo of it on cassette? NO! I don't do cassette demos, blah blah blah...

GO BACK AND DO IT AGAIN

So I had to have a meeting with the head of Mentorn, Mr Tom Gutteridge, and go through the whole guitar and kazoo thing again. Never mind — the tune was a corker, the approach to recording, with a live band smacking it out, was sound, and I have no fear of presenting my ideas. He explained to me that Mentorn must make the maximum amount of money possible for all music used in the making of their programmes. All the music on all Mentorn programmes has to be administered by Mentorn's publishing company, Golden Break Music. They take half the performance royalty and all income the music earns in any other way: take it or leave it. This type of deal is not uncommon these days — in fact it can be a lot worse. I took it.

I'd already composed all the cues and plotted them so that they could be mixed and matched. This means that all cues can be 'crashed' together, as the nature of the show makes accurate timings for cues impossible. So half the cues are 'crash endings'. These do exactly what they sound as though they should do — one looped sting is used as a voice-over bed and when the piece winds up you crash-end it with one of the other stings. Using the

'F beat' helps too, as putting a crash end on any beat doesn't make it fall out of time. This is more

SOUND SUITE

With a million bedroom studios (including mine) in the world, why should anybody bother spending money going into a small studio to record a session? A few reasons that spring to mind are: balanced monitors, soundproofing, another set of experienced ears, someone else taking care of the miking up, routing signals, patching in effects, and making good tea and coffee. As a result of all this, you can spend all your time on the creative processes at hand — and you're not responsible for the washing-up at the end of the day.

I use Sound Suite studios (0171 485 4881) as often as possible, because the owner and engineer, Pete Rackham, has bionic ears, knows more about mic placement than all the boffins at Neumann, can navigate his way through the worst spaghetti jungle of patch leads to plug in another compressor (this time on the effect returns), and the tea and coffee are lovely.

The studio has been there for 20 years; the original desk was designed and built by Ted Fletcher (of Joemeek compressor fame) and was used by Trevor Horn to record 'Video Killed The Radio Star'. Another huge (and revolutionary) hit to come out of the studio was Paul Hardcastle's 'N N N Nineteen'.

The gear in the studio, after its recent refurbishment, includes an Amek Hendrix 40-channel mixing console, an Otari MTR90 2-inch analogue multitrack, two Tascam DA88 digital 8-tracks, Queded and Genelec monitoring, and a little cassette radio for the most important monitoring of the lot. Well, things always sound great when they're played through massive speakers.



Sound Suite Studios engineer Pete Rackham twiddling knobs.

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WRITING A CHANNEL 5 THEME TUNE

► than can be said for the majority of daytime TV magazine shows, where long stings suddenly end out of nowhere, or limply fade out, or go into a weird time signature in order to finish.

WHAT'S THE SCORE?

With 34 cues written for eight players (including my part — did you think I'd remember them just because I wrote them?) I decided to get horn-playing guru Dick Hanson (ex-Shaking Stevens, amongst many other more credible names) to transpose and copy the sax and trumpet parts in their relevant keys. I had enough scoring to do with drum, bass, piano and guitar parts.

Then, for the second time, I booked the best players in town and a day at the compact but superbly appointed Sound Suite studios in Camden, with Pete Rackham engineering. I organised the rhythm section to start their three-hour session an hour before the horns turned up, so that we could get a drum sound and make sure the backbeat groove was right. This scheduling also meant that, if need be, the horns had an hour to overdub any parts that didn't quite sit properly during a live take. If you're aiming to record 34 cues in two hours you have to be totally sure the parts work and the players can sight-read with pizzazz. The fact that most of the cues were shorter than seven



Mr Webley 'takes it' with his tambourine.

seconds helped a fair bit, but it was a pressurised session nonetheless. Even more pressure was heaped on by the arrival of the film crew halfway through, asking us to run through the theme a couple of times so that they could get their angles right, and so on. I was a bit shocked to see a well-known newsreader in the control room — was *News At Ten* doing an exposé on composers bluffing as bass players? No such luck — he'd popped in to take one of the TV producers to the pub and was just seeing what was going on: BOING! In truth, I think the intrusion of the cameras, both film and still (the photos from the latter can be seen accompanying this article), helped to keep everyone on their toes.

We striped the 2-inch multitrack tape with SMPTE code, so that the automated desk could keep mixing as easy as possible, and laid down a click-track to keep strict time for both the opening title graphic hit-points and the crash endings. The musicians were all on top form, as that calibre of player always is, and the music sounds... well, check for yourself on Channel 5 every night at 7pm, every morning at 10am (which, as every



"My work is done here... It is time to move on..."

PITCHING A WINNER

George's method of pitching his tune to the Channel 5 and Mentorn executives was unconventional, to say the least. We asked two of them for their reactions.

Channel 5 Commissioning Editor Alan Nixon: "I knew of George, though we hadn't met, then Paul Gibbs, the Executive Series Editor for *Exclusive*, came in to pitch some new music and brought in this character. George's first words to me were 'I'm not going to pitch to you, because I'm not very good at pitching.' He then brought out his guitar, a small Marshall speaker, a drum machine, and a kazoo, and proceeded to play through the video of the title sequence of *Exclusive*. He talked his way through the programme, embellishing it with hoots from the kazoo and bits from the drum machine, and little flashes of sound that he'd made up, and then on the cassette he had some drum rolls to show how it would come in and out. It was a full-blown cabaret performance really, as

opposed to a pitch. The force of his personality made it entertaining, and he was able to answer specific questions about how he would solve particular problems. The way he presented it made it easier to say 'Yes, that's a great idea.'"

Julian Phillips: "With most pitches, you have one or two people playing their tape and people nod or shake their heads, and generally look around at each other for a reaction. Then they say 'Mmm, that's not bad, yes. Well, have another bash.' Then they listen to the next version and say 'Ah, that's a bit better. Maybe you could...' and you go on and on and on. George got over having to do all that with this brilliant idea: he said 'Why don't I just bring along the kazoo and guitar and play the theme tune to you. I'll play a couple of other well-known theme tunes so that you can hear what they sound like on a kazoo and guitar, and then I'll play the one I'm pitching to you.' People are so gobsmacked by the absurd idea of someone coming to a commissioning editor with a kazoo and a guitar that

they say 'OK, let's give it a try.' It was a bizarre sight to see. But memorable."

What were you actually looking for in the music for *Exclusive*?

Alan Nixon: "We wanted it to be modern. The music we had was a bit showbizzy. It was OK, but it was a bit muzak-like for me. The words George used in describing the theme included 'classic' and 'soul', something that would not be bedded in a particular era, but would actually cover lots of eras. We were looking for something that was pure and would cross generations without upsetting any of them."

Julian Phillips: "George is different to some composers, in that he will always campaign to have live musicians. I said 'How about George Webley?' because I'd heard the *Have I Got News for You* theme tune, and it sounded like a really rocking band. It just sounded really live and really good. And that's what appealed to me. I thought that's what we were lacking in our programme." Debbie Poyser

THE MAGIC RECTANGLE

My *Exclusive* appearance isn't the first time my ugly mug has made it onto the box, by any means. Apart from doing spots with a variety of artists on most of the pop music shows in the 1980s, I was the Bandleader/Musical Director during a five-day-a-week, 14-month run (350 hours) of live TV on Derek Jameson's chat show on Sky. I also appeared on BBC2's *Newswight*, and was driven to and from BBC Television Centre in a limo that contained a mini-bar, a fax machine, a TV — the lot. En route I received four calls from the producer asking my view on the night's subject ('Is Pop Music Dead?') and my opinion on my opponent's viewpoint. (Basically, they want you to have a massive row with the other guest.) At the studio you wait with a couple of politicians, someone from the clergy and various TV people, every one of them getting absolutely plastered — except for Kirsty Wark, who is the best presenter I've ever seen in action. My appearance fee was £30; my driver charged the BBC £260 for the round trip.

I was also involved with the last two ITV Telethons, which collectively raised over £50 million, going on air

at 7pm on a Saturday and finishing at 10pm on a Sunday — that's 27 hours non-stop on camera! (In fact, every hour there was a 10-minute break while the broadcast stopped for news and weather and you could queue for the toilets or some food, along with about 250 technical staff.) My job as Musical Director was to back any and all guests that happened to turn up, and play appropriate music for whatever feature was next.

A typical hour would involve playing the sting in and out of the break eight times, a Foxtrot for the Croydon OAP Ballroom Dancers, the theme from *The Dam Busters* for people dressed as World War One pilots with wheelbarrows full of toy frogs, 'Kung Fu Fighting' to accompany an under-sevens karate team chopping balsa wood, and some tough-guy music while the world record for the most press-ups in a 24-hour period was broken. In the course of the two broadcasts, presented by Frank Bough and Judith Chalmers, I was slapped on the wrist twice for the walk-on music I provided for Claire Rayner ('You Are The Wind Beneath My Wings') and Wayne Sleep ('Dancing Queen').

“The truth is that there is no standard way of getting a job in film, TV or radio.”

composer will tell you, is Tellytubby time), and on Sundays.

After everyone had done their part, which included signing the MUPACT agreement and being paid, I was left with Pete, the engineer, to mix. We started by going for a curry, after which we set up the automated mix, gated the drums, had a cup of tea and compressed the horns a touch. We monitored it all through a little portable radio. I took the DAT master home and, using my ancient Mega 4 Atari-based *Sound Tools*, cleaned up the starts and ends. I delivered the job the next day and it went on air three days later, with the short 'making of' piece. I looked as though I hadn't slept for a month — which is about right, as the week before I'd done the music for Jo Brand's Channel 4 series *Like It Or Lump It*, and I'm in the middle of composing and recording a Children's Symphony (for details see all the press that'll be blagging as soon as I can get round to it).

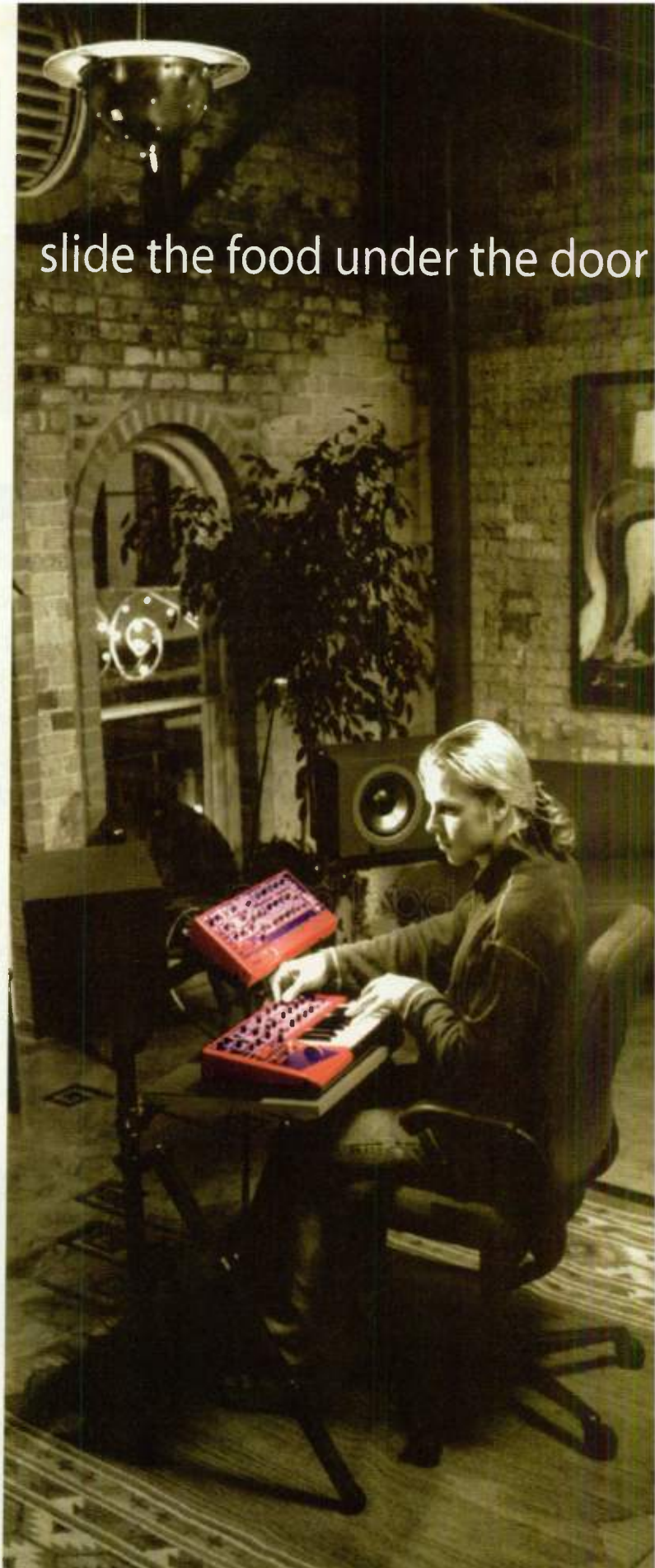
THEY DIDN'T GET MY GOOD SIDE

One minor thing wrong with the film piece was that when Ian the cameraman asked us to play the theme a couple of times to get the right angles, he said that the film would be used to accompany the finished mix. But when they showed us playing, they actually used the sound from Ian's camera, which had picked up whatever it was directed at. So at one point all you could hear was the horns wailing, then the drummer took a lead role, and throughout there was no bass at all (I was DI'd). Maybe I could release it as a Dub mix. Oops, I can't — I don't have any rights over it any more.

Now that everything is in the can, on the box, with all contracts signed, sealed and delivered, I guess it's back to watching the phone again. Anyone out there want a tune for anything?

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PART 5: THE ORIGINS OF S&S

At the January NAMM show in 1987, Roland launched their D50, which mixed synthesis and sampled sounds in one package, a combination which has remained popular to the current day. PAUL WIFFEN examines how S&S evolved into the most widespread form of sound generation on the market.

Until Roland launched the D50, sampling and synthesis had been perceived as two wholly different disciplines, almost like competitive ways of doing the same thing. Some people favoured sampling because it gave you a more accurate representation of actual instruments (the holy grail of piano, strings and brass, for example), while others stuck to the various styles of synthesis because they offered greater expressivity and speed of use. There had been massive improvements in

the sampling arena in the preceding few years. It was no longer just the province of rich stars and well-paid programmers. The Ensoniq Mirage had solved the expense problem, the Prophet 2000 had made state-of-the-art fidelity affordable (12-bit linear as opposed to 8-bit companded) and shortly thereafter the Akai S900 had made fidelity relatively easy to use as well (thereby drastically reducing my income, as I had been making a nice living out of operating first Emu and then Sequential samplers for people who found them difficult to use!). So sampler ownership was reaching a much wider market than in the early '80s.

Sampling's principal remaining drawback in the late '80s was the amount of time it took to load sounds. As a result, the majority of people playing live, and those who were frightened by the idea of using computer technology (RAM, floppy disks and hard drives), were still using the various competing forms of synthesis we have examined in previous instalments of this series, because even if less sonic authenticity was available from these forms of synthesis, they responded better to velocity and aftertouch and (most importantly, I suspect) you could switch sounds instantaneously. The great debate raged between the two opposing

Roland's S&S breakthrough, the D50 (seen here with its PG1000 programmer).



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SYNTH PROGRAMMING

- schools of thought, often with things getting a bit personal. The great irony was that the whole situation was about to be resolved, by these two supposedly conflicting technologies being merged together (a bit like this year's shock announcement that Bill Gates was putting money into Apple).

BEFORE THE D50

It has to be said that sampling and analogue synthesis were not existing in glorious isolation anyway; as early as the PPG Waveform it had been possible to make a sample and then play it back on the Wave synth through analogue filters. The Emulator II added analogue filtering and enveloping to sampling technology, and this was

worthy of the workstation title, it was Korg who had the breakthrough success with the M1, not because its sequencer was notably easy to use, but because of the sheer size of its palette of sounds. The reason was that the samples in the M1 were larger than those in the D50, in the same way that the D50's samples had been larger than the percussion snippets in the ESQ1.

HOW DID THEY DO THAT?

It's still well worth looking at how the D50 generated sounds, because in the course of taking a few enforced shortcuts (dictated by the budget they were working to), the Roland engineers came up with some techniques which changed synthesis forever.

The D50 was actually a hybrid of three previously distinct technologies:

- Analogue (or subtractive) synthesis
- Digital sampling
- Digital signal processing (DSP) for effects

These core technologies met in the D50, perhaps not for the first time, but certainly in the most affordable and usable way. Although each on its own would not have been enough to make a viable instrument (the samples were too short, the synthesis too restricted and the effects too



Ensoniq's ESQ1 was an early synth that featured short on-board PCM samples.

carried over into more affordable samplers such as the Mirage, Prophet 2000 and Akai S900 (although many people never used the facility). And even on synthesizers there had been the odd attempt to increase the fidelity of certain sounds by using small PCM samples loaded into ROM. (This was how the Ensoniq ESQ1 provided its drum sounds.) But all these half measures meant that synthesis and sampling were seen as mutually exclusive fields — until the D50 came along.

The D50 used a much larger amount of PCM ROM (separate from that holding the operating system of the synth) to store a significant number of samples, allowing the expressive performance of a wide range of sounds previously only possible with any fidelity on a sampler. Although the D50 itself didn't have a sequencer, this approach paved the way for a new breed of instruments known as 'workstations', which were designed to perform a wide range of musical tasks — for example, playing drum, bass, piano and string parts simultaneously using an internal sequencer. These sounds were the ones which were the most difficult to make with analogue or digital synthesis, the ones which had previously only been possible by loading a disk or two's worth of data into a sampler. Although Ensoniq had already released the first instrument

“Until Roland launched the D50, sampling and synthesis had been perceived as two wholly different disciplines, almost like competitive ways of doing the same thing.”

primitive), the combination of the three made an instrument people couldn't wait to get their hands on. And although its imitative capabilities have long since been surpassed, as a synthesizer it still has much to recommend it today.

Let's first analyse the strengths and weaknesses of the D50's three component technologies:

- Analogue synthesis took electronically generated waveforms and used filtering to shape the harmonic content of the sound over time. While such a process was excellent for creating rich and

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SYNTH PROGRAMMING

► interesting sound timbres, its imitative capabilities were limited, especially for inexperienced users. In addition, polyphony was usually limited, due to the need for discrete circuitry for each voice.

- The digital sampler used the technique of digitising sound and storing it in computer memory to allow real instruments to be recorded and played back from the keyboard. This provided an instant realism unavailable from traditional synthesizers, but with a loss of expressivity (the only nuances available being those 'frozen' in the recording). The amount of sample recording time available was very limited, due to the high cost of computer memory. In addition, instruments had to be sampled every few notes along the keyboard for authentic reproduction, which used up the available memory even more quickly. Looping (repeating an unvarying section of the recorded sound for as long as the key was held down) helped reduce memory usage enormously. Techniques such as fading or switching between samples depending on how hard the key was hit increased expressivity, as did the introduction of analogue components such as filters and envelopes, to allow the timbre of the recording to be changed by playing style.

- Digital signal processing, the third component, had reached the stage where a single DSP chip could be programmed to imitate many different analogue effects, such as chorus, flanging, reverb and echo, and even combine two or more of these effects simultaneously.

Roland used the term Linear Arithmetic Synthesis (or LA Synthesis, for short) to promote this combination of technologies, although the irony is that the term gives very little clue as to how the D50 works, based, as it is, on one often-overlooked part of the process which determines how two waveforms are combined. The options are to sum the waveforms together (like two oscillators in analogue synthesis) or multiply them (as in ring modulation or various digital synthesis techniques). It will become clear that this part of the process played little or no part in the D50's phenomenal success. It seems likely that the term was coined more for its two-letter acronym value (like FM, PD, and so on).

So what were the key components which gave LA synthesis its appeal?

THE SAMPLED ATTACK

What let analogue synthesizers down more than anything in terms of imitation was that they could not create the extremely complex sets of harmonics present at the beginning of most acoustically produced sounds. The first few milliseconds of sound, when a piano hammer strikes a string or a bow begins to move on a cello, have a huge harmonic content not available in traditional electronic waveforms. If we do not hear these short-lived frequencies, we perceive the sound as lacking in authenticity.

The Roland engineers realised that if they could use a digital recording to produce the initial attack, this would go a long way towards creating realistic instrument sounds. In addition, very little computer memory would be needed to store these very short 'attacks'. Pulse Code Modulation was used to record the attacks, and they were stored on Read Only Memory (ROM) chips, which did not lose their contents when the power was shut off, unlike the Random Access Memory (RAM) chips used in samplers. This did away with the need for floppy disk drives (although a memory card could be used to make further PCM samples available).

THE SUSTAIN LOOP

The Roland engineers turned to waveforms that had more in common with analogue synths in order to produce the sustained portion of the sound. The looped portions of samples often sounded very similar to traditional synthesizer timbres. They were known as single-cycle loops, as they contained only one of the repeating patterns which make up the timbre of an electronic oscillator. The small amount of data contained in such loops meant that they took up very little room in the ROM chips, which meant that notes could be held indefinitely without using up valuable RAM space.

PARTIALS

Obviously, the fact that different parts of the sound were being created by different PCM waveforms meant that it was necessary to control these sources separately. The solution that was devised to allow this was called the Partial. There were four Partial's available for each sound program in the D50. Each Partial could be loaded

THE REST OF THE D-SERIES

As with the Yamaha DX7, the previous universally successful synthesizer, the D50 spawned a whole series of descendants, both larger and smaller, from the flagship D70 to the D5 and D10 at the lower end of the market. None of the D50's descendants really added anything to the basic principle of LA synthesis, nor to the basic architecture of their antecedent. The D70 was the only machine which expanded at all on the spec of the D50, and that was in practical areas like the number of keys on the keyboard, and controller functions. So the D50 remains the definitive example of LA synthesis.

One of the D50's smaller brothers, the D10.





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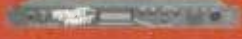
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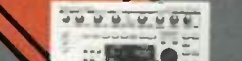
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SYNTH PROGRAMMING

▶ with a PCM waveform and then combined with its fellows. Each Partial used one voice of the D50's polyphony, so it was often better not to use all four Partials unless really necessary (more complex sounds would result in less polyphony). Most of the more realistic sounds used at least two Partials (one for the sampled attack and one for the loop section). However, some of the sounds had four Partials, using two pairs of two to create the effect of two sounds layered together (piano and strings, for example). Perhaps the sounds which characterised the D50 the best were those which used all four Partials independently, to create complex evolving timbres. These did not require much playing, but simply sustaining a note or chord while different elements faded in and out. Such sounds were almost unknown to the average musician before the D50, being only possible on professional systems such as the Synclavier or PPG.

ADD OR MULTIPLY?

Although I've played down the importance of the way the Partials were combined in the success of LA synthesis, it is actually one of the things which makes the LA process of interest as a synthesis type today, now that it has been superseded by systems with more memory. The standard way of combining the different elements of sound since



The D50's Partial Algorithms, as reproduced on its front panel.

the beginning of synthesis was simply to mix them — ie. sum them in a linear fashion. This was just one way of combining the sounds on the D50 (admittedly the one used by the majority of its sounds). The other was to multiply the waveforms together, which tends to create metallic or bell-like timbres, as the normal harmonic series is supplemented by less usual frequencies. This is where (for me at least) the really interesting sounds from the D50 were created. Although the success of the instrument can be attributed more to the new level of authenticity it brought to conventional keyboard sounds than any revolutionary new timbres it created, it is in this latter area that purchasers of second-hand D50s today may want to look for its unique character.

The combination of the four Partials on the D50 was determined by Algorithms. Although there were nowhere near as many as offered by 6-operator FM, they were illustrated on the front panel of the instrument, just like on the DX7 (see picture above). These algorithms allowed you to determine which sounds were added together and which multiplied. You could, for example, ▶

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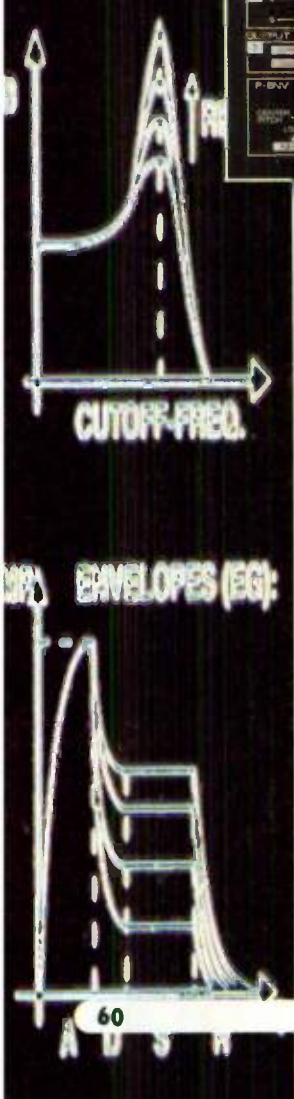
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SYNTH PROGRAMMING

- ▶ multiply two pairs of Partials and then add the results, or multiply one pair and add the result to two other Partials. However, this feature of the machine was perhaps the least exploited, with 95% of sounds created by simply adding together whichever Partials were selected.

ENVELOPING

The combination of sampled attack and single-cycle loops meant that realistic strings, brass and other sustained sounds could be easily created. However, pianos and other timbres produced by striking do not sustain forever, but die away gradually. A single-cycle loop, therefore, has to be "faded out" to simulate this effect. The more sophisticated samplers had already borrowed envelopes from analogue synthesis to deal with this, and the D-series engineers followed suit. Because the D-series used sampled attacks along with single-cycle loops, a more complex envelope system than the conventional ADSR was used, with six independently adjustable times and levels was employed. In this the D50, once again, had more in common with the DX7 than conventional analogue synthesizers.

Because the D50 featured analogue-style filtering (albeit digitally controlled, hence the term DCF), these envelopes could be used to adjust not just the volume of the loop over time but also the harmonic content. This was absolutely critical to the realism of LA synthesis, as you might not want the looped part of the sound to retain its full harmonic content throughout a decay. Without the ability to vary harmonic content, any decaying sounds, from pianos and acoustic guitars, through to tuned percussion, would have had little realism.

BLENDING PARTIALS

Even very careful adjustment of the basic envelopes could not prevent the attack and looped segments sounding like two different sounds being triggered at the same time. What was needed was something to 'fuse' the sounds together so that they became one instead of two distinct timbres. To achieve this, the Roland engineers used DSP effects such as reverb and chorusing to blend the parts together. Reverb tends to make the point where a sound ends difficult to perceive, so this was perfect for hiding the fact that the sampled attack had suddenly stopped and the looped portion was the only part remaining. Chorus was also good for adding some timbral movement to the single-cycle loops, which can be a little static to the ear.

Because the sounds which needed this 'smearing' really did need it, in order to be usable at all, the Roland engineers made the effects setting part of the basic patch, so that it was always automatically selected with the program, becoming one with the sound and therefore a fundamental component of the synthesizer for the first time. Previous synths had often featured a chorus unit, but usually as a separate item (it was not usually tied in permanently and selected simultaneously with the timbre, except in the case of the Roland Jupiters and Elka Synthex). Although the inclusion of full-scale DSP effects may originally have been decided upon to mask problems with this style of sound creation, it changed the face of synthesis forever. Today it is virtually impossible to sell anything but the most basic of monosynths without

LA SYNTHESIS IN THE '90S

While the fidelity and sonic quality of LA synthesis have long since been surpassed, the role of the D50 need not be a purely historical one. Unlike the DX7, which can be replaced by more recent FM synths from Yamaha and others, the D50 can still make certain sounds which no other single synth on the market can emulate, and many of its trademark sounds still have a place in modern music.

One of the things for which the D50 became famous, and eventually infamous, was its looped sounds featuring a rhythmic element and shifting harmonic overlays, previously seen only on the Prophet VS and PPGs. These are now a staple of most synthesizers, and for this we really do have to thank the D50. The most famous D50 sound of this type was 'Digital Native Dance', a slowly evolving combination of synth timbres and a percussion loop. Although this particular sound was done to death as an intro on recordings by many artists in 1987, including the great Wacko himself, the other complex looped/ambient sounds on the D50 still have a certain charm. You can even create your own combinations by mixing and matching synth timbres with percussion loops.

Interestingly, these PCM loops pre-date the use of sampled drum loops, now omnipresent in most modern recordings, but they have the same drawback as sample loops in that their tempo cannot be

changed without re-pitching the loop, and they therefore cannot be synchronised to other instruments within the track (hence their use as intros and ambient backgrounds). The *ReCycle* approach developed by Steinberg cannot be used, as there is no way to download PCM samples into the computer, and even if there were, the results cannot be loaded back in nor sync'd to MIDI Clock. However, if you're fortunate enough to find a pitching where the loop fits harmonically and rhythmically with your track, re-triggering at the beginning of each bar (or every few bars) can be quite effective. If not, you may need to use the loop as a starting point or inspiration for a track and then fade it out when the other elements kick in. It must be said, though, that there are better systems available now for creating interesting synthesized loops in your music.

Ironically, it is in the setup of the often-overlooked Linear/Arithmetic algorithms that the biggest potential for creating unique sounds on the D50 remains. Avoiding the linear summing of partials and opting instead for arithmetic combining brings you into the sort of territory you could otherwise only explore with ring modulation or FM, to which the LA process is related. It's the same procedure of building complex sounds very quickly by multiplying simpler waveforms together, but what's unique about the D50 is that the source samples are no longer just

sine waves (as in the case of Yamaha FM) or other analogue waveforms (as in basic ring modulation) but complex, sample-derived timbres which already have many harmonic characteristics before you combine them. The result of multiplying such sources together can give unpredictable but fascinating results — occasionally beautiful, often angular, and even ugly, but never dull. Even timbres which are unpleasant when dry acquire an interesting character when processed through effects, so don't write off even the ugliest sounds until you've smoothed them out with some chorus or reverb.

I find it particularly interesting to try this with one of the aforementioned percussive loops on one Partial and a sustain loop on the other, as this imparts a crunchy rhythmic feel to a sustained timbre. Persistent experimentation is the key here, as the result will not always be usable on first combination (unless you're at the most industrial end of the techno movement, in which case the first thing you try will probably fit right in).

One tip, though: steer clear of sampled attacks for things like this. If both Partials you're combining are just attacks, any nuances of arithmetic combination will probably not have time to come through and if only one of the Partials uses a sampled attack, the other will sound even more dull and lifeless once the attack is over. Pair arithmetically combined sounds of similar duration, and then add attacks or longer sustains linearly, for a more even result.

INTRODUCING THE HR824 ACTIVE MONITOR.

If you've been trusting the quality of your creative product to passive monitors, there's an astonishing revelation waiting for you. In our opinion, the active, biamplified HR824 is the most accurate near-field monitor available — so accurate that it essentially has no "sound" of its own. Rather, Mackie Designs' High Resolution Series™ HR824 is the first small monitor with power response so flat that it can serve as a completely neutral conductor for whatever signal you send it.



Mackie acoustic engineer David Bie uses scanning laser vibrometry to map HR824 tweeter dome vibrations.

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



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

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.



(HR824)

SCIENCE, NOT SNAKE OIL.

Internally-biamplified, servo-controlled speakers aren't a new concept. But to keep the cost of such monitors reasonable, it's taken advances in measurement instrumentation, transducers, and electronics technology. In developing the HR Series, Mackie Designs sought out the most talented acoustic engineers and then made an enormous commitment to exotic technology. The HR824 is the result of painstaking research and money-is-no-object components, not to mention thousands of hours of listening tests and tens of thousands of dollars in tooling.

FLAT RESPONSE... ON OR OFF-AXIS.

One of the first things you notice about the HR824 is the gigantic "sweet spot." The detailed sound field stays with you as you move back and forth across the console — and extends far enough behind you that musicians and producers can hear the same accurate playback.

The reason is our proprietary exponential high frequency wave guide. Without it, a monitor speaker tends to project critical high frequencies in a narrow beam (Fig. A) — while creating undesirable edge diffraction as sound waves interact with the edges of the speaker.



HR824 Active Monitors accept balanced or unbalanced 1/4" and XLR inputs. Jacks & removable IEC

power cord face downward so that the speaker can be placed close to rear wall surfaces.

CLEAN ARTICULATED BASS.

Seasoned recording engineers can't believe the HR824's controlled low bass extension. They hear low frequency accuracy that simply can't be achieved with passive speakers using external amplifiers. Why?

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.

It constantly monitors the LF unit's motional parameters and applies appropriate control and damping. An oversized magnet structure and extra-long voice coil lets the woofer achieve over 16 mm of cone excursion. Bass notes start and stop instantly, without "tubbiness."

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 trans-

ducer cone and reach your ears. The typical problem of small-monitor midrange "boxiness" is eliminated.

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

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.

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 ± 1.5 dB, 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. 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.

TAILOR THEM TO YOUR SPACE.

Because control rooms come in all shapes, sizes and cubic volumes, each HR824 has a three-position Low Frequency Acoustic Space control. It maintains flat bass response whether you place your monitors away from walls (whole space), against the wall (half space) or in corners (quarter space). A low frequency Roll-Off switch at 80Hz lets you emulate small home stereo speakers or popular small studio monitors.

CONFRONT REALITY AT YOUR MACKIE DESIGNS DEALER.

We've made some pretty audacious claims in this ad. But hearing is believing. So bring your favorite demo material and put our High Resolution Series monitors through their paces.

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

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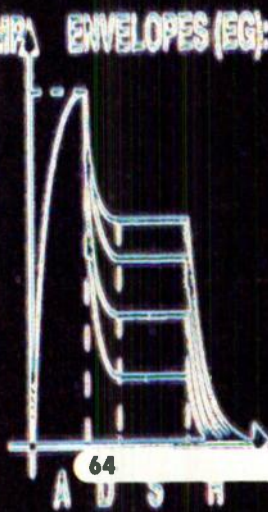
SINUS

SQUARE

SAW-UP

SAW-DOWN

RANDOM



SYNTH PROGRAMMING

▶ a built-in effects capability. This is because once a programmable DSP effect section has been added to a synth, there is no reason not to make available as many different effect algorithms as possible.

THE WIDER EFFECT

Once the DSP chip was inside the unit, there was no reason to limit its use to disguising the shortcomings of the D50's synthesis system. Reverb and chorus had a very pleasing cosmetic effect on any sound and were used on virtually every patch. Effects like distortion and ring modulation could take the most bland source waveforms and turn them into complex, expressive sounds. As a result, the D50 caused an even bigger change in the world of synthesis than the processing of sampled sounds through analogue-style synthesis. With the exception of a few professionals, who would pointedly ask to hear synths on demo with the effects bypassed, the majority of purchasers simply accepted that this was an improvement in the final sound they could obtain from a synth, without the need to hook-up expensive external effects. Soon built-in effects were the norm, not the exception, for synthesizers.

THE KORG M1

The next refinement of the PCM-based synthesizer was the Korg M1, which burst upon the world one year later at the 1988 NAMM show in Los Angeles. The price for memory had come down since the launch of the D-series, allowing Korg to increase the amount of memory within their new instrument. The major advantage of this was that instead of having to split samples into attack portions and single-cycle loops, they could use samples which moved naturally from the attack into a longer looped section, in exactly the same way as in a sampler. This meant that it was no longer necessary to disguise the join between the attack and the loop, because there no longer was one.

Another advance the M1 made was that only

one voice of polyphony was required to play back each entire sound. This meant that polyphony did not vary from one sound to the next quite as dramatically as on the D50 and, at the same time, the sounds were not so reliant on the built-in effects to make them sound natural. Sound-stacking could be used to make very complex timbres, rather than being necessary just to create authentic simpler ones.

Of course, this did not mean that all the M1's sounds were perfect reproductions of the

“Interestingly, the D50's PCM loops pre-date the use of sampled drum loops, now omnipresent in modern recordings.”

instruments from which they had been sampled. With hindsight, a lot of the original sounds in the M1 used perhaps too short a segment of attack sound, and the loops came too early for authentic reproduction of timbres like pianos, guitars and other sounds which die away gradually (although anything which could sustain indefinitely, like strings and brass, was extremely authentic). As a result, the M1 produced a 'compressed' sound which became very popular in certain styles of dance music. The M1 Piano, in particular, became a staple of house remixes because it was artificially bright and 'in your face', and the organ sound on it was a similar staple for garage music. ▶

Korg's landmark M1 workstation.



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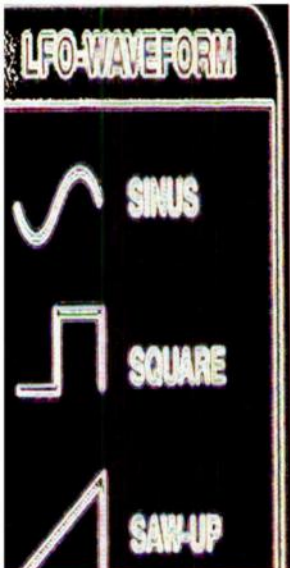
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SYNTH PROGRAMMING

- ▶ Whilst you would rarely use an M1 piano today for a 'straight' piano sound, at the time the M1 brought an unprecedented level of authenticity to sample-based synths.

The other thing which the M1 offered, over and above the authenticity of its sounds, was multitimbrality (the ability to play numerous different timbres at the same time). This could be done from the on-board sequencer or via MIDI, assigning each timbre to a different channel for triggering. Multitimbrality wasn't new; Sequential circuits had introduced it at the end of 1983 in the Six-Trak and Ensoniq had made it a major feature of all their products since the ESQ1 in 1985. However, the M1 was the first instrument with a good range of really authentic sounds to offer this facility. As such, it was perhaps the first synth whose on-board demos sounded like complete pieces of music, because it had everything from authentic drums and basses, to piano, strings and brass, guitars and synthesizer sounds, all in one unit.

Many previous keyboards had featured sequencers, but the usefulness of these was limited by the number of timbres they could produce simultaneously, or by the limited range of the synthesis type they featured. The full PCM multitimbrality of the M1 meant that the sequencer became much more than a sketch-pad or demo facility. It was a compositional tool which was hooked directly to the sounds. This meant that people who had no computer sequencing facilities or knowledge of MIDI could sit down and play something, record it, and overdub more tracks, with different sounds on each one. Whilst those who had mastered MIDI and computer sequencing would find nothing remarkable about this, it was a real revelation to those who had never experienced the power of MIDI sequencing.

The term 'workstation' was borrowed from the computer industry to market this concept, as well as a floppy disk drive as standard, so that M1 sounds and sequences could be recorded, saved and loaded back into the machine. As a result of all these features, Korg found themselves with the best-selling synthesizer of 1988/9.

THE DSP EFFECT

The only area which caused a bit of difficulty for M1 users (and still does today, as one in every 10 calls to the Korg technical helpline still bears out) was the allocation of effects in multitimbral mode. Like the D50, the M1 features built-in DSP for a wide variety of effects, which are also memorised and selected by the individual sound Programs. So whilst using a single timbre, it is possible to obtain sounds which are dramatically altered by the DSP. However, when Combi mode (which allows multiple timbres to be available simultaneously) is selected, the chances are that these sounds will suddenly become very flat and uninteresting. This is because the DSP circuitry in the M1 can only produce one effect setup at a time. Unless the Combi setup has exactly the same effects and routing setup as the individual Program, there's bound to be a noticeable difference

to a Program when it's selected as just one of the sounds in Combi mode. The degree of difference is determined by two factors.

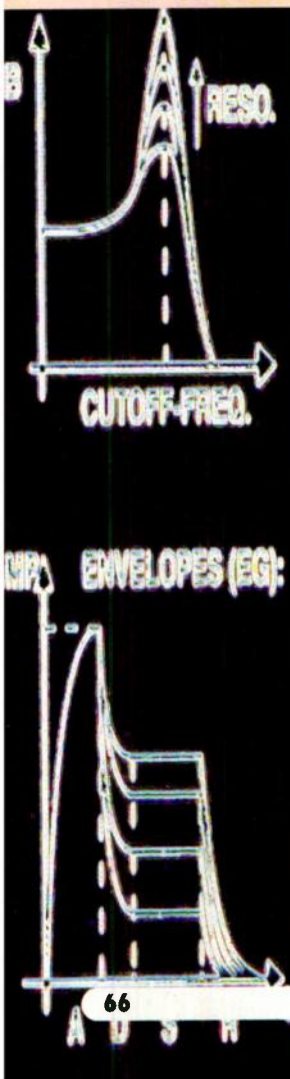
The first of these is how close the settings of the individual Program are to those selected in the Combi. If reverb is selected for both, and only the amount of early reflection or size of space has been changed, the difference will be subtle and not noticed by many novice users. If the Combi and Program settings have different effects selected, such as chorus and echo, the difference will be far more noticeable even to the most untrained ear.

However, the second factor is usually what alerts the novice user to the problem. If, in Combi mode, the user selects a Program where a complex DSP effect is actually creating the timbre from a very simple source (such as a distorted guitar sound), suddenly all the character of the distorted guitar or synth disappears and is replaced by a thin plucked sound. This often happens after three or four backing tracks have already been recorded and the user wants a really exciting lead instrument to play over the top. The general reverb used for the other sounds just does not work as a substitute for the distortion the guitar Program uses. The change in some timbres is so radical that some users at the time even contacted their dealers to report that their synth was not working properly. Many dealers received M1s back for repair, only to find that there was nothing wrong with them, except for an inability to faithfully reproduce several different Programs simultaneously in Combi mode. This is because the M1 does not have multiple effects processors (as do most other multitimbral workstations). M1 users have to try and make Combi setups for multitimbral sequencing which can share the same effects setup. This may mean backing off the reverb on that string sound, so that the bassline doesn't disappear in woolly mush, or leaving the chorus off the guitar, because it makes the piano sound like a honky-tonk.

The best way to deal with this situation is to try and plan which sounds you want to use simultaneously in advance. It is usually obvious which sounds really need the effects to retain their inherent character and which ones only use the DSP for a little sugar-coating. Then you need to reach a compromise between the amount of effect needed to give one sound its character and the amount which will not render the others unrecognisable.

Ideally, each M1 sound would have effect 'send' amounts, but this capability was not introduced by Korg until much later, on workstations such as the X-series. The result was not the same as if separate effects were available on each part individually, but it did give the best compromise available. This effects limitation was only finally resolved last year on the Trinity, which does have enough DSP horsepower to allocate 'insert' effects separately to each part during multitimbral operation, and also to offer an overall master effect, such as reverb, which is available to every part in amounts determined by effect 'sends'.

"As a result of all the M1's features, Korg found themselves with the best-selling synth of 1988/9."



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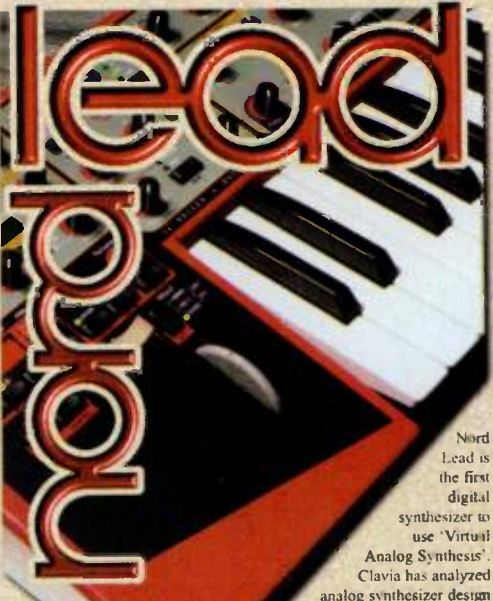


And the latest addition to KORG's range is the TR-RACK, pictured below this rack has all the features of the famous Trinity, but in rack format. This rack is sure to be a hit with those of you who want powerful synthesizer effects but don't have the room for the full keyboard. Try it today.

NEW TR-RACK



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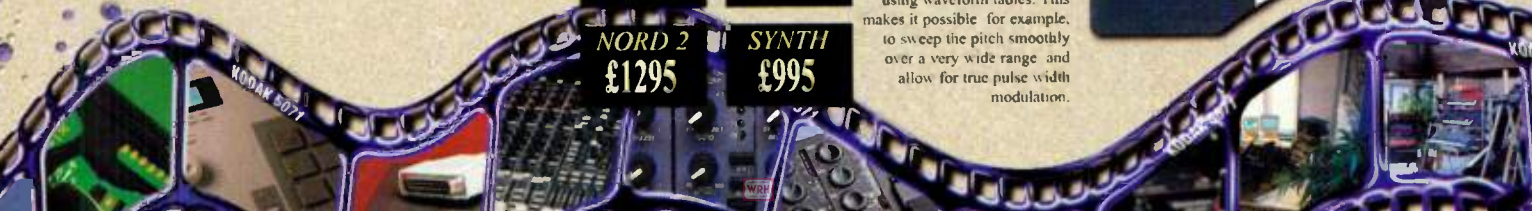
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novation



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 LFOs, arpeggiator, analogue chorus and distortion effects and stereo outputs with assignable autopanning. The MIDI to

cv/gate converter can now be run on a separate 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
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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, squealing leads, and all manner of

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SYNTRACK
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SPECIAL

HOT NEW MONITORS

Mackie's eagerly awaited HR824's have now arrived, and believe us they were worth the wait! These monitors are receiving rave reviews by magazines and users alike, just like Mackie's other lines these monitors are built like tanks and perform like a Rolls Royce. Come and see what all the fuss is about and we will blow your mind!



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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 out and Events other products out for yourself, you won't be disappointed! Check out the new amazing EVENT cards on page 8 of this advert.



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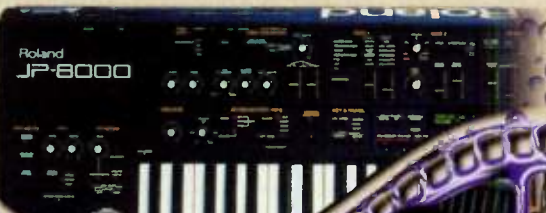


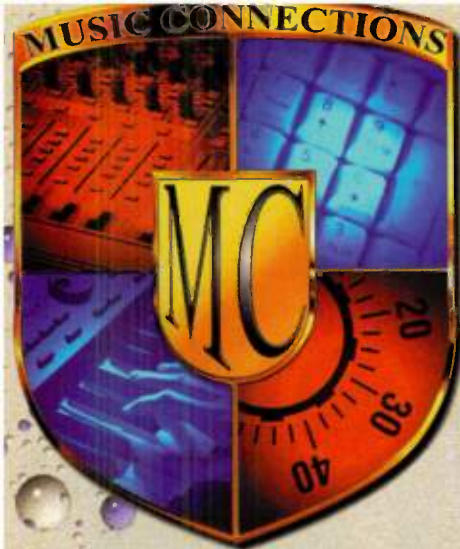
Has this company woken up from a deep sleep or what. I mean, this is the company that bought us DX synths, TX Synths and VL synthesis. And now this little wonder called the ANIX. This synth really must be heard. No advert can ever convey just how good this little gem really is. Don't forget there's still the CSIX & VL70 as well. Also hot on the heels of the ANIX 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.

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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

forgetting 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!



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

Up to 128 note polyphonic • Up to 32Mb High Quality ROM sounds • Up to 32Mb Multitimbral with voice card • 16 Outputs • Digital Modular Synthesis • 64 x 6 Pole filters with 2 filters • 24 bit stereo effects • Advanced 48 track sequencer •

Stereo sampling up to 64Mb • Digital resampling • Pc & Mac Editor included • SCSI

Interface & 2 Great CD-ROM's included.



ESI-4000

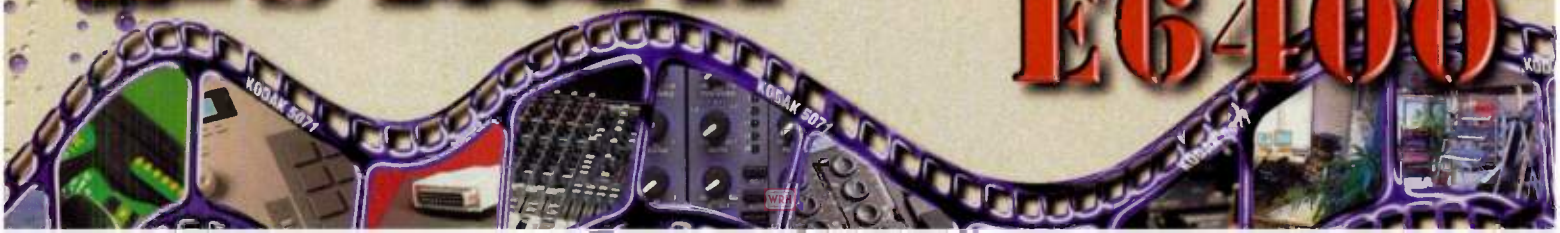
Get ready to shift into a new dimension of sound and value with the new ESI-4000. 64 Voice polyphony - the ESI-4000 gives you 64 voices of music power so you can layer and sequence thick, lush sounds and never drop a note. Easy to use - the ESI-4000 provides you with an intuitive user interface that is easy to learn and a pleasure to use - you'll spend more time making music less time reading manuals. Powerful DSP and sample editing - The ESI-4000 gives you incredibly powerful digital signal processing that lets you massage and manipulate samples to create your own unique sounds. Built-in sample editing tools such as automatic truncation, normalization, 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 different 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 SIMMs and you can easily upgrade the number of outputs, add dual 24-bit effects and digital FO with the ESI turbo kit. Unbeatable value - the ESI-4000 starts at only £1199 with 4Mb RAM, making it the best value sampler in it's class. Shift dimensions and see the ESI-4000 at Music Connections



E-SYNTH



E6400



CONNECTIONS

ESSEX - 01245 354777 BIRMINGHAM - 0121 2124777
 LEEDS - 01943 850533 SOUTHAMPTON - 01703 233444

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...

And because we are probably the country's largest AKAI retailer we can offer you the best package deals, technical support and back-up that most of our customers require. Currently top of our hit list is the stunning CD3000XL, as standard this machine includes a CD-ROM player; 8 separate outputs, 8 Mb memory and solely from Music Connections the brilliant EB16 effects board. If you don't want to be disappointed call as soon as possible, as the stunning price we are selling this for means that our meagre stocks will not last very long. Happy Shopping!



MPC2000

CD3000XL



CALL FOR AMAZING DEALS!



\$20



A3000

The A3000 is an affordably priced 64-pedal, 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 its 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 a 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.

YAMAHA

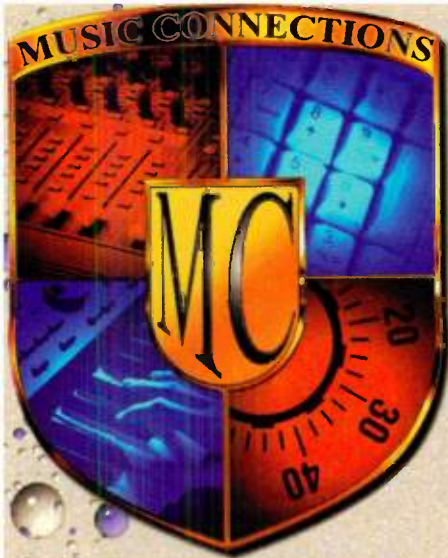


ULTIMATE PIANO

EAST WEST

We are the **SOLE RETAILER** for **EAST WEST** in the Midlands and South of the country, visit us to find out why these sampling CD discs are turning **AMERICA** on!





MUSIC

Chelmsford Late openings are now by appointment only. please call before you visit. 01245 354 777

LONDON - 0171 7315993
BRISTOL - 0117 9467700

SOUNDTRACS

A dedicated multitrack recording console must provide the following: Superb audio performance, exceptional equalization, versatile monitoring, comprehensive patching and 1st class ergonomics.

All are in abundance in the stunning new Topaz Project Studio Console from Soundtracs.

LAST FEW AVAILABLE

Topaz

CALL FOR AMAZING DEALS!

KORG

168RC
The 168RC has been created with this goal; to help you create stunning recordings without adding noise, by converting from analogue to digital and back again. The 168RC utilises KORG's renowned heritage in DSP design coupled with 16 channels of Digital I/O in the industry standard ADAT optical format. So two digital 8 channel devices can be simultaneously mixed to 8 buses digitally, using the optical link.

ENTER THE WORLD OF ADVANCED AFFORDABLE DIGITAL RECORDING

YAMAHA



03D
£CALL

YAMAHA 03D
If you're ready for a compact, comfortably priced, full-featured digital mixer - one especially made for professional project and post production studios relying on modular digital multitrack recorders such as TASCAM, ADAT, AES/EBU and YAMAHA digital formats -

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.



02R
£CALL



MACKIE

DIGITAL 8-BUS

- 48 true channels for tracking, overdub & mixdown jitter-free, touch-updateable motorized faders
 - 12 aux sends per channel
 - 10 fade & mute groups
 - 24-bit output
 - 32-bit processing
 - Direct assign
 - Dynamic & snapshot recall of all parameters
 - Multiple simultaneous digital effects, dynamics & EQ
 - V-pot virtual rotary controls
 - SVGA monitor output
 - Mouse & keyboard inputs
 - Built-in hard disk & floppy drive
 - Instantly upgradeable DSP effects
 - Dedicated transport controls & jog shuttle
 - Built-in multifunction meter bridge
 - Powerful CPU with 8 megs of memory
 - Record-ready button on every channel
- and that's just a preliminary spec list!

These consoles offer the highest audio and build quality with easy to use features that take the effort out of superb mixing.

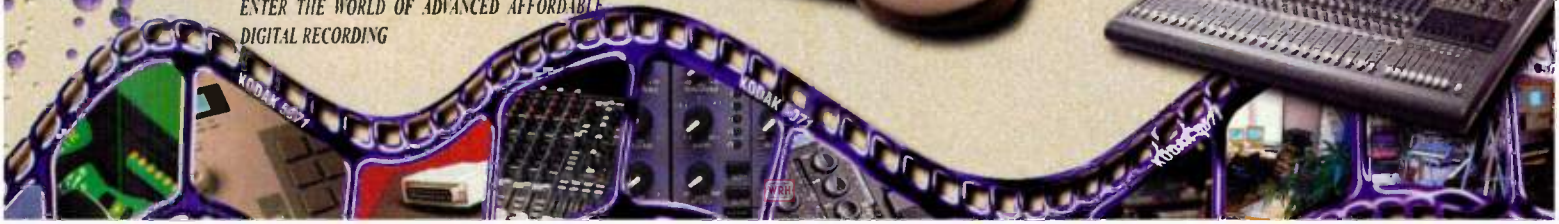
Don't forget the Original Mackie 8-BUS

Still one of the leading mixing consoles in the world for reliability, sound quality, ease of use and ergonomics. Put this together with our amazing price deals and you've got a serious machine at a serious price.

CALL FOR DETAILS!
COMPLETE MACKIE RANGE AVAILABLE AT ALL STORES!



Still the world leader in small mixers the VLZ range includes 1202, 1402, 1604, SR24, SR32 and LM3204.



CONNECTIONS

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PreSonus

Audio Electronics

The ACP-8 is 8 high quality compressor/gates housed in a steel 2U rack mount unit. Each compressor allows control of threshold, ratio, attack, release and output gain. Each is individually selectable for hard or soft knee, peak or auto compression. Each gate features threshold, release and attenuation controls. It's all here!

DCP-8 Now £599



The DCP-8 is an eight channel, digitally controlled analog dynamics processor, plug it into the inserts of your mixer, MIDI it up to your sequencer and it will give you a compressor/limiter, a noise gate, automated fader levels, automated mutes and glitch free real-time control of parameters (even compression ratio) across all eight channels. Settings may be saved as a snapshot into one of the 100 user memories. A DCP-8 environment is available for EMAGIC Logic. Presonus will make you a custom DCP-8 if you have a specific need that is not addressed in the stock unit, how's that for service!

VC3 Pro Channel
 The Joemeek 'Channel' philosophy on a budget. This box is stunning! A classic high performance microphone pre-amplifier, Joemeek optical compressor and Joemeek enhancer. The Joemeek VC3 Pro Channel is essential when warming up digital sound, playing live or any function which demands the highest quality signal processing on a budget. The Joemeek VC3 Pro Channel will out-perform many similar boxes costing 3 times the price.

Joemeek



VITALIZER
 The unrivalled Vitalizer equalization system has been created using a highly complex system of variable, inter-active filters and amplitude controlled phase shifters. These are under the control of a specially designed analogue compressor that responds to both the dynamics and frequency content of the input signal. Specially developed to be compatible with the way the human ear perceives sound, the unit ingeniously re-shapes the entire sound spectrum, so it appears louder, more detailed and commercially appealing.



EFFECTS



REV-500
 £CALL

Best unlikes the SX-700 Studio Effects Processor, a 1U rackmount unit that features standard spatial effects like reverb and delay, the latest four-stage Harmonist (intelligent pitch shifter) and other modulation effects, as well as RSS 3-D effects that can place your sound anywhere in a three-dimensional field. Overall, it puts more spatial processing at your fingertips than a whole slew of dedicated effects. And the SX-700 delivers better performance and a more user-friendly interface than ever before.



SX-700
 £CALL

GREEN RANGE
 A dual Mic Preamp, parametric EQ and compressor combine to make Focusrite the range to suit all needs. NEW COMPRESSOR/LIMITER & CHANNEL STRIP AVAILABLE.



GREEN
 £CALL

With such a large range of effects on the market at the present time, it is impossible to display all the effects we currently hold in stock. But you can be sure that if it's a Focusrite EQ, Lexicon reverb, Behringer compression, Presonus Midigate, Drawmer compressor, ART valve etc, etc then we are the company for you.



TLA
 £CALL

E-300
 £699

The introduction of the Equitek series microphones signaled the most significant improvement in microphone technology in decades. The extraordinary transparency resulting from our unique servo design and exceptional flexibility have created a new 'bench mark' for cost and performance.

E-200
 £449

These mics have received stunning reviews in all pro-audio and hi-tech magazines why not come in and let your ears be the judge!

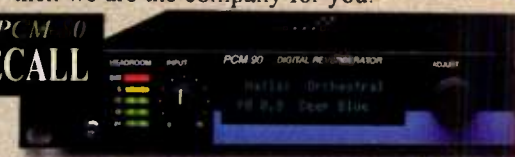


CAD

New CAD Valve Mic
 £1495

E-100
 £299

PCM-0
 £CALL

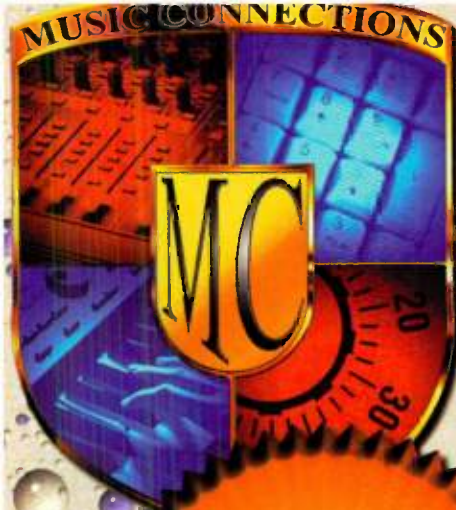


PCM-90
 £CALL



MPX-1
 £CALL





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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 accidentally punched-in on and wiped out. DARWIN will do it all.

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.

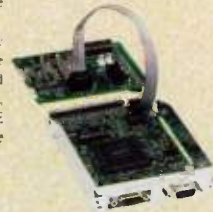
Yes that's right just £1495. Now when we heard this news we had to stop and think? Is there anything that's comparable at anywhere near the price to this amazing piece of equipment. To tell you the truth, we don't think so. And could this now, really be the end of tape based recorders as we know them?

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.



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 Reef (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.



ENSONIQ PARIS™ 20-bit Multitrack Recording system

PARIS is the most advanced digital audio recording system ever developed. PARIS seamlessly integrates 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 expendable 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.



LAYLA - NOW SHIPPING

EVENT LAYLA - 20bit Multitrack Recording System

Record it - Hook up directly to each of your console's 8 buses. Transfer tracks from a tape based digital recorder for editing. Record your band live without premixing. Layla gives you 8 independent balanced analog inputs - all simultaneously accessible, all outfitted with exceptionally low noise 24-bit A/D converters. (We even put two aux inputs on the front panel to help you capture those moments of inspiration without needing to fire up your whole rig.)

Play it - Forget about having to premix output tracks forever. Layla features 10 independent balanced analog outputs, each one boasting a superior quality DAC, for true 20-bit audio performance. And our exclusive Omnibus™ audio assignment architecture lets you easily configure the outputs as aux sends, monitor mixes, discrete track outs, you decide. Or create a 24-bit stereo master mix to send to the digital output.

Edit it - Work with total freedom. Edit your music with the precision and flexibility that only random access disk based recording can provide. Layla is compatible with any audio recording editing application that uses standard Microsoft Windows 95 calls - which means Layla works with virtually all of today's most popular programs including combination MIDI sequencing digital audio recording packages. Don't get own recording software? Not to worry. Layla complete with it's own powerful, easy to use multi-track audio recording and editing environment, so you can enjoy a no-hassle musical experience right out of the box.

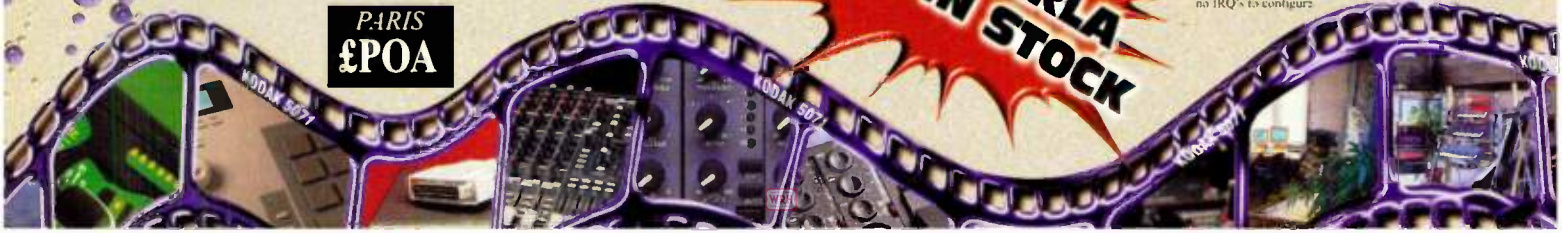
Sync it - Synchronize to picture via SMPTE/MTC. Lock to external word clock. Generate sample accurate sync from the master clock out. Layla offers synchronization capabilities that make it perfectly at home in a variety of professional environments. You can even synchronize multiple Layla systems, expansion is as simple as plugging in another card.

MIDI it - We know you'll appreciate the convenience of being able to create a simple, yet powerful audio/MIDI multitrack recording system without having to back up a ton of additional gear. Did we mention that Layla is a true plug and play system? That's right, no jumpers to set, no IRQ's to configure.

**GINA/DARLA
NOW IN STOCK**

ENSONIQ

PARIS
£POA



CONNECTIONS

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Digidesign



**ProTools
 & CALL**

If you rely on ProTools, Mackie's HUI studio console can boost your productivity and your creativity!
 Now you can literally get your hands on ProTools digital audio workstation

software. Mackie Design's HUI is designed to control and respond to Digidesign's ProTools Version 4.0 and in the near future, DAE compatible software too. HUI lets you mix via a real, tactile control surface complete with motorized faders, rather than with a mouse or a unidirectional fader pack. Perform real-time, hands-on multi-channel fades, mutes, select and adjust sends, create subgroups, and change dynamics. In short: track and mix down just the way you would on a large, automated console, yet with complete bi-directional interaction with ProTools 4.0. HUI will immediately reflect all standard mixing values, functions and pointers. HUI controller architecture supports standard MIDI protocol in either 7-bit or higher resolution 9-bit applications as well as utilizing simple controller and note values. Rear panel I/O includes analog jacks (three stereo audio pairs), a footswitch jack, ADB mouse thru, MIDI in and out and RS422 port for direct computer connections.



Audiomedia III now available. Call for details.

NOW SHIPPING

The KORG 1212 I/O brings the price of full function multi-channel computer based recording to a point that just about anyone can afford. The card features 12 inputs and 12 outputs configured as two analog I/O's, an SPDIF I/O and an 8 channel ADAT optical I/O. All I/O's can be used simultaneously for maximum interfacing flexibility.



KORG

1212 I/O

FOSTEX D90 & D160

Professional Digital Multitrack Recording.

Fostex

Choosing to 'go digital' is just becoming one of the easier equipment decisions you have to make when considering a new multitrack. But choosing the right digital multitrack can be somewhat more difficult. Before this decision can be made, you have to be sure that your chosen recorder excels in four critical areas: audio quality, expansion, synchronization and editing.

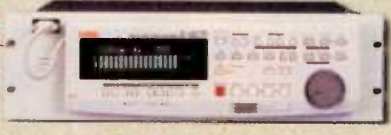


Rebirth Techno Micro Composer RB-338
 Software synthesis / Two Bass Lines / One Rhythm Section / Digital Delay / Distortion / Integrated Sequencer / Full Automation.
Believe the unbelievable.



BRANDS

AKAI



Digital Performer 2.1



THE NEW DPS-12 HAS ARRIVED!
 This digital personal studio is a 12 track, 18-bit in, 20 bit out digital multitracker incorporating a MIDI-automatable digital mixer. Sample at 32, 44.1 or 48 kHz without data compression to an internal Iomega 1Gb Jaz drive or other drives via SCSI. With an estimated recording time of 270 minutes at 32 kHz you must not miss this little wonder, or any of AKAI's other products that we hold in stock for that matter.



From MidiExpress to MIDI Flyer and Digital Performer we stock it all. Mark of the Unicorn provide answers to all your MIDI problems, and being compatible with with all music software they've become an industry standard. Available for either Mac or PC these interfaces are so complete that you may never need to unplug your gear ever again.

Call us for demos, brochures, information and unbeatable prices on these studio necessities.



NOW SHIPPING!

SHIPPING 1ST WEEK OF JAN

Turn over for superb sale deals



MUSIC

Notice to Salespersons:
 Chelsea is in need of a hard working, experienced, dedicated salesperson. If you believe you fit the bill please give us a call.

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ART

APPLIED RESEARCH AND TECHNOLOGY
PORTABLE SOLUTIONS

With all of the same awesome sonic advantages as the Dual Leveler and Pro VLA, the new Personal Leveler delivers classic, transparent, punchy and music-friendly compression in a handy, single channel, table-top package. The benefits of Vactrol based levelling are now for everyone!

The FX-1 brings ART's Dual processing technology to musicians and recordists of all levels, in a compact all steel chassis. Two banks of thirty single and multi-effect algorithm chains are arranged in logical order for ease of use. With ART's exclusive More feature, every program can be enhanced with more of just the right effect instantly. Dual mono processing allows you to process two individual channels with totally separate effects. The ultimate in personal digital processing!

ART's Tube MP, they're low cost, high performance tube mic preamp has redefined warmth for both digital and analog gear. Simply plug in your mic and dial in your sound. Great as a direct box. Nothing could be easier, nothing could sound better!



PreSonus BLUE £149

BLUE MAX IS THE WORLD'S FIRST AND ONLY FULL-FEATURED SMART COMPRESSOR/LIMITER - A TRUE DREAM TOY THROUGH INNOVATION, COMES A REVOLUTIONARY PRODUCT DESIGNED TO TAKE THE WORRY OUT OF USING DYNAMICS PROCESSING FOR STUDIO RECORDING, LIVE SOUND REINFORCEMENT, BROADCAST APPLICATIONS AND PERMANENT SOUND SYSTEM INSTALLATIONS. BLUE MAX BOASTS FIFTEEN STUDIO PROVEN PRESET COMPRESSOR AND LIMITER SETTINGS FOR THOSE INSTRUMENTS THAT NEED DYNAMICS PROCESSING THE MOST. IMAGINE DIALLING UP THE PERFECT COMPRESSION SETTING FOR THAT KILLER SNARE SOUND OR PUTTING VIXALS IN YOUR FACE WITHOUT LOSING THE REST OF THE MIX. HOW ABOUT GETTING THAT BASS GUITAR UNDER CONTROL WITH BLUE MAX IT'S AS SIMPLE TURNING THE DENSITY KNOB TO THE SETTING YOU WANT. DON'T WORRY ABOUT THRESHOLD AND RATIO, ATTACK OR RELEASE, SOFT KNEE OR HARD KNEE EVER AGAIN, WE DID IT ALL FOR YOU IN ONE BEAUTIFULLY DESIGNED, EASY TO USE HALF RACK SPACE UNIT.

IN ADDITION TO FIFTEEN FACTORY PRESETS, BLUE MAX CAN BE RUN IN MANUAL MODE THAT GIVES YOU FULL CONTROL OVER COMPRESSION PARAMETERS INCLUDING VARIABLE INPUT/OUTPUT, ATTACK AND RELEASE TIMES AS WELL AS RATIO SETTINGS FROM 1:1 TO 20:1. FULL ON-BOARD METERING SHOWS INPUT/OUTPUT LEVELS AND GAIN REDUCTION. BLUE MAX CAN BE OPERATED IN STEREO OR MONO WITH HIGH GAIN MONO INPUTS FOR PLUGGING IN INSTRUMENTS. BLUE MAX ALSO INCLUDES A SIDECHAIN FOR DE-ESSING, DUCKING AND OTHER FORMS OF SPECTRAL PROCESSING. INPUTS AND OUTPUTS ARE 1/4" TRS UN-BALANCED OPERATION IS SWITCHABLE +48V or -10dBV. THE POWER TRANSFORMER IS SWITCHABLE FOR INTERNATIONAL OPERATION. BLUE MAX IS HOUSED IN A SINGLE 1/2 RACK SPACE, ALL STEEL CHASSIS, AND IN KEEPING WITH THE PRESONUS "NO WALL WART" TRADITION HAS AN INTERNAL POWER SUPPLY USING OUR PROVEN DYNAMICS PROCESSING TECHNOLOGY.



UNTOUCHABLE DAT DEALS CALL FOR PRICES.

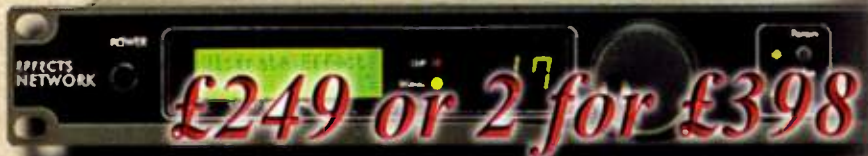


THE ACP-22 IS A TWO CHANNEL DYNAMICS PROCESSOR DESIGNED TO PROVIDE COMPRESSION, LIMITING AND NOISE GATING IN A VARIETY OF APPLICATIONS, SUCH AS MULTITRACK RECORDING, LIVE SOUND REINFORCEMENT AND BROADCAST AND PERMANENT SOUND INSTALLATIONS IN ANY APPLICATION. THE ACP-22 PROVIDES TWO CHANNELS OF CRYSTAL CLEAR COMPRESSION WITH FULL CONTROL OVER COMPRESSION THRESHOLD, RATIO FROM 1:1 TO INFINITY, VARIABLE ATTACK AND RELEASE TIMES AND SWITCHABLE HARD/SOFT KNEE. AN AUTO MODE TAKES THE WORRY OUT OF SETTING THE COMPRESSOR BY OFFERING PROGRAM DEPENDENT ATTACK AND RELEASE TIMES. A LINK BUTTON ALLOWS FOR TRUE STEREO LINK OPERATION. THE ACP-22 HAS ONBOARD METERING FOR GAIN REDUCTION AS WELL AS INPUT/OUTPUT METERS. INDEPENDENT LED'S SHOW SOFT/HARD KNEE, AUTO IN/OUT AND CHANNEL BYPASS POSITIONS. DE-ESSING, DUCKING AND OTHER FORMS OF SPECTRAL PROCESSING CAN BE ACCOMPLISHED USING THE SIDECHAIN PROVIDED ON BOTH CHANNELS.

THE NOISE GATES ON THE ACP-22 ARE UNPARALLELED BY GIVING CONTROL OVER THRESHOLD, VARIABLE ATTACK AND RELEASE AND SWITCHABLE GATE RANGE (-60DB -40DB). THE ACP-22 ALSO HAS A UNIQUE LOW PASS GATE FILTER WHICH ELIMINATES CYMBALS AND OTHER HIGHER FREQUENCY RANGE INSTRUMENTS FROM OPENING UP DRUM AND/OR VOCAL GATES WITHOUT AFFECTING THE AUDIO OUTPUT. INDEPENDENT GATEKEY SIDE CHAIN IS INCLUDED FOR INTERNAL TRIGGERING AND PRECISE FILTERING. LED'S ON THE GATE SHOW GATE POSITION OPEN OR CLOSED AND GATE RANGE (-60DB -40DB).

INPUTS AND OUTPUTS ON THE ACP-22 ARE EITHER XLR BALANCED OR 1/4" TRS UNBALANCED. EACH CHANNEL OPERATES AT +48V or -10dBV. SELECTED VIA REAR PANEL SWITCH. THE ACP-22 IS HOUSED IN A ONE-RACK SPACE, ALL STEEL CHASSIS. IN KEEPING WITH THE PRESONUS "NO WALL WART" TRADITION, AN INTERNAL POWER SUPPLY WITH VOLTAGE (FOR INTERNATIONAL USE) IS STANDARD.

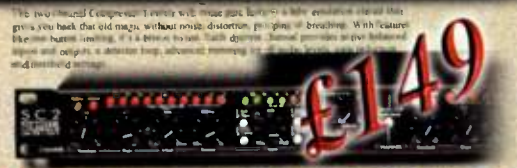
At last, a multi-processor that offers the incredible sound quality of dedicated high-end processors. Use the Effects Network as a reverb, and the intuitive interface behaves exactly as you'd expect it to. Shift to a delay or chorus and both the sound and interface are right there with you. If you don't have the budget for a dozen dedicated processors and are tired of the sonic and interface limitations of a multi-processor, the Effects Network is the answer.



Like it's big brother the Pro VLA, the Dual Leveler is built to level signal as opposed to altering their complete dynamic range. Built in a read and rack-savvy 1U chassis, the Dual Leveler imparts all of it's Vactrol Tube compression per-analy into a streamlined, stereo, cost effective package.



NEW The ACP-22 Stereo Compressor/Limiter with Spectral Gates



HOT ART DEALS

CONNECTIONS

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DEALS



- A) TASCAM 564 & BLUEMAX £995**
- B) TASCAM 564 & ACP-22 £1099**
- C) TASCAM 564 & ART FX NETWORK £995**
- D) TASCAM M1600mk2 16ch £699**
- E) TASCAM M1600mk2 24ch £1099**
- F) TASCAM 424 & TUBE MP £449**
- G) TASCAM 424 & TUBE MP, CAD MIC & 10 CASSETTES £499**
- H) KORG PROPHECY £499**
- I) YAMAHA PROMIX 01 £995**
- J) YAMAHA MX12/4 £299**





MUSIC CONNECTIONS

DEALS
Part 1

CHELSEA

MIDI TRISH PITCH B II	£349
FOSTER KR	£599
STUDIO MASTER PROLINE 16 & 16 GOLD & POSTEX B16	£599
ROLAND D70	£850

CHELMSFORD

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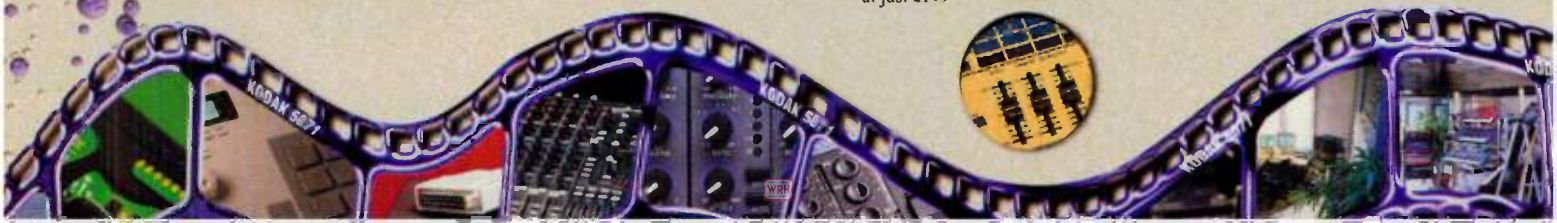
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DOEPFER MS404 MIDI ANALOGUE SYNTHESIZER

German synth manufacturers Doepfer Musikelektronik have been producing excellent analogue synth gear for about four years now, including MIDI keyboards, hybrid analogue/MIDI sequencers, MIDI-CV interfaces, and an open-ended, expandable modular synth system, the A100, with more than 40 individual, affordable — and some quite esoteric — synth modules available, and more on the way. Until recently, the UK hasn't really been one of Doepfer's target markets; however, Bristol-based EMIS have now been appointed official UK distributors, and are re-launching the entire range, with a revamped pricing structure and a new mouth-watering catalogue, so watch this space.

CRAFT WORK

The MS404 being reviewed here is a MIDI-controllable, one-oscillator, monophonic analogue synth module, and is the baby of the Doepfer range — though it still holds a few surprises considering its price. Apart from a built-in MIDI-CV interface, the audio and CV side of the MS404 is pure analogue — there are no patch memories or SysEx to bother with for owners of this instrument.

This synth is *small*. The fact that it's presented in a sturdy, pressed-steel, 1U rackmount case only 80mm deep is even more astonishing when you consider that it also contains a built-in power supply. The front panel is logically and clearly laid out, with 15 control knobs (real-time analogue pots, and not scanned digital controllers, remember — so no zipper noise here), six small toggle switches, a couple of LEDs to indicate LFO speeds, and a couple more to show MIDI input activity and Glide status. Doepfer have also, rather thoughtfully, printed numbered graduations around each knob, making it easier to note down favoured patches and settings. The rear panel has all the usual suspects: MIDI In and Thru sockets, mono audio output and input jack sockets, both working at standard -10dB line level, plus a small audio input level control and two jack sockets labelled CV and Gate (see the 'CV In Or Out?' box). There's also a neat combined IEC mains input socket/fuse holder/power switch. Nice!

BUNDLE OF FUN

The front panel is divided into five sections: MIDI, VCO, VCF, VCA and Envelope, which gives you a pretty good idea of what to expect. Running through these in order, left to right:

- The minimalist MIDI section has just one small rubber push-button, labelled Learn, and two LEDs, with one labelled Glide, and the other unlabelled (more on this section later).

- The first analogue section contains the controls relating to the MS404's single VCO (Voltage Controlled Oscillator). The first knob is marked Glide and is for setting Portamento amount (from zero to four seconds), then come Tune (plus or minus a couple of tones) and Pulse Width (for varying the width of the Pulse waveform, but naturally, only when the Pulse wave is selected). There are then three 3-way switches: the first for selecting the VCO waveform (offering a choice of Sawtooth/Off/Pulse), and the second for choosing the VCO output signal (here the selection is VCO (on), Off (no signal) or Noise (the white variety). Unfortunately, you can't have the noise signal and oscillator on simultaneously, which is a shame. The third of the 3-way switches is a modulation selector, which works in tandem with the next two knobs and another switch; together all four of these control the first of the MS404's two LFOs.

LFO 1 produces a fixed triangular control waveform (though this can be altered to a square wave with a factory modification, if you really are desperate) and can only be used to modulate the VCO. Three types of modulation are available, via the aforementioned 3-position modulation selector switch: FM (pitch modulation), Off (no modulation), or PWM (Pulse Width Modulation). PWM is only audible if the VCO waveform switch is set to Pulse, and works by changing the width of the Pulse waveform in a cyclic manner, so that it changes from a short pulse to a square wave over time. At slow

Apart from a few MIDI-supported commands, the Doepfer MS404 is completely analogue — so there are no patch memories, no SysEx, and no storable front-panel settings. CHRIS CARTER explains why you'd nevertheless be mad to overlook it...

Doepfer MS404



The MS404's rear panel, including CV/Gate sockets and audio input.

pros & cons

DOEPFER MS404 £299

pros

- Authentic, all-analogue audio circuitry.
- Great sound quality, particularly the VCF.
- Built-in MIDI-to-CV interface, which can double as stand-alone MIDI-to-CV converter.
- External audio input.
- Easy to use, with a clear and logical layout.
- Solid, compact case with built-in power supply.
- Excellent value for money.

cons

- High note priority only.
- VCO and noise signals can't be mixed.
- Limited VCO/LFO modulation routing.
- Noise and ADSR outputs can't be used as VCO modulation sources.
- No CV/Gate inputs without internal modification.

summary

A true analogue monosynth with an authentic sound, plenty of features and just enough MIDI to make it easy to integrate into most setups. A second VCO and more flexible VCO/LFO patching would have been nice, but would have pushed the price beyond the very reasonable £299. Recommended for both beginners and pros alike.

SOUND ON SOUND

rates, PWM sounds like a chorus or detuning effect, and is useful for fattening sounds, while at higher rates it takes on a more metallic edge and sounds like ring modulation. Aside from the modulation selector switch, the other three controls relating to LFO 1 are the Level knob, which adjusts the intensity of the modulation that will be applied to the LFO, the Freq control for adjusting the LFO speed, and, rightmost in the VCO section, a 3-way frequency-Range switch, which defies convention by using a Low/High/Med configuration instead of the usual Low/Med/High. Despite this, the LFO's range is impressive for an LFO, stretching from 0.01Hz, where one cycle takes a few minutes, to 5kHz, and way up into the audio range, which allows for some useful intermodulations, drones and generally weird effects across the whole frequency spectrum.

- The third section on the front panel contains the controls relating to the VCF (Voltage Controlled Filter). Here you find the Freq knob (for adjusting the filter cutoff frequency), the 3-way Tracking switch (for selecting how much of the keyboard control voltage affects the filter frequency), and the Envelope knob (for adjusting the extent to which the filter is affected by the ADSR envelope). Next come the three controls relating to LFO 2, which is solely for modulating the VCF frequency, and is identical to LFO 1, except that it lacks the modulation selector switch. Last in this section is the Emphasis control (also known as 'Q', or Resonance), which emphasises harmonics at the filter cutoff point, and adds that distinctive resonant peakiness we all know and love. As with most analogue filters, when this control is turned fully clockwise, it pushes the VCF into self-oscillation, producing an almost pure sine wave signal. Once oscillating, the filter becomes, in effect, a second VCO, to be played by the MIDI or CV In, and modulated by LFO 2 if required.

- The MS404's Voltage Controlled Amplifier (VCA) merits a section to itself, but is only represented by

a single knob, marked Accent. However, behind the scenes, the MS404 is summing CV signals from the ADSR generator, MIDI volume controller #7 (via the CV interface) and an offset control from the Accent knob. This knob, in reality, acts as a master volume control, because decreasing the Accent control also reduces the envelope generator signal and the effect of any MIDI volume changes.

- The final front-panel section contains the controls for the MS404's Envelope generator, which uses a standard Attack, Decay, Sustain and Release (ADSR) configuration, with a knob for each stage. The Envelope outputs a control voltage directly to the VCA and VCF (to the latter via the VCF Envelope Depth control, so if you don't want the same envelope settings to affect the oscillator and filter, you can at least set this control to zero; the filter will then be completely unaffected by the envelope). The Attack, Decay, Sustain and Release controls cover a pretty good range, from super-short Kraftwerk-like blips to 20-second ambient attacks and decays, and should be more than adequate for most situations.

THE M WORD

Because this is a monophonic instrument with no programmable analogue functions, Doepfer have only included a few basic MIDI features, providing a single (but selectable) MIDI channel via which MIDI information may be transmitted into the MS404 from an attached MIDI keyboard or sequencer. Once in the unit, various MIDI commands are converted into CV/Gate signals (see the table in the 'MIDI-Supported MS404 Functions' box elsewhere in this article for more details) A further MIDI function is the use of Program Changes 0-5 to set the status of the VCF and VCA velocity response and the Envelope highest-note Retrigger on/off mode (for example, Program Change 2 turns VCF velocity response off, while Program Change 3 turns it on, and so on).

Setting any MIDI function couldn't be easier; you press the MS404's Learn button, whereupon the MIDI LED above it flashes until the MS404 receives a MIDI signal on a given channel from your attached MIDI keyboard or sequencer. When you perform this 'learning' process, the MS404 registers the MIDI channel you're transmitting on and stores this and any MIDI functions you have set (such as velocity, retrigger mode, and so on) in non-volatile memory; however, if you forget yourself and send other MIDI functions on a different MIDI channel when the MS404 is in Learn mode, the synth will switch to receiving further data on the new MIDI channel

SPECIFICATION

Unfortunately, Doepfer haven't published any technical specifications for the MS404 in its manual (which is a good read, by the way). However, after discussing this with EMIS, I came up with the following:

1 x VCO	Sawtooth and variable pulse waveforms, range approximately 1Hz to 5kHz
1 x VCF	24dB/octave low-pass with resonance (no further spec available)
1 x VCA	Logarithmic response, -10dB line-level output (no further spec available)
1 x Envelope Generator	ADSR type, A: 0-15s, D: 0-23s, S: 0-100%, R: 0-23s
2 x LFO	Triangular waveform (or square wave with internal modification); range approximately 0.01Hz to 5kHz
1 x Noise Generator	White noise, fixed level
1 x MIDI-CV Interface	3 x CV (1V per octave), 1 x Gate (+5V), glide switching, 5-octave range
Dimensions	1U rackmount module, depth 80mm, weight 3lbs

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Doepfer MS404

CV IN OR OUT?

The two rear-panel sockets labelled CV and Gate need a little further explanation. As supplied from Doepfer's factory, the CV and Gate sockets are wired as outputs from the internal MIDI-CV interface, and MIDI note, pitch-bend and mod wheel information appearing at the MS404 MIDI In are converted in the MS404 and retransmitted out as CV/Gate signals through these two sockets. This enables the unit to be used as a stand-alone MIDI-CV interface, even if you aren't using it as a synth.

However, the MS404 is also quite capable of acting as a totally analogue, non-MIDI, voltage-controlled monosynth module. But for your MS404 to receive and act on external CV/Gate signals, you currently have to either order the unit pre-configured to CV/Gate input, or return it to EMIS for a small modification. Not a very satisfactory arrangement, as I'm sure you'll agree, particularly if you intend to control the synth from something like a Roland TB303 Bassline, which only has CV/Gate outputs. However, after I voiced my frustration to EMIS, they informed me that anyone ordering an MS404 can request a small modification, which consists of a rear-mounted toggle switch to select either internal MIDI control (CV/Gate out) or external CV/Gate control (no MIDI In). This will be an essential option for anyone considering using the synth in both MIDI and CV situations.

► automatically. I also couldn't get the MS404 to respond to more than one program change message at once; I had to send them individually.

Although the MS404 will respond to the full MIDI Note range (0-127), the VCO only has a range of five octaves (with an audio upper limit of 5kHz, the same as the LFO's). This five-octave 'window' can be anywhere on your keyboard and is best set each time you turn on the unit. Setting this simply involves pressing the Learn button (as above) and playing your lowest C note; from then on you won't hear any notes below this bottom C, or above the five-octave ceiling.

IN USE

Because the MS404 is an analogue instrument, it responds to temperature changes, and needs a warm-up period of around 20 minutes to reach optimum stability. If you bear this in mind (and don't stick it in the fridge or oven), the VCO has no trouble tracking a MIDI keyboard accurately over the maximum five octaves, and will remain stable for hours on end.

The waveforms sound fine: the sawtooth has plenty of buzz and bite, and the pulse wave sounds suitably reedy, thin, hollow or square, depending on the position of the Pulse Width knob — which can, if you wish, make the wave so narrow as to be inaudible. The pulse wave sounds especially good when being modulated by LFO 1, but it's a shame you can't use LFO 2 to modulate it while LFO 1 is used for a touch of VCO pitch-modulation, for an even fatter sound. The MIDI-switchable Glide is a handy feature, and works particularly well for Roland TB303 impersonations. The Noise generator sounds, well... white noisy. I would have liked the option of mixing the noise with the VCO, but as it stands it's either one or t'other.

The VCF is generally considered to be one of the most important ingredients of the overall character of a synth, and the filter in the MS404 is no exception. Of the 24dB/octave low-pass type, it uses a 'transistor ladder' design, the same kind used in Moog synths. It sounds particularly sweet, with a nice musical quality in the mid frequencies, and, with the emphasis control whacked up to about three-quarters of its maximum setting, it's almost crystalline in the upper regions. In the lower octaves, the filter loses a little of its character, but is still capable of producing a decent

oomph (for want of a better word) that, in conjunction with the VCO, works particularly well for Minimoog-style basslines and Roland TB303-style, peaky, resonant type bass sequences.

The inclusion of an external audio input is welcome, particularly when you can then mangle your sounds with such a fine-sounding filter. I tried out a number of sources, including a sampler, drum machine and several keyboards, to see how accommodating the input level was. Generally, most source material came out sounding great; digital synths, in particular, benefited from a touch of analogue warmth. When I deliberately pushed the input into distortion (which can sometimes happen if you're just playing big chords on a keyboard) it sounded more like an overdrive effect. This could prove quite usable, in the right situation.

CONCLUSIONS

I like the MS404; it's small, it's solid, and it sounds superb. It may look a little bland (if anything, it resembles a piece of test gear), but once you start using and exploring it, it reveals an altogether different persona. Hooked up to a MIDI keyboard controller, you could consider this as a serious alternative to a lot of second-hand monosynths of yore, such as the Korg MS10, Roland SH101, Moog Prodigy or even a Roland TB303 Bassline, as it can match most of these sound for sound. But without two VCOs, the MS404 is never going to sound as fat as a Minimoog, Roland SH2 or Korg MS20, although that could be remedied by feeding another VCO or keyboard through the external audio input.

Operationally, it's a piece of cake, as most of the controls will be obvious to anyone who's been near a synth before, even for relative newcomers to analogue. If you're an analogue purist, you might cringe at the thought of mixing analogue and MIDI, but bear in mind that the MIDI spec has been kept to a minimum, and doesn't interfere with the audio side of things at all. On the other hand, others may bemoan the lack of programmability, patch memories and MIDI SysEx, but that would be missing the point. The MS404 is, and is meant to be little more than, an analogue monosynth (complete with 20 minute warm-up); one that has the option of controllability from a MIDI keyboard. And don't be misled by the affordable price; this is a very capable, expressive instrument covering the full range of sounds you would expect from a quality analogue synth, due in part to the excellent voltage-controlled filter. If this is a sign of what's to come from Doepfer, I can't wait to see more.

SOS

MIDI-SUPPORTED MS404 FUNCTIONS

The following MIDI events are recognised by the MS404's internal MIDI/CV converter and turned into CV/Gate signals.

INCOMING MIDI SIGNAL	IS CONVERTED TO
MIDI Note	VCO Pitch and VCF Frequency
MIDI Note length	Gate
MIDI Velocity	VCF Frequency and VCA Level
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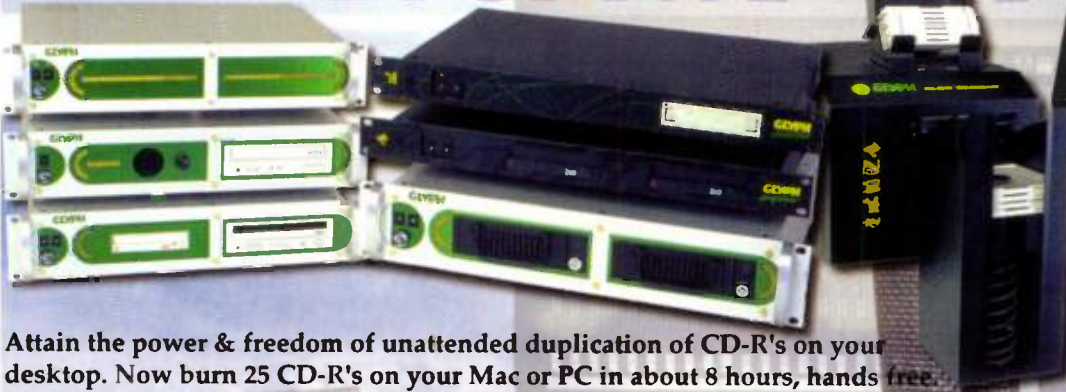
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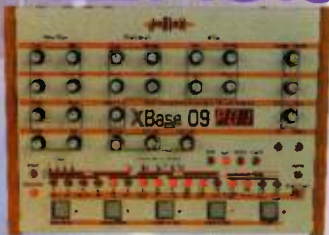
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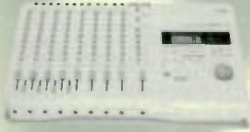
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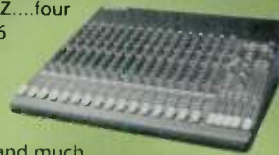


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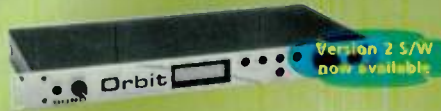


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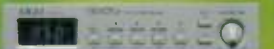


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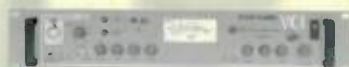


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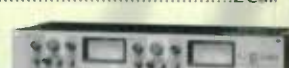
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pitching Winner?

LEXICON VOCAL FIX CARD FOR THE PCM80

PAUL WHITE tries out a new hardware solution for dodgy vocalists.

Lexicon's PCM80 is an extraordinarily powerful effects processor, but it doesn't come with an intelligent pitch-shifter as standard, so Lexicon instead decided to develop a dedicated algorithm that could be loaded from a PCMCIA card for the specific purpose of correcting vocal pitching problems. The result is the Vocal Fix ROM card, which may be used with any PCM80 version 1.10 or above.

DEALING WITH THE CARD

The easiest way to load the algorithm is to switch on the PCM80 with the card in place, at which point the new algorithm loads automatically and is available in addition to any existing programs. The card may be removed from the PCM80 and the algorithm will continue to work until the unit is powered down. However, the card is required for loading the algorithm each time the machine is powered up. You can also insert the card into a running machine and load the algorithm from the front-panel controls. It should be noted that only one algorithm card can be loaded at a time — if you've already loaded up algorithms from another card, the second card will refuse to load.

Vocal Fix is designed to help patch up vocal tracks that aren't as perfectly pitched as they might be (unlike other PCM80 effects cards, this one contains just a single algorithm, combining a dedicated pitch-shifter with a general-purpose chamber reverb). The algorithm is true stereo, allowing stereo sources to be processed, but as the pitch-detection circuit requires a monophonic input you have to treat only one vocal part at a time. Figure 1 (below) shows the signal flow of the algorithm.

The main reason the Vocal Fix requires a monophonic input is that it must first track the



pitch of the incoming signal in order to work out how far off-pitch it is. In addition, treating monophonic vocal lines means that it's also possible for the pitch-shifter to constantly adapt its splicing routine to fit in with the vocal frequency, resulting in far smoother pitch-shifting. All conventional pitch-shifters work by breaking the input signal into a stream of very short audio samples, which are then either sped up or slowed down, looped, and then spliced back together. If this process occurs with no regard for the input frequency, the sound can become very glitchy or lumpy, but if the splice points coincide with individual cycles (or multiples of cycles) of the processed waveform, they become much less obvious.

Using the algorithm is fairly straightforward, and tweaking just a few parameters optimises the process for different vocal styles. (There are also a

pros & cons

LEXICON VOCAL FIX £249

pros

- Simple user interface.
- Three different ways to tackle pitching problems.
- Lexicon's chamber reverb is included.
- Good double-tracking simulations possible.

cons

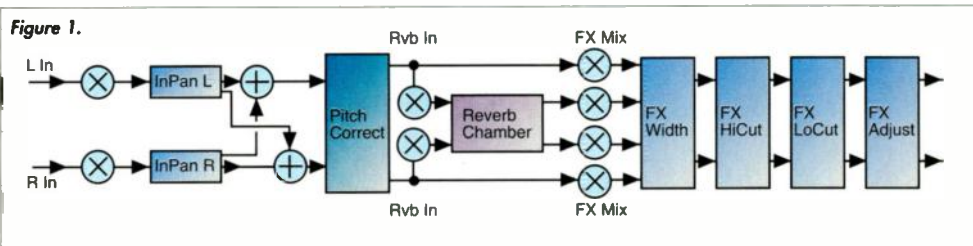
- Pitch-tracking is sometimes fooled by wild vibrato or pitch scooping.
- Processing delay is noticeable as a tight slap-back effect unless you have the means to offset it.

summary

Vocal Fix is a valuable accessory for anyone who uses a PCM80 in a studio environment, and though there are more sophisticated software packages available for pitch correction, this solution has the benefit of immediacy and low cost.

SOUND ON SOUND

Figure 1.



couple of special effect modes that will be described later.) When a vocal signal is fed into the PCM80, the display shows the pitch to the nearest chromatic note, plus the number of cents deviation. Pitch correction is best applied to notes identified as being audibly wrong — this isn't one of those systems that tries to correct every sung note to the nearest semitone, as such an approach is fraught with technical problems and is, in any case, rarely artistically desirable. You can try it, if you want to, by applying correction all the way through a track, but this isn't something you'd normally do.

Correction is carried out manually, either using the Adjust knob (or you could use a switch) on the PCM80 itself to activate the Correction process, or via a MIDI keyboard. When 'Correct' is activated, the pitch is pulled towards the nearest semitone by an amount determined by the Correction percentage parameter. If you're using a MIDI keyboard, the pitch-bend wheel may be used to directly sharpen or flatten the pitch of the processed sound over a fairly narrow range (useful for fine-tuning sharp or flat notes) or any sung note can be forced to a completely different pitch by keying the desired note on the keyboard. Pitch correction only occurs when a key is pressed, so you don't have to play along

“At around half the price of a typical software plug-in, the Vocal Fix card combines good value with an extremely simple user interface.”

with the whole melody — only the wrong notes. There's no formant correction, so notes shifted too far from their original pitch will suffer from Mickey Mouse syndrome, but in reality most shifts will be fairly small, so the effect of formant shifting should be inaudible. Because most operations require only pitch correction, the default reverb setting is zero, but this is easily turned up if required.

PARAMETERS

Compared with most PCM80 effects, there are relatively few parameters to worry about with the Vocal Fix algorithm.

- The first parameter is 'Correction', which allows you to set the percentage of pitch correction to be applied, from none at all to 100%. If set to 100%, the algorithm will attempt to 'pitch quantise' the incoming vocal as closely as possible to the nearest note, whereas a lower value means it will be shifted in the right direction, but not so far as to become perfectly accurate.
- 'GldResp' (Glide Response) sets the shifter's response time to the detected pitch source, and also to any internally routed controllers that may be in use to further modify the sound. High settings result in close tracking, while low settings mean that the pitch change will lag behind the detected pitch. The manual suggests a setting of around 50% for the most natural results on most material.
- 'Tracking' relates to how precisely and quickly the tracking algorithm follows pitch changes in the original source. At its fastest, tracking will follow fairly fast vibrato or pitch bending, while slower settings will tend to average these out more. Fastest

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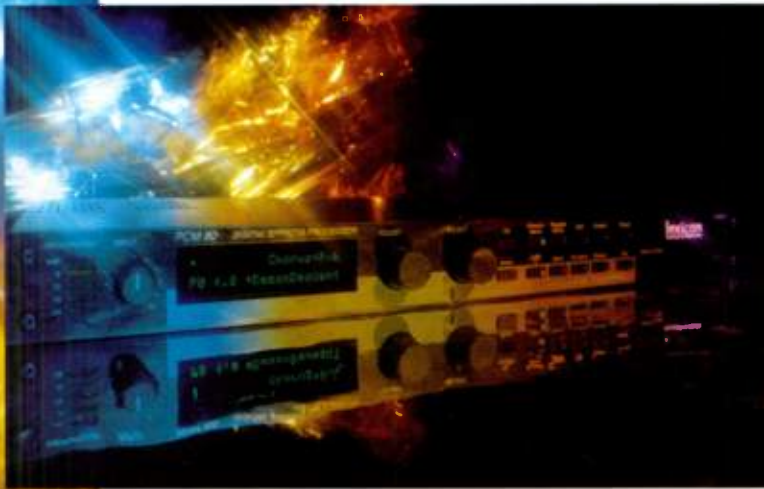
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Lexicon Vocal Fix Card

► is usually the best setting for natural-sounding pitch-shifting; the slower settings can be used to create special effects. There's also a Hold setting that freezes the output pitch at the last detected pitch — ideal for renditions of the One Note Samba.

- 'Low Pitch' and 'High Pitch' enable limits to be set on the highest and lowest notes to be detected, which is useful if there's headphone spill from instruments outside the voice's natural range that might cause false triggering during vocal pauses. In such cases I'd also be inclined to gate the input to



on both your patience in choosing the best settings and on the nature of the incoming vocal line. I found that vocals with heavy vibrato or strong pitch scoops could fool the system, giving rise to the occasional yodel!

The card comes with just 10 presets, numbered 0 to 9, the first of which is a general-purpose patch using a MIDI keyboard as the controller. Here the MIDI key selects a new note, the pitch-bend wheel offers fine pitch control, and the sustain pedal turns the Correct mode on and off. Correction may also be turned on and off using the Adjust knob. The next four patches are similar, but with different vocal ranges set for bass, tenor, alto and soprano.

Preset 6 allows a constant offset to be applied to tracks that are consistently sharp, though the keyboard can still be used to fix totally wrong notes. Preset 7 provides a very authentic double-tracking effect, where the delay and pitch-shift of the doubled sound can be made to wander randomly via the Adjust knob. Preset 8 uses the Adjust knob to freeze the pitch of any vocal being processed, while preset 9 is designed for demonstration use. In this preset, only the right input is active, and all the pitch parameters are in the PCM80's softkey row for easy access.

SUMMARY

At around half the price of a typical hard disk workstation software plug-in, the Vocal Fix card combines good value with an extremely simple user interface. The fact that you can switch in correction only when you need it means that vocal tracks stay natural-sounding, and though you don't get the same scope for fine-tuning and tweaking as with, say, the Antares *Autotune* TDM plug-in software, the results achievable with Vocal Fix are generally good and very easy to obtain — though if you listen to the dry vocal in isolation you can just about hear the tell-tale modulation that informs you you're listening to a pitch-shifter. Using the MIDI key shift to change notes takes a little getting used to, and on tricky vocals you may have to vary the parameters relating to pitch-tracking and shifting, but the quality of shifting is generally smooth and natural. Even so, if the singer uses a lot of pitch-bends you can find the correction algorithm dithering between two different pitches, and if the material is really difficult to track you may have to resort to using the pitch-bend wheel to put in the necessary shift manually. However, for most real-life situations Vocal Fix gives you the right tools to do the job as painlessly as possible.

SOS

the PCM80, to give it as clean a feed as possible.

- 'Tuning' enables a tuning reference other than A440 to be used if desired, while 'Splice' adjusts the crossfade between the successive packets of sampled audio that are created in the shifting process. Higher values than the default 8ms produce a smoother sound, but at the expense of transient definition.

- Last, but not least, there's the 'Shift Cents' and 'Shift Semitones' parameters, which allow a fixed pitch-shift to be set up in coarse steps of one semitone and fine steps of one cent. The range is one octave in semitone steps, but as the cents range covers up to 1200 cents, this can be added on, to provide a maximum of two octaves of shift in either direction.

USING VOCAL FIX

Generally, the vocal track to be processed would be routed via the PCM80 and then recorded to a spare track on your multitrack. As with any digital processor, the pitch-shift algorithm involves a certain amount of time delay, but if you use a digital recording system that allows negative track delays to be set up, these can be compensated for. The amount of delay depends on the pitch of the note being shifted, with the best case being around 30ms and the worst case being a hefty 82ms. Lexicon provide a table of the delay in samples at various pitches, so that you can choose a suitable offset.

Slight pitch corrections can be made very smoothly, but the success of using a MIDI keyboard to play in completely new notes depends

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FAR

FAR CR10A POWERED NEARFIELD MONITORS

Combining your
monitoring and
amplification

requirements into one portable enclosure has obvious
benefits. CHRISTOPHER HOLDER has a double date with
a couple of sophisticated little performers.

unsophisticated powered monitor option (which essentially involves tacking an amp on to the back of a speaker), and work on the more complicated active option (involving an active crossover, two amplifiers optimised for the two drivers, and normally considerably more money) later.

So what FAR have done is take an existing CR10 monitor and bolt a 50W monobloc amplifier onto the back of the box. There are inputs for a balanced XLR or an unbalanced jack plug, and also around at the back is a rotary volume pot and an on/off switch (although it bewilders me why these controls are not on the front, to save you the 'reach around, grope and hope' situation). Bolting on an amplifier in this manner makes for a deep cabinet, and with the IEC power socket pointing directly outwards you may find the cabinets closer to the wall than you'd ideally like. I know that other manufacturers have the IEC socket pointing downwards, to make the arrangement a little more streamlined, and the CR10A would benefit from this tweak.

CAN'T SEE WITHOUT M'SPECS

FAR have been good enough to supply me with more graphs, measurements and specifications than you could shake a B&K 4133 test mic at. The ducted-port cabinet is a foot high, about as deep, and 21.5 centimetres wide. At some 10kg apiece, the CR10A cabinets have the same sort of weight and dimensions (and, in the case of the review pair, the same colour) as a breeze block. But that's where the analogy ends — I am in no way advocating the use of a breeze block for your nearfield monitor requirements, although a lorry of CR10A cabs would make for an interesting Wimpey home.

Looking at the performance statistics, FAR quote a sensitivity of 92dB @ 1W/1m, and a maximum pressure level for the two cabinets of 115dB @ 1m. The frequency range is noted at 45-23000Hz ±3dB, which really does seem quite extraordinary given the 5-inch woofer and small dimensions of the box. The power amplifier

Belgium, the home of bureaucracy and chocolate, the home of bureaucratic chocolatiers, and chocolate bureaucrats... the home of Fundamental Acoustic Research (FAR). The founding father of FAR, um... the FARther, Pierre Thomas, has been making studio monitors for quite some time now, mostly taking care of main monitoring systems to order and gaining considerable respect on the continent in the process. Comparatively recently, Pierre has taken to supplying for the mass market, building some solid, well-crafted nearfields, as well as larger models offering comparable performance to the big-name brands, without the big-name price tag.

THE POWER & THE STORY

Powered and active nearfields are becoming rather fashionable these days. I don't mean 'Paris catwalk' fashionable (although I'm sure Vivienne Westwood would find a suitably perverted and *recherché* use for a pair) but more and more manufacturers are seeing the advantages of offering the option. The benefits include the portability of integrating the amp and speaker, as well as eliminating the sonic degradation of the amp running long speaker cables. FAR have initially decided to go for the more

pros & cons

FAR CR10A £795

pros

- Compact.
- Terrific bass extension given the size.
- Good solid build quality.
- Pleasing, natural overall sound.

cons

- No video shielding.
- Rear-facing volume control.

summary

These monitors are easy to love. Natural sounding and pleasing to the ear, yet transparent and revealing enough to entrust any mix with. Of course it comes down to personal preference, but these monitors are well worth serious consideration.

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FAR CR10A MONITORS

▶ statistics show 50W of available power at 8Ω, and a signal-to-noise ratio of >100dB.

That's the statistics, but nothing can take the place of a darn good workout in the studio.

PLEASED WITH PUNCH

In practice, I think my first reaction is in response to the tremendous bass extension. I demonstrated the CR10As to a colleague, who took one look at the small cabinets and then began nosing about for signs of a sub-woofer, such as the low-end response. But I have to point out that FAR haven't magically sold their souls in exchange for the ability to bend the immutable laws of physics — the bass response hasn't got the sheer volume that you'll encounter on larger size boxes. The response is decidedly punchy, with the impression of deep bass, which admittedly suits my nearfield preferences more than a separate sub — both configurations have

STAYING ACTIVE

Amongst others, Spondor and KRK offer powered monitors in their ranges. There are plenty of active monitors out there as well. For instance, take a look at Genelec's 1029 nearfields, the Spirit Absolute 4Ps, or the new Mackie active monitors. FAR are also producing a powered version of their larger CR20 nearfields, but in the meantime, stay tuned for our FAR AV5 active monitor review in coming months.

Recent relevant SOS reviews:

- Zobel Active One: September '97
- Spondor QT100: August '97
- Dynaudio BM6A: March '97
- Genelec 1029A: February '97
- Event 20/20 Active: July '96

their place, but the CR10As do it for me. Listening back to Vangelis' *Bladerunner* soundtrack, I felt the speakers dealt with the apocalyptic rumblings with considerable aplomb; likewise, the more percussive sub-bass of Erykah Badu's rhythm section was reproduced without the slightest wobble. Very impressive.

There's a small bump in the frequency response around the 1k range and a slight notch around the crossover frequency of 2.5k, and it all contributes to a clear and seemingly neutral mid range. Vocals poke out just enough to be useful when monitoring, and rhythm parts maintain real clarity.

Further up the frequency spectrum, the soft-dome tweeter's output gradually lifts all the way above 20kHz. The result isn't entirely unpleasing, if you can decipher that particular double negative. If I don't sound entirely convinced it's because I'm not. The CR10As

don't have the American West Coast razor-sharp highs or the more musical restraint characterised by the better British monitor designs; they seem to fall somewhere in between, with the high range having a tendency to be a little harsh when pushed, but not offering a transparent and artificial clarity characteristic of the likes of the (US-made) KRK equivalents.

I monitored on the CR10As for days on end at relatively high levels and can complain of very little listening fatigue. In terms of level, the CR10As report a maximum pressure level of 115dbSPL @ 1m for the combination of the two cabinets, which is plenty of level for any sane engineer. In practice, I found myself turning the level pots on the speakers all the way to the maximum volume and bringing the L&R faders on the desk up towards unity gain to achieve the sort of high SPL to which I sometimes subject myself. In short there's enough welly to mix loudly without any significant distortion but not with heaps in reserve. I think that with the qualities of these loudspeakers (particularly their bass extension) it's easy to forget the constraints of their actual dimensions — ie. they're bloody loud for their size.

FAR FETCHED

These nearfields are instantly likeable. From the first moment you take a listen there's an effortless, natural character about them that makes you feel at ease. It takes next to no time to get accustomed to the CR10As — you'll quickly find yourself mastering with smug assurance, and in turn these monitors will reward you with mixes that will sound equally at home on your hi-fi speakers, in your car and on your uncle's 25-year old PYE music centre. They haven't got the sort of detail that sends shivers down your spine, and I've also heard slightly better stereo imaging, but the size, the convenience of being self-contained, the bass extension and the mid-range clarity all add up to a highly desirable nearfield monitor. If you're in the market, put these on your list of 'must hears'.

SOS

E CR10A £795 per pair;
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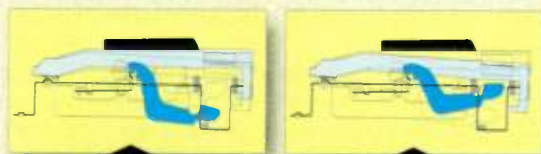
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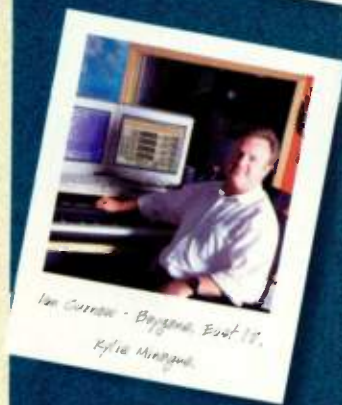


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Route Machine

Midiman are a company devoted to producing cost-effective problem solvers, and with the Digipatch they're aiming to solve the problem of affordable digital patching. PAUL WHITE finds out how well they've succeeded.

MIDIMAN DIGIPATCH 12X6 DIGITAL AUDIO PATCHBAY



Program changing, SysEx dumping and loading of patch data, or control via the supplied utility software (for both Mac and PC).

The 12 inputs are arranged as six S/PDIF phono sockets and six optical connectors; the latter can be used either for S/PDIF signals or ADAT signals. There's no AES/EBU option and no TDIF capability — the system is limited to serial digital formats that can be sent down either a standard optical cable or a phono socket. The six outputs are arranged as pairs of connectors so that you get the same signal on both a phono connector and an optical output at the same time. In situations where you need to change optical S/PDIF to

electrical S/PDIF or vice-versa, this is obviously very useful, but because the unit doesn't monitor or interfere with the digital signals in any way, it's entirely up to the user to make sensible routing decisions. If you route an ADAT signal to one of the outputs and then try to read it from the phono socket using a DAT machine's S/PDIF input, for example, it's clearly not going to work.

CONTROL

The Digipatch has eight buttons on its front panel, not counting the power LED, plus a 4-digit LED display showing the Program Number, the Target (output) and the Source (input). The Source number includes a decimal point when an optical source is selected. Routing is accomplished by first selecting the Target output, using up/down buttons, then assigning one of the 12 possible Sources (or no Source at all if you select 0) to it, using the Source up/down buttons. Because you can't mix digital data streams without a digital mixer, you can't route more than one input to the same output, but you can route the same input to two or more outputs to split a signal to multiple destinations.

Once the routing has been set up for all the desired outputs, the complete setup may be stored as a Program, the number of which is selected using more up/down buttons. A maximum of 50 Programs (numbered 0 to 49) may be stored. A Store button looks after the storing part of the procedure, while a MIDI button can be pressed

The increasing amount of digital equipment finding its way into our studios brings its own special patching problems. Digital mixers and soundcards may include any combination of ADAT and S/PDIF optical interfaces or electrical AES/EBU and S/PDIF sockets, all of which need to be connected to something. Then there are DAT machines, ADATs, DA88s and various hard disk recording systems to consider, not to mention outboard D/A and A/D converters. As with analogue audio devices, you don't necessarily want all of these connected in the same way at all times. The most elegant solution is to use some form of digital patching system, but traditionally these have been both expensive and complicated.

California-based Midiman have come up with a simple but effective low-cost solution to digital patching with their Digipatch 12-in, 6-out programmable digital patchbay. This 1U rackmounting device, powered by a wall-wart power supply has 12 digital inputs, each of which may be routed to a choice of six digital outputs. Only one input can be routed to an output at any one time, and no digital signal processing takes place at all, which means that the data structure of the incoming signal is passed through without change, regardless of format, flag settings, sample rate or whatever else. A complete patching setup may be stored as a Program for later recall and, true to the MIDI part of their name, Midiman have given the unit MIDI In and Out sockets for remote

pros & cons

MIDIMAN DIGIPATCH £379

pros

- Easy to use.
- Doesn't change the data in any way.
- Can convert from optical to phono and vice-versa.

cons

- Wall-wart PSU.
- Would be more useful with a 'guest' input and output connector on the front panel for pieces of gear brought into the studio on a temporary basis.

summary

It's simple, it's effective and it doesn't cost a lot. If you need to repatch your digital I/O cables on a regular basis, the Digipatch provides a neat and inexpensive solution.

SOUND ON SOUND

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- **High resolution A/D converters**, high-performance mic-amps and balanced line inputs.
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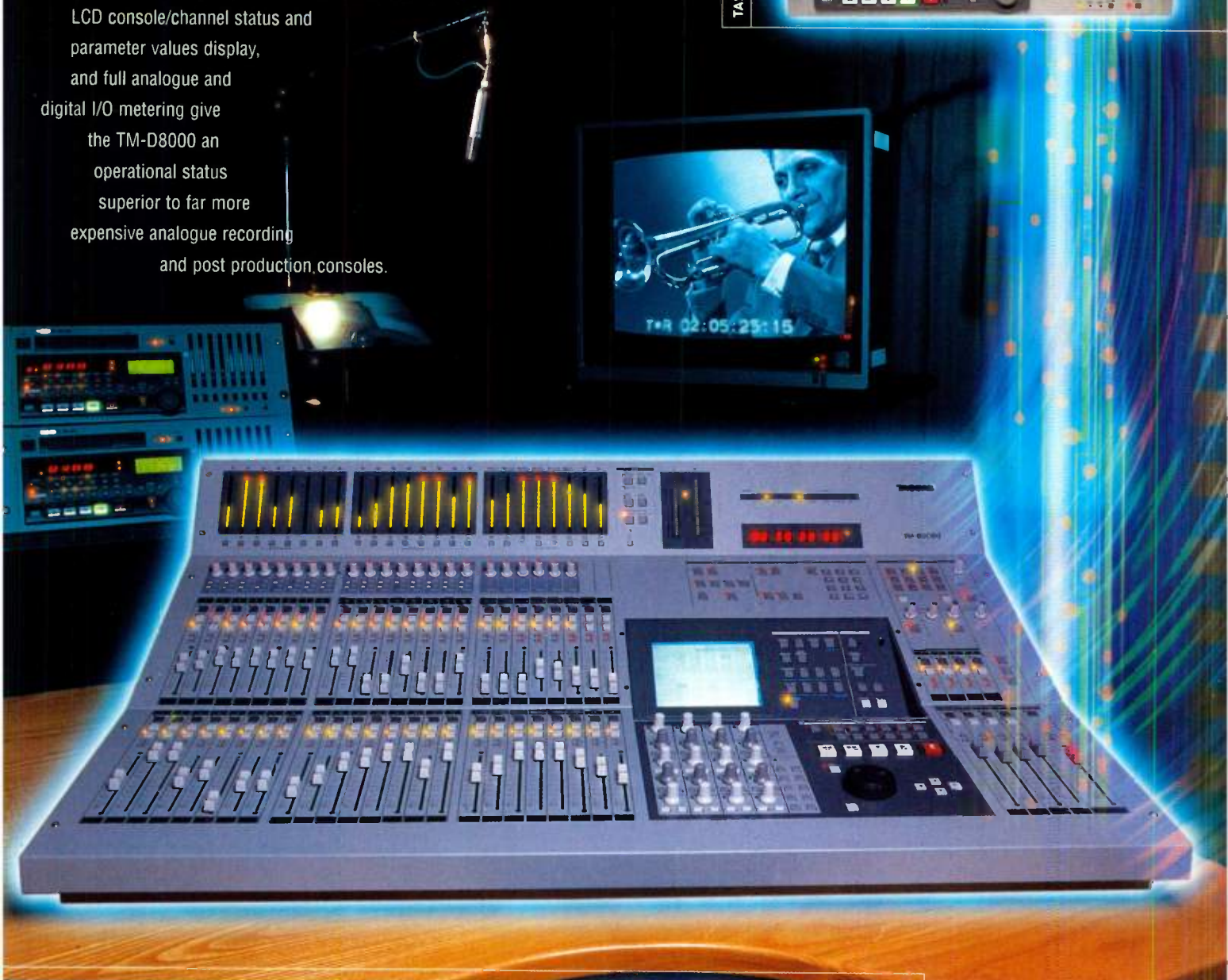
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TASCAM DA88



TASCAM DA98



Midiman Digipatch

- ▶ and held down to switch the front-panel buttons to a different mode for MIDI setup. When this button is depressed, the MIDI channel can be viewed and changed using the Program up/down buttons. To disable external Program Changes, the MIDI channel should be set to 00. Also available in this mode is the ability to enable or disable a 'soft Thru' on the MIDI Out socket, and pressing the Store button when the MIDI button is down allows a SysEx dump to be initiated. The Digipatch also features a number of diagnostic routines, activated by holding down certain combinations of buttons during power-up.

THE UTILITY SOFTWARE

The supplied PC and Mac utility software is compatible with a number of MIDI drivers, including Mark of the Unicorn's FreeMIDI version 1.2 or later, Opcode's Open Music System (OMS) version 2.2 or later, Apple's MIDI Manager 2.0.2 or later, and standard modem and printer drivers. Using this software, up to 15 different units can be controlled via MIDI, each from its own window. One of these windows is shown in Figure 1 (see above). This enables routing to be carried out on-screen, rather than via the Digipatch's front panel, and also allows routing setups to be stored as Programs.

There are two modes of MIDI communication relevant to the software — Single Ended and Two Way. Single Ended mode involves the computer sending SysEx data to the Digipatch without having any way of knowing whether it's been received or not. This mode is useful when you don't have a spare MIDI In port.

In Two Way mode, the computer looks to see how many Digipatch units are connected, using system exclusive messages (the last Digipatch in the chain needs to be hooked back to a MIDI In port in Two Way mode), and creates a Patchbay Window for each one it detects. All the program data from each unit is read into the computer's memory, and saved in a preferences file.

SUMMARY

The first thing you need to ask yourself with a product like this is "who needs it?" If you only have a single DAT machine in your studio, clearly you don't need it, but what if you have a pair of DAT machines plus a hard disk editor with digital I/O? Sometimes you might want to connect the DAT machines so that you can clone from one to the other, while at other times you'll want to be able to feed material into or out of the hard disk editor. I have such a system at home, with the further complication of an Alesis AI-1 sample-rate converter, and as with any sample-rate converter, when you don't need it, it's best to bypass it. The Digipatch can hold Programs to cope with all these scenarios and more. It can also convert from optical to phono or vice versa — useful for those people backing up their Fostex hard disk multitrack data to a DAT machine that only has phono S/PDIF sockets. Also, if you're lucky enough to have a soundcard with an ADAT interface, you may

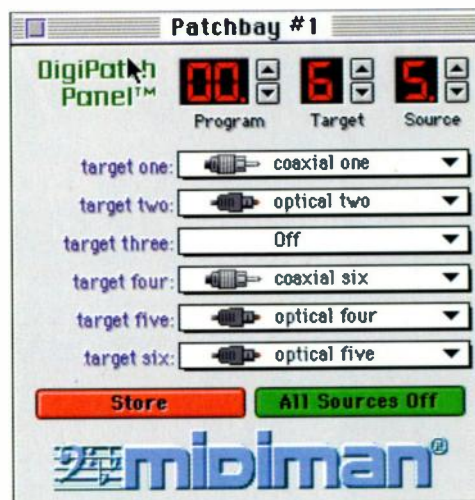


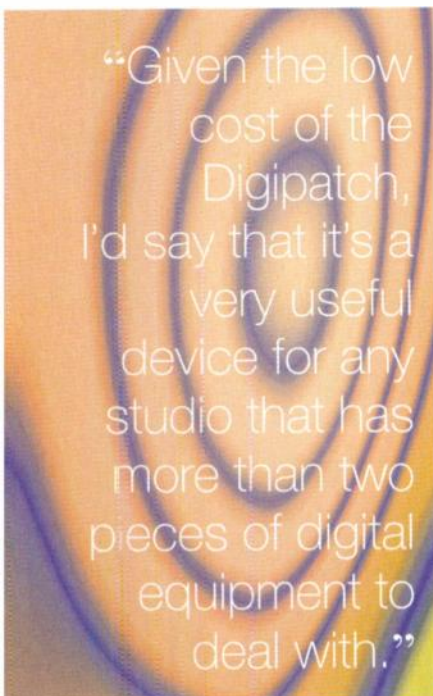
Figure 1: Digipatch utility software.

occasionally want to route this to and from an ADAT. Without a patchbay, this would involve a lot of re-plugging and probably quite a bit of head scratching. Using the Digipatch to do the job for you means that all you have to do is sit down with a piece of paper, work out your obvious routing requirements, then create a series of Programs to store them. After that, you simply need a crib sheet relating the patch numbers to the jobs they do and you're away. Given the low cost of the Digipatch, I'd say that it's a very useful device for any studio that has more than two pieces of digital equipment to deal with, and the fact that it's a simple switcher rather than a data processor makes it very straightforward to use. Having the utility software is a useful bonus and it works extremely simply.

I have no serious criticisms of the Digipatch, and I didn't encounter any problems using either the hardware or the software. In addition, because the digital data is not changed in any way, there is no mechanism for the introduction of clock jitter or other undesirable artifacts. I don't much like the idea of yet another wall-wart power supply in my studio, and (though this is more of a suggestion than a criticism) it would be nice to have at least one input and output on the front panel, so that 'guest' equipment brought into the studio could be hooked up without you having to burrow through a sea of cables and optical connectors to find the rear panel. I can also see the appeal of a slightly more sophisticated model with a few AES/EBU-format inputs and outputs on XLRs. On the whole, though, this is a very practical piece of equipment that could make digital patching a whole lot easier.

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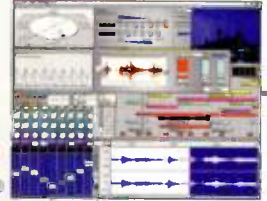
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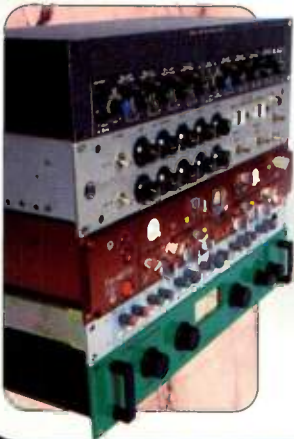
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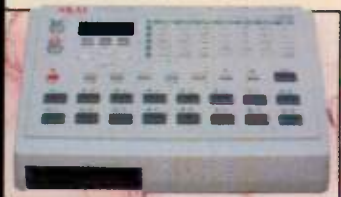
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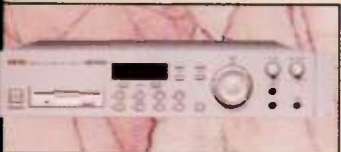


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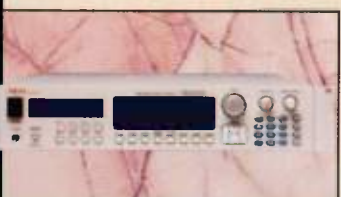
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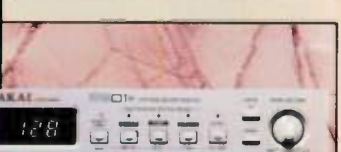
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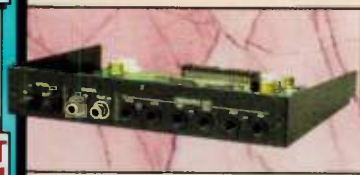
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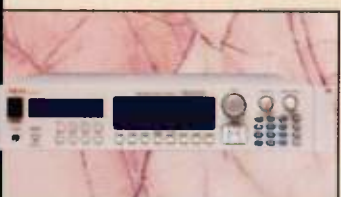
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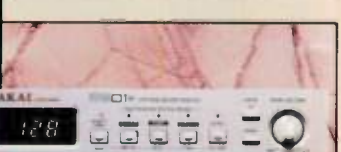
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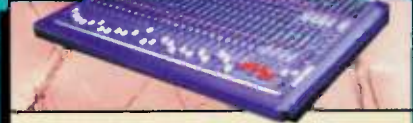


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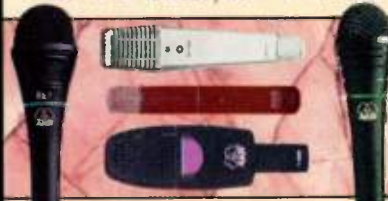
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Spreading the Load

RECORDING & STORING LARGE PROJECTS ON PC HARD DISKS

Storing large PC-based hard disk recording projects can become tricky, especially when you need to make regular backups too. MARTIN WALKER looks at the options available.

As you probably know, digital audio recorded at a sample rate of 44.1kHz occupies about 5Mb of hard disk space per minute. An album lasting for one hour in its final CD stereo format will thus need about 600Mb. While you're doing your recording, though, you'll need more than two tracks, and the problem is that once you start adding tracks the amount of hard disk space required to store the audio expands rapidly. Fortunately, multitrack recording on hard disk, such as with MIDI + Audio sequencers, rarely

which is peanuts as modern hard drive sizes go. However, these must be viewed as absolute minimum sizes, since some extra space is bound to be occupied by alternative takes which will not be used in the final version, but which you won't want to delete until everything is finalised. In fact, I suspect that many people would back up such takes and keep them for posterity — you never know when they might come in handy during a remix.

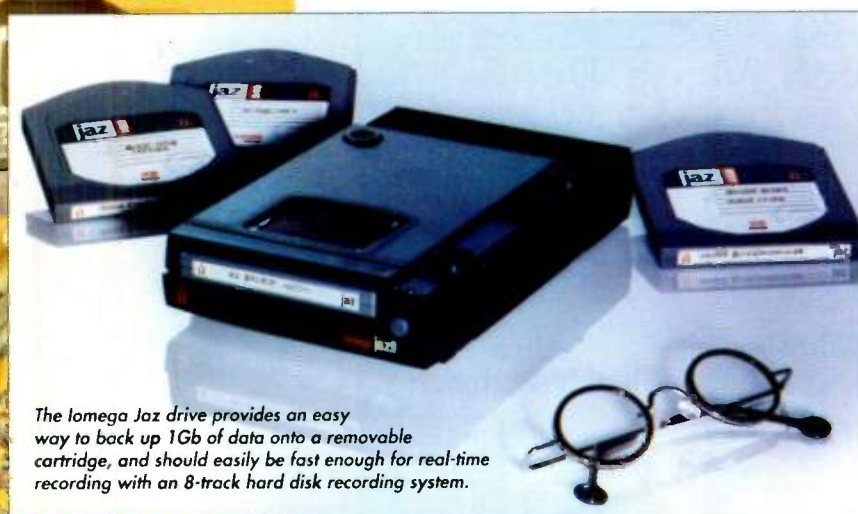
Once you move to 16-track, or if you find yourself filling the entire length of each project track, you'll quickly find yourself exceeding the 2Gb size limit imposed by DOS and Windows 95 for a single drive partition. At this point many people start to panic, imagining possible mayhem if recording and playing back across multiple partitions, or even multiple hard drives. But this needn't be a problem — in fact, using multiple drives may even improve overall performance compared to accessing a single huge one.

CHANNELLING YOUR EFFORT

The 'Drive Size' box shows that a separate 3Gb hard drive for audio should be adequate for most people running 8-track systems, since this would provide 71 minutes of recording time for each track, which should be enough for most album projects. If you have a 16-track system, the popular 5.1Gb drive size will provide 60 minutes of storage, and since a single CD can run to 74 minutes, one of the newer 6.4Gb drives, yielding 76 minutes, would probably be a safer bet. If you want to go beyond 16 tracks, the largest drives that are easily available at the moment are 9.1Gb. A drive of this size would provide 72 minutes of 24-track storage, and 54 minutes with 32 tracks.

However, it's not just the size of the drive that's important. Each time you double the number of tracks, you're asking the drive to work twice as hard just shifting data to and from the soundcard, and the performance of the drive can often be the limiting factor in the maximum number of tracks available. The most useful indication of hard drive performance is Average Access Time (my 'Bottleneck Blues' feature discussed this in greater length — see the 'Further Reading' box). Each audio track is stored in a different place on the drive, and in order for your MIDI + Audio sequencer to replay these multiple data streams, the drive must access the appropriate part of each stream in rotation.

First a small section of the first track will be grabbed, then the equivalent section of the second



The Omega Jaz drive provides an easy way to back up 1Gb of data onto a removable cartridge, and should easily be fast enough for real-time recording with an 8-track hard disk recording system.

requires each individual track to last the entire length of a song (unless you're dealing with a live performance), and data is only actually recorded when a track is active.

If we assume, for example, that on average, each track has content that lasts about 50% of the total recording time, for 4-track use you'd need a minimum of 5Mb (amount per mono minute) x 60 minutes (total project length) x 4 (number of tracks), ÷ 2 (50% of each track filled), which once again gives a total hard disk storage requirement of 600Mb. For 8-track use this expands to 1.2Gb,

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- 5 Octave keyboard with Velocity and Channel Aftertouch (5000S and 5000W only)

KAWAI

RECORDING & STORAGE ON PC HARD DISKS

- ▶ stereo signals, and even more slowly for multitrack projects. Dedicated backup drives can 'archive' your data using compression software, or you can save the project data just as it is. If you need rapid access to a project, to quickly create another mix, fly in extra vocals or add extra tracks, you won't want to spend a long time archiving the current contents of your hard drives, and then reloading the archived version of the project in question.

The simplest solution, for smaller projects, is to use a removable drive like the 1Gb Iomega Jaz and 1.5Gb Syquest Syjet models. These store data on removable cartridges. If you only need eight tracks, these can even be used for direct recording, although many people prefer to use a fixed hard drive for this, in order to tweak more performance from the PC system, reserving the removable one for backup purposes. Of the two, the Syjet is slightly faster and offers greater capacity, but is more expensive (you can't have it both ways). Incidentally, the little Iomega Zip drive is wonderful

PC recording system (reviewed in the last issue of *SOS*) features a model with two drives that can be unplugged, allowing the musician to keep a project safely tucked away for future use, and the Glyph range has 'hot swap' options for its hard drives (more on this range later on). The advantage over using the more specialist drives with removable media is that you're not limited by the capacity of the cartridge — if you want another 9Gb storage at a moment's notice, you plug in another hard drive with this capacity. Of course, swapping the entire drive will prove rather more expensive than an equivalent-sized removable cartridge (if available), but you do get the advantage of top-flight performance if you buy a huge top-flight drive, whilst still being able to plug in a range of smaller drives to suit other projects. However, don't be tempted to use removable drives *instead* of backing up your data, as this is asking for trouble.

MEDIA TRENDS

Another new audio storage trend has been emerging of late — the CD-R. Since most projects end up on CD anyway, and there are an increasing number of cheap CD-R drives for the PC which record at 4x speed, an entire 'album in progress' can be recorded onto a blank CD in 15 minutes or so, and then played back on any audio CD player. The same data can also be read back at an even faster rate, using standard CD-ROM drives. These are available at up to 24x speed, so even a full 74-minute CD could be reloaded in only a few minutes, especially if the data is saved in CD-ROM format, rather than standard CD Audio format (which can take rather longer to read in). The CD-R discs can only be used once, but they are now down to about £2 each (if bought in quantity) so, for up to 74 minutes of stereo data, are even cheaper than DAT tapes. For multitrack use, they could still be viable if you are prepared to split a project across several discs, saving a track or two onto each — you should get about nine minutes of 16-track audio per CD-R.

One drawback of CD-R for file backup in the past was that the discs were normally written on a track-by-track basis, rather than using the more versatile file-based approach taken by computers. This makes 'burning a CD' a rather more specialised process. The latest software, such as

"Each time you double the number of tracks, you're asking the drive to work twice as hard just shifting data to and from the soundcard, and the performance of the drive can often be the limiting factor in the maximum number of tracks available."

for general-purpose storage of samples and individual songs but, with a capacity of 100Mb, is not large enough (or fast enough) for multitrack use. Similarly, the Syquest EZFlyer, at 230Mb, is more suited to portable sample storage.

Of course, the easiest option is not to back up the data at all, but to swap the whole hard drive. Various options exist to do this — the Soundscape

TECH TALK

The ultimate hard disk performance is dependent on many technical factors. So many bits of jargon are bandied about that it can be hard to sort out the advertising 'puff' from the important parts. Ultra DMA (also known as Ultra-ATA and Ultra DMA/33) seems to be the latest go-faster feature, but this is definitely worth getting. DMA (Direct Memory Access) allows data to be transferred directly from the hard disk to memory (and vice versa), without tying up the computer's main processor (CPU). This allows the

CPU to spend more time doing other calculations, resulting in much better overall performance. DMA replaces PIO (Programmed Input Output), which does tie up the processor.

For EIDE devices using DMA, the theoretical maximum transfer speed is 16Mb per second. Ultra DMA/33, as its name suggests, increases this maximum speed to 33Mb per second (for those hard drives that support it), by using a more advanced data transfer method. This releases significantly more processing time than normal DMA, which is excellent news for anyone running real-time audio plug-ins. In fact,

tests have shown faster performance from EIDE drives using Ultra DMA than from those using Ultra Wide SCSI.

Drives featuring this new technology are starting to appear (Maxtor, for example, have just launched a new selection of DiamondMax drives with Ultra DMA). Although Ultra DMA drives will work fine with older systems, you can only access their Ultra DMA performance if you have a motherboard featuring the fairly new Intel 430TX chipset.

Another consideration is thermal recalibration. As hard drives heat up during use they expand slightly. To ensure that the read/write heads

remain accurately positioned over the data, every hard drive has a mechanism to periodically check its calibration. Some non-AV drives stop for up to half a second to do this, every 20 minutes or so, and this is disastrous if you're continuously accessing a drive for audio/visual work. AV drives are specially designed to minimise the disruption, and are unlikely to disturb the normal flow of data for more than about 30ms. When using more than eight tracks, always look either at AV drives or, at the very least, for evidence in the spec of a minimal recalibration time.

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DISTRIBUTION

► Adaptec's *Easy CD Pro* and CeQuadrat's *PacketCD*, uses a technique known as 'packet writing', and this allows you to write smaller bursts of data to the disc. This uses the space more effectively. It also changes the writing process to a simple Windows 95 'drag and drop' procedure, using the 'Save' or 'Save As' options to write files in exactly the same way as to any other drive.

SHINE ON

Magneto-Optical (MO) drives use a rather different method of recording and retrieving data, combining the more usual magnetic system, used by floppy and hard drives, with laser light. There are both magnetic and optical layers on the MO disk. The magnetic layer is used to store the information, but a laser is used to read it back from the optical layer, whose polarity is locally altered by the adjacent magnetic data. Data is written not by a magnetic field, but by using the laser at a higher power setting. Heating up the exact spot on the disk to around 200 degrees Centigrade causes the magnetic layer at this point to lose its strength. Then a low-level magnetic field can be used to set the orientation of the magnetic layer, providing the normal '0' or '1' value.

MO technology has its pros and cons, just like any other format. Disadvantages are that writing is slower than a normal hard drive, since two passes are needed to overwrite any existing data — one to wipe the earlier data, and the second to write the new. However, advances have been made that speed this process, and MO drives are available in both 5.25-inch and 3.5-inch formats, with storage capacity of up to about 650Mb. One big advantage of MO drives is that their contents are not affected by stray magnetic fields. The same could not be

“Don't be tempted to use removable drives instead of backing up your data. This is asking for trouble.”

said of traditional hard drives, floppy disks or DAT tapes! Also, for long-term storage, the shelf life of MO disks is supposedly as high as 100 years! Several manufacturers, such as Panasonic, have combined a type of optical drive with a normal CD-ROM player, and these use rewritable 5.25-inch 650Mb media costing about £22 each, but can play back standard CD-ROM disks as well. These are still popular, but something tells me that most musicians would probably prefer to buy a CD-R drive, and live with its 'write-once' approach.

A REEL SOLUTION

For the most cost-effective archive storage, tape drives are still very popular. The main difference between these and the other forms of storage already mentioned is exactly the same as that between analogue/digital tape recorders, and hard disk recording — the lack of random access. Although this means that it can take far more time to recover a single file from a complete computer backup, music data storage is normally on a complete project-by-project basis, containing fewer individual files, so this isn't such a disadvantage. The main advantages of tape are that the storage capacity is only limited by the maximum length of tape, and that since tape drives have been used for years to provide computer backup, they have an enviable reputation for long-term reliability. The downside is that reading and writing is normally much slower than with other systems, since although compression methods work well for much computer data in speeding up these processes, music data rarely compresses as effectively.

The most familiar tape format for musicians is probably DAT, albeit in a slightly different set of formats known as DDS (Digital Data Storage). Many DDS drive mechanisms are available from both Sony and Hewlett-Packard, and these can back up 4Gb of data (up to 8Gb when compressed) onto a single DDS2 format tape, and 12Gb data (up to 24Gb compressed) onto a single DDS3 tape. The drives themselves are much like audio DAT machines, but without the audio converters, and use identical-looking 4mm tape cartridges with even more emphasis on data integrity. Data DAT machines are fast, with transfer rates of 60 to 120Mb per minute. However, the larger models tend to be priced at well over £1000, ►

FAILURE GUARANTEED?

Hard Drives, along with a host of other electronic and mechanical components, have a reliability quoted as MTBF (Mean Time Between Failures). A figure of 500,000 hours does not mean that every drive will last for that time and then give up the ghost, but that, statistically, it is likely that the majority of drives will achieve this lifespan. Unfortunately, a few stray drives will always tend to fail within the first few days of use but, thereafter, most should last until the MTBF figure quoted.

SYSTEMS OFF THE PEG

Once you go beyond 8-track recording, building a balanced system becomes more problematic. Although you'll go for the fastest system you can afford, you will have little idea of how many simultaneous tracks the system can manage until you install your chosen software and try it

out. If you want to bypass most of the hassles involved in putting together an hard disk recording system on a PC, buying a complete ready-to-go system is an attractive alternative. These are available from various companies who advertise in the pages of *SOS*, but one that caught my eye recently is the Red Submarine Computer Company, specialising in PCs. They appear to have given a lot of thought to the real needs of musicians, and even highlight (in their catalogue) two ways to significantly reduce unwanted acoustic noise from hard drives and cooling fans!

The cheapest system in their range (the *Composer*) uses a Pentium 166MMX, a 3.2Gb EIDE drive and 32Mb RAM, to provide a good workhorse system for running *Cubase* or *Cakewalk Audio*, with up to eight audio tracks mixed down to a Turtle Beach Fiji soundcard.

If you want eight discrete channels, the 8-track *Studio* system features a Pentium 200MMX, 32Mb of RAM, a 4.2Gb Ultra Fast SCSI drive and an ARC 8 PCI soundcard, which gives eight ins and eight outs, as well as 24-bit digital I/O. This system, and all others above it in the range, up to the 24-track *Studio* setup, feature Ultra Fast SCSI drives for audio storage, plus a smaller 1.2Gb EIDE drive for programs.

Companies like Red Submarine can supply you with a complete package, so that your dream system performance doesn't become a nightmare.

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RECORDING & STORAGE ON PC HARD DISKS



Glyph Technologies specialise in SCSI drives for real-time storage, backup, and CD reading and writing, with both tabletop and rackmounting models in their range. The company also say that their drives are tweaked for higher than off-the-shelf performance when used for AV work.



► and will probably be more suitable for professional studio use, where time is money.

For those of us with a little more time than money, there are various other tape storage systems available. For those with more modest storage requirements, Iomega market the Ditto 2Gb drive, which uses Sony-developed QW-2Gb (compressed) tapes costing about £16 each. The transfer rate is only about 8Mb per minute (0.5Gb per hour), but, as they say, the price is right, at about £100 for the stand-alone external version. There's also a bigger, 3.2Gb, version at about £140. The next stage up is to use one of the Travan mini-cartridges, which were developed by the 3M company. These are a widely used standard within

the computer industry, and can store between 4Gb (up to 8Gb compressed) on a single cartridge costing about £30. Transfer rates are between 32 and 65Mb per minute. A Travan-based 8Gb backup unit can cost as little as £300, so this is a particularly cost-effective solution.

NARROWING IT DOWN

Most of these drives can be purchased in both internal and external versions. If you only have one PC to back up, the internal version will normally be a little cheaper, but for use with several PCs an external unit is more useful, as well as being portable. Although many external drives that plug into the parallel (printer) port of the PC are available, they can never be as fast as one that plugs into a SCSI port, so for the large file sizes used by hard disk recording, SCSI backup drives have to be the best bet. After all, many large hard disk recording systems will be SCSI-based anyway, so you will already have the required SCSI host adaptor card.

There are several manufacturers (including Dynatek, Glyph, and Micropolis) who specialise in providing hard drives and backup drives specifically tailored for audio/visual use. A rack width can normally accommodate two drives side by side, which gives you plenty of options. The best course of action is to get further details of each range, and then discuss your specific requirements with the company concerned. You can, of course, also buy backup drives through mainstream computer retailers, but what you save in initial cost will probably be outweighed by the long-term support provided by a specialist. It's your data: you decide how important it is.

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PEERING INTO THE FUTURE

As more and more data needs to be squirted along the data busses, there are new standards poised to make this process ever faster. The USB (Universal Serial Buss) is being much touted at the moment, and its strength lies in allowing a daisy chain of up to 127 peripherals to be attached to PCs, although its data rate is fairly slow by today's standards, at 12Mbps (mega bits per second). Since the USB connection provides a 5V power supply as well as signal connections, it can provide user-friendly upgrades, by removing the need to open up the PC quite so often, and backup devices attached via USB should be faster than those attached to the PC parallel port.

Although PC motherboards have had USB hardware capability for some time, most manufacturers have neglected to fit the appropriate sockets, partly to save a few pennies, and partly because there is, as yet, little to plug into them. Windows 95 also has limited support for USB. However, the new TX motherboards (more about these in a future issue) provide more extensive USB support, and USB peripherals are expected to become more important within the next few months. Windows 98 (now expected in the second quarter of 1998) will also provide much more built-in support for USB.

One of the most eagerly awaited developments is DVD (Digital Video Disc), which is a much more advanced form of CD-ROM, with media of 4.7Gb single-sided capacity and 9.4Gb double-sided. CD-ROMs will still play back on DVD drives, but CD-R discs will not, since the laser required to read them is a different colour. Once blank DVD discs come down to a sensible price, this would seem to be the ideal medium for audio backup. However, with this much storage we still need a much faster means of transferring data. Firewire, or, to give it its proper title, 'IEEE-1394 Firewire', is designed to do just this. It has sufficient speed (up to 50Mb per second) to allow multi-channel digital audio streams and synchronised video to be ported in real time to external devices, and should provide us with a universal audio/visual standard. The cables have only six cores (two twisted pairs for data and signalling, and two pins for power), so we should also eventually see the end of the hugely confusing selection of SCSI cables currently on offer. Firewire is also supported by a huge range of companies, not only those from the computer industry, but also music giants such as Yamaha. Anything that simplifies the interconnection of digital signals is to be applauded, but if Firewire eventually becomes the universal standard that many people are expecting, musicians will be clapping more loudly than anyone else.

SOS

FURTHER READING

I've already covered many aspects of PC hard drives in the PC Musician section of SOS. Check out these issues:

- January 1997: Drive Time Part 1 (Choosing PC Disk Drives).
- February 1997: Drive Time Part 2 (SCSI Drives and Host Adaptors).
- August 1997: Bottleneck Blues (Identifying the weakest link in a PC Hard Disk Recording System).
- September 1997: Driving it Home (Installing a New PC Hard Drive).

SOUND ON SOUND

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Gina, from Event Electronics, is a PCI soundcard that features two analogue inputs and eight independent analogue outputs, all on standard quarter-inch jack sockets, as well as an S/PDIF digital input and output. Being PCI, it will work with both PC and Mac, although currently only the PC software drivers are available, with the Mac ones lagging slightly behind. The drivers allow full-duplex operation, so you can simultaneously record on four channels

(two analogue, two digital) whilst playing back on all 10 outputs (eight analogue plus two digital).

Gina is the middle sister in the trio of Event soundcards, and is probably the one that will become entry-level for professionals. The baby in the range is Darla, but even she manages two inputs and eight independent outputs on phonos, all mounted on a tiny box which plugs directly onto the back of the card. Gina adds an S/PDIF digital input and output, again on phono sockets, to this spec, but the audio outputs emerge from standard unbalanced quarter-inch jack sockets, mounted on a rugged breakout box that attaches

the big event

EVENT ELECTRONICS
GINA MULTITRACK
PCI SOUND CARD

Layla, Darla and Gina are the eagerly awaited multi-channel PCI soundcards from Event Electronics, which promise a complete audio solution featuring eight independent outputs.

MARTIN WALKER interfaces with Gina — and falls in love.

to the soundcard via a three-foot cable. The big sister is Layla, and she features eight simultaneous inputs instead of the two of her siblings, and 10 analogue outputs, as well as wordclock I/O, and a MIDI In, Out, and Thru. In addition, all Layla's converters (eight A/D and 10 D/A) are in a professional rackmount case, leaving only digital signals inside the PC, for ultimate sound quality.

Electronic design is top-notch throughout the range: the converters are all are 20-bit 128x

The Gina soundcard (seen here with her breakout box) may look small, but it packs a mean punch when it comes to audio performance.



oversampling, and the S/PDIF I/O has 24-bit resolution. Unlike many other cards, this 24-bit path is maintained internally — only at the analogue inputs and outputs is the signal dithered down to 16-bit, so it is quite possible for signals lower than -96dB to be heard (which is to say that the dynamic range exceeds 96dB). All three cards feature a Motorola 56301 DSP, which works at 66mips (million instructions per second) in the case of Darla and Gina, and 80mips with Layla, and this is the nerve centre of each card, controlling the PCI buss and routing data through the system, as well as providing sample-rate conversion and dithering.

INSTALLATION

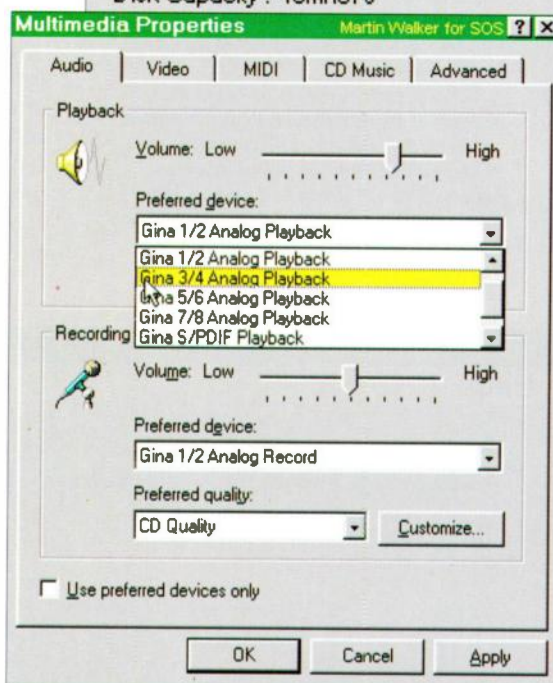
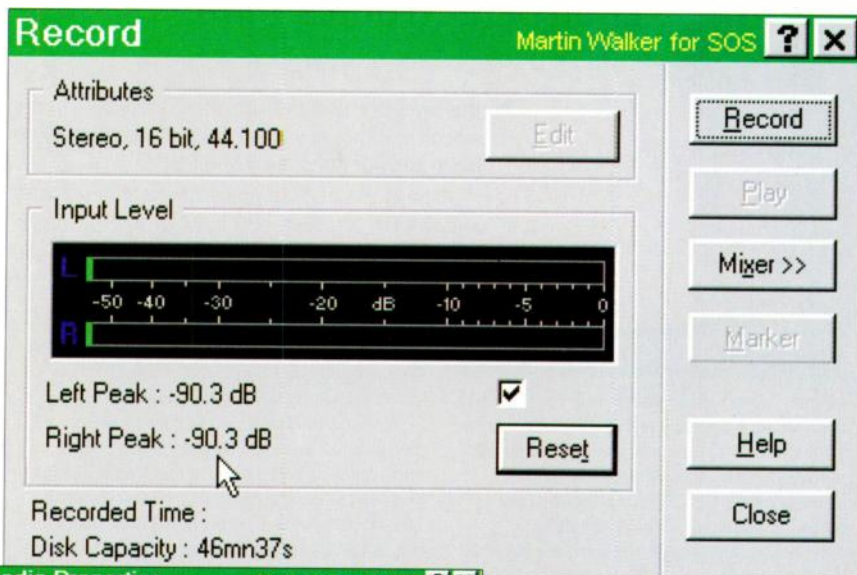
Since Gina is a short (5.5-inch) PCI expansion card, you should be able to fit it into any available PCI slot in your PC. As always, try to keep it away from the video card and the hard disk controller. Sadly, this is the only area where an old ISA card has an advantage, since nearly all modern video cards will be PCI, and therefore closer. The next step is to connect up the supplied cable between the 25-way 'D'-type connector on the card and the audio breakout box. Contrary to some rumours, the audio converters do not seem to be inside this breakout box. As its name suggests, it simply provides a set of audio sockets in a convenient external form. The manual states that between the card and the audio connectors is "a shielded audio cable that has been custom manufactured to exacting standards."

Gina is Plug and Play, so when you switch your PC back on, the new hardware will be detected automatically, and Windows 95 will request the supplied CD-ROM containing the drivers. Once the appropriate two files have been installed, you can nip into Control Panel, Device Manager, 'Sound, video and game controllers,' to check that everything is OK. If you find the Properties page of the 'Gina by Echo' driver reads that "This device is working properly", you're home and dry. Since the card is a PCI Buss Mastering device, it needs no DMA at all, only a single IRQ which is allocated automatically by Plug and Play. The manual has a very useful appendix in case of conflicts, although I had no problems at all in this respect.

Once installed, the new audio drivers will appear to Windows 95 as a set of four stereo WAV playback devices, along with one stereo digital one, which will emerge from the phono socket on the card (see screen dump above). The recording options again appear in pairs: Gina 1/2 Analogue Record, and Gina S/PDIF Record. As long as your hard disk recording package can see multiple drivers (and nearly all do) you're ready to start recording.

PERFORMANCE

The first thing I did, once the drivers were installed, was launch *WaveLab*, to measure background noise levels. As anyone who read my 'Card Tricks' feature in the November issue will know, the best of seven



When I selected the basic Gina 1/2 Analogue Record in WaveLab, the results spoke for themselves — a steady -90.3dB noise level, and no DC offset at all. This is streets ahead of any other card previously installed in my PC, and the digital input, as expected, stayed glued resolutely at -96.3dB (no measurable signal at all).

Once the drivers have been installed, you'll find them in Control Panel/Multimedia/Audio, as a series of stereo WAV devices. The eight outputs appear as Gina 1/2 Analogue Playback, along with 3/4, 5/6, 7/8, and Gina S/PDIF Playback, as seen here. They can thus be accessed by any hard disk recording package that recognises multiple-standard multimedia drivers.

stereo soundcards so far installed in my PC managed a noise level of -72dB, which is perfectly acceptable for general use, but not really suitable for mastering an album. The Gina background noise level measured about -90dB. This is as good as either of my Sony DAT recorders, and, for the first time ever, I could even see the background buss noise from my mixer above the noise floor of the soundcard when I raised the mixer's master faders! As a further check, I re-installed Gina in another PCI slot, right next to my video card, and it was still rock solid, reading -90.3dB (see top screen above).

In fact, at these low levels, noise measurements are more difficult to measure accurately, as, for a 16-bit signal, the intervals between adjacent dB settings become rather coarse, going directly from -90.3 to -96.3dB (the latter figure denotes no measurable signal at all). Sure enough, when switched to the S/PDIF input, *WaveLab* measured -96.3dB. I had been coming to the conclusion that any audio signal inside my PC was destined to remain mid-fi, unless I spent lots more money. However, the Gina managed to buck a trend. If ▶

pros & cons

EVENT GINA £499

pros

- Excellent sound quality and low noise.
- Digital I/O built in.
- Good value for money.
- Easy to fit half-length PCI card.

cons

- Mac drivers not yet available.

summary

This is a very competitively priced soundcard with a performance that, for once, seems to be in line with the published specification. Highly recommended.

SOUND ON SOUND

Event Electronics Gina

- ▶ this level of noise performance is possible in my machine, it proves that other cards must simply be more susceptible to interference.

Gina works at all sample rates between 11kHz and 48kHz, and will play back at any bit depth supported by your software, from 8-bit to 24-bit. The S/PDIF I/O is 24-bit, and audio from this input

SPEC CHECK

All three cards claim a similar basic performance: the frequency response of both Gina and Layla is 10Hz-22kHz +/-0.5dB, whereas Daria is quoted as 20Hz-22kHz +/-0.5dB. All three quote a dynamic range of 98dB, and a THD+n (Total Harmonic Distortion + noise) of 0.003%, 20Hz-22kHz, A-weighted. However, the potential and actual performance of soundcards can be greatly modified by the effects of different PCs, and this is why I was so impressed by the noise performance of the Gina, since it bettered any other card installed in my PC to date, by a sizeable margin. Whether this is partly due to more careful or advanced design, better screening, or simply the fact that it is the first PCI card I have installed, is difficult to say. Gina's performance does, however, prove that a

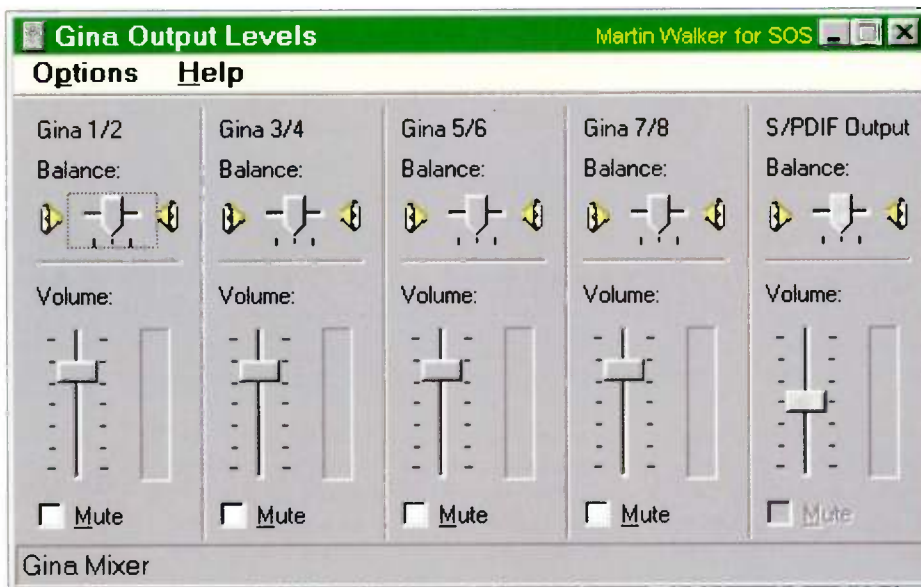
professional spec can be achieved without having the converters outside the PC, although this is still the optimum solution if you can afford it.

All the cards feature a PCI buss master interface, which means that they have enough intelligence on-board to move audio data without tying up the computer's main processor, and so should manage more tracks in a MIDI + Audio sequencer than those that rely on old-fashioned DMA. With full-duplex operation extending simultaneously to all four inputs and 10 outputs, this is a winner.

As far as PC performance goes, you need a minimum of any Pentium processor, 16Mb RAM, and a hard disk with 10ms access time and throughput of 2.65Mb per second. Of course, you'd be better off aiming for a Pentium 166 MMX or better, and 32Mb of RAM, to get more from your investment.

can be recorded and output at full 24-bit resolution. To make input-level adjustment even easier when recording, the Advanced page settings for the Analogue input levels feature something called EasyTrim — it sounds like a gimmick, but it really works. Set up the loudest signal you're likely to record and then enable EasyTrim, for either or both inputs, by clicking in the appropriate box. When you click again to un-check the box, the input fader will jump to the optimum position (it gives you a couple of dBs headroom beyond the peak level of your signal, just in case). To be honest, this is a better system than permanently lining up Gina with a 1kHz oscillator on your mixer output, since you can quickly redo it for each track you intend to record, at whatever level it might be.

I found no problems running *Cubase VST* with the MME drivers, although the forthcoming ASIO drivers will give you much better latency performance (see the 'Future Developments' box). Gina also worked fine running DirectX plug-ins such as the Waves *Native Power Pack*. Event claim compatibility with all applications that use the 'standard WAV device driver. These include ▶



Input and Output levels can be set from the standard Windows 95 mixer, whose icon should appear on your Taskbar if you have ticked the 'Show volume control on taskbar' box, which is located in the Multimedia properties window.

FUTURE DEVELOPMENTS

It's good to see that the standard drivers are functional with the Event cards on the PC right from the start, but application-specific drivers will achieve better performance in the long run. Event are currently working with Steinberg to implement ASIO (Audio Stream Input and Output) drivers for *Cubase VST* PC, and these are likely to reduce the latency (time discrepancy between recording and playback) from the current value of about three-quarters of a second to about 20ms. As long as you directly monitor the signal you're recording, either by listening to it via your normal mixing desk, or by monitoring the input to the soundcard, this latency should cause you few problems, since *Cubase* automatically adjusts the

timing of the recorded audio to keep everything in sync. The beauty of the ASIO drivers will be that, with only 20ms latency, you can feasibly listen to the sound coming off disk while you're recording it (complete with any real-time effects), just as you can with a three-head tape machine. No promises have been given for delivery of these drivers (which means they can't be broken), but the rumours are that Santa Claus may yet be able to deliver them. The second-generation ASIO driver for *Cubase VST* may well offer on-board DSP processing, so that the Motorola DSP chip can run plug-ins directly, taking some of the load off your computer. This development is likely to happen in tandem for both the standard MME and ASIO drivers,

with the second-generation ASIO drivers also running VST-based processing directly on the soundcard.

Another promise from Event is that the ASIO drivers should achieve direct 20-bit recording onto hard disk with *Cubase VST*. This should markedly improve fidelity for low-level signals, although hard disk space will be swallowed up faster than usual. Finally, although Gina is not currently capable of sync'ing to external sources using the S/PDIF sockets, it is hoped to introduce this facility as well.

Apart from Windows 95 on the PC, Windows NT support seems a bit unlikely, although it has not been ruled out. On the other hand, Mac drivers are lagging a bit, due to unforeseen circumstances, but should be available shortly to run on any Macintosh PowerPC with System 7.5.

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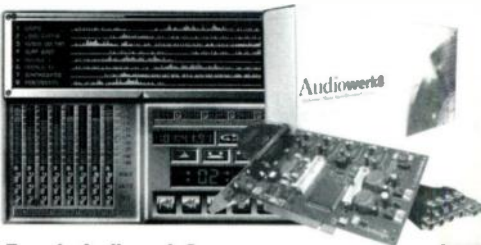
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Event Electronics Gina

TESTING ONE TWO

Event provide the freely downloadable *Echo Reporter* on their web site, so that you can see whether your PC has enough power and resources to run any of the Event cards, and if so, how many simultaneous playback tracks are likely to be possible (see screen dump below). It also reports any spare interrupts, and your PCI BIOS version (Gina needs version 2.10, but most modern machines will have this). My freshly defragmented D: partition (used solely for audio recording) showed a possible 24 tracks of playback while recording a single stereo track (Pentium 166 MMX and 32Mb RAM). All the data boxes are user-adjustable, so once your hard disk transfer rate has been measured, you can see how playback performance alters as the number of simultaneous recorded channels increases. You can also see the effect of changing bit depth (8, 16, 24 or 32-bit), and sample rate (22.05, 44.1 or 48kHz). Of course, for the Gina, only two analogue tracks can be recorded simultaneously, but the Layla extends this to eight.

Whilst the HD transfer rates will be

accurate, the other figures are estimates of track numbers, and can't account for the extra overhead of the hard disk recording package used. However, this is still an extremely useful utility, and I suggest you download it straight away!

The Echo Reporter software tests your hardware for you. Here it reports that my hard disk is capable of up to 24-track playback whilst simultaneously recording two more. The Record Time (top right) shows the maximum length of recording time available for a selected number of tracks, from 1 to 999 (assuming continuous uninterrupted recording).

Windows 95 drivers have been slow to appear. Even when they have, support has been limited to a single stereo output when used with some MIDI + Audio sequencers, with full multi-channel support still uncertain. Other high-quality cards, even the stereo ones at £300-500, have digital I/O only as an add-on extra, costing typically another £100. If you buy a card without digital I/O, and want to add it as a stand-alone extra, it could cost between £200 and 300, bringing the total price way beyond the cost of Gina.

If you have a more sophisticated studio with multiple digital devices, you may need additional

Hard Disk Performance Martin Walker for SOS

Transfer Information

Target Drive: D: [v]

Transfer Settings

Record Time: Drive D

Available Disk Space: 1348.3 MB

Avail Record Time: (h:m:s) 00:33:23

Size: 16-bit [v] Rate: 44.1 [v]

Number of Tracks: 8 [v]

Results: Drive D

Transfer Rate	Max Simultaneous Tracks
Read: 2212 Kb/s	Playback: 24 [v]
Write: 5309 Kb/s	Record: 2 [v]

Size: 16-bit [v] Rate: 44.1 [v]

Test Disk

Done

- ▶ sequencers such as *Cakewalk*, *Cubase* and *Logic*, *Cool Edit Pro*, *Samplitude*, and *SAW Plus*, as well as WAV editors such as *Sound Forge* and *WaveLab*.

When you're installing the card, only the two driver files end up by default on your hard drive, which makes a welcome change from some cards that insist on giving you hordes of bells and whistles, when all you want are the basics. However, also on the CD-ROM are various demos to try at your leisure, including a Special Edition version of *Cool Edit Pro*. This is fully functional, but allows a maximum of 10 tracks.

SUMMARY

What can I say? Gina installs easily, and has drivers that work with Windows 95 straight away, providing access to all eight outputs with the majority of software from day one. This soundcard also has the best audio specification, by far, of all eight cards that have been installed in my PC over the years. Even though other multi-channel cards with this sort of specification exist, for one reason or another they have proved an awkward or impossible choice for PC owners, since some

facilities such as the wordclock I/O provided by Layla, but for basic 8-track recording, with digital I/O, Gina takes some beating. Note that although Gina is not capable of syncing to external sources via the S/PDIF sockets at the moment, Event are promising this in a future driver upgrade.

Basically, this is the one I've been waiting for — a multi-channel soundcard that combines the speed of a PCI slot with the added convenience of built-in digital input and output. If you haven't cottoned on by now, I'm having one of these. No way is this one going back — I've already super-glued it to the card slot. Need I say more?

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8/10

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9/10

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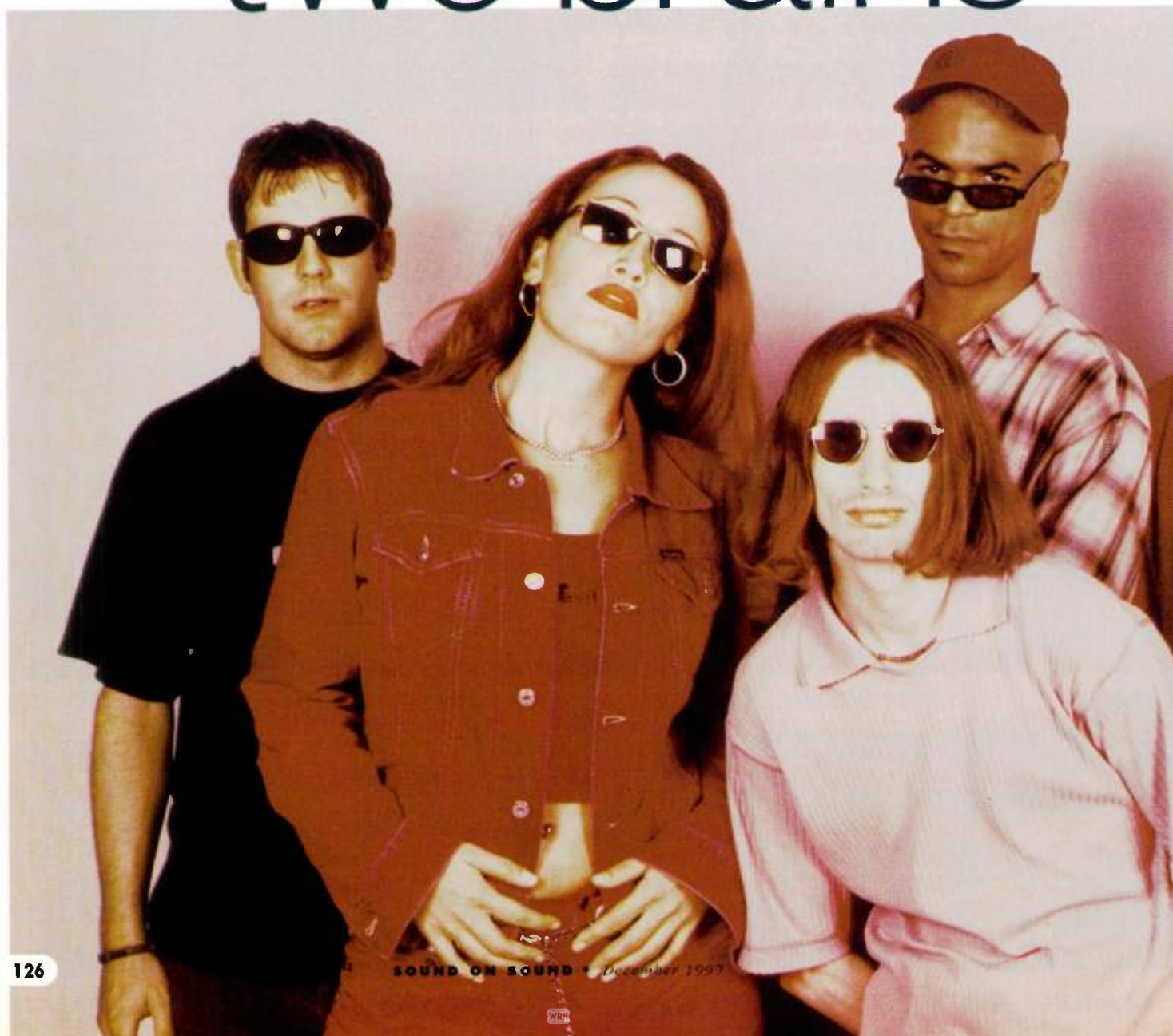
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The perpetrators of recent smash hit 'Da Ya Think I'm Sexy?' might look like a leopardskin-clad disco covers band composed of several people, but in fact, they're the pet electronic project of two Mancunians with their heads firmly screwed on and an eye to the future of dance music. MATT BELL explores the slightly schizophrenic world of N-Trance...

“NANA NANA NAAH-NAAH!!”. It is the evening of Friday October 31st, 1997, and as *Top Of The Pops* is beamed into living rooms nationwide, so too is a radically updated version of Rod Stewart's late-'70s hymn to leopardskin, 'Do You Think I'm Sexy?' by N-Trance. 'Da Ya Think I'm Sexy?' as the group have mysteriously renamed it — has become the third cover hit the band have enjoyed in the last two years (following 1995's 'Stayin' Alive' and this year's 'D.I.S.C.O.') by sampling the hooks of old disco classics and reworking them for the modern club market. Easy money, you might say; this is

the band with DALE LONGWORTH • KEVIN O'TOOLE ■ N-TRANCE two brains



obviously a group bereft of talent, stealing other people's ideas by means of modern sampling technology and reaping the rewards.

But as with so many other aspects of life, it's not quite that simple. For a start, reworking those disco tunes around a main sampled section isn't as easy as it looks; a lot of studio work goes into their creation. But more importantly, there's more to N-Trance themselves than their cover hits. They've had plenty of self-penned successes, for one thing, such as their 1995 dancefloor classic (and UK number 2) 'Set You Free'. And then there's the material they're working on at the moment: the hard-hitting, *Robocop*-sampling 'Violent Mechanical Psychopath' which exhibits distinct leanings towards the recent output of The Prodigy; the expansive, driving instrumental 'Deep Blue', which Kevin O'Toole, one of N-Trance's core creative duo, proclaims "the best thing we've ever done"; and 'The Mind Of The Machine', a hardcore collaboration with Hollywood actor Stephen Berkoff. It's all a long way from 'Stayin' Alive', and the brains behind the group are only too aware of this; in fact, as I visit their Manchester-based Deep Blue studio in late September 1997, they're discussing bringing N-Trance to the end of its life after the imminent release of the next album, and looking forward to continuing in their new-found,



The controlling intelligences of N-Trance (Dale Longworth, extreme left, and Kevin O'Toole, extreme right) flank the other band members: (left to right) vocalist Kelly Llorenna, dancer Lee Limer, and rapper/vocalist Jerome Stokes.



more progressive vein under a new name. As Dale Longworth, the other half of the duo, affirms, "Our main problem is that now people expect pop from N-Trance... and that's not the way we want to go."

LOST IN BLUE

Deep Blue Studios is located in an arts complex near Piccadilly station in the heart of the city; and Dale and Kevin have fitted it out like the true *Star Wars* fanatics they are. Models of Star Destroyers, Rebel Fighters, the Millennium Falcon, and plastic figures from the film litter the studio. A video and Nintendo games console attached to a TV sit snugly in one corner, along with some of the duo's favourite films: *Robocop*, George Lucas's *THX1138*, and *Dune*. As befits the creative team behind a 5-piece group (Dale and Kevin plus vocalist Kelly Llorenna, rapper/vocalist Jerome Stokes, and dancer Lee Limer) who sold over 1.5 million copies worldwide of just one single last year ('Stayin' Alive'), they seem to have everything they could wish for.

Of course, it wasn't always like this. N-Trance's rise to fame was far from immediate. Inspired heavily by the KLF, N-Trance were formed in 1990 by Dale and Kevin when they met at college on a theatre sound engineering course (Dale: "We had no singer at first, so we were just doing trancey instrumental stuff — that's why we're called N-Trance"). After a 12-month 'false start' to their recording career with Pete Waterman's Manchester-based 380 Records, the duo signed an amicable 50/50 deal with independent Blackburn-based All Around The World records (with whom they remain to this day) on the strength of a single they had written for their new vocalist Kelly, 'Set

Deep Blue Studios, Manchester. Note Star Wars memorabilia (Kevin: "The B-wing and the Y-wing fighters cost over a hundred quid") and Imperial Stormtrooper, as well as Nintendo games console and footballing trophies. Oh, and there's some recording equipment in there somewhere, too...



Left: N-Trance's favourite gear lurks next to the Mackie desk (and that Stormtrooper again) at Deep Blue: Roland TB303, SH101 (with Kenton Pro 2 MIDI-CV converter) and TR606 Drumatrix; also Roland Juno 106, and Korg M1 and Trinity workstations.

► You Free'. After (once again) a couple of false starts, the track was released a third time in January 1995, whereupon it shot to number two in the charts and sold over a million copies.

WHAT'S YOUR PLEASURE?

By the time the group's debut album, *Electronic Pleasure*, was released towards the end of 1995, Dale and Kevin had experienced their second enormous success, this time worldwide: the Bee Gees-sampling 'Stayin' Alive'. Kevin explains how the track came about.

"One day, we were driving to a studio listening to the radio, and they played PM Dawn's 'Set Adrift On Memory Bliss' [1991 sample-based hit, which laid a trendy beat over Spandau Ballet's 'True' — Ed], followed by The Bee Gees 'Staying Alive', and we thought 'If we put a beat under that...' So we sampled The Bee Gees off a CD, and just put a rap over the top off another record to get us started. We played it to some people, and they said it was pretty catchy..."

'Stayin' Alive' reached number one in eight countries, allowing Kevin and Dale to set up Deep

Blue Studios, and equip it in whatever way they wished. As far as they were concerned, this opportunity could not come quickly enough, as they had struggled to get by on the minimum of equipment from their beginnings. Dale starts the sorry tale: "When we started, we had just the Korg M1, the Roland R8 drum machine, and the Atari". Kevin: "We had a Juno 106 as well. That was all, though. We didn't even have a mixer: at first, we wired everything up into one plug and stuck it through a hi-fi."

Dale: "That was our mixer; a jack plug."

Kevin: "We just couldn't afford one at first. The M1 cost me two grand — we had no money left."

Dale: "We borrowed a mixer from college for a bit. Only trouble was, it was a *lighting* mixer..."

Gradually, matters improved, and until fairly recently, the group owned a Tascam 2524, with which they were delighted (Kevin: "That was great, 'cause of all the MIDI muting. All our mixes sounded like they'd been done on an SSL, dead clean").

However, a recent refit saw them switch to a Mackie 8-buss console, enlarged with further expander units to give a total of 80 inputs. Dale: "They didn't make the 2524s any bigger, and we couldn't expand. So we got the Mackie. Most of our setup is hard-wired through the desk, so the same instruments always come up on the same channels, which makes things quicker. Even so, we still have to go and master somewhere else, on an SSL. But this place is good enough for demos and remixes." In truth, Deep Blue is now a more-than-adequately equipped studio. A soundproofed vocal booth (see the 'Whole Booth' box) nestles at the back of the main room, one side of which is mainly occupied by the enormously expanded Mackie desk. A pair of turntables lurks to one side, but most of the rest of the main recording area is stuffed with both vintage and ultra-modern keyboards (there are, curiously, very few synth modules, aside from a couple contained in a blue rack pod that accompanies the band to gigs). MIDI sequencing for the whole studio is provided by an elderly Atari 1040ST (see 'Long Live The Atari' box), and digital multitrack recording by a stack of four chained Tascam DA88s, which now ultimately record everything the band produce, MIDI-generated or not. It's a nice compact setup, with a cosy feel; yet as Dale has explained, they still trek to London to master on an SSL console — for the moment.

Dale: "I don't care what anyone says about home setups, everything's been mastered on an SSL. There's that statistic; 95 percent of what you hear on the radio has been mastered on an SSL. You can't argue with that."

Kevin interjects: "It's actually a lot easier with the DA88s than it used to be. Now, we just take four tapes down to London, hire another four DA88s there, and master from those. We make sure everything sounds right before we go down, with all the vocals compiled, and everything spot on. When we did the first album, we took the whole *studio* down to London. It took ages to set up, and then we'd get halfway through a song and think, 'shall we put the Juno in here?' — and



LONG LIVE THE ATARI — THEY HOPE

As explained in the main part of this feature, N-Trance rely exclusively on their aging Atari 1040ST for all their MIDI sequencing needs. Dale and Kevin seem to view theirs with a mixture of fondness and slight concern, much as one might a slightly dotty uncle.

Kevin: "Ataris never seem to work when you move them about too much, do they?"

Dale: "This is all right, this one! Our last one used to stop working if you ran it for more than three hours. We got this one out of *Loot* for 60 quid. Everyone says to us 'get a Mac, get a Mac', but we just think..."

Kevin: "...why should we get one of those?' And they say, 'well... because... it's in colour!'. *Grrreat.*"

Dale: "It's a sequencer, not a fucking telly."

Kevin: "We did the first album on Pro24. We didn't even have Cubase. But it did what we wanted. All we needed was for it to record what we played, quantise it, and then record pitch-bends and stuff over the top."

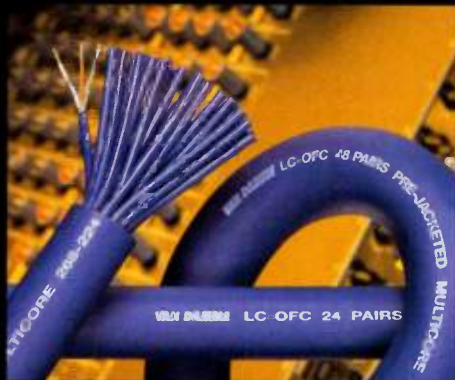
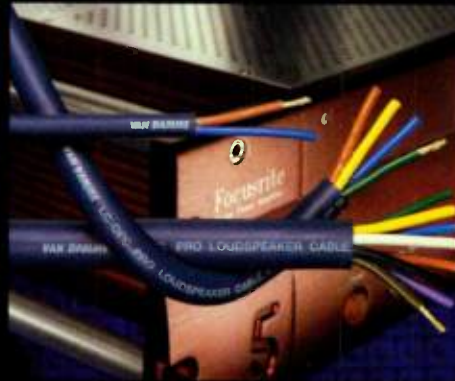
Dale: "The thing is, if you start losing yourself in the technology — you know, 'Oh, you can do this', and 'How do you do that?' — by the time you've worked it all out, your

song's disappeared."

Kevin: "I can't see the Atari going for another 10 years, though. We've already got it up to 4Mb of RAM, and put a hard drive on it. People say 'Oh, don't give it up, you can put samples on it and everything.' Well, yeah — but we've got a sampler over there for that..."

Dale: "Ten years? It's knackered *now*, mate. What about the keyboard?"

Well, what *about* the keyboard, I enquire? "It's fucked," explains Kevin, "some of the keys don't work. We can't get the letter 'O'. That's why our version of 'Do You Think I'm Sexy' is spelt with 'A's, you see..."



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Fax 0171 700 3888

► realise we'd left it up here."

Dale: "Also, we were paying a grand a day for an SSL in London, and we ended up recording stuff there, which we could have done here for nothing."

Kevin: "We're hoping to set up a proper SSL complex in Manchester, 'cause there isn't one at the moment. We want to do something for bands round here."

Dale: "I can't believe no-one's got an SSL studio up here. OK, so the music industry on the whole is based in London, but we're from here, we record here, our record company's up here, our video guys are here, Ikon, the company who do all our sleeves, Internet design and interactive media stuff, are based up here... we've got a really good team here. Well, now we're in a position where we can make it all happen up here. So why not? All we need is the mastering facilities, and we're laughing."

COVERING ALL ANGLES

With three massive sample-based hits now behind them, Dale and Kevin are now past masters of the art of constructing a hit around someone else's record. I ask them to take me through the process. First, there's the choice of material... why have they always chosen disco, and what should you look out for in a song that makes it ideal sample/cover material?

Dale: "Disco's just catchy stuff; the sort of music that people can still dance to today if you beef it up a bit."

Kevin: "The best thing to do is look through the *Guinness Book Of Hit Singles* and see what made number one years ago. Boney M, Abba..."

Dale: "We always pick fun records that

have already been massive hits — so it's already been proven that they work."

Kevin: "Everyone does it. Look at these rappers from America. Puff Daddy, The Fugees, Coolio; they haven't done one of their own songs yet."

Kevin: "Also — this is something we haven't done — if you're going to pick a song to re-release, try and pick a song by a band that only had a couple of hits, 'cause they'll need the money! When you pick someone like Rod Stewart or The Bee Gees, they don't — so they can just say no. Actually, it didn't take all that long for The Bee Gees to agree to us, but Rod Stewart took over a year — it was the biggest sample clearance job ever, apparently."

"We did try to do 'Paradise City' by Guns & Roses, but we couldn't get clearance on it. The band wouldn't let us do it."

Dale: "We heard they were arguing; we don't know who was who, but some of them were up for it and some didn't want us to. They've split up now, so we like to think we caused that, at least!"

Kevin considers another point: "Another good thing to look for — or create — in these covers is an audience participation part. Like in 'Sexy' there's the 'na, na, na, nah-nah' bit. You just *know* if you put something like that in it everyone'll start singing along to it."

Dale: "If you have a bit in the song where you can either shout out loud or do a dance to it — like Whigfield's 'Saturday Night' — everyone loves it in clubs."

Once N-Trance have chosen a track, there are the technicalities of melding the original song with a new rhythm and backing track to consider. Kevin continues: "You start with a

THE WHOLE BOOTH, AND NOTHING BUT THE BOOTH

When N-Trance moved into what is now Deep Blue, they inherited a completely empty space, which they then divided up into various different rooms and areas themselves. One item they were

determined to construct was a vocal booth, as their vocal recording options had previously been a touch, well, limited. Kevin explains:

"Before we moved here, we were still recording in my bedroom at home, and it had this really metallic sound. We wanted a really good, dead sound for the rap vocals, and everyone said we needed a proper vocal booth. We just had to stick a duvet over the rapper's head... there you go, that's one of our classic recording techniques! Mind you, it worked."

"When we got here, we used something in *Sound On Sound* to build the booth. There was a big feature on studio construction [see SOS 'Practical Studio Design' series, starting August '93, folks — Ed] — how to put in the floating floor and everything. It turned out really well."

Dale: "You have some good stuff in your mag like that."

Aww, shucks, guys — you shouldn't...

Deep Blue's vocal booth, as constructed according to *Sound On Sound's* advice. The stick balanced between the monitors is marked 'Artist Adjustment Tool'. "Just in case they get a bit full of themselves" says Dale.



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London 0181 800 8288
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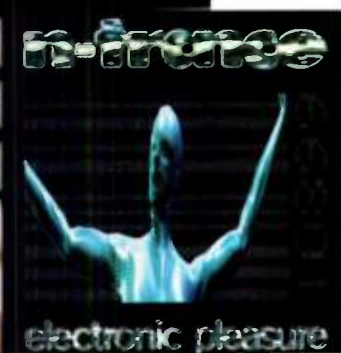
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▶ sampled loop of the song, and remove the original kick drum from it — the snare doesn't matter, because you can cover it up with a new one. To notch out the kick, you just look for the peak on your sampler, and then EQ it out. It sounds like a click after that: you can't hear it. Then you just experiment to see which sort of sounds fit. We have certain snare and kick sounds that we particularly like; the kick is one we made up ourselves from three other kick sounds. As far as rhythms go, your best bet, at the end of the day, is a 4/4 kick with the snare on every second beat..."

Dale: "So everyone can dance to it..."

Kevin: "... and that's your beat sorted out. Your hi-hat just needs to be straight fours on the beat. Anyone who messes around with the hi-hats and other complicated stuff for this kind of music is wasting their time. You don't need fills, for example. If you listen to the drums on 'Stayin' Alive', there's no fills at all. We used a sample of a machine gun for that fill effect."

Dale: "You just need a beat to dance to. We know people who have spent weeks on kick drums; but it's

just a drum! If the song's there, it doesn't matter."

If the duo seem cautious about making the new drum track too complex, they are still more reticent about changing basslines. Kevin: "You can redo the bassline easily if you have to, but you really have to watch it, and not overdo it. Sometimes, we'll put a chugging Euro 'octave' bassline in, played with a buzzy analogue synth sound, just to hold the beat a bit. But you can't make it too complicated. Think of something like Prince's 'When Doves Cry'; there's no bassline in that, but it still sounds brilliant."

Dale: "In 'Stayin' Alive', the sampled guitar riff is already like the bassline — it didn't need much else."

REHEATING THE LEOPARDSKIN

Moving onto specifics, I wonder how N-Trance actually put together their cover hits in the studio, and what problems they had to overcome. We consider their two biggest cover hits, 'Stayin' Alive' and 'Da Ya Think I'm Sexy?'.

Dale: "The original version of 'Stayin' Alive' that we put together had sampled The Bee Gees ▶

DEEP BLUE EQUIPMENT LIST

KEYBOARDS/SYNTHS

- Akai AK73
- Hammond XB2

Kevin: "This supplies all our organ sounds, 'cause I like to use that Jazz Organ sound sometimes, but getting a real B2 through the door is a bit much to ask!"

- Korg M1

Dale: "The M1 doesn't get used much now, though it was good for rave piano in its day."

- Korg Mlnlkorg

Dale: "We call this 'The Cooker', 'cause that's what it looks like..."

- Korg Trinity

Dale: "We use the Trinity tons."

Kevin: "We constructed 'Deep Blue' around a flutey sound on that."

- Korg PolySix (x2)
- Korg Propaacy
- Novation BassStation

Dale: "We got this 'cause everyone says it's supposed to be like a 303. It's nothing like one, though — and it freezes up on us all the time. Nothing ever sounds like a 303."

- Oberheim Matrix 1000
- Roland AX1
- Roland Juno 106
- Roland Jupfiter 6
- Roland JV1080

Kevin: "That's really good for orchestral stuff. There was a diagram we saw in *Sound On Sound* showing the layout of a real orchestra. If you create a multitimbral setup on the JV for orchestral sounds and pan them all to the places shown on your diagram, the result sounds just like a real orchestra."

- Roland SH5
- Roland SH101

Kevin: "I like the internal sequencer on

this — you can't clock it to anything, but you can 'DJ' a sequence in to the rest of your track, until it fits, and then sample it and loop it. It sounds great."

- Sequential Circuits Prophet 5

Kevin: "We only ever use one noise out of this!"

Dale: "We drove all the way to Edinburgh in your van for that as well. Shocking."

Kevin: "Everyone says, if you're going to do dance, get a TB303, a Prophet 5, a Jupiter 8 and an OB8. So we got the Prophet — but it's not that good."

- Yamaha Clavinova

Kevin: "This is probably one of the dearest keyboards we've got — it's properly weighted, and you've got to have *something* that sounds like a real piano."

- Yamaha SY22

RECORDING

- AKG C414B mic
- Behringer 1400 Multigate
- Boss SE50 multi-effects
- Boss SE70 multi-effects

Kevin: "One of the best effects units we've got; you can get a great Leslie-type sound on it. We also use the vocoder a lot, as well — some of our older keyboards are brilliant through that, and the distortion effects sound really good on the TB303. It is a bit noisy, but it is good."

- Casio DA7 DAT machine
- dbx 160XT compressor
- EV MC150 mic
- Lexicon LXP15 multi-effects
- Lexicon PCM90 reverb

Dale: "This is good, but we only really use our effects for listening and demos, not really for recording. You're never going to beat something as good as

the Lexicon 480 or AMS delays. The stuff we've got here is good... but not as good as those."

- Mackie 8-Buss desk (extended to 80 inputs)
- Neumann U87A mic
- Phillips CD920 CD player
- P&R Patchbay

Kevin: "Here's something it took us a while to get. We used to keep just getting round the back of the machines to swap things over. I don't know how we lived like that now."

- Roland SDE330 delay (x2)
- Shure SM58 mic
- Sony MZ1 MiniDisc
- Soundcraft Absolute 2 monitors
- SPL MikeMan mic preamp
- Tascam DA30 MkII DAT machine
- Tascam DA88 (x4) & remote
- Technics RSBS1601 cassette deck
- Technics SL1210 MkII record decks (x2)
- Yamaha SPX90 multi-effects
- Yamaha SPX990 multi-effects

Kevin: "This has a brilliant gated reverb sound, but it's noisy."

SAMPLING

- Akai S3200 (with 1Gb hard drive)

DRUM MACHINES/SEQUENCERS

- Roland R8M drum module

Kevin: "We still use this a lot, because we've got all the TR808 and 909 set drum cards for it."

Dale: "On the B-side to 'Da Ya Think I'm Sexy', 'Spice', we just ran through as many vintage drum sounds as we could, and came across all the old CR78 and 808 ones. It was pure electro, body-popping stuff."

Kevin: "You still can't beat those drum sounds, they really drive a song along. That track was originally about The Spice Girls, you know. We had all these

samples in from the film *Dune*, saying things like 'We must halt all spice production'. But it's just a B-side..."

Dale: "...and we didn't want to end up giving all the money from the A-side away in sample clearance."

Kevin: "You do have to think about things like that."

- Roland TB303 Bassline

Kevin: "This is the best thing we own."

Dale: "It's God."

Kevin: "I got it for about 100 quid in a shop in Oldham; they didn't know what it was."

Dale: "It goes on nearly every track now."

Kevin: "It's so versatile, for something with basically only two waveforms. Especially the sound you get when you distort one through your desk; that sounds great."

Dale: "Roland should just start making them again, like they used to be, and stop mucking about with these digital versions of it... with drums on them. You don't want drums... why don't they just make the TB again, but with MIDI?"

- Roland TR606 drum machine

COMPUTERS/SOFTWARE

- Atari 1040ST (with 4Mb of RAM)
- Stelnberg *Cubase*

MISCELLANEOUS

- Hamer Slammer Electric Guitar
- Hohner Rockwood Bass Guitar
- Micro Scalextric Super Endurance
- Mitre indoor football
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Roland XP-50 Music Workstation



Featuring the same sound engine, effects processing and wave expandability as the XP-80, the 61 note XP-50 represents a cost-effective integration of all the features that make a great workstation.

- 64 voice polyphony and 16-part multimbral capability.
- 16 Mbytes of internal waveform memory, 80 Mbytes when fully expanded (16-bit linear format)
- 16-track MRC-Pro sequencer with direct-from-disk playback.
- Powerful Groove Quantize function.
- RPS for on-the-fly triggering of patterns
- 40 insert effects in addition to digital reverb and chorus.

Roland MC-303 Groovebox



The MC-303 is a self-contained, retro-styled sequencer and integrated sound module with some very high-tech features. Techno, rap, jungle, hip-hop, acid and other dance styles can now be approached easily and creatively by dance composers and other groove enthusiasts with little or no musical training.

- 448 dedicated dance sounds.
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 - Low Boost feature.
 - Part/Rhythm Instrument Mute enables use as a mixer.
- Specifications
- Parts: 16 (8 main, 8 RPS) • Tones: 448 • Rhythm Sets: 12 • Maximum Polyphony: 28 voices • Effects: Reverb/Delay, Chorus/Flinger • Sequencer: 8 tracks, 10 songs, Patterns (133 preset + 211 RPS + 300 variation + 50 user - max) approx 14,000 note storage • Keyboard Pad; 16 keys (also Octave Up/Down) • Display: 7-segment LED x 6 • Connectors: Output (L/Mono, R) • Headphones, MIDI (In/Out), Foot control, AC adaptor • Dimensions: 378 (W) x 244 (D) x 91 (H) mm (14-14/16" x 9-10/16" x 3-9/16") • Weight (incl AC adaptor): 3.0 kg (6lb 10 ozs)

Roland VS-880

Digital Studio Workstation

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Workstation- the best-selling dedicated hard-disk recorder in history. New V-Expanded VS-880 features are available to original VS-880 owners through the VS-880-S1 System Expansion Kit.

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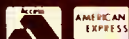
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▶ themselves. We had to have their parts re-sung."

Kevin: "They said we could use the main funky guitar riff, but not the vocal 'ah, ah, ah, ah, Staying Alive, Staying Alive' bit. We were wondering what to do about the music under that bit, but luckily the guitar riff, which we were allowed to use, fits under that — it's not played like that in the original, but it still fits. And then we got two session singers in to sing over the top. When they first started singing, it sounded nothing like The Bee Gees!"

Dale: "We did about 30 tracks of them singing, but they just couldn't get high enough, so we used the varispeed to slow the tape multitrack down and recorded it that way. Then it was just about right."

Dale: "Barry Gibb still thought he could hear himself on it afterwards."

Kevin: "Well, we had to get it to sound the same. It wouldn't have worked otherwise."

The situation with 'Da Ya Think I'm Sexy?' was a little different. When sample clearance for the track was initially delayed, N-Trance first tried re-recording the track themselves, with drums and guitar. Dale: "It just wasn't the same; no-one else can sing like Rod, so we sampled it off the CD in the end."

This, however, was just the start of their problems.

Kevin: "The finished 'Da Ya Think I'm Sexy?' may sound easy — but you try sampling that track and getting it all in time! The Bee Gees one was dead easy to lift and use, 'cause they must have used a drum machine click or something to sync to — it was all in time. 'Do You Think I'm Sexy?' wasn't. It took hours to do. We had to sample tiny sections and time-stretch bits, as well as taking the kick drum out, as described earlier, and replacing it with a new one... I did all that with our Akai S3200, by ear. I'm used to mixing records and DJing on decks, so I can tell when a kick's going out of time. But once you've got the kick and snare in time, the guitar's out, 'cause that was all live when the track was recorded as well. You have to stretch everything else as well."

I venture that this sort of task sounded like an ideal job for a hard disk recording setup, and wonder why Dale and Kevin have stuck with the Akai. Kevin: "I find the sampler easiest. I'm used to it."

ART VS. COMMERCE

As mentioned at the start of this piece, Dale and Kevin's music is continuing to develop in the studio, and along lines far different to the ones that produced 'Da Ya Think I'm Sexy?' and 'Staying Alive'. As Kevin explains, work on what was due to be the group's second album is complete, but the pair are now having second thoughts, and are on the point of splitting the album into two separate projects.

"We've done this song called 'Violent Mechanical Psychopath', which we think is one of the best things we've ever done, but it doesn't sound like N-Trance. Half of the album's really cool and hardcore, and the other half's like..."

Dale: "'Da Ya Think I'm Sexy'! Everyone has a problem with us doing such a wide range of stuff, so we're going to split it and do two albums."

Kevin: "When you're trying to sell to Spain or Japan, say, they want it all to sound the same — they want pop. You can't put hard tracks next to pop — they want 10 'Da Ya Think I'm Sexy?'s. And if Japan say they want pop, we'll do it, 'cause we know we'll sell tons of albums — and then we can do our other stuff under a different name."

"With the N-Trance stuff now, there's no deep meaning to it — it's designed to have a few pints to and have a laugh dancing to it. And kids buy it, so that's what brings the money in for us."

Dale: "We'll put out the pop album out as N-Trance, and that might be the last N-Trance album. Then we'll start again as something else."

All's well, then: the pop kids get their N-Trance album, and this finances Dale and Kevin's continuing excursions into more harder-edged material. In fact, it would seem there's just one snag...

Kevin: "We can't think of a name for the new group. Maybe we'll use something from *Star Wars*."

Dale suddenly grins. "Sometimes, we're just like big kids, aren't we? We've got all these figures and models, and the Nintendo and the Playstation, and a Scalextric next door..."

SAMPLE THIS!

Which sums up N-Trance in a nutshell. On the one hand, hip purveyors of the coolest, most cutting-edge dance music; on the other, two Manchester lads chanting along to a Rod Stewart sample on *Top Of The Pops*. On the one hand, shrewd businessmen full of plans to revitalise the recording industry in Manchester with a new studio complex; on the other, self-confessed 'big kids' addicted to their Sony Playstation and their *Star Wars* figures. On the one hand, the Kevin O'Toole who sits hunched over his sampler into the depths of the night, time-stretching a *Robocop* sample until it fits into a track just so; and on the other, the Kevin who, as I leave Deep Blue, offers me the following advice:

"If you sample yourself saying 'Blokes A Week Off' and reverse it, it sounds like Arnie saying something really rude."

Don't try this at home, kids.



The recording heart of Deep Blue studios — four Tascam DA88s. And an Imperial Star Destroyer, natch.

THE LIVE JIVE

Anyone who thinks dance music isn't 'rock and roll' enough should listen to some of N-Trance's stories about their early gigging days; these are tales of Transit van-centred debauchery that make Led Zeppelin look like St Winifred's School Choir, and are sadly unsuitable for reproduction here. However, suggest that dance PAs are in some way 'tame' and the band get quite excited. This is the duo, after all, who once fused the entire lighting system of a club by turning their on-stage water cannon (an entirely artistically valid part of their stage act, naturally) onto the lighting desk. Kevin: "It is like rock and roll. You're touring Scotland in a crappy van, all of you in the back with all the gear... you can't brake too hard or you'll all be squashed... you don't know if you're going to get paid... we had loads of arguments about that, and

used to just play for beers sometimes..."

Were you actually playing anything live then? Kevin: "Naw, it was all off DAT."

Dale: "The first one was off cassette! You could tell when we were on, 'cause the whole club filled with hiss... it was like the call to us in the dressing room."

Kevin: "We took the Atari on stage, but it just had a game on it..."

Dale sighs: "There's a lot of bollocks talked about dance bands who play live; I know things about bands who've said they do it all live... but when I worked for a PA company before this, I used to see the stage sheets that said 'DAT player to the left and right channels, and two live mics for the vocals, please.' And there's always some live percussion. A band off DAT always has some live congas up the front to try and make it look real!"

Kevin: "We know, 'cause we've done it!"

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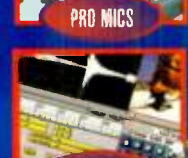
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Burn Baby Burn

YAMAHA CDR400TX CD-R WRITER



Yamaha's new CD-ROM burner comes with the option of a cut-price copy of Toast 3.5, allowing you to create backups, burn CDs, and even make your own CD-ROMs.

PAUL WHITE tries out the combination.

With the price of blank recordable CDs falling to below the equivalent length of DAT tape, there is a strong case for using them in the computer-based studio, not only for making your own audio CDs, but also for backing up the digital audio files and MIDI sequence data from completed projects, or even for archiving your DAT masters. Of course they may also be used to back up other data from your computer — in my case, it would be quite useful to be able to move several hundred out-of-date SOS articles and graphic files into CD-R storage, to let me get some of my hard drive back!

Yamaha's CDR400tx is a SCSI2 external CD-R read/write drive with full Multimedia Command Set support, yet is no larger than a compact CD-ROM player. There are few controls, other than a power switch, eject button and a couple of LEDs to indicate that the drive is ready, and whether it is reading or writing — as with all such devices, the real work is done via software.

The CDR400tx connects to the host computer via SCSI, which means that it can be used with pretty much any Mac, or with a PC that has a

suitable SCSI card fitted. The SCSI ID may be set using one of those thumbwheel switches that you have to jab with a ballpoint pen instead of a thumb, and a SCSI Thru port is provided. There's no need for a terminator as a switchable, internal terminator is fitted. Unfortunately, as there are at least three possible options for the 'other end' of a SCSI2 cable, you have to provide your own, and this will cost around £20.

The CDR400tx is able to write discs at 1x, 2x or 4x speed, and can read CD-ROMs at up to six times normal speed, which equates to a data transfer rate of 900K per second. However, the real limitation on how fast you can burn is the type of software you're running, the model and speed of your computer, and the hard drive you use for storing your audio files. Digital audio extraction is also possible at six times speed.

A 2Mb buffer (which is equivalent to 500 disc sectors) is included, and the access speed is 250ms, which, although slow by hard disk standards, is par for the course for CD-R. A motorised tray is used to load the disc, and this is the one area of the machine that I feel nervous about — the tray is so flimsy that it almost sags under its own weight, but providing you don't use it as a coffee cup holder, lean on it or leave it open in a strong breeze, I'm sure it will be fine. Two phonos provide a stereo audio output at a nominal 1V line level (20Hz-20kHz).

Yamaha don't deliver their own software with the drive — it doesn't even come with a driver —

pros & cons

YAMAHA CDR400TX £399

pros

- Fast, compact and reasonably priced.
- Comprehensive feature set, including disk-at-once write mode and zero track-gap spacing.
- Toast available as a low-cost option.
- Well supported by third-party software.

cons

- Drive tray rather flimsy.

summary

A well-specified, fast drive that works reliably and has a good level of software support.

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* Bar the shouting

▶ but they offer the option of Astarte's *Toast* software (for Macintosh) for around £50 extra, and I've just managed to get the latest version (3.5), which sports some useful enhancements for audio CD work. Windows users could use CeQuadrat's *WinOnCD*, though it seems that several of the major PC digital editing software packages will shortly become CDR400tx-compatible, and Sonic Foundry's *CD Architect* (reviewed in October 1997's *Sound On Sound*) already supports the drive. Digidesign users may be pleased to know that *Masterlist CD* v1.4 now supports this drive, which means you can turn out fully PQ-coded masters.

BURNING WITH TOAST

Toast is a kind of jack-of-all trades ROM-burning package capable of handling audio CDs, Mac-format CD-ROMS, PC-format CD-ROMS and generic CD-ROMs that may comply with some other type of formatting. *Toast* also makes it possible to produce duplicates from your master CDs, so once you've mastered and compiled your album on hard disk, copies can be run off, taking around 20 minutes each. Another audio feature is the ability to make an audio CD by compiling your own selection

of tracks from existing CDs, though I'm sure you don't need me to remind you that unless you're doing this only for your own use, using CDs you own, you might fall foul of copyright law.

However, *Toast* does have some rather frustrating limitations for audio CD compilation, especially if you've just compiled your album using Digidesign *Sound Designer II*'s playlist and you're too tight to buy *Masterlist CD*. *Toast* can only put track IDs at the start of a file, so you have to break your album up into separate song files, then clean up the starts and finishes by trimming and discarding the unwanted data at either end. Only then can you move the desired files into *Toast*'s playlist and add your own gaps, in 0.5-second increments. While *Toast* can turn *SDII* text or numeric markers into index points (which only some CD machines can read), it can't turn them into track IDs.

On the face of it, this precludes the siting of track IDs in the middle of sections of audio, such as during a track crossfade, or during applause on a live album, but there is a possible way around that. Yamaha's drive can handle track spacings of down to zero seconds, something that not all drives will do, so you could split a linked pair of tracks into two files,

TRIED AND TESTED FOR PC

I tried the CDR400tx with my PC setup, and was impressed by its physical design, and in particular the twin LED readout: the one on the left shows either red (power but no disc), red flashing (inserting or ejecting disc), green flashing (initialising disc), or steady green (power and disc inserted). The second of the two LEDs provides comprehensive read/write activity information, so that you know exactly what's going on at each stage of the burning process. The power switch on the front panel is also very welcome, since most other drives expect you to delve around the back. On the mechanical side, the CD tray itself makes a wonderful hi-tech sound as it emerges, but is quite flexible, as Paul White mentions, so if you're the clumsy type you should take care while it's exposed. The only negative point for studio use (and this applies to all external

drives) is the noise of the cooling fan.

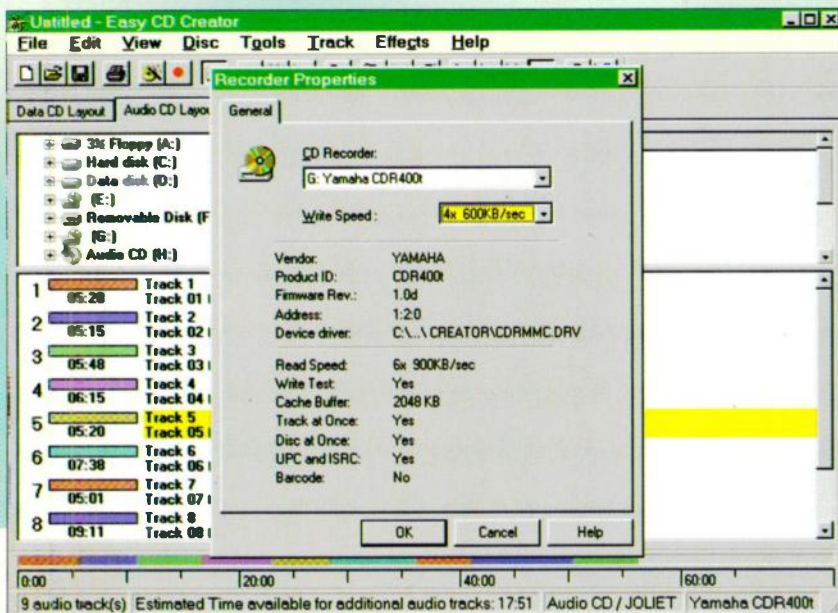
The CDR400tx worked fine when playing back audio CDs, although, like all CD-ROM drives used for audio purposes, you do get a tiny bit of 'ticking' going on quietly in the background. As with seemingly all Yamaha 'voicing', the sound is extremely crisp and 'zingy'.

As with every other CD recorder on the market, you can buy this unit bundled with a variety of software. Yamaha leaves it up to each supplier to offer their own choices, but most can offer several alternatives, including *Direct CD*, *CD Creator* (originally from Corel, but now part of the Adaptec empire), Adaptec's own *Easy CD Pro*, and Cequadrat's *WinOnCD 3*. Sonic Foundry's *CD Architect* already supports the CDR400tx directly.

I've already covered Cequadrat's *WinOnCD 3* as part of the Teac CDR50S review in the May issue of

SOS, but Steinberg's *WaveLab 1.6* also uses the Cequadrat 'engine' for CD writing, so I checked out the Cequadrat web site (www.cequadrat.com/), and this confirmed that the Yamaha CDR400tx is supported. I do wish, though, that individual drivers were available from this site — I'm surely not the only person who resents having to download over a megabyte of data just to find out whether one particular driver has been added or updated. Fortunately, anyone with *WaveLab 1.6* can download a 222K update, which includes the CDR400tx driver, directly from the Steinberg web site (www.steinberg-us.com/).

Adaptec seem intent on taking over the world when it comes to CD-writing software, having incorporated Astarte's *Toast* and Corel's *CD Creator* into their empire. The latest piece of PC software from Adaptec is *Easy CD Creator*, which has a number of intriguing features. From the moment you start the application, the *EasyCD Wizard* provides a selection of either/or responses, to get you as far as the actual burn with the minimum of effort and time. It works surprisingly well. If you type in the Track Names and details, the package will even allow you to print a neatly formatted jewel-case insert. This package is fine for general-purpose data or audio use, and it also allows you to modify the 2-second gap between tracks. It also supports digital importing of audio tracks, which worked fine with the CDR400tx, achieving 6x speed in the process. This makes it easy to copy most sorts of CDs — it takes 10 minutes to read an hour-long CD at 6x speed, and 15 minutes to burn a new one at 4x write speed. As I also had a TEAC SCSI CD-ROM drive to hand, I tried the ultimate test — real-time copying of an audio CD, simultaneously reading from the TEAC drive, and writing to the Yamaha one at 4x speed. A 72-minute CD took exactly 18 minutes, with no buffer underrun errors on my machine. However, there were occasional low-level 'ticks' on the CD-R after burning,



Easy CD Creator is an excellent all-in-one PC software bundle which provides support for all CD-writing modes and is suitable for the Yamaha CDR400tx.

import them into *Toast*, then play one after the other with a gap time of zero.

To be truly useful as a professional audio CD writing tool, *Toast* should really accept Digidesign markers for use as track IDs to be translated into PQ codes, or, at the very least, you should be able to compile *SDII* regions within *Toast*'s playlist. Even the facility to put your album in as one long file, then enter the PQ codes by hand would be acceptable, but entering individual tracks as separate files seems to be the only option. However, there's a more basic reason not to use *Toast* for producing CD masters for duplication: *Toast* compiles its audio albums in track-at-once rather than disk-at-once mode, and most CD manufacturers demand masters written in disk-at-once mode. In track-at-once mode, the writing laser shuts off between each track, which can lead to errors.

To write CDs for professional duplication, you need another program, such as *Toast CD-DA*, *CD Architect*, or Digidesign's *Masterlist CD* on the Mac. It's here that stand-alone CD writers score, as they can translate DAT IDs directly into CD start

IDs, though the designers of most of them have completely overlooked the need to make the recorder stop on cue at the end of the album!

The basic *Toast* software fares better for more conventional CD-ROM work, and when backing up files it provides a means to create a temporary partition on your hard drive into which you can place the files you want to back up. The partition requires contiguous disk space, so you may find you have to defragment your drive first. This is the method you'd use for backing up MIDI and audio files, something CD-R is extremely good at. If you have a removable hard drive, you don't even need to create a partition — you simply copy all your files to the removable drive, then back up the entire volume.

SUMMARY

Yamaha's CDR400tx is one of the fastest and most comprehensively specified low-cost CD-ROM burners around and, unlike some devices that are restricted by their hardware, is really limited only by the software being used. Fortunately, it seems to be gaining a high level of software support, and there are several useful packages supporting it already. The high speed, the fact that any data the support software demands can be burned, and that zero track spacing is supported is all good news, as is the fact that both separate sessions and disk-at-once mode are supported.

Toast is a very flexible piece of software considering its low cost. However, it falls rather short of being up to the job of professional CD mastering, which means that you'll have to look elsewhere for software if you want to offer a comprehensive commercial service. However, if all you need to do is knock out CD demos that can be played on a regular CD player, *Toast* will do it for you. Astarte's own *Toast CD-DA* is more flexible but, as far as I'm aware, it still isn't capable of importing *SDII* regions — though the program is due to be superseded by a more advanced program, called *Jam*, which should be arriving on our breakfast tables soon. Digidesign's *Masterlist CD* only works with drives specifically supported by the software, and I was very pleased to see the CDR400tx on the supported list for version 1.4.

PC users are, for once, rather better off than Mac owners, in that there's already a large choice of software capable of compiling, editing and burning audio CDs on the PC — all you need is a relatively inexpensive SCSI card, a big hard drive, and you're in business.

SOS

which, on closer inspection, were actual gaps and overlaps in the waveforms, and which were definitely not on the original CD. I tried again, this time writing an image file on the hard disk first, and all was well. This suggests that the problem is due to the two SCSI devices accessing the bus at the same time, which is a bit worrying, but at least it seems unconnected to the actual drives.

If you fancy making up a compilation from your favourite LPs, cassette tapes and CDs, another application included as part of the same bundle is *Spin Doctor*, which lets you "Easily turn scratchy LPs into crystal clear CDs". This uses your soundcard's input to record from external sources, and provides various recording options, which include basic click, pop and hiss reduction, silence detection for automatically splitting albums into tracks, and loudness balancing for individual tracks. A 'verify before write' option is also included, so that you can hear these treatments before burning the audio CD. You wouldn't expect it to rival *Sound Forge* or *WaveLab*, but it works well. There is a red sheet inside the box, warning you to contact your legal adviser before copying anything, but we musicians respect other artists' copyright, don't we?

Martin Walker

The Yamaha CDR400tx value kit for PC.



£ CDR400TX with media, manual and lead (no software) £399; *Toast* £49 extra; CDR400TX-VK (Value Kit PC bundle with *WinOnCD* software) £450. Prices include VAT.

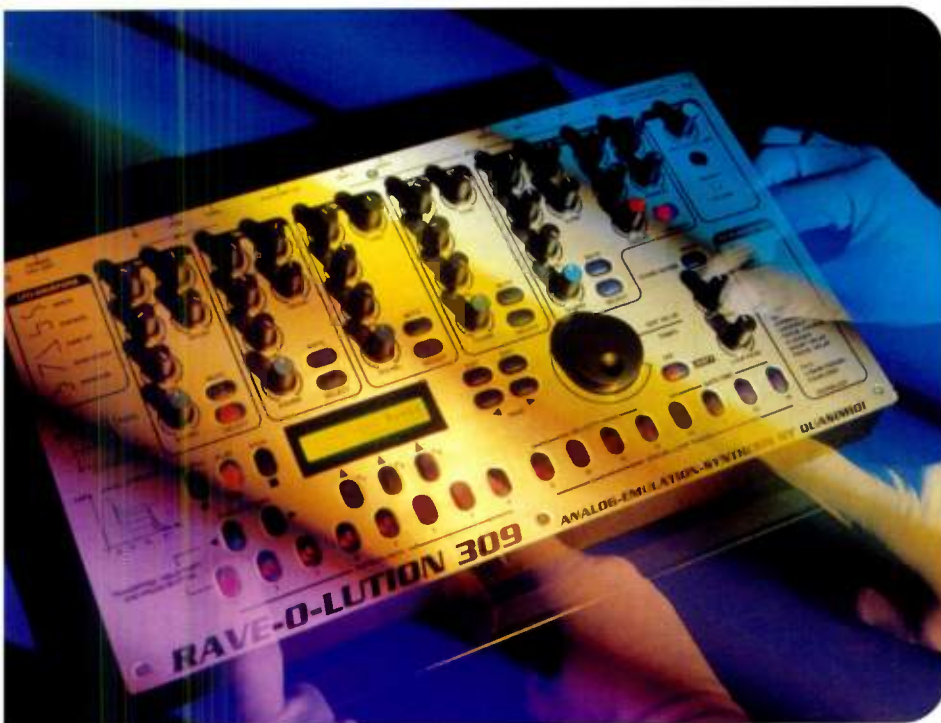
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On either side of the main operating system chip there's a socket where the synth and drum/percussion expansion options are installed. Essentially, the synth expansion adds 37 new oscillator models, offering up to four oscillators each, two new filter algorithms (12dB low-pass and 12dB high-pass), plus sequence-sync'able LFOs. You can now assign 16th, 8th, quarter and whole note values, that follow the 309's tempo, to the LFO. The new waveforms can be auditioned in 32 example sounds, but these memory locations are *not* accessible under normal circumstances. There are still 128 synth patch memory locations.

The synth expansion offers one — or is that two? — especially important new feature if the audio expansion option is also installed: two extra bass/lead synths. These synths can be played on their own MIDI channels, from an external keyboard or sequencer, or set up to double the main bass/lead synth. It's also possible to trigger the extra synths from the 309's drum sections. Let's be clear, though: you do *not* get two extra sequence tracks, just two extra synth voices.

Each synth has all the programmability the 309 has to offer, and tweaks can be made from the front panel, and sent over MIDI or recorded into

Children of the Rave-O-Lution

QUASIMIDI RAVE-O-LUTION 309 UPGRADES

Quasimidi are delivering on their promise to provide new goodies for owners of the 309 dance box. DEREK JOHNSON raves a bit...

pros & cons

QUASIMIDI 309 EXPANSION OPTIONS

pros

- Easy to install.
- Nifty LFO and filter enhancements.
- Flexible input options.
- Two extra synth voices.
- Double the drum and percussion memories.

cons

- The price of all three options together would buy a whole extra sound module.
- No room for further expansion!

summary

The excellent just got better. These options are highly recommended for any serious 309 user and will significantly expand the power and usability of this machine.

SOUND ON SOUND

The promise of upgradability was one of many attractive features of Quasimidi's 309 all-in-one techno box. Read about some of the others in our review in May of this year: faithful reproduction of analogue drum and synth sounds, intuitive retro-style, pattern-based sequencer, and plentiful real-time controls. Upgrades were imminent, but details were sketchy: we only knew there would be some kind of sound expansion and that extra audio sockets would fill blanked holes. Just in time for Christmas, the upgrades have arrived. Are they essential purchases for the existing 309 owner?

SYNTH EXPANSION

Whether you buy one or all three expansion options, your 309's operating system needs to be upgraded to v2.0 (see 'v2.0 Software' box). Luckily, this upgrade is provided as a matter of course, and is easily installed by simply removing a plate from the 309's bottom and swapping the old chip for the new one. Full, clear instructions are given, as is the necessary chip-removal tool.

the dedicated Master track). Press and hold F1 or F2 (under the display), and you can use the bass/lead synth's controls. For more detailed editing, double-pressing F1 or F2 takes you to the main editing pages, visible on the display.

DRUMS & PERCUSSION EXPANSION

The drums and percussion option is equally impressive, adding extra kick (14), snare (11), hi-hat (8) and percussion (127) waveform models and samples. There are also now 20 instead of 10 percussion kits. Amongst the percussion instruments is a selection of synth waveforms, that can, given the correctly programmed kit, be played melodically, albeit with a maximum range of 12 notes. A variety of hits, chords, yells and so on fill out the collection of synth-based percussion. All drum and percussion sounds have most of the 309's synth parameters, including the new enhanced LFO — just the thing for wild, tempo-driven modulated drum parts. This expansion also doubles the number of memory locations (to 128) for each of the drum and percussion sections, and adds 38 new preset Patterns.

QUASIMIDI RAVE-O-LUTION 309 UPGRADES



The back panel of an expanded 309, with the audio option installed.

AUDIO EXPANSION

Now to the audio expansion, possibly the most exciting option of the lot. This board is a little trickier to install, but the instructions are once again very clear. Basically, the expansion offers a pair of audio inputs and an extra pair of (assignable) outputs. Any line-level audio appearing at the inputs can be treated — singly or as a stereo pair — with the full complement of 309 synthesis technology. And remember, that includes a wicked, newly enhanced filter and sync'able LFOs. You can also trigger the inputs from any of the drum machine/sequencer sections, for instant gated effects. The flexibility is quite staggering, and this option takes some beating for the creative mangling of sound. Take your pick: a tape deck, CD player, turntable (given a suitable preamp), audio output of a digital synth or sampler, or the audio from a larger analogue system are all grist for the Quasimidi mill. I had an enjoyable time deconstructing Radio 1 with the 309: using the tap tempo and sync'd LFOs modulating the filter, virtually anything — the waffling jocks or the music they were playing between the waffle — came across as a mangled yet coherent and synchronised part of whatever Pattern 1 was working with. Highly recommended. Outputs 3 and 4 can be used to send any 309 sounds (or the treated audio ins) to a mixer for external processing; of course, on-board effects are not available in this case.

Knobs and editing parameters are accessed in exactly the same way as the synth expansion; in fact, when you double-press F1 or F2 to get to the editing pages, there are options for choosing the audio input or synth waveforms, so you could have one audio input and one extra MIDI-controlled synth, if you liked. The only difference is that if you want to work on a stereo input, you double-press F3; pressing and holding F3 lets you use the synth section's real-time controls on a stereo signal.

CONCLUSION

To go back to my initial question: are these options essential purchases? With no reference to financial considerations, the answer is "Yes", emphatically. In the real world, of course, we're talking about £347 for all three options, which is more than 50% of the 309's £649 retail price. Add all the options, and the Rave-O-Lution will have cost you just under

VERSION 2.0 SOFTWARE

The new software adds one or two nice touches to the 309's operating system. Initially, the 309 couldn't follow Song Position Pointers when sync'd to an external device; v2.0 changes that, and SPPs are now happily recognised. Track mode is switchable to internal and external; before, it was one or the other, so the 309's sequencer couldn't control an internal sound at the same time as playing an external instrument over MIDI. Many users also wanted to be able to copy Motifs — the building blocks of Patterns. This is now possible, and you can even copy Motifs from one section to another (Kick to Hi-Hat, for example).

The most significant enhancement has to be the implementation of real-time loop recording when editing Patterns. Not only do Patterns loop while you add or delete note events, but you can actually switch sounds while you're doing it, using the Select buttons. A little jitter occurs when you change sounds, but nothing too distracting. This is a highly immediate way to create patterns, very reminiscent of the TR909 or TR808.

£1000. As a first choice, I'd recommend the audio expansion, although with this installed, the synth expansion really is worthwhile: between them, they offer two extra synths and as much external signal processing as you could reasonably want, which isn't at all bad for the money. And once you've passed those hurdles, another £99 for all those extra drum sounds — not to mention extra drum memories — begins to look reasonable. As a committed 309 user, you'll probably start budgeting for these options. They give what is already a cutting-edge musical tool that much more bite.

SOS

E Synth expansion, £99; Drums & percussion expansion, £99; Audio expansion, £149. Prices include VAT. User installation of the upgrades does not invalidate warranty, but anyone nervous about doing the job themselves should contact Turnkey.

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DISTRIBUTION

I first become conscious of Morcheeba at the end of 1995, when Ken Lower, head of press at China Records, phoned to rave about a new band his label had just signed. According to Ken, Morcheeba, comprising brothers Paul and Ross Godfrey, and vocalist Skye Edwards, were brilliant — really special, and so different that once their first album hit the shops they were going to be mega. Well, of course, that's what press officers are paid to tell journalists and I didn't put too much store by it — at least, not until a few months later, when he sent me a pre-release copy of their first album, *Who Can You Trust?* The album made it onto my CD player late one Friday night and within a couple of tracks I was hooked. Ken was right; this was really different, a dreamy combination of weird and wonderful influences, from blues and soul to hip-hop, techno and seminal '60s film music. Morcheeba were so unusual that they defied classification. I played the CD again and again and kept finding new surprises among these amazingly complex layers of sound. I played it to all my friends, too, and was impressed by the number of people who really loved it — even my mate Vicky, who claims she only likes Abba.

Who Can You Trust? was finally released in the UK in the Spring of 1996, and before long everyone was outdoing themselves trying to come up with new ways in which to label this very individual band. No-one quite managed it — not even the band, who describe themselves as plain old singer/songwriters and state quite categorically that they are “not trip-hop's new saviours and have no desire to be heralded as Portishead's heirs or Tricky's bastard love child”. Although Morcheeba are impossible to pigeonhole, this hasn't stopped them going down a storm with both public and fellow musicians alike. Their debut album has sold more than 150,000 copies worldwide; their singles — ‘Trigger Hippie’, ‘The Music That We Hear’ and ‘Tape Loop’ — have all been hits in the UK; they have undertaken four European tours which successfully sold out 1000-seater venues, and they wowed US audiences when they supported Live and Fiona Apple. Morcheeba are also courted by the likes of George Michael and David Byrne, who was so impressed that he recorded nine songs with them, six of which made it onto his last album, *Feelings*. And, to cap what must feel like a charmed couple of years, vocalist Skye recently appeared on

Morcheeba, Vicar?

PAUL GODFREY • PETE NORRIS • MORCHEEBA

Morcheeba make their weird and wonderful music in a studio in Clapham that used to belong to The Orb.

To find out more about the band and their gear, SUE SILLITOE ventured south of the river to meet

Paul Godfrey and the band's programmer and producer Pete Norris.

Morcheeba (l-r): Ross Godfrey, Skye Edwards, and Paul Godfrey.





Pete Norris (left) and Paul Godfrey (right) at the Morcheeba Studio.

the BBC's incredibly stylish 'Perfect Day' promotional video, proving that she is more than able to hold her own amongst seasoned artists like David Bowie, Lou Reed, Elton John and Bono. Yet despite all this, Morcheeba have remained surprisingly unaffected and are determined not to let the trappings of success get in the way of their music. In fact, so keen are they to retain creative control that the first thing they did on signing to China was to buy their own studio. It made commercial sense as well as creative sense, so what could be better?

HUNTING FOR THE RIGHT HOME

"We found this studio in *Loot*," says Paul Godfrey. "In fact we saw it twice, but the first time we didn't pursue it because we thought it would be too expensive. Eventually we decided to come and have a look, and as soon as we walked in we knew it was right. It used to be a commercial studio called Joe's Garage, then it belonged to The Orb. Now it's ours and we really like it." The clincher in terms of getting the studio was the deal Morcheeba signed with China Records, which literally gave them enough money to move out of the bedroom. "We had a little studio in my brother's flat in Finchley," Godfrey says. "It wasn't anything grand — just a small mixing desk, an Akai S950, an ADAT, Atari and *Cubase*. The first album was recorded and mixed there — I had to light my rollies on beat so that you couldn't hear my lighter, because we did all the vocals in the same room. On the track 'Small Town' you can even hear the fan heater, although you might have a bit of a job spotting it among the rest of the atmospheric noises." In these basic surroundings it's amazing that Skye Edwards coped at all, especially as she had only recently met Ross and Paul and had no real experience as a singer. "Ross met her at a party in Greenwich," says Pete Norris. "He was very direct and said 'you're going to be our singer'. She said 'OK'. Little did she know!" "Yes, it's true," Godfrey elaborates.

"Ross is an astonishing musician, and as my background is engineering (Paul used to work at Astra Studios in Kent) we were always putting together ideas. It was a combination of blues and hip-hop — kind of X Records stuff — but with no real focus because we had no vocals. What we needed was a singer."

When Ross, a former BRITS school student, met Skye she was a fashion student working part-time in The Body Shop and had no real ambition to be a vocalist. "She got completely misled by us," laughs Paul. "That's why the album sounds like it does, because she's in shock and doesn't really want to be there. Four days before we signed with China she told us she was having a baby. It was like a runaway train — everything happened so fast it was difficult to keep up with it." With due reference to Skye's baptism by fire, the band have added a decent live room and isolation booth to their new studio, which is where part of the first album was recorded. At least now the poor girl has room to breathe! "We've actually done quite a lot of work," says Pete Norris. "The place was empty when we moved in, just a shell. None of The Orb's gear was here, except their multicore, which we bought for £500. I'm still using it now, even though the buggers had pulled it all out of the floor. I mean what can you do with old cable? Not a lot, really. But it was pulled up because they were moving and it was sitting in a pile in the corner with a few bits of other junk."

"We put in an offer and Paul and I spent an entire Sunday working out which of the rat runs each length went in. Obviously the connectors on either end were completely useless because we had a different wiring plan. But to have appropriate lengths of 24-pair multicore was great so we just put it back into the floor." Norris adds that it was like sorting out a plate of spaghetti. "We kept saying 'shit, this bit's not long enough — let's try this bit. Great, put that bit there and try that bit over here'. Eventually it worked out so well that we now have a much better studio design than we would have

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Morcheeba

- ▶ achieved starting from scratch. The studio has racks for outboard gear and a separate area for computer workstations, whereas my design would have been more centred around the desk to keep cabling costs down. I prefer this layout because it gives me room to move.” He adds that when he used to work at Rondor Music’s studios in Parsons Green — which is where the band did their demo for ‘Trigger Hippy’ and where they met Norris — he could barely stand up because the ceiling was so low. “At least I don’t have that problem here.”

THE SHOPPING LIST

Having acquired the studio, Morcheeba and Pete Norris set about equipping it. “Most of what’s here is what we put on our original shopping list.”



Morcheeba mixing — Mackie 32:8:2 mixer with 24:8 expander, and Yamaha NS10 and Alesis Monitor Two monitors.

says Paul Godfrey. “The Otari MTR90 24-track is a later addition, but the rest was bought when we moved in.” Godfrey based the studio on the Beastie Boys’ *Check Your Head* album cover. “I wanted my studio to be like their studio and we’ve pretty much achieved it. I’m a huge Beastie Boys fan and I really love the way they create sounds by mixing old and new technology. It’s unique. I’ve always said we may sound like bollocks but at least we’ve got a studio like the Beastie Boys.”

“Yeah, well, next time we do a studio, I’m having soldering sherpas to do all the wiring,” laughs Norris, who did everything himself when they first moved in because he was in the worst possible position — that of knowing how to do it but not knowing anyone else who could. “By the time we bought the

Otari I’d learned how to delegate. I got Kelsey to send over everything I needed and all I had to do was solder on 48 cannons.”

Godfrey and Norris’ choice of console was a 32:8:2 Mackie with a 24:8 expander. “We got the Mackie because it’s cheap and wonderful,” Norris says. “Design money has been spent in the right areas, so although it doesn’t have masses of flash features, it sounds great, because virtually every connector is balanced. That makes an enormous difference. People often wonder why their home studios are not quiet, and what it comes down to is bad wiring and small mixers with no balanced connections. If the whole thing is unbalanced it’s almost impossible to get the studio silent.” Having no automation might bother some people, especially for mixing, but Godfrey prefers it. “It makes you more brutal in the arrangement. We turn everything up and if it doesn’t sound good we wipe over it. If that leaves a hole, then we find something better to fill it with. If you have too much automation you end up sounding like some band from the 1980s where there’s too much of everything, and it all just gets louder and louder.” Morcheeba make creative decisions throughout the recording process, so that by the time they mix they have a pretty clear idea of what they want on their master. Godfrey: “It’s much more interesting to make decisions you intend to keep and then work around them.”

As Morcheeba’s studio is private, they have no



Alesis Matica 900 power amps, Alesis Quadraverb, Midiverb III and Q2 effects, plus Lexicon PCM90 reverb and, of course, record decks.

clients to impress and therefore their equipment choice is very personal. Apart from the Mackie and Otari MTR90, they have two Alesis ADATs with remote control, two Akai S950 samplers and one S3000, an Atari running *Cubase v2* and various compressors, gates and EQs, including a TLA valve compressor, a Drawmer DS201 gate and an Amek 9098 EQ. They use a wide range of delay and reverb units — check out the equipment list — and have Alesis monitoring, with the ubiquitous Yamaha NS10s for nearfield use. ▶

“Remixing is about the marketing tail wagging the dog. We don’t get involved in that because it’s horrible and formulated, and for people who have no self-belief”

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Morcheeba

WHAT'S A SYNTHI?

Keyboards and synthesizers feature in Morcheeba's studio, and the collection includes a Roland Super Jupiter MKS80, a Novation BassStation, a Hammond organ and a Wurlitzer electric piano. But first prize for pure weirdness goes to the EMS Synthi A — a 1970s beast in a box that was originally designed as a teaching tool and a portable version of the desktop VCS3 which features so heavily on *Dark Side Of The Moon*. Godfrey and Norris really like the Synthi, but they have little time for modern sound modules that they describe as poor photocopies of the real thing. "Stepping through patches in the vain hope of finding something to make your track for you is pointless," Norris says. "People should use original instruments." "Don't tell them that," quips Godfrey. "That's our secret." Joking aside, Morcheeba believe making music is about being creative and unique and that you can't achieve anything if you buy your sounds off the shelf. Norris adds: "It's not impossible to edit these sounds,



Morcheeba's prized EMS Synthi A.

but it's difficult and about as much fun as trying to paint your hall through your letterbox. If your music is hands-on — or at least foot on a guitar pedal — you're involved and part of the creative process, so there's a much better chance of the track working out. In my view, a patch that is nearly right is just not good enough."

ATARI: STILL WORKING

Morcheeba run *Cubase* v2 on an Atari computer and use it primarily for drums — no music, only loops, kicks and snares. Godfrey admits that his first copy of the software came via nefarious means, but then he was a poor struggling artist at the time



Morcheeba's computer and sampling setup — Atari 1040STFM running *Cubase*, two Akai S950s, and TEAC CD player.

and it was a long time ago — honest! "I wanted *Notator* but couldn't afford it, so I got *Cubase* and learned how to use that instead," he says. "We don't use it for keyboard parts but it's useful for drums — and even now we can afford a proper sequencing program we don't want to change it." As it happens, they've had version sitting in a box for some time, but they checked it out and rejected it because their Atari wasn't able to keep up. Norris: "They doubled the recording resolution and started to leave the hardware behind. If Atari had brought out a bigger machine everything would have been equal. But functions like screen redraws were so slow that Paul wasn't having any of it.

"You don't need that level of sophistication. That's the problem affecting software generally — manufacturers make it bigger and bigger, and generally it's not what artists and producers want or need."

So in what way do Godfrey and Norris feel technology contributes to Morcheeba's music? They both laugh at that question. "It enables us to commit music to tape. It would be hard to record without a tape recorder, although Morcheeba would still be a great band with bongos and acoustic guitars," says Norris. "Technology — especially *Cubase* — helps with the arrangement, but it doesn't enable you to do anything you can't do manually if you sit down with a manuscript and score it," Godfrey adds.

DARE WE ASK ABOUT HARD DISK?

"Hard disk sounds shit," says Godfrey unequivocally. "I'd only want it if we were going to get anal about editing things afterwards." This is unlikely, as Morcheeba say they don't like to paint themselves into tight corners — certainly not to the point where anal editing might be required. "I find it hard to believe that people have software for re-pitching and re-tuning backing vocals. Why the hell didn't they just kick arse when they were recording the backing vocals? Why not make the singers perform it better and get that right version on tape?" says Norris. Put like that, it's hard to disagree. Eventually Godfrey concedes that hard disk is useful sometimes, but in his opinion you can't beat 2-inch tape. "I'm no great fan of ADATs, even though we run them. I've never liked putting my precious music on VHS video tape, and I feel the same way about hard disk. It's just not tangible and substantial." ▶

CHEEBA CENTRAL STUDIO GEAR LIST

COMPUTING

- Apple Macintosh Powerbook 190CS
- Atari 1040STFM, 2.5Mb, with Steinberg *Cubase* v2

RECORDING

- Alesis 3630 compressor (x2)
- Alesis ADAT (x2) with BRC remote control
- Alesis Midiverb multi-effects
- Alesis Matica 900 amplifiers (x2)
- Alesis Monitor Two monitors
- Alesis Quadraverb multi-effects
- Alesis Quadraverb 2 multi-effects
- Amek 9098 EQ
- Casio portable DAT machine

- Denon cassette deck
- Drawmer DS201 gate
- Lexicon PCM80 effects
- Mackie 32:8:2 mixing console with Mackie 24:8 expander
- Otari MTR90 MkII 24-track tape machine
- Panasonic SV3700 DAT machine
- Roland RE201 Space Echo
- Sony D7 multi-effects
- TEAC CD player
- Technics SU8077K amplifier
- TL Audio C1 valve compressor
- Yamaha 1010 analogue delay
- Yamaha NS10 monitors

MICROPHONES

- AKG C3000 (x2)
- Shure SM57 (x2)

- Shure SM58
- Shure Beta 52 (x2)
- Shure Beta 56 (x4)
- Shure Beta 57
- Shure Beta 58
- Shure Beta 87

SYNTHS & KEYBOARDS

- EMS Synthi A
- Hammond organ
- Hohner Clavinet
- Marlin Synthesizer
- Novation BassStation
- Rhodes electric piano
- Roland MKS80 Super Jupiter
- Wurlitzer electric piano

SAMPLING

- Akai S950 sampler, 1Mb (x2).
- Akai S3000 sampler, 8Mb, with Iomega Zip drive

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PEAVEY

Morcheeba

► “For some people hard disk makes perfect sense” adds Norris. “I can’t imagine broadcasters going back to quarter-inch tape and making their edits with a razor blade. But music recording is a linear process. Songs start at the beginning and finish at the end. You don’t need random access. I can wait for the tape to rewind on a 4-minute song.

Two different takes on guitar technology — a pedal steel guitar and a Roland GR300 guitar synth.



The vintage Roland RE201 Space Echo occupies a quiet corner of the studio.

I’m not going to get old that fast. Anyway, it’s all marketing. People should work out what they need to execute their sound and stick to that.”

WHAT ABOUT DAVID BYRNE?

Godfrey and Norris are so laid back about Morcheeba’s recording sessions with ex-Talking Heads frontman David Byrne that you almost think they’re putting it on. Then you notice that Godfrey is trying hard not to look too pleased with himself and Norris is sort of smiling to himself, and you realise they’re actually chuffed as hell. Byrne got in touch after hearing their first

album. “He said it was dark, dreamy and deep — displaying a sense of humour,” laughs Godfrey. “He phoned while we were on tour and said we could either go to New York or he would come to Clapham — sort of ‘my place or yours’.

“We were comfortable here, so we said come over. It was funny because we could have gone anywhere in the world, but we wanted to be comfortable. We work at a very basic, telepathic level and it’s all based on feeling. We hardly talk at all — just nod at each other. David fitted in really well and just grooved with it.

“Once Ross was asleep on the sofa as usual — he’s like that in the studio, either dead to the world or wide awake playing a blinding guitar solo — while David was setting up his guitar pedals for him. He finished it, then said ‘all he has to do now is sit down and play. Is there anything else I can do?’ “We said yes — wake Ross up if you like. Poor old Ross. There he is with one of his heroes setting up his guitar pedals and he sleeps right through it!”

Do Morcheeba plan to work as producers on any other hip and trendy albums? According to Godfrey, that’s unlikely, firstly because the band have enough on their plate finishing their next album, and secondly because they are reluctant to let other artists

buy into the Morcheeba sound. “At the moment people are trying to buy into our sound wholesale, saying ‘let’s get Morcheeba to do our next record’ and offering us lots of money,” he explains. “With David Byrne it was different — we wanted to work with him because he was an artist we had a great deal of respect for and it was fun. But in general we are turning down production deals we are offered because we don’t want to sell ourselves and exchange our credibility for cash. After all, what’s the point of selling Morcheeba to someone else?”

Godfrey is equally dismissive about remixing, and feels record companies should stop wasting artists’ money by insisting on so many different versions of the same track just to fill up a CD single. “Many records have the same sound because record companies are using the same remixers and it’s all becoming staid and boring. I think some people are beginning to see through the remix nonsense. Certainly a lot of producers don’t like having their productions interfered with, and who can blame them? Remixing is about the marketing tail wagging the dog. We don’t get involved in that because it’s horrible and formulated, and for people who have no self-belief.”

And where did the name Morcheeba come from?

“It’s tongue in cheek — MOR as in middle of the road, and ‘cheeba’, which is slang for grass,” says Paul Godfrey. “I invented the name while I was on holiday in France as a sort of piss-take of hip hop and guns and all that stuff. Our lyrics are sometimes described as menacing but I don’t think our music is — not with Skye’s really sweet voice on top. That’s the trouble with this business — other people have a tendency to take you too seriously!”

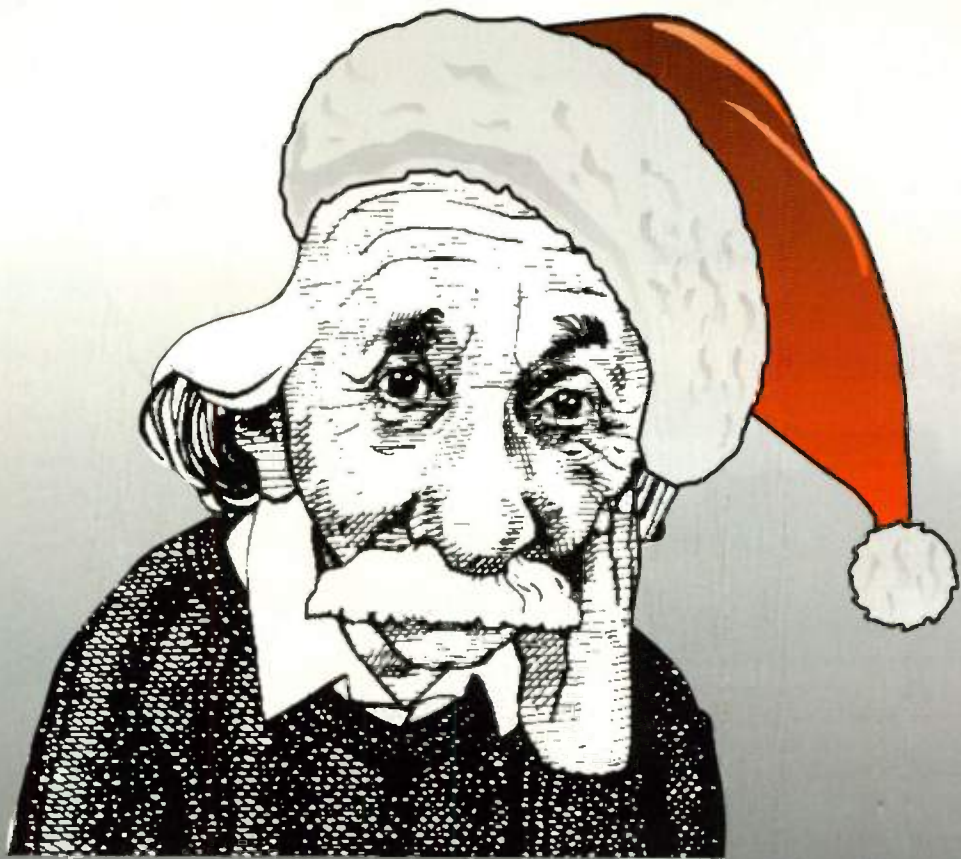
THE FUTURE

Morcheeba are now well into their second album, which should be ready for release next spring. “I like working under pressure, but I like it to be pressure I impose on myself,” says Godfrey. “I don’t like being told what to do by anyone, even if they have lent us £50,000 to build a studio.” He adds that the new album is not as ‘down’ as the first album. “I never went out, never spoke to anyone — it was a very isolating experience. Prior to that, I’d had a pretty awful time in my personal life and it inspired the pain for that record. It was therapeutic.

“Then we had to go on the road, which just blew our minds. We were taken out of our environment, spread thinly across the rest of the world, and were absolutely worn out when we got back. The last thing we wanted to do was go into a small studio and start recording, so we decided to party like mad for four months until we realised we did eventually have to make another record.”

As it happens, most of the songs for the second album were written before the first album was released, so there was scope for the band to party without completely losing the plot. “Mind you, we’ve lost it now,” Godfrey laughs. “We are having a lot of fun and we wouldn’t change it for the world.” “Two or three million quid, maybe,” adds Norris. “but not the world.”

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Fostex have had more than their fair share of recording firsts, including the world's first quarter-inch 8-track analogue tape machine, the first half-inch 16-track machine and the first hard disk multitracker designed as a direct replacement for its cassette-based counterpart. While Fostex can hardly claim the credit for inventing hard disk audio recording, their DMT8, D80, D90 and now the D160 have done much to democratise the process, not only by keeping the hardware affordable, but

3.2Gb can be housed in a removable disk caddy, and up to 38 minutes of 16-track recording (all tracks recorded), is possible from a single 3.2Gb drive using the latest Fostex FDMS3 disk management system. FDMS3 is a great improvement over the systems used in earlier machines that gave the same maximum recording time, regardless of how many tracks were used. Now the disk space is managed in an intelligent fashion, which means that if you only use half the tracks, the unused disk space is available for use in other songs.

In addition to the basic 16 tracks, a further eight 'ghost' tracks may be recorded to store alternative versions of takes (some people call these virtual tracks — see the separate box for more on these). For AV users, the optional 8345 module enables the D160 to generate, or chase and lock

SWEET SIXTEEN

FOSTEX D160 HARD DISK MULTITRACK RECORDER

Pioneered by Fostex, the concept of the 'personal' digital multitrack — a stand-alone digital recorder with a simple, cassette multitracker-like interface — has been around for two years now. But the new D160 is the first of the bunch to offer 16-track capabilities. PAUL WHITE finds that good things actually come in sixteens...

to LTC (Linear SMPTE Time Code), with provision for video or wordclock sync. A further expansion option (5041) is available to provide fully balanced inputs and outputs at +4dBu on standard 'D' connectors; as supplied, the D160's ins and outs are on unbalanced, -10dBV phonos. A similar balancing option is now available for the D90.

Though this is a 16-track recorder, users who don't have access to equipment with the ADAT optical digital interface will only be able to record a maximum of eight tracks at any one time. To save on cost, there are only eight sets of input converters, but by using an ADAT interface, eight digital inputs plus the eight analogue inputs can be recorded together, or alternatively, 16 channels of digital inputs can be recorded in one shot, providing the two digital sources are sync'ed together. Multiple D160s, or combinations of D160s, D90s, D80s and DMT8s, may also be locked together when more tracks are needed.

Like its 8-track counterpart, the D160 has comprehensive MIDI options, including integral MTC generation for sync'ing MIDI sequencers. The input converters are 18-bit, 64x oversampling delta-sigma types with 20-bit, 128x oversampling converters on the output, and the data recorded to disk is 16-bit at either 44.1kHz or 48kHz (ADATs are usually run at 48kHz), with no data compression. Varispeed of up to plus or minus 6% is available.

THE D160 PACKAGE

The D160 uses the same basic 3U packaging as the D90 and only weighs half a kilogram more. The storage medium is an EIDE hard drive fitted into a removable caddy, and further caddies are available, allowing drives to be swapped when there's a need to switch projects. The caddy bay is located on the front panel of the main unit, but under normal operating conditions it's hidden by the control panel. However, because hard drives are not entirely silent, Fostex have included the provision

also by making it relatively simple to operate. If you're looking for a tapeless equivalent to a 16-track tape machine that doesn't have a learning curve like climbing the north face of the Eiger in oven gloves while someone pours chip fat on you from above, the D160 seems ideal. My task, should I choose to accept it, is to see whether or not the reality lives up to the promise.

If I had to describe the D160 in just one sentence, I'd say it's about as close as you can get to a tapeless 16-track tape recorder. It doesn't process sounds, it doesn't mix sounds and it doesn't double as a MIDI sequencer or cappuccino maker — it simply provides 16 tracks of audio recording with some basic cut, copy and paste editing facilities thrown in. It comes well equipped with sync functions for use with a MIDI sequencer or to run alongside a digital multitrack equipped with an MTC output, but further sync options are available for those who need to integrate the machine into a professional video environment.

The D160 is in many ways similar to the 8-track D90 reviewed back in August this year, and if you compare front panels you'll notice that, apart from a few differences in the display, the layout is identical. Even so, the D160 is a little more than just a 16-track version of the D90, as it incorporates a number of new features, both in its standard form and as options, including the provision of a SCSI2 interface in the basic model. Hard drives of up to

pros & cons

FOSTEX D160 £2932

pros

- Generally easy to use.
- Good sound quality.
- Affordable.
- Mechanically much quieter than a computer-based system.
- Front panel may be used as a remote control.

cons

- The manual needs to be half the size and four times as clear.
- Punch in/out programming routine is cumbersome.
- You can only punch in and out once before having to stop the machine — you can't do multiple punch-ins on the fly.

summary

The D160 is a logical step up from the D90 and features sync compatibility with its predecessors in the series. As a tapeless tape machine, the D160 is a hard act to follow, and despite the manual, it's very easy to use.

SOUND ON SOUND



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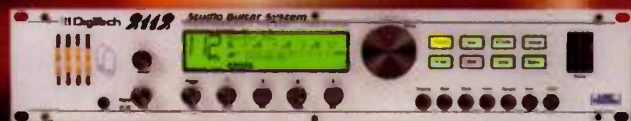


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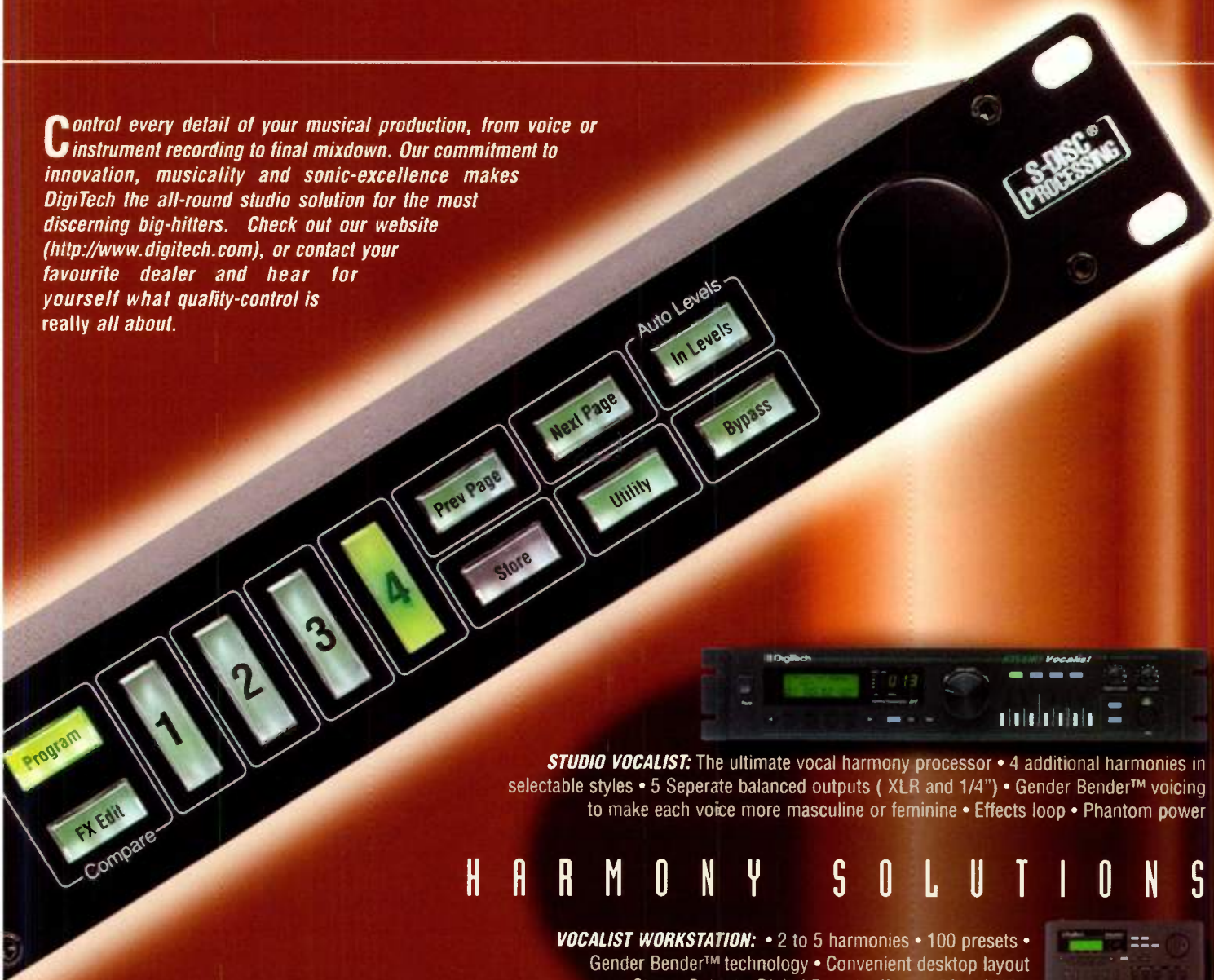
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FOSTEX D160



waste space if tracks or parts of tracks are left unrecorded, so the overall recording time could be longer than you expect. According to the needs of the user, the recording time can be divided into up to 99 separate 'projects' (the D90 has a maximum of nine), where a project would normally be used to record one song. Each project contains a certain amount of setup data, including tempo map details, song name, sync reference, MTC format and so on, and there's also a protect facility to prevent the accidental erasure or modification of individual projects. Also in the setup menu is the master/slave status of the machine, the device ID number, record sample frequency, IDE/SCSI drive selection, and so on.

As with the D90, the D160's manual is a perfect example of how an extremely long-winded script combined with a poor Japanese-to-English translation can make a relatively simple machine seem very daunting. There's around 190 pages of appallingly convoluted waffle to wade through, and you often have to read the same paragraph 10 times to figure out what it really means. If you plan reading more than one page at a time, have plenty of black coffee ready. For example, I noticed that the machine has only eight Record Ready buttons labelled 1/9, 2/10, 3/11 and so on, so it's obvious that there must be some way to switch between the lower bank of eight and the upper bank. Try as I might to find this information, I couldn't get far enough into the text to find the answer without my eyes glazing over. Fortunately, pressing the Shift button to the right of the Record Track buttons switches from tracks 1-8 to tracks 9-16, allowing the eight analogue inputs to be recorded to the desired tracks, and it's possible to select tracks from both banks at the same time. Putting the machine into Input Monitor mode for armed tracks involves pressing Record twice.

Unfortunately, there's even less physical correlation between the positions of the 16 plasma level meters on the display and the Record Track buttons than there was on the D90, so you really do have to ensure that the correct track's red Record Ready square is illuminated before you hit Record. I feel much happier when the record arm buttons are directly below the meter they refer to. Punching in manually is simple; you just hold down Play and hit Record at the appropriate moment. To punch out, you hit Play again, but once you've done that, you have to stop the machine before you can do another punch-in. This is rather silly, as it's common practice when patching up a vocal track to leave the recorder rolling as the singer runs through again, then manually punch in and out as you come to the phrases that need replacing. Having to stop after every punch-in rather ruins the flow of the process, and what's worse, this limitation applies to footswitch punch-in/out too.

Once again, the Fostex documentation makes claims about non-destructive cut and paste editing, and once again, this isn't entirely the case. ▶

- ▶ to remotely mount the front panel using either one or two 5-metre extension cables, and as the front panel also contains the metering, the bulk of the hardware can be mounted well out of the way.

Unbalanced phono inputs (8) and outputs (16) are fitted as standard, along with two sets of ADAT optical ins and outs. MIDI In, Out and Thru sockets are located to the right of the 25-way SCSI2 'D' connector. On the review model, there were three balanced 25-way 'D' connectors providing access to the 5041 balancing option. Also pre-fitted to the review model was the 8345 timecode board, which has XLRs for timecode in and out, as well as BNC connectors for wordclock in and out and video input and thru. Both the wordclock and video inputs have switchable 75Ω termination.

SYSTEM OVERVIEW

Though it can still be thought of as a virtual tape machine, the new disk handling system doesn't

MIDI SYNC

The D160 can both generate and sync to MTC, but in order for this to be useful in a MIDI sequencer context, an internal tempo map is required to translate real time into bars and beats. The tempo map can contain up to 64 tempo changes, and from this, the D160 can output MTC or MIDI Clock with SPPs (Song Position Pointers). MIDI Machine Control is also supported.

MTC is required when multiple D160s or combinations of D160s and earlier machines are required

to run in sync. The sync setup involves the units being daisy-chained via both their MIDI and optical data sockets with Chase Lock engaged.

ADAT sync requires MTC, and optical data connections are needed if you want to transfer track data from one machine to the other. Although the Fostex RDS can be locked up with no additional hardware other than connecting cables, conventional ADATs and ADAT XTs need BRCs or other hardware to output MTC. When I reviewed the D90 back in August, I

speculated that Fostex might have considered including an Alesis-style 9-pin sync interface for sync'ing ADATs without the need for MTC, but so far there's been no response.

Once a recording has been made on the D160, it will sync to an external MTC-compliant MIDI device providing the speed remains within acceptable limits. If you don't want to record the song before sync'ing up, you only have to record a track or two of silence to keep the sync system happy, then record over them when you need to.

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FOSTEX D160



- ▶ When data is cut, copied or moved, you can only undo the last step you did — this isn't a playlist system that lets you go back to square one if things don't work out. Material being copied or moved is handled by a clipboard system, and Undo just cancels the last edit. Redo cancels Undo, just in case you can't decide which version was best!

The actual editing functions are very basic by digital standards, but in the machine's favour, cut, copy and paste provides plenty of scope for copying your one good chorus or 'comping' up one good guitar solo out of six average ones without things getting too complicated. Copy and paste, move and paste, or cut and erase operations may be referred to absolute time, MTC or MIDI bar and beat positions, depending on which time frame you've selected to work in for the current project. If you want to work in bars and beats, you need to create a tempo map, which can have up to 64 tempo changes. There's no way to automatically load in a tempo map from your sequencer, so this has to be done manually, but it's still the best way to work when editing music.

I/O SILVER LINING

No hard disk recorder is devoid of data backup problems, but the D160 gives you plenty of options. If you don't need to archive long-term, you can simply swap hard drives, but if you need to keep more things on the go, you could hook up a Jaz drive to the SCSI port and back up to that, providing files are no bigger than 1Gb. Backups normally comprise individual projects, so file size shouldn't be a problem. However, a cheaper alternative is to back up to DAT or ADAT tape, and both options are provided for. Data may be stored to any DAT machine with an optical digital interface (or an S/PDIF interface used with a Fostex COP1 optical-to-S/PDIF converter), or to any ADAT via the optical interface. This is pretty slow, but it's a lot cheaper than putting hard drives or Jaz cartridges on the shelf.

CONTROL INTERFACE

The D160's control panel is identical to that used on the D90, though the display has a larger area given

over to metering, and less space for text messages and other data. The now familiar jog/shuttle dial is a practical way to locate and cue specific points within songs; the sprung shuttle part of the dial provides up to 20 times play speed cueing in seven speed steps. Digital scrubbing is handled by the jog dial, which also doubles up for parameter recall and data entry. The quality of the display text is a great improvement over that of the D90, with a large, clear time/location readout at the top of the screen.

Fostex have tried hard to make this machine 'feel' like a tape machine, so rather than providing instant 'rewind', the D160 behaves as though it is fast-winding at 30 times normal play speed. Pressing both Play and wind/rewind accesses a five times play speed cueing facility for quickly getting about within a song.

One area in which many computer-based systems fall down badly is that of punching in and out. There's no problem here though (other than having to stop before you can punch in again), as once again, the tape metaphor has been adopted, with punching in either from the tape-like transport controls or the rear-panel footswitch jack (pedal optional). Punching in and out is gapless, and a 10ms crossfade ensures all transitions are smooth and free from clicks.

Both ADAT and optical S/PDIF data can be recorded and played back at either 44.1kHz or 48kHz sampling rates using the same optical ports for both S/PDIF and ADAT data. Digital I/O type is selected in the setup menu, as are most other project-related variables. Prior to recording, it is necessary to select a program to record into, and if the source is digital, the user must set the sample rate of the D160 to correspond with that of the source. Different programs can be recorded at different sample rates, but as you'd expect, you can't mix sample rates within a program.

With the increase in the number of digital mixers supporting the ADAT interface protocol, having an ADAT interface is becoming very important, and the D160 provides separate ADAT ports for track I/O 1 to 8 and 9 to 16. Because of the sync capabilities of

VIRTUAL TRACKS

The way the D160 handles virtual tracks isn't exactly conventional, but it does the job. In addition to the 16 'real' tracks, there are eight further tracks numbered from 17 to 24, which can only be accessed using the Track Exchange function. You can't record directly into them or play back from them. Track Exchange allows any two tracks, real or virtual, to be swapped in location (within the same Program only), so once you've recorded a real track, you can exchange it with a virtual track to store away your first take, leaving the real track free for another go. Think of the virtual tracks as 'pigeon-holes' for audio data that can only be accessed by exchanging their contents with those of real tracks, and you've got the idea. To hear the virtual track, you have to use the exchange function again to get your data back into a real track. As I said, it's unorthodox, and it can get a little tedious, but at least it's straightforward in concept, and it works.

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Other improvements include Power Mac native code for super fast DSP edits and screen redrawing; and vertical zoom of the Track Overview window, which lets you easily edit at the top level of your windows.

Version 3.5 now comes on a CD-ROM that includes superb extras such as DSP plug-ins from Waves and Arboretum, Beat Boy drum clips, Proto Dance Grooves, an arpeggiator from Cyburban, the new Galaxy 2.1, an interactive guide to OMS, 100 MIDI files and a lot more.

To find out more - call SCV London today or drop into your local Opcode stockist.



FOSTEX D160

▶ this machine, song data can be recorded from an ADAT, edited, and then returned to the ADAT in perfect sync, but this requires an MTC source from the ADAT, so a BRC or Datasync type of unit is needed.

If a digital S/PDIF source is being recorded, the left and right channels can each be routed to any of the 16 channels. When S/PDIF is being used to provide an output, the tracks are arranged on odd/even pairs and any one pair may be selected.

IN THE DRIVING SEAT

Before you can record, the hard drive must be formatted, though this would normally be done before purchase, unless you've specified a different drive. If no recording has taken place before, the default program is 01, but other than the concept of programs to hold individual songs, the operation is remarkably tape-machine like. I was also very impressed by how quiet the machine is — there's no fan and the internal drive is reasonably well isolated, so recording most things in the same room shouldn't be a major concern, providing you use an extension cable to keep the hard drive section away from the mic.

Though the essential track select, record, punch-in and transport modes are almost identical to those you'd find on a multitrack tape machine, I find the routine for storing in and out locator points for the auto punch-in mode involves too many button presses. I've commented on this in my reviews of the earlier Fostex machines; if the punch in and out points are very close together, the adopted system may be far too long-winded to accomplish the task in the available time. Exactly the same is true when selecting start and end points for editing, though at least you can do this at your own pace. Other tape machine-like functions include auto looping, adjustable pre-roll, and rehearsal mode, where you can hear how your punch-in will sound before you go ahead and do it.

Though a few buttons have dual functions, they are clearly labelled, and on the whole the dedicated nature of the control buttons is to be commended. Unlike most digital tape machines, MTC output is provided without the need for extra hardware, so sync'ing a sequencer is as easy as plugging in a MIDI lead and setting the correct MTC parameters.

As with its predecessors, the recording quality is excellent, and for all intents and purposes, it's comparable with ADAT, DAT or DA88. I could detect no glitches at punch-in or -out points — a clear advantage over analogue tape — and of course there's absolutely no wow and flutter or significant speed drift. Some of the sync modes necessitate a visit to the manual, where, for

the most part, things are explained about as badly as they could be; it's as though the copy was written by a dyslexic lawyer! Once you've picked your way through the Japanese English, the information is actually there if you persevere, but staying awake as you do it can be quite a challenge!

Sync tests using two ADATs plus a BRC demonstrated that the D160 locked up flawlessly and quickly to both MTC and SMPTE, and I found the chase lock LED on the front panel (which confirms that the sync is solid) very reassuring. I also piped a short section of 16 tracks of ADAT across to the machine in one hit, again with no difficulty.

SUMMARY

A D160 complete with a 3.2Gb drive will set you back a little under £3000, which, even at today's low digital multitrack prices, works out a little cheaper than buying a pair of digital tape machines. True, the media costs are higher than tape, but a lot depends on how many projects you have on the go at once, and on how much time you can afford for making DAT backups. The built-in MTC support is great news for sequencer users, while the optional video sync capabilities and master and slave sync operation should win over a number of pro AV or video post-production users, although I know that some people will look on the back panel and mumble about the D160 not having a Sony 9-pin connector. Certainly the ability to sync MIDI sequencers, previous Fostex hard disk machines, D160s and ADATs in the same system is very handy (you need an MTC interface for the ADATs, of course), and with the few exceptions I've already mentioned, operating the machine couldn't be easier. Don't let the dreadful manual put you off, as you can figure out the majority of what you need to know in half an hour without even opening it. If you're moving up from tape machines, and want to dip a toe in the waters of digital audio without risking your whole leg, the D160 is a very attractive way to go. SOS

E D160 (including 2.55Gb drive) £2931.63; 8345 timecode option (LTC, video sync, and wordclock) £581.63; 5041 balanced I/O option board £293.75. Prices include VAT.

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Though the V-Drum system is ideally suited to the hi-tech drummer, its modular brain features, modelled timbres and powerful editing features may lend it appeal as a source of high-quality sounds for the non-drummer.

NICHOLAS ROWLAND checks out this beat feat.



Sticks 'n' Tones

ROLAND V-DRUMS

Scan the hi-tech musical landscape of the past decade and you'll see the bleached bones of defunct electronic drum kits, once proudly advertised with slogans such as "The Future of Percussion", "Real Drums Suck", "Chuck Out Your Chinas" and so on. These pathetic remains — usually with the words 'Made in the UK' still discernible through the dust — are testament to a fatal misunderstanding of why people become drummers in the first place. You see, as all the drummer jokes suggest, we really are the modern-day equivalent of Neanderthals thrashing around on goat skins stretched over hollow gourds. And that's why we have also tended to judge electronics almost entirely on how they feel 'under the stick'. Forget the advantages of mind-blowing sounds and modern-age MIDIness: the fact that most electronic drum systems of yesteryear had the dynamic response of wet fish slapped on concrete made them a total turn-off.

I mention this now because it explains why drummers should view Roland's new V-Drums as a revelation — nay, revolution — in the field of electronic percussion. Expressive, dynamic, responsive... probably for the first time ever, the

versatility and range which electronic drums always promised have been delivered without compromising the sheer enjoyment of the physical drum-playing experience. In short, even before you hear what it sounds like, you'll be sold on how the V-Drums feel to play.

Before we get too apocalyptic here, I'd better just return to earth with an explanation of what exactly the V-Drums System is. In the blue corner we have the new TD10 Percussion Sound Module, where the big news is the use of Roland's proprietary acoustic modelling software (Composite Object Sound Modelling, or COSM for short) for generating the majority of its 600 drum and percussion sounds. Other spec-sheet highlights include 50 melodic instruments, 50 user-programmable kits, effects processing, onboard sequencer, 12 trigger inputs, eight outputs, and expandability via memory cards and an expansion board.

In the red corner are the PD100 and PD120 pads. Developed in conjunction with drum manufacturers Remo, these offer all the natural feel and speed of response of acoustic drums, plus virtually silent performance (useful for practising) and, with certain TD10 sounds, the ability to play in traditional style with brushes. The system also offers positional

pros & cons

ROLAND V-DRUMS

pros

- Brilliant sounds — another triumph for COSM.
- Operating system of beautiful simplicity.
- Great to play.
- Expandable, future-proof architecture.

cons

- A few limitations of the pad/voice assignment nature.
- My bank manager won't give me a loan to buy one.
- Er... do I really have to write something else here?

summary

I know it's a cliché, but the V-Drums could change your life...

SOUND ON SOUND

detection, where the timbre of sounds will change according to the position of the stick on the drum pad — a feature also accessible with Roland's older pad designs, the PD7 and PD9. This is good news for existing Roland compact drum system owners. The TD10 is also compatible with the KD7 kick-pedal trigger unit and FD7 hi-hat control pedal, enabling you to build up a complete electronic kit without a real drum or cymbal in sight. That said, it can also be triggered from real drums if necessary and via MIDI. In fact, Roland are trumpeting the virtues of the TD10 brain as a stand-alone drum sound module for the project studio.

ELECTRONICS & ERGONOMICS

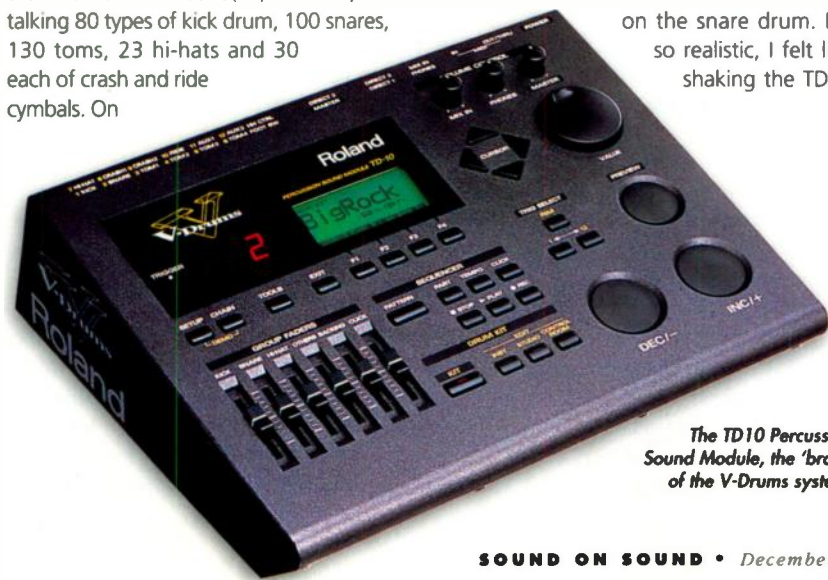
The V-Drums system was conceived right from the start as a drummers' instrument, one by-product of which is its extreme user-friendliness. The large LCD display doesn't just glow with names and numbers, but also with some neat graphics of different types of drums, mixer screens, even pictures of different scenes to accompany the ambiances (locker rooms, beaches, caves and so on.) They're not just a novelty item — they really do help you navigate your way round the system. The TD10 is also well-equipped in the knobs and knockers department, offering dedicated buttons for virtually all the major features. Jumping from parameter to parameter is a breeze, and most functions involve no more than three screens' worth of parameters. And if you do get stuck up the proverbial creek without a manual, you'll find a menu of help screens is just a button-push away. One drummer-y feature worth pointing out is the fact that the increment/decrement buttons are large and rubbery enough to survive a poke in the eye with a sharp drum stick. And if you want to do some editing without pads, another highly useful feature is the touch-sensitive 'preview' button, which allows you to play the TD10's 650 sounds from the front panel.

THE EARS HAVE IT

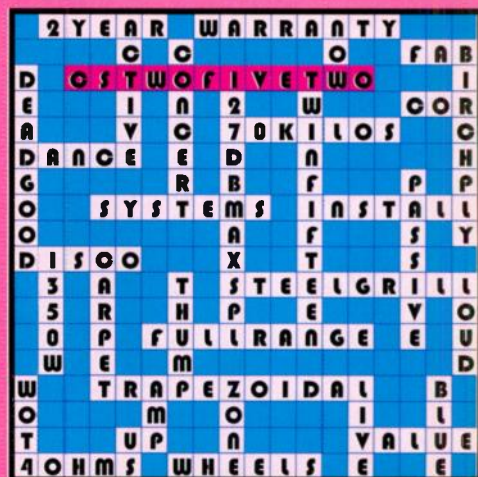
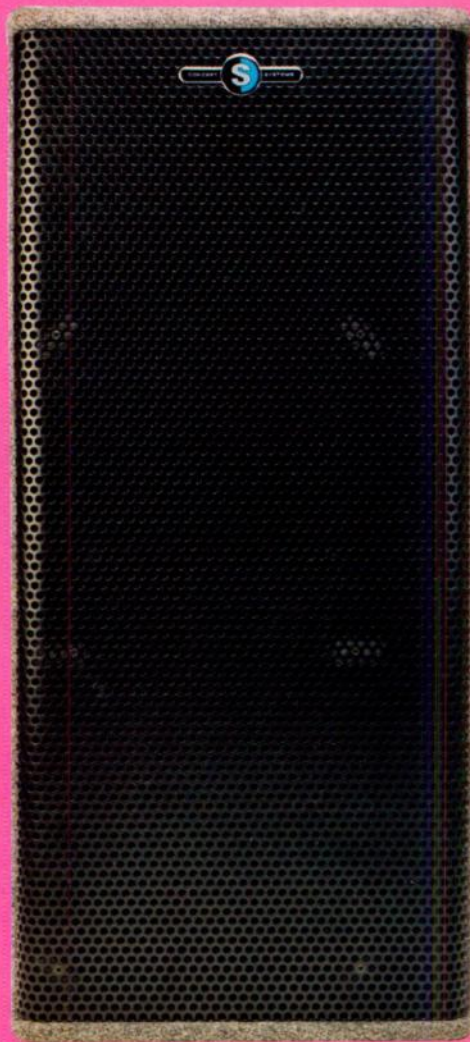
As you might expect, the instrument list is heavily weighted towards conventional drumkit sounds. In round(ish) numbers, we're talking 80 types of kick drum, 100 snares, 130 toms, 23 hi-hats and 30 each of crash and ride cymbals. On

top of that there's 100+ percussion instruments (including Latin, hand-held, orchestral and tuned percussion voices). The remainder of the 600 voices are made up with an eclectic mixture of scratches, pops, special effects and guitar, bass and brass slides, labelled under the catch-all title 'Other'. Normally, I'd ask you to grab a pint and take a seat as I talked you through the various groups of sounds. But as space is short, you'll have to be content with an overall verdict of "superb quality", "brilliant expression", with extra "pleasing work and effort" stars for the snares, hi-hats and ride cymbals. The implementation of these latter sounds is nothing short of stunning. Even the most die-hard acoustic drum enthusiast will believe that electronics can fly.

Maximum polyphony is 56 notes — which non-Octopus drummers might think is on the generous side. Don't forget, though, that once the 4-track sequencer is playing, even human drummers will need all the polyphony they can get. Crudely put, sounds fall into two camps: those that can be edited with an extended range of parameters and those that can't. The first are known as V-Edit voices and they comprise the kicks, snares and toms. Of these three drum types, it's the snares which are the most complex, in terms of how the COSM technology has been applied. You can select from different types of shell material (brass, wood or steel), apply different heads, alter the depth of the shell (from 1 to 20 inches in 1-inch steps), muffle the sound with virtual gaffa tape or donut-shaped mufflers, apply extreme tunings (up to +/- four octaves) and even loosen the snares. Given these parameters, I defy anyone not to create the snare sound of their dreams. I remember at one stage in my musical life spending some considerable time in a local studio with gaffa tape and empty cigarette packets, trying to get rid of some nasty overtones on my acoustic snare drum. My gob was truly smacked when I achieved exactly the effect I had in mind back then with just a few button pushes. Another virtual action which you need to hear to believe is the way you can loosen and even throw off the snares on the snare drum. It's so realistic, I felt like shaking the TD10



The TD10 Percussion Sound Module, the 'brain' of the V-Drums system.



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▶ to see whether some real drums dropped out.

Editing of kicks and toms is a similarly rich experience, even though there are a few less parameters to play with. You still get the choice of heads and a menu of tuning and damping options, but your choice of drum size is limited to 'deep' or 'deeper'. Given that you can still come up with dozens of variations on a basic voice, I'm certainly not complaining.

The acoustic sounds are augmented by voices from Roland's classic TR808 and TR909 beat boxes. This being the world of COSM, the sound-shaping controls for these sounds follow the style of the original machines. So for the TR808, say, you're

of Cave, Living Room, Locker Room and Bathroom, to Dome Stadium. The size of the space can also be altered, as can 'wall materials' (Wood, Plaster or Glass). Then it's time to position the ambient room mics — 'High' capturing the higher frequencies of the room and giving a brighter setting, and 'Low' picking up the lower frequencies and imparting a warmer sound. Kicks, snares and toms have their own individual mics, with placement options comprising Outside, Standard and Inside. For kicks and snares you also have a choice of mic types: Condenser, Dynamic and (for snares) Lo-fi. Ambient effects can be applied in different amounts to each individual drum. It's worth underlining that these ambiances are not simply fancy names for different reverb treatments. Through the TD10's effects section, you can apply reverb on top of an ambience, if you so desire.

This brings us to the so-called Control Room where we get to play with the TD10's rather well-appointed mixer and rack of outboard gear. Along with individual volume, pan and output assignment, we can bring in a separate, fully programmable compressor and 2-band parametric EQ for each of the sounds assigned to the first 10 trigger inputs. There's also a 3-band master equaliser which can be applied to all the kits at once. This is a godsend if you're playing live and need to make a last-minute quick fix to compensate for a dodgy sound system. The effects section offers 30 algorithms — 14 reverbs (including halls, rooms, plates, gate reverb and non-linear reverbs); four delays, including a beat delay which is sync'd to the tempo of the sequencer and where delay times are specified in note values; two types each of flanger/delay, phaser/delay, chorus/delay and pitch-shift/delay multi-effects. Using the pitch-shift/delay, you can create some neat rhythmic effects, with sounds rising or falling in time to the beat. Also included are four 3D delay algorithms (as encountered in the highly acclaimed Roland RSS-equipped spatial echo boxes) which can add a sense of spaciousness and movement to the sound. As you might expect, all these effects functions are extensively programmable and can be saved as part of individual kit setups.

CONSEQUENCES

The TD10 comes equipped with a 4-track sequencer which is primarily intended as a practice aid and musical scratchpad. There are 100 pattern locations in all, the first 50 of which are permanently filled with a selection of factory presets covering a range of mainstream musical styles — jazz, big band, soft rock, blues and so on. Making use of the TD10's melodic voices, they sound like those 'playalonga' styles you find on home keyboards. While not exactly highbrow stuff, they are fun to practise with — certainly better than playing to a click track. In a studio situation, they might also prove more inspirational than a click track, and perhaps even help you come up with new rhythmic ideas for your own compositions. There is space to record 50 user



The TD10's rear panel.

presented with a screen of virtual knobs offering control over Attack, Tune, Tone, Snappy and Decay. Similarly, parameters for the analogue electronic drum voices comprise Attack, Tone Pitch, Noise Pitch, Decay, Noise Tone Balance and Pitch Bend. Sadly, this feast of V-Edit functions stops after the kicks, snares and toms. With all the other sounds, you are limited to tweaking tuning and decay. As the sound quality of all voices is so high and the range of sounds available so broad, this is generally not so bad, though it would have been interesting to have extended editing parameters for some of the more complex percussion instruments. I look forward to the future expansion board and extra wave cards with interest.

While we're picking at what few shortcomings the TD10 has, I might as well point out that while any sound can be assigned to any pad, certain combinations limit your editing options. For example, only when you assign a V-Edit sound to inputs 1-6 do you get the full menu of V-Edit options. Furthermore, it's only when V-Edit kick sounds are assigned to the kick input that you can shape them using the V-Edit parameters. When assigned to any other input, even 2-6, the available editing parameters are limited to tuning and decay. There are a number of other quirks too. I can't see them being particularly bothersome, but at least I've drawn your attention to the small print.

Of course, individual sounds are only the beginning. The premise behind Roland's COSM technology is that it mimics not just a single instrument, but all the elements in the sound chain — in other words, everything that shapes the sound as it travels from source to ear. So, having assembled your virtual kit, it's time to turn your attention to the virtual space you'd like to play it in. The 10 options range from Beach (no ambience) through the likes

OF PADS AND PEDALS

I won't make any bones about it — the new V-Drum pads really are the canine tackle: the most playable and responsive I've yet encountered in a career which goes right back to the days of the early Simmons SDSV riot shields. There are two varieties — the 10-inch diameter PD100 and the 12-inch PD120. The PD120 offers a separate rim trigger which makes it the best choice for snare drum duties. Both are robustly constructed, with drum heads (made from a custom woven fabric) which are tensioned with a conventional drum key to suit your particular playing style preferences.

Thanks to some damn clever software, the TD10 will detect the position of the stick on the head and alter the timbre of the sound accordingly. This facility also works with the PD7 and PD9 pads, though be warned that only two of the TD10's inputs offer this facility — those designated for the snare and the ride cymbal.

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INS, OUTS AND SHAKE IT ALL ABOUTS

The TD10's back panel provides a wondrous eyeful of sockets to gaze upon — inputs for up to 12 dual triggers (that is, pads with separate rim triggers). You can assign separate sounds to the pads and the rims, allowing each TD10 kit to consist of up to 24 voices.

- **Footswitch jack:** a footswitch can be used to step through kits, as well as starting/stopping sequences.
- **Hi-hat control jack:** dedicated for use with the FD7 pedal.
- **Output Master:** left and right stereo output.
- **Output Direct 1,2,3:** configured as stereo pairs. Ambience can be applied to voices assigned to these jacks, but not digital effects.
- **Mix in jack:** can be used to connect an external sound source such as CD or cassette, or for custom monitoring. Sound input here can be assigned to master outs and/or phones.
- **Memory card slot:** takes optional M512E memory card for storing drum kits, sequencer performance data, and so on.
- **Phones jack,** and dedicated phones volume control on front-panel.
- **MIDI In,** combined MIDI In/Thru.

▶ patterns, though it's real-time programming only, folks. Editing facilities are pretty basic. You can't do much more than chop patterns about a bit, and copy and append them to other locations. But it's useful enough if you want to record your own playing or just get some ideas down quickly. Sequences can be triggered from pads; you can also set up a pad to act as the start and stop control. And you can also trigger sequences from an optional footswitch. While some sequences loop round and round in the time-honoured tradition, others are what, in TD10 speak, are known as Tap mode sequences. This means that they will advance one step each time a particular pad is played. Sequences can be recorded in various common and not-so-common time signatures, and at tempos from 20-260bpm. A click can be superimposed over a sequence, or you can use the metronome in isolation. The click sound can be chosen from a range of 16 percussion instruments, or you can opt for the rather severe voice to count it out for you. You can also send the click to the master or phones outputs, or both. Both the sequencer and metronome can be driven from an external MIDI clock, which makes the TD10 ideal for those drummers who need to play along with sequenced tracks, either on stage or in the studio.

MIDI MATTERS

As we're on the hard MIDI stuff now, let me assure you that the V-Drums will happily function as a trigger-to-MIDI converter. Note numbers are programmable for each pad, as are gate times — essential when you want to trigger longer sounds or loops. When recording a V-Drums performance into a sequencer, you can capture all the nuances of the hi-hat, plus the positional sensing for the snare and ride cymbal inputs. These functions are brought to you courtesy of control change numbers 4, 16 and 17 respectively, though there are options to swap them around, or control them via a modulation wheel. As a sound module controlled by an external device, the TD10 offers up to 4-part multitimbrality, one part being the kit sounds, the other three being whatever melodic instruments are assigned to the sequencer section. You may not have gathered (and there's no reason why you should) that a TD10 kit normally consists of a maximum of 24 voices (one pad and one rim sound for each of the 12 pad inputs). To access more than 24 sounds via MIDI, you can assign instruments to the MIDI note numbers not being used by the kit sounds. You can create up to four of these collections of MIDI/voice assignments (called Percussion Groups) and assign one to each kit. Each instrument within the percussion group can be edited, with parameters comprising volume, pan, pitch, decay, ambience and effects send. There are a number of limitations to this system, including the fact that you can't include TR808/909 or electro drum sounds within a percussion group. A kit sound will also have priority when assigned to the same note number as a percussion group



The PD pods offer the drummer hitherto unheard-of expression and dynamic in an electronic kit.

sound. Both these limitations are niggles rather than major disasters. In terms of sync'ing to external devices, the TD10 can be told to be slave and master, or can be left to make up its own mind, depending on whether you press its start button or the one on the sequencer first.

VERDICT

Even in a review of this length, I'm sure I've left a few stones unturned, such as the housekeeping functions to copy and name kits, and also how you can make global adjustments to certain parameters without going in and changing them individually for each kit. But I think you've got the idea by now.

The TD10 itself is a wonderful piece of technology. Though brilliantly simple to use, it's packed full of features which make it readily adaptable to any serious music application, be it playing live, studio recording or post-production MIDI editing. Even if it sounded half as good as it does, it would be a winner. Taken as a complete system, the V-Drums is a true player's instrument. And for the reasons I laid out at the beginning, this is the highest praise you could give an electronic drum system. For once I agree with the marketing men. As it says in Roland's brochures — welcome to the future of percussion.

505

E V-Basic kit (TD10, 2 PD120s, 1 PD100, 1 PD7, 1 PD9, 1 KD7 kick pad, FD7 hi-hat controller) £2599; TD10 Expansion Kit (2 additional PD9s, 1 PD20, 1 PD100, 2 MDY-7U cymbal holders) £899; TD10 £1399; PD120 £339; PD100 £299; optional MDS10U rack £549. Prices include VAT.

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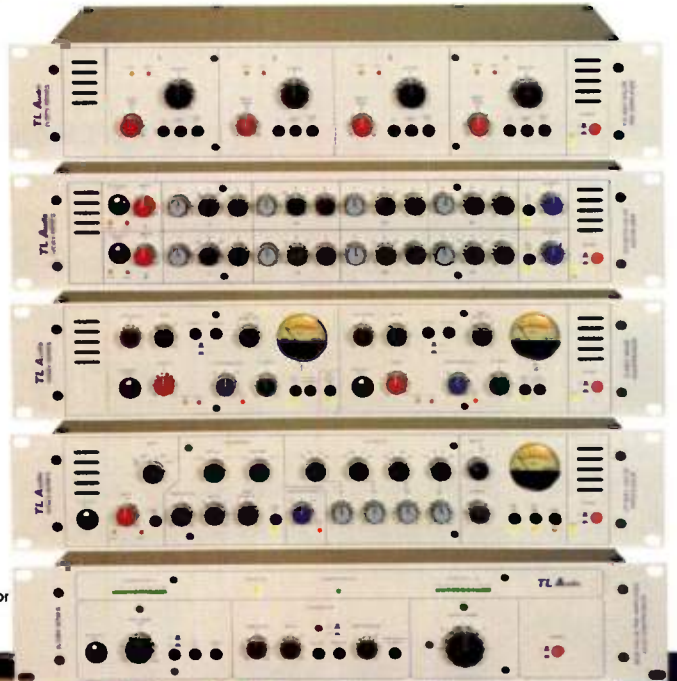
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into gear

EQUIPPING A HOME STUDIO

PART 1: THE BASICS.
In the first part of this new series, DAVID MELLOR gives his personal slant on creating a studio that will stay with you as your recording skills and budget improve.

Getting the most 'bang for the buck', as the US military put it, is the top priority of the home studio buyer. Few of us have money to burn and we want equipment that will help us make the most of our talent and set us on the road to success. But often people get the idea that there is such a thing as the perfect studio, and endlessly change and reconfigure their equipment in a hopeless quest for something that doesn't exist. In this series I'm going to tell you how I think you might go about equipping a studio. (I'm sure you have some gear already, so pick and choose the bits that interest you from what I say.) But more than that, I intend to make sure you're on the right track, so that you really do get the best out of your studio, and so that, whatever your musical ambitions are, you stand the best chance of achieving them.

HOME STUDIO GOLDEN RULES

1. Never sell.
2. Never upgrade.

Shocked? There is an incredible market in second-hand music and recording equipment and many people, for whatever reason, find the need to sell their gear. But why are they selling it? Is it worn out? Have they exhausted its possibilities? Have they taken

up gardening? Did they buy the wrong thing in the first place? And how much are they going to lose on the deal? Golden Rule Number 1 is to buy only those things that you can use until they wear out. Buy a good mic, new or second-hand, and it will last you 20 years — literally. Buy a mediocre mic and it will always be mediocre, even on the day you buy it. Buy a good keyboard and eventually it will become a classic, and even in the interim period when it appears to have been superseded by newer models, it will still be as good as when you bought it — providing that it's well maintained, of course. Golden Rule Number 1 leads to Number 2: never upgrade. If you bought the right thing in the first place, why should you have to trade it in to upgrade to something better? Hang on to it and buy something else when you have the money. Add to your earlier purchases rather than replacing them, so that you're building up your facility and it's getting better all the time. Habitual upgraders may have a few of the latest models, but for the same amount of hard-earned cash, your studio will be more comprehensively equipped. And these days the best is not necessarily the most expensive.

Of course, where there's a rule, there's an exception — and this rule is no exception. There is one high-value item which must be upgraded as you progress. You will only need one, and almost

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equipping a home studio

- ▶ MIDI master keyboard and sound module, or modules. A master keyboard, sometimes called a mother keyboard, has no sounds of its own but is simply a controller. Some of these, if you look around, can be amazingly cheap and they will do their job effectively, if sometimes not elegantly. Of course you get what you pay for, and a top-of-the-range master keyboard should last you a lifetime — plus it has no sounds of its own to go out of date, as one *SOS* advertiser has noted. Multitimbral modules can be extremely good value for money, and useful either in a multitrack studio or MIDI-sequenced setup.

THE SAMPLER

Every studio needs a sampler. Repeat after me...

The sampler is simply the most versatile instrument ever invented and it is limited only by the sounds you can find to put in it. Samplers are amazingly good value these days, and even the lower models in a range can perform as well as the more expensive items. Select a sampler on the basis of its control and editing features. If you plan simply to load in samples and programs from CD-ROM (few samplers can't work with a CD-ROM these days), a basic model may be all you require. If, however, you plan to create your own samples and programs, you need a wider range of features, and proper access to them. Unlike keyboards, where I feel that extra outputs often aren't worth the bother, you can't have too many outputs on a sampler, and usually they are almost as easy to use as the main stereo outputs. Maybe keyboard manufacturers should buy a sampler and take it apart so they can see how it *should* be done.

The reason why your sampler needs extra outputs is that with a decent memory expansion (16Mb is good, 32 is better) you can load up a variety of completely different sounds. You will almost certainly want to process these individually through your mixing console, and if sampling is the most important part of your work, this will be essential. When it comes to buying a CD-ROM drive, take to heart the advice of the manufacturer of your sampler, because not all models of CD-ROM drive work with every sampler, so the super-terrific 24x speed drive you sourced from an ad in the computer press may turn out to be a non-starter, if you're not careful.

You'll also need a means of storing your samples. I can see a trend emerging for samplers to have internal bulk storage. You can store on floppy disk, but you need a lot of disks and a lot of patience to store 32Mb on floppy — and then re-load it later. The choice, in essence, comes down to removable magnetic hard disks or optical disks. You could have a fixed hard disk, but it isn't as versatile. The difference between magnetic hard disks and opticals is price — an optical drive is more expensive, but the disks themselves are cheaper, so you'll save money in the long run. Optical disks are also slower than magnetic hard disks, but the new LIMDOW (Light Intensity Modulation Direct OverWrite) types promise to up the ante. Oddly enough, you may be better off with a smaller capacity drive rather than a larger one. For one thing, your sampler may only be

able to format a disk to a certain size and much of its capacity may be wasted. For another, having too much data on one disk makes it more difficult to organise, and if the disk becomes corrupted you may lose your entire sample library!

I should mention sample CDs and CD-ROMs. Sample CDs are in audio format and you can play them on your ordinary CD player. This is fine for drum loops, because you can easily listen for the section you want, and you're probably only going to make a single sample program, which is dead easy. But if you want the sound of an orchestra, you really do need the CD-ROM version, which loads up in a few seconds. The alternative may be hours or even days of programming. Bear in mind that sample CD-ROMs come in different versions for different samplers. Although one sampler may be able to load samples and programs in a different manufacturer's format, don't expect them to sound right without a little tweaking, and sometimes a lot of tweaking.

ALL HANDS ON DECKS

Record players, or 'decks', as they are known in the business, are not typical *Sound On Sound* territory, but they have become an important musical instrument in their own right. There's quite a mythology around decks and DJs, and it's often thought by the public that DJs create music on their twin decks. What some DJs can achieve with a pair of decks, and a special DJ mixer that incorporates a sideways-operating crossfader to switch between the two, is nothing short of amazing, but they are heavily reliant on their source material — the white label records that are made in the studio and pressed in small quantities, and acetates or dub plates, copies of which are individually cut. In the studio, the source sounds from which the music is built are often taken from vinyl, so you need at least one deck in your studio. Since the vinyl will often come from a DJ's record collection, why not go the whole way and have the proper twin decks and mixer ready? Don't forget that you need copyright clearance for samples before release. MCPS (0181 664 4400) can help with this.

A DJ turntable needs to be direct drive, which means that there is no belt or idler wheel between the motor and the turntable — the turntable is effectively part of the motor. It also needs to be tough enough to take a few knocks — hi-fi turntables need not apply. The cartridge and stylus need to be especially tough to withstand back-cueing and scratching. The major manufacturers have specialist models in their ranges.

As I said earlier, a DJ mixer is different to a recording mixer. The market in DJ mixers is very fluid and it would be difficult to recommend a particular model, but look for smoothness of operation of the crossfader. That will indicate the overall quality. If the crossfader can be replaced easily — they get a fair bit of abuse — that's a bonus. Transformer buttons and kill switches allow the DJ to interact with the music from the twin decks in real time, in a way that would be difficult to replicate with traditional studio techniques.

Next month, computers in the studio.

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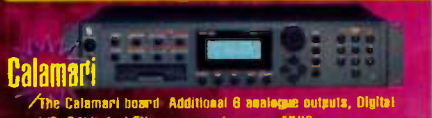
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Lexicon studio

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Considering the amount of money we spend on our private studios, it's positively disheartening to have to trust the end results to compact analogue cassettes. If you're going for a serious release you can get commercial CDs made, but that's only practical for numbers in excess of around 500, and though DAT is a good mastering medium, virtually no end users have DAT machines in their hi-fi systems. That leaves the cassette, with all its noise, speed instability and noise-reduction compatibility problems, as the only means of distributing copies that virtually anybody can play. At least, that was the situation until a short time ago, when CD recorders and blank CD-R disks started to fall in price, making it commercially viable to 'burn' your own one-off CDs. It's ironic, then, that Philips, the company behind that sonic abomination, the analogue cassette, should be the first to produce a CD recorder that costs less than a budget DAT machine. Better news still is that the Philips CDR870 can also record onto the new generation of CD-RW rewritable discs. It's even possible to get a commercial CD made using your CD-R as a master, but with an all-inclusive price of under £500, there has to be a catch — doesn't there?

real-time use and claim to generate no uncorrectable errors. Now that we've got the media cost issue out of the way, what does the hardware offer?

UNWRAPPING THE BOX

Considering the exciting potential of a machine like this, the Philips CDR870 looks very much like any other boring black CD player. Analogue audio ins and outs are on stereo phono jacks, while both optical and phono S/PDIF I/O is fitted. This means that digital connections can be made to any DAT machine, regardless of whether the DAT machine has a phono or optical connector. An infra-red remote control unit comes with the machine, and you also get a pair of phono cables, plus a short digital phono cable, as part of the package.

In concept, a CD recorder is much like any other recorder — you feed it an input, you hit record, and eventually a CD pops out. Actually, there's a little more to it than that, but not much. Whenever a CD is recorded, the process has to be completed by creating a table of contents so that a normal CD player knows how many tracks there are, where they start, and so on. Once this is done, no more recording can take place on the disc, but if you want to record a few tracks at a time, you can do this with no problem. You won't be able to play the disc on a regular CD player until you've finally created your table of contents by pressing the Finalise button, but prior to that, adding a new piece of audio is easy, as the machine always finds the end of the previously recorded material for you. Because you can only

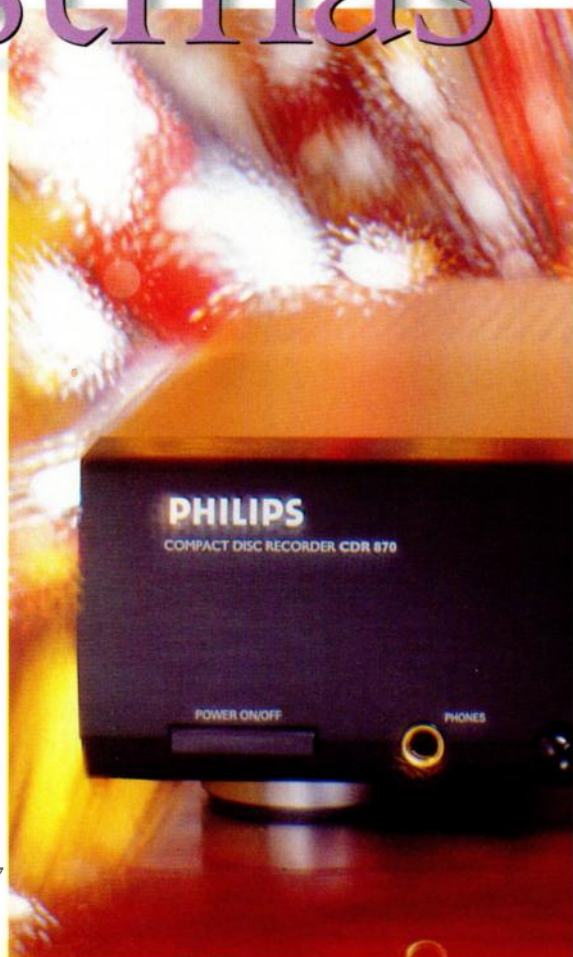
Write Christmas

PHILIPS CDR870 CD WRITER

Are you hanging up your stocking on the wall? Are you making your own re-recordable CD masters on a stand-alone CD writer for under £500? PAUL WHITE is...

Well, there is a catch, but it's a relatively small one. The same paranoid media barons who cursed our DAT machines with SCMS have conspired to ensure that consumer CD-R machines can only use special consumer-type CD-R blanks, the price of which includes some notional contribution towards copyright fees claimed to be lost through the copying of commercial records and CDs. The lower cost CD-Rs used for computer backup or multiple-speed audio disc copies are rejected by the machine, though there's an argument against using such discs for real-time recording in any case, as their construction is optimised for 2x or 4x speed operation.

Only a year or two ago, general-purpose CD-R blanks cost over £10 each, and even today some dealers are still trying it on by asking over a fiver each, but if you shop around the average price is less than half that if you buy 10 or more discs at a time. Consumer CD-Rs are rather more expensive, with some brands still costing the best part of £10 each, but to take the sting out of the consumer CD-R restriction, SRTL are supplying Philips' own blank consumer CD-R74DA discs for just £3.99 including VAT, with further discounts for quantities of 20 or more. These particular discs are optimised for



write on a regular CD-R once, there's no possibility of recording over anything you've already done.

KEEPING TRACK

One of the concerns when making a music CD is correctly marking the track boundaries. This may be done manually or automatically with the Philips machine: in Auto mode, when recording from an analogue source, any gap longer than three seconds will register as a track break, so when the sound resumes a new track will be created. This is fine unless you have a live album to do with no gaps, in which case you'll need to attend the recording and press Rec (or Track Incr on the remote) at the appropriate times. To stop recording, you have to press Stop manually. The manual claims that the recorder will stop automatically after detecting 20 seconds of silence, but this only seemed to work in Auto mode, where the track IDs are created automatically — not in Manual mode.

In Auto analogue mode, tracks are numbered according to the number of pauses detected, whereas in Auto digital mode, the track IDs are generated from the DAT's own start IDs. There's also a CDSync mode which allows synchronised digital copying from a CD player, but this also works for DAT machines, DCCs, and MiniDisc players. In CDSync mode, the recording process begins automatically when the CD starts playing and stops 20 seconds after the CD has finished. The track IDs of the original CD are transferred to the copy. Pressing the CDSync option once then going into Record will only record one track, whereas activating CDSync twice, prior to Record, will record the whole album or tape.

When recording from DAT by simply hitting Record (that is, using Manual rather than Auto mode), the machine ignored long silences, Track IDs, End IDs, me unplugging the digital cable —

even taking the tape out failed to halt it! The Stop button seems to be the only way to end regular recording, and the same seems to apply in analogue non-auto mode. I experimented by recording from DAT in the CDSync mode, and this seems to be the best way to work, as you're guaranteed a synchronous start, plus automatic Start-ID-to-track-number conversion. However, you do need to ensure that your DAT tape has IDs in the appropriate places. As with CDs, recording stops after 20 seconds of silence or when you press Stop — DAT End IDs aren't recognised in any mode.

If you're recording from a digital source, there's no level setting to worry about — the recording is effectively a clone of the original, and both Auto and CDSync modes register track IDs directly from DAT, CD DCC or MD. However, as most DAT machines only write an ID once they sense signal, it's common for the IDs to come a fraction of a second late, so it's good practice to manually move your DAT IDs half a second or so backwards before making your CD. Also beware of DAT machines that automatically create a start ID when you start recording a blank section at the beginning of the tape — this will have to be manually erased. As with analogue recording, if you don't want to use the track IDs from DAT, or if you're brave enough to record directly from the S/PDIF output of a digital audio workstation that doesn't support IDs, you can put your own track IDs in manually, by pressing Rec or Track Incr.

RECORDING

Tracks can be recorded to the CDR870 one at a time, in either analogue or digital modes, but if you have any thought of mastering from the disc, it's best to work from an edited DAT and write the disc in one hit, so that you don't get errors between tracks where the laser switches on and off. On the other hand, if all you need is a demo, ▶

pros & cons

PHILIPS CDR870 £499

pros

- Very affordable.
- Easy to use.
- Choice of analogue, S/PDIF optical or S/PDIF co-axial inputs.
- Can record onto the new CD-RW rewritable discs, as well as write-once CD-Rs.
- Integral sample-rate conversion means that copies can be made from consumer DAT, MiniDisc or DCC machines.

cons

- Uses the slightly more expensive consumer discs, but even these cost under £4 for 74 minutes of recording.
- As with all the other CD-R machines I've tried, there's no satisfactory way of programming an exact stop time.
- DAT End IDs are not recognised.
- SCMS means you can't make digital copies of CD-R discs made from digital sources, though you could always buy an SCMS stripper if that's a problem for you.

summary

At well under half the price of its nearest competitor, the CDR870 is affordable, simple to use, works with rewritable discs, and has no more vices than its more costly counterparts. An essential piece of kit for just about any project studio.

SOUND ON SOUND



Philips CDR870



► writing individual tracks is fine.

The recording process may be started by pressing Record, after which the Record icon flashes in the display, though if either auto mode is required, the relevant button must be hit first. If you're recording digitally and the digital input is not connected properly, or is at the wrong format, the word 'Dig' will flash in the display. Commercial CDs use a 44.1kHz sampling rate, and consumer DAT machines are often set to record at 48kHz, but even though the manual doesn't tell you this, the CDR870 includes sample-rate conversion on the digital input, so sources at 48kHz, 44.1kHz and 32kHz sample rates can be accommodated. However, there is one warning about sample rate conversion — as it is active all the time, even 44.1kHz tracks will be processed and, while this doesn't normally cause problems, if you've mastered an album using some fancy noise-shaping process, the sample-rate conversion process is likely to mask any benefits by adding simple dither. Again, even far more expensive machines have the same limitation.

WRITING WRONGS

Though CD-RWs are more expensive than CD-Rs, they can be erased and re-used, which can be useful if you're preparing a master for duplication and you want to be sure it's absolutely right. In an ideal world, you'd be able to put the finished CD-RW master into your regular CD machine and then make a CD-R copy via the CDR870 but, as explained in the SCMS box elsewhere in this article, built-in SCMS (Serial Copy Management System) prevents you from making further digital copies of your compiled discs unless you have an SCMS stripper (which removes the SCMC copy protection).

The recording procedure for a CD-RW is exactly the same as for a regular CD-R, but if you want to use it again, you need to erase it first. Finalised discs can only be erased completely, whereas partially recorded discs that haven't yet been finalised can be erased a track at a time, starting with the last track recorded.

Naturally the CDR870 can play back conventional CDs as well as ones you've recorded yourself, but I'd be inclined to leave routine playback to a regular CD player, to maximise laser life. However, the laser is only on when recording or playing, so you don't have to switch your machine off every second it's not in use! According to the distributors, the laser life-expectation of the CDR870 is comparable with that of a regular CD player, and replacements are

sensibly priced, should they ever be needed.

Operational quirks are few, and tend to be shared by other stand-alone CD writers, even the expensive ones. The most annoying is the lack of a way to make the machine stop automatically at the end of a recording. If you're making a CD master from DAT, you don't want 20 seconds of silence at the end of your album, nor do you want to have to hover over the stop button to do the job manually — what happens if the phone rings halfway through the last track? A system for reading DAT End IDs would be fine — but this isn't present on the CDR870 or any other stand-alone CD recorder I've used.

The fact that the machine always stops after a 20-second gap in Auto mode can also work against you, as you might want to create a CD with a 20-second silence in it. As it is, the CDR870 doesn't let you record more than 20 seconds of silence without ceasing recording, unless you're in Manual record mode (either analogue or digital). As an example of where you might need to record long silences, I recently worked on a relaxation tape where the speaker introduced a one-minute silence for meditation about three quarters of the way through the tape. This would have been impossible to transfer to disc in Auto mode.

COMPLETELY SLEIGHED

Though there are a few very minor operational irritations, the CDR870 represents superb value and handles the job of making one-off CDs from DAT or analogue sources with ease. Having to pay the extra for consumer discs rankles a bit when you're actually recording your own material (and not benefiting from the licence fee of the discs!), but at the price SRTL are selling them they don't cost much more than regular CD-Rs from other sources.

Using the machine is extremely easy, and the recording process seems quite reliable — something that can't always be said of computer-based systems, where you have to spend ages compiling the individual files in a playlist, then they trash your CD-R disc because of a buffer under-run error!

At this price, I can't think of many studio owners who don't need one of these machines — my order is in already. I have a friend who bought one of the original CD-R writers a couple of years back and it cost him over three grand. After only a few hundred hours of use, the laser has gone down and the company in question wanted to charge him £1500 for the repair work! Today he could buy a brand-new Philips machine that would do essentially the same job and still have £1000 left over! If the CDR870 isn't top of your Christmas list, it's certainly top of mine.

505

SCMS OF THE EARTH

I guess you thought you'd left SCMS behind with your DAT machine, but sadly it raises its ugly head on this and any all other consumer CD-R machines. And, just as with DAT machines, it inconveniences the legitimate user while presenting no real obstacle to the professional pirate. Most commercial audio CDs can be copied using this machine, and providing the disc is for personal use only, that's fine — the cost of the blank disc includes a licensing fee to do this. However, SCMS prevents you from taking further copies of CD-Rs originally made from a digital source, so if you've made a master CD-R of your own material using a DAT tape as a source (assuming the recording is via the digital interface), you can't make further copies from the CD-R. However, you can make as many copies as you like from the original music CD, which is what any self-respecting pirate would do. Once again, insanity triumphs!

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4 New Mixers *MixWizard Series*

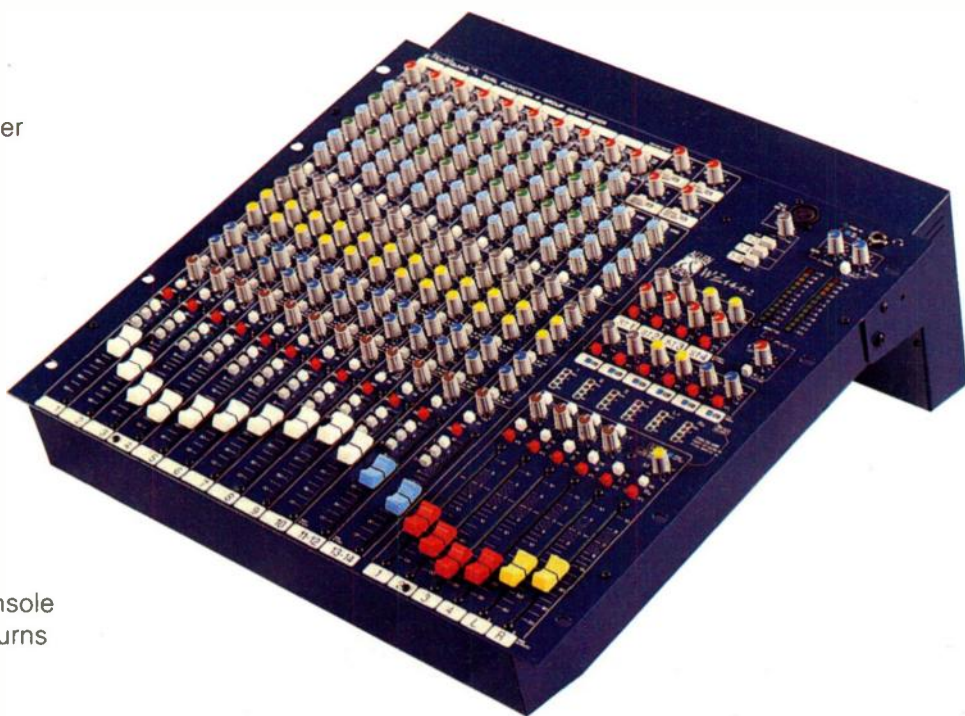
Rolled into one: WZ14:4:2

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2  **Monitors**
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Monitor Mixer

3  **Dual Mode**
Simultaneous
Front-of-House
and Monitor Mixer

4  **Recording**
6 Aux recording console
with 4 stereo fx returns
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4 BAND EQ
Only with a full-spectrum four band EQ can you eliminate 'dead spots' from your control. Inferior three-band designs often miss out the entire frequencies between the bands, making adjustment of crucial frequencies impossible. We don't accept compromise; why should you?

6 AUXES
With its 6 auxes, mode switching and 4 groups, WZ14:4:2 gives you more routing options than any other mixer in its class. Because each aux has its own controls, every one of your mixes is truly independent. More auxes mean more opportunities for creativity - whether you're creating FX sends or stage monitor feeds.

MODE SWITCHING
WZ14:4:2's mode switches allow you to transfer any, all or none of the aux masters to the main
100mm group faders for optimum control. Another switch converts the mono output to a listen wedge facility. Because mode switches are set below the panel, they'll only be activated when you want them to be.

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- 2 dual input stereo line channels
- 4 stereo returns with LR + aux routing
- 4 groups with subgrouping to LR
- 6 auxes with balanced sends
- +48V phantom power
- 4 band, 2 sweep EQ with bypass switch
- 100mm faders throughout
- Professional build: steel case, nutted pots, vertical circuit boards
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Digital Tape Recording System (DTRS) machines are the most common type of digital multitracks found in broadcast or post-production environments. Tascam's original DTRS machine, the DA88, was joined by the slightly simplified but more cost-effective DA38 about two years ago, and now, with the launch of the DA98, the Tascam DTRS family consists of three machines.

Despite the obvious move towards hard disk recording and 20-bit (or more) resolution, Tascam have continued to develop their DTRS machines. The DA38 was the result of making the technology more cost-effective in an attempt to reach the lower budget sectors of the market, and the DA98 is the result of discussions with 'high-end' users (mainly in the post-production industry) about what they wanted from the DA88. As a result, the flagship DA98 is effectively an updated DA88 with all the bells and whistles built in.

HARDWARE

You could not mistake the DA98 for anything other than part of the DA family, as, apart from the new backlit display panel, its control panel is superficially identical to the other DA machines. The bargraph metering is on the right-hand side, the transport controls are laid out beneath the tape slot and even the unusual arrangement of the Play and Record buttons (they're adjacent) is the same.

The tape transport mechanism in the new machine is a derivative of that in the DA38, which was itself an evolution of the original and extremely

reliable DA88 mechanism. Much of the DA98's electronics has evolved too, taking advantage of new integrated circuits.

From the user's point of view, one of the most significant improvements between the new machine and the original DA88 workhorse is that timecode generation and chase synchronisation are provided as a built-in facility (it was an optional extra on the DA88 and not available at all on the DA38).

Another significant improvement which the DA98 exhibits over its forebears is that its 9-pin remote control has been updated to conform fully with the ubiquitous Sony P2 protocol (as opposed to Tascam's own version of RS422 control), although the machine can also emulate a variety of 'standard' 9-pin machines, as well as adopting the original control format for backwards compatibility.

FLAGSHIP FEATURES

There is only so much a digital 8-track machine can do, and within certain parameters, any digital multitrack is much like another. However, the DA98 has some unique features which could make life considerably easier. Probably the most significant of these is the inclusion of proper off-tape confidence monitoring, complete with an obvious but comforting 240ms off-tape delay! There is a comprehensive tape/source selection system, with automatic switching functions dependent on transport status just like an analogue multitrack, although there are a few restrictions on recording when using the off-tape monitoring mode, of which more later.

I have already mentioned the built-in synchronisation system, which appears to work

TASCAM DA98 DIGITAL MULTITRACK RECORDER

WHAT'S IN STORE FOR '98?

It started at 88, dropped to 38, now rises to 98... no, it's not the chart performance of the new Spice Girls album, but Tascam's rather strange way of numbering the models in their respected DA series of digital multitrack recorders. HUGH ROBJOHNS checks out the new flagship in the range.



extremely efficiently. Obviously highly optimised to the mechanics of the machine, the DA98's chase and lock-up times are very fast. The timecode chase operations are very sophisticated, with a continuous re-chase option (where the machine tries to accurately follow the incoming timecode, complete with its potential speed variations), or a 'synchronise and run-free' mode where it locates to the right place and then locks to a stable video signal or wordclock.

Another useful addition to the feature list is an internal signal routing matrix which allows full mapping between either the digital TDIF or analogue inputs and any of the eight recording tracks. This routing matrix also permits internal track copying to move audio from one track to another, but the system is not capable of combining the audio from multiple tracks, so you can't use it to bounce down.

To take account of the growing number of affordable digital desks, Tascam have equipped the DA98 with an internal dithering system so that signals presented on the TDIF inputs with greater than 16-bit resolution can be sensibly reduced to the 16 bits the tape format is capable of storing. It is a shame that Tascam didn't see fit to incorporate a mode for track-sharing, to allow 4- or 5-track recording with 24-bit resolution, as there does seem to be growing interest in this kind of operation, and there are already a number of third-party interfaces on the market to allow exactly this.

Of particular interest to music recording users is the DA98's ability to slip tracks relative to one another by up to 150ms in fine increments. This feature can be used to compensate for the different arrival times of sound when using spaced microphones (correcting for distances of up to 50 metres).

Tascam have discarded -10dBV analogue connections completely from the DA98, as they clearly see this machine only serving in professional environments. Balanced analogue I/Os are via 'D'-sub connectors at a nominal +4dBu level and the same wiring convention has been used as other DTRS machines. Recording headroom within the machine is determined through the operating software and the machine can be set up such that a nominal +4dBu reference level is aligned to either the 'Tascam Operating Level' (-16dBFS), the EBU level (-18dBFS), or the SMPTE level (-20dBFS). In practice, this means that the machine can accommodate peak analogue signal levels of between +20dBu and +24dBu respectively.

Two new timecode-stripping modes on the DA98 — ABS13 and ABS23 — effectively automate the process of providing a timecode pre-roll and starting each recording on a memorable timecode point. The first mode provides up to 10 minutes of recording (with a 3-minute pre-roll), and the second allows up to 20 minutes recording. Taking the ABS13 mode as an example, once activated it will start the tape with a timecode of, say, 00:57:00:00, with the first programme material going down at 01:00:00:00. Ten minutes later, the timecode is forced to 01:57:00:00 and the cycle repeated, and each subsequent programme item starts at the top of the next hour (in terms of timecode values). The ABS time on the tape is continuous and sequential from the start of the tape, of course. This facility has been added primarily for the convenience of film dubbing houses, to suit typical film reel lengths, but would also be very handy for recording and locating several commercials or even music recordings within the same tape.

Virtually all of the DA98's settings are made through the new LCD panel, and there are no controls or switches on the rear panel at all. The software control on the LCD is navigated with simple cursor keys and an Enter/Escape system which are reasonably intuitive to negotiate. As most users tend to operate this kind of machine in a repetitive way, and only use a few different setups, the 10 most commonly used menu functions can be assigned to instant access 'function-keys'. These can also be used as locator memories to supplement the familiar 2-point auto-locator with its A/B repeat functions. Best of all, they can also be used as numeric keys for data entry of things like timecode values — something which previously could only be done through the large remote controller panel.

KNOBS AND TWIDDLY BITS

The DA98's rear panel is a forest of connectors, but they are organised in five 'levels' on the left-hand side of the panel, with a standard IEC mains lead in the bottom right-hand corner.

Balanced analogue I/Os at the +4dBu nominal level are arranged on the lower two levels using the Tascam standard 25-way 'D'-sub connectors. The middle row of the five contains multi-pin interfaces for the meter bridge, the TDIF I/O, and the Sync in/out connectors which provide sample-accurate locking with other DA-family machines.

The top row of interfaces provides timecode in and out (on XLRs at last), video in and through (with an automatic 75Ω termination function), and

pros & cons

TASCAM DA98 £4399

pros

- Off-tape monitoring.
- Fast synchroniser.
- Input routing matrix.
- Intuitive software control.

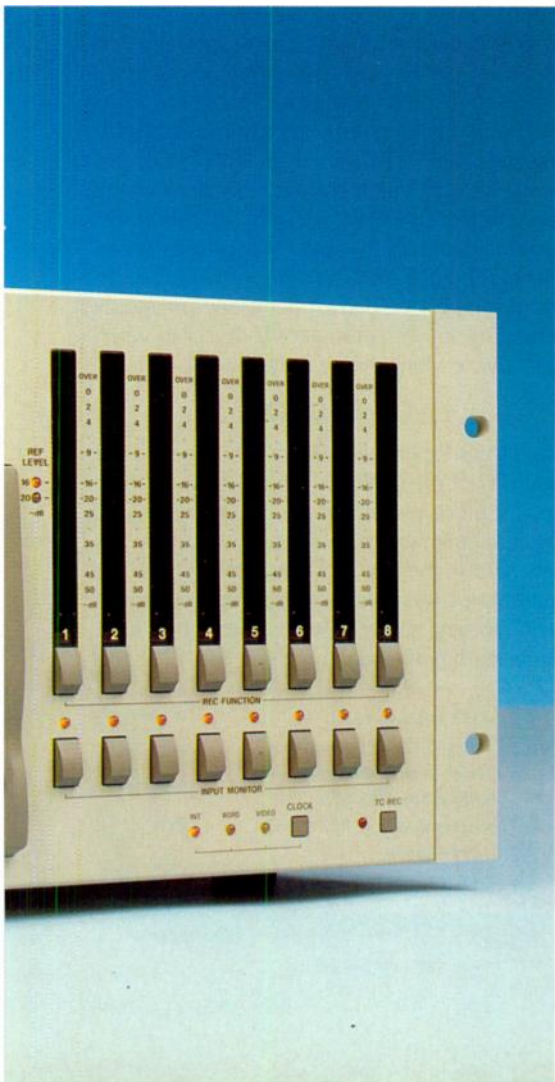
cons

- Original format restrictions maintained.
- Cannot record 20/24-bit signals directly.

summary

The DA98 is the deserving flagship of the DTRS range — a machine which has clearly evolved from its predecessors. With very welcome off-tape monitoring, built-in tape synchroniser, and comprehensive software control, this machine is the most professional member of the DA family.

SOUND ON SOUND



TASCAM DA98



► wordsync in, out and through (also with auto-termination). The video and wordsync connectors employ BNCs. Immediately below these facilities are an RS422 interface (now conforming to the Sony protocol more fully), the standard set of three MIDI sockets, and a parallel machine control port.

The 4-line, 20-character backlit LCD panel immediately to the right of the tape time display is probably the most striking feature of the DA98. Other than that though, any DA88 user would feel very comfortable with the controls on this machine, as most of them are identical to its siblings, or are very intuitive. For example, the new row of buttons beneath the track-arming keys, which control the input monitoring status on a track-by-track basis, hardly require rocket scientists to figure them out. On the extreme left-hand side there are three small buttons and indicators which provide selection of the Digital Inputs, activate the Chase Sync mode, and engage the Confidence (off-tape) Monitoring facility.

Around the timer display, there are a lot more indicators than in the other DA models, and in addition to the usual LEDs, status indicators are provided for the (new) track copy mode, pull-up/down status for drop-frame timecode synchronisation, and for the (new) track delay mode.

I mentioned earlier the inclusion of 'Function Keys' and these are alternative uses for 10 of the keys directly below the time display (those labelled RHSL, Auto Punch, Memo 1, and so on). There is labelling below their main functions to indicate their enhanced roles. These Function Key modes are accessed by pressing the 'Shift' button (adjacent to the cursor keys) and three possibilities exist for these keys. They can be used as quick-access menu keys (ie. providing direct entry to user-determined menu pages), additional locate position memories, or a numeric keypad for data entry.

There are a total of 12 menu pages and they are identified as pages 0 to 9, E and F. If you happen to remember the identification address of a specific menu, it can be located by selecting the appropriate number or letter from the 'Home' menu at the top of the software tree. The cursor keys are used to navigate around a selected menu page and to identify the particular parameter you wish to alter. Hitting the Enter key allows the parameter to be edited and, again, the cursor keys are used to increment or decrement the value as necessary.

The first menu (Group 0) provides functions like track delays, track copying, locate memory stores, locate pre-roll time, and varispeed settings. Group 1 has settings for in and out point times (for drop-in rehearsals and recordings), pre- and post-rolls (ie. playback window before and after the drop-in), drop-in crossfade duration, and dither type.

Group 2 covers things like TDIF input word lengths, signal reference levels and the internal oscillator settings, while Groups 3 and 4 are involved with machine ID flags in multi-machine systems, time reference sources, control protocols, machine offsets, and timecode chasing. Group 5 relates to the comprehensive timecode features such as frame rates, video resolving, and timecode

sources, while Group 6 is concerned with RS422 operation, including machine emulation, record delays, and track mapping from edit controllers.

All the MIDI functions and the operation of the 'Function Key' modes are set up in Group 7, Group 8 sets the timecode generator, and Group 9 controls an automatic head cleaning system and provides off-tape error-rates. The last two menus, E and F, provide displays of various kinds of data, such as information from the various timecode sources, and display of software versions. Obviously, a great deal of the machine's functionality can be customised, and so Tascam have provided three user memories, plus a factory preset memory.

OFF-TAPE MONITORING

The monitoring arrangements on the DA98 are very complicated from a technical standpoint, but Tascam have been able to make them extremely intuitive to operate. Modes such as 'All Input' and 'Input Monitor' will be very familiar, but there are also automatic switching facilities called 'Auto Mon' and 'Shtl Mon'. The former forces the monitoring to off-tape on any armed tracks when in Play mode, but input when in record or stopped. The 'Shtl Mon' mode only works when 'Auto Mon' is enabled and simply allows the input signal to be heard on armed tracks during tape shuttling operations (with this mode off, you would hear the replayed track chattering as it spools).

The new confidence monitoring mode is switchable on a track-by-track basis using the Input Monitor buttons in conjunction with the global 'Confidence Monitor' enable switch over on the left of the front panel. Its operation is entirely logical, but the handbook carries all the usual warnings about not using the facility when overdubbing (tracks would be recorded out of sync with each other, of course). Because of the way the confidence monitoring mode works (and the nature of the tape format) when active, track arming is switched in pairs, and so to avoid possible embarrassment, any previously armed tracks are automatically cancelled when Confidence Monitoring is switched on!

CONCLUSION

The DA98 retains all the positive aspects and flexibility of the DA88, but improves upon them with a more professional user interface and facilities optimised towards post-production. It is very hard to think of anything that has been left out of the DA98 — it really does appear to be a DTRS machine built to meet the needs of the most demanding professional.

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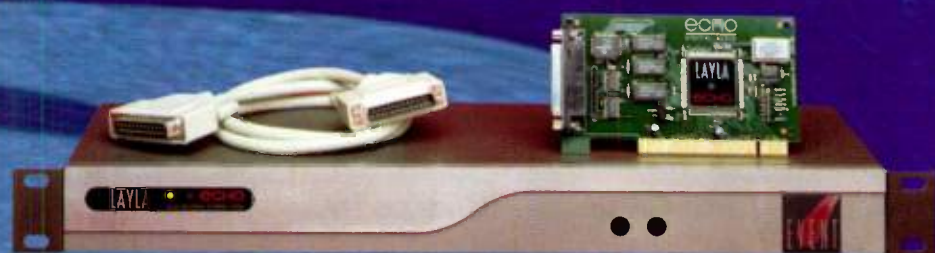
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DIG IT: The S/PDIF digital interface supports stereo signals with up to 24-bit resolution - on both input and output - so it's ideal for mastering or maybe even a digital effects loop. Whatever the application, your audio tracks are handled with 24-bit precision throughout Layla's internal audio path.

SYNC IT: Synchronize multiple Layla systems - expansion is as simple as plugging in another card and connecting word clocks. A larger system means not only having more hardware ins and outs (how does 24 inputs x 36 outputs grab you?), your DSP horsepower grows as well.

MIDI IT: The on-board MIDI interface lets you create a powerful audio/MIDI multitrack recording system without having to hook up additional gear. And Layla is true Plug-and-Play™ - no jumpers to set, no IRQs to configure (in fact, only one IRQ is used for both audio and MIDI functions and no DMA channels at all are used.)

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TCHAD BLAKE

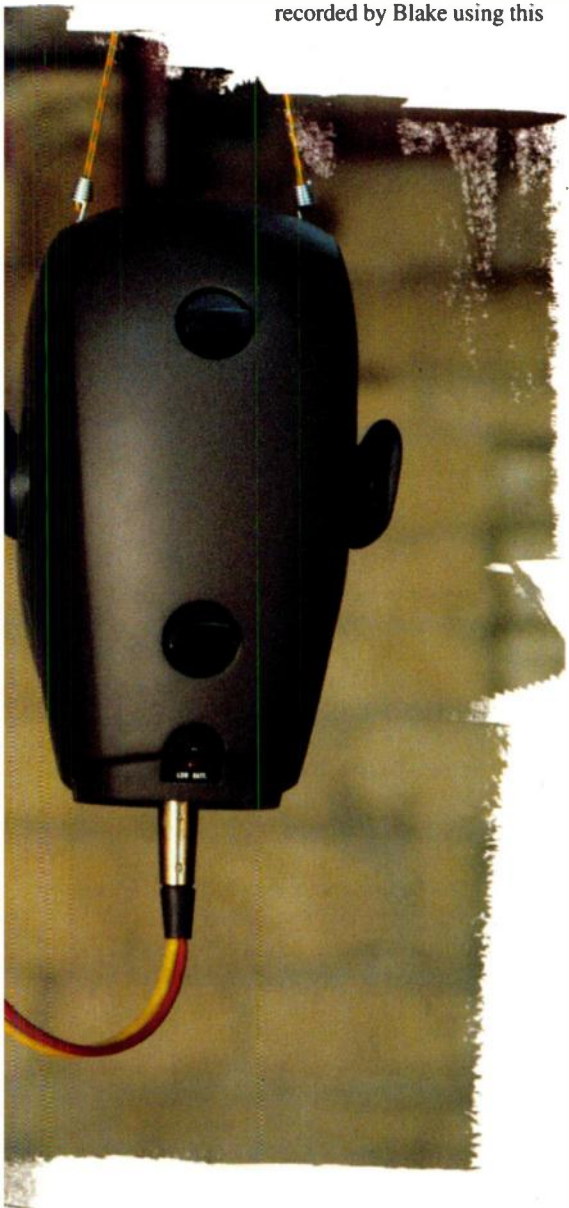


This inventive American has graduated from aiding and abetting producer Mitchell Froom in his sonic escapades to full production duties on a variety of live and studio albums. PAUL TINGEN talks to a devotee of binaural recording who's more than just a dummy head.

Anyone out there who's exploring today's ever-cheaper CD-quality recording options should sit up and take note. If you're working with live music you could do a lot worse than following the example of American engineer and producer Tchad Blake. Try, for example, this bit of outlandish inventiveness: take some leads, two cheap Lavalier mics, a tiny portable DAT recorder, plus a multitude of batteries and DAT tapes. Stick the Lavalier mics in your ears, connect them to your

DAT recorder, and put your head in front of whatever it is that you want to capture. Record for a few hours, moving or turning your head when you want a different balance. Then spend a few more hours editing the lot in a hard disk editor, add PQ coding, transfer back to DAT, and send off to the CD factory. Before you know it, you've got a CD. This is exactly what renowned American engineer and producer Tchad Blake has been doing in recent years, with some stunning results.

The new sister label to Peter Gabriel's Real World label, Womad Select, has released several CDs that contain material recorded by Blake using this



method, called binaural recording: *Dawn Raga*, by the famous Indian electric mandolin player U Srinivas (1995); *Made In Sardinia*, by Sardinia's number one guitarist, Gesuino Deiana (1997); and *Kaira Naata*, by the Gambian kora player Pa Bobo Jobarteh and the Kaira Trio (1997). All three CDs contain some more than excellent music. Blake's talents were also recently put to use by Robert Fripp's Discipline label, on a CD release featuring the talents of Chapman Stick player Tony Levin, drummer Jerry Marotta, and flautist Steve Gorn. The evocatively-titled *From The Caves Of The*

Iron Mountain was indeed recorded in a cave, and saw Blake walking around the cave and floating in a boat in an underground lake, with mics in his ears to record special sound effects.

Blake's interest in binaural recording and environmental noises goes back a long way, and it's only recently that he has found an outlet for it. Via transatlantic telephone from his house in Hollywood, the 42-year old American explained: "I've always been interested in environmental sound. When I was young I used to record stuff with a mono cassette recorder while I was just walking around, or getting in the car, closing the doors, and driving off, things like that. I just loved those sounds. I used to be a guitar player as a teenager, then did some work in photography and odd jobs here and there, and when I was 25 I started work at Wally Heider's studio in LA, as a janitor and runner, and immediately put together my own binaural system using their equipment, sticking little microphones in my ears and walking around Hollywood recording city sounds. This was around 1979-80. After three years at Wally Heider's, I moved on to work as an engineer for a small demo studio, and then I worked at The Sunset Sound Factory for nearly five years as an assistant engineer. It was here that I met Mitchell Froom, in 1986."



U Srinivas's *Dawn Raga* album.

CONTRAST

The meeting with producer Mitchell Froom was a turning point in Blake's life. The two hit it off, and have been working together ever since. They've been responsible for a whole string of records, many of them extremely influential. Froom brought Blake in for the last stage of Crowded

"For me the studio is a fantasy world, a place to make things happen that couldn't possibly happen in real life."

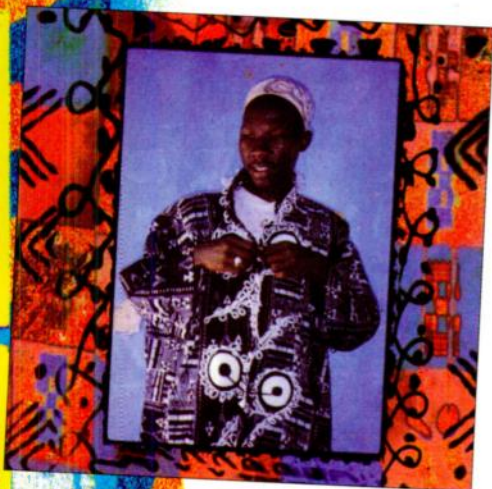
House's debut album, *Crowded House* (1986), and since then they've gone from strength to strength, doing two more albums with Crowded House, and working with Elvis Costello, Suzanne Vega, Los Lobos, Paul McCartney, Richard Thompson, The Pretenders, and the illustrious Latin Playboys (1994). Blake also worked alone as a producer and engineer with Crowded House's Finn brothers (*Finn*, 1995), The Wild Colonialists, Soul Coughing, and has also produced and recorded Sierra Leone's SE Rogie (RW, 1994), Madagascar's Justin Vali Trio (RW, 1995) and Zimbabwe's Thomas Mapfumo (WS, 1997). The weird, wacky and wonderful Latin Playboys album featured Los Lobos members Louie Perez and David Hidalgo, as

TCHAD BLAKE

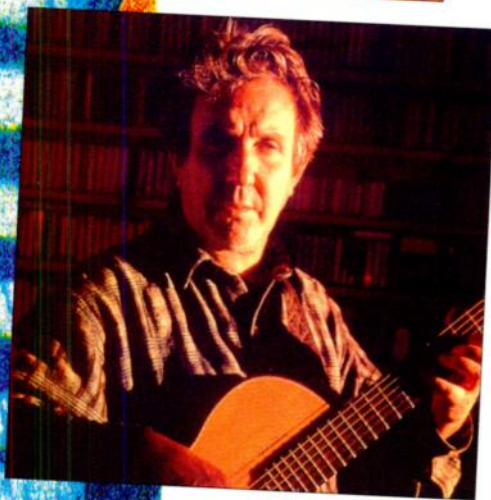
► well as Froom and Blake, and was based on 4-track Portastudio material that Hidalgo recorded in his kitchen (see *SOS* November 1994). It was on this record that Blake managed to find a serious application for his environmental binaural recordings for the first time.

Blake: "I've kept on doing binaural recordings throughout the years, but I never had an outlet for the idea. I suggested it many times, but it never seemed to fly with artists or producers. Then it finally started a little bit with *Kiko*, and on the Latin Playboys project we ended up using a lot of natural ambience to complement Hidalgo's demos.

Pa Bobo's Kaira Naata.



Some of the binaural stuff came from my archives, some of it I specifically got for the record. I walked around the block collecting sounds, and for the song 'Rudy's Party' we put binaural microphones on the roof of the studio, and recorded the street sounds that went on at the same time as we were doing some overdubs downstairs. I think binaural ambience and music are a great combination. I record music at home, and all my demos have a binaural aspect, whether it's just atmospheric, or something like a weaving machine from India laying the basis for the rhythm. On Mitchell Froom's new solo album [out early 1998] we used the rhythm made by some guys in Venice cracking 30-foot whips as a basis for one song. I love that contrast between music and binaural stuff. When you're listening to it via speakers, rather than headphones, it's not truly binaural anymore, so it becomes more of an effect which changes your perspective of the music."



*Gesuino Deiana's
Made in Sardinia album.*

These days, Blake uses two different binaural recording techniques. One involves a dummy head; in the other his own head is promoted — or demoted — to dummy head: "If I'm in a controlled environment where there's no wind, usually indoors, I use the Neumann KU100 dummy head. It's the state-of-the-art binaural recording microphone. When I'm outside and walking around, and really in the field, I use my little portable setup — two omnidirectional Sony ECM50 Lavalier mics which I stick in my ears, attached to a headband that keeps the wires in place. The Sonys are these kind of clip-on lapel mics. They're not great sounding, but they work quite well in a binaural situation. For some reason, they lose some low end when you stick them in your ears — I'm not a very technical engineer, so I don't know why. I just like the way they sound. I've tried other microphones, but besides

not fitting in my ears properly, they don't sound as nice as the ECM50s."

MUSIC IN CONTEXT

When Blake is recording outside the studio, he uses the tiny Sony TCD D7 portable DAT to record both the Neumann dummy head and the Sonys. He explains: "I record straight into the D7 — no effects, no extra mic preamps. I just love the way the D7 sounds. I've never heard my binaural stuff sound better over headphones than when I listen back to that machine. There probably are machines with far better mic preamps and things like that, but it's very important for me to have backups when I'm doing field trips to places like the Gambia or Zimbabwe. I take two sets of everything with me on field trips: two sets of microphones, two sets of D7 DAT machines, and tons of batteries and tapes. I wouldn't be able to do that if I was using the Sony Pro DAT, because of all the battery packs I'd need to take with me. Sometimes I don't have access to AC to recharge

"I've used reverb on maybe two records in the last 10 years."

the batteries for a few days, so AA batteries are vital. On certain field trips I also take the Neumann head with me, but that's a luxury, because I also have to bring some sort of mic stand, extra cables and batteries, so it takes up a lot of room, and travelling in buses becomes a hassle. I need to travel by car when I carry the Neumann, and that's not always possible."

According to Blake, the albums he made with Sardinian guitarist Gesuino Deiana and Gambian kora player Pa Bobo were both recorded equally with the ECM50s and the KU100: "When you hear me on the Sardinian record being outside and walking around or sitting in a car, or you hear sheep, or that guy playing harmonica in the opening track, which was recorded in a pizzeria, that's all done with the Sonys. The music that has some ambience was recorded in a church with the dummy head. The sleeve says that most of the recording was done in Real World, but that's a typographical error — everything on the CD was recorded in Sardinia. Part of the point of doing these binaural recordings is that I want to give the listener a sense of where the music comes from. I don't want them to just hear the music out of context. It's a way of showing what helped the musician develop his or her style. For example, when Gesuino Deiana is playing he listens to every sound that he hears. Whether it's a car passing or a dog barking, he'll actually mimic that on his guitar a little bit and he'll incorporate that into his compositions. He doesn't get heavy about that, it's just something that happens, often totally unconsciously."

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► “In Gambia I didn’t only record environmental noises with the Sonys, but also some of the music. Some stuff was recorded in remote villages and it was just too difficult to bring the Neumann. Also, when I’m recording with a lot of people around, the Neumann tends to attract too much attention, whereas when I have the Sonys in my ears, bystanders think that I’m just listening; they don’t realise I’m recording, so they leave me alone. Another advantage of the ECM50s is that when you record wind with them, it actually sounds like wind. You don’t get that sound of collapsing capsules that you get with other microphones. The Neumann can’t handle the tiniest bit of wind — it immediately goes crazy and doesn’t sound good at all. But with the ECM50s, if there’s wind I can adjust my head a bit, and what you hear is the wind around my ears; it sounds very natural. I’ve

“A weird sound doesn’t only give more character to a track, it’s also easier to fit into a track, and that track needs less overdubs.”

also recorded a CD in Zimbabwe, which will be released next year on the Womad Select label, as the first in the ‘Document’ Series. This series was Peter Gabriel’s idea, and each CD will feature different artists from one country. Peter is also planning to put some stuff out in this series, but my work will be just me, going on trips and documenting them. Everything on the Zimbabwean CD is recorded with the ECM50s, and in one case I’m recording a shepherd playing an oil-can banjo in the middle of a storm. There’s an intense wind, and it actually sounds great.”

UNCOMFORTABLE

For people attempting to record music, rather than environmental sounds, with binaural microphone techniques, recording wind as naturally as possible will generally be the least of their concerns. They will be more concerned with getting the music on tape to sound as good as possible. Blake offers a few anecdotes about how he achieved this, mainly through upgrading his own ‘dummy head’ to an intelligent one: “The thing about using the ECM50 mics is that I can mix on the fly, purely by positioning myself. The kora was the most difficult instrument to record; it’s about as quiet as an electric guitar played without an amp. Traditionally, people used to play percussion with small sticks on the sides of their instruments, but these days they’re playing things like the balafon, which is a kind of marimba, with a resin mallet, or there are loud drums playing too, so you can hardly hear it. When I recorded the Gambian record, I had to bring my nose to about an inch

away from Pa Joba’s fingers. And when the balafon then did a solo, I’d move my head four or five inches away from the kora and turn it slightly towards the balafon, so it comes in stronger and moves from the left channel to the centre. I must admit that after these recordings I did have a sore neck, purely from having to bend myself over the kora and stay in one position for a long time. The other thing about recording with these in-ear mics is that I can’t swallow, because it makes a huge noise. I’ve learnt how to keep myself from swallowing through proper breathing.”

All in all, it seems binaural recording can lead to some uncomfortable situations. There have traditionally also been a lot of doubts over its technical merits, but Blake is adamant about the advantages: “I know there are other stereo microphone techniques, like MS recording and the Blumlein arrangement, and I actually have a Soundfield microphone myself, but I prefer the sound of binaural. When you record a moving object like an animal with a stereo pair, when you hear it go from, say, left to centre, there’s a small area where there’s a slight phase discrepancy. For a moment the sound changes, and that sounds very weird and unnatural to me. I know people say that the problem with binaural is that there’s no actual centre, that it’s very difficult to get things to sound right in front, but I’ve never found that to be the case. Or, at least, only when you record something that’s very close to your face — then you can get the feeling that it’s coming from behind. Binaural isn’t perfect, you don’t get 100% accurate localisation, but I simply love what it does. It sounds fantastic and really natural and spatial on headphones. I also love the way it translates to the speakers. It’s no longer truly binaural when you listen to speakers, but it has its own sound, which is really cool, almost like a fishbowl effect. You get this depth that you don’t get from any other kind of stereo miking technique. And finally, it’s great for field recording, because it’s cheap, really portable and really simple, and I’m not carrying anything in my hands, so I can walk around, take pictures, do all sorts of things.”

QUICK

Blake has also applied binaural recording techniques in the recording studio. He recorded *Dawn Raga*, the wonderful CD by the Indian electric mandolin prodigy U Srinivas, entirely with the Neumann head at Real World, into a Panasonic DAT recorder and without any compression. Through an oversight, the CD sleeve doesn’t mention this, nor does it mention that Blake produced the album. *Dawn Raga* is one of the best examples you’ll ever hear of how good binaural recording can sound under controlled circumstances. The song ‘Angels Heap’ on the Finn brothers’ album was also recorded binaurally, and Blake asserts that since he bought the Neumann in 1992, it’s his regular overhead mic for drums. He also found the weirdest usage for the Neumann head and two rubber tubes when he had

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TCHAD BLAKE

- Louie Perez sing into them for a track on Mitchell Froom's forthcoming solo album, which was produced and engineered by Blake: "I taped two rubber tubes to the ears of the binaural head, and then joined the other ends of the two tubes together. Louie sang into the two tubes sitting side by side, and if he moved ever so slightly to the left it would mainly be picked up by the left ear of the head, and if he moved to the right it would be picked up by the right ear. This gave a real weird resonant sound in the binaural head."

Once Blake has recorded his binaural projects, he edits his material with his SADiE hard disk editor. Blake: "Portable DAT recorders and the SADiE are two of the reasons why I am able to put out these binaural recordings at the moment, and do it very cheaply and quickly. In the past I used quarter-inch tape and had to edit and crossfade with it, which required the technology of a pretty major studio. Now I can do the editing at home on my SADiE, which has a lot of hard disk space, and Exabyte and a CD-R cutter. I normally only do balancing of levels and flow in the SADiE, and I sometimes bring the low end up a bit in the ECM50 recordings, because of the loss of bass in the recording. I also occasionally do some crossfades, or blend different recordings to get an effect, like on the Zimbabwean record, on which I created a collage of sound. I mix things onto DAT, and then it goes straight to the CD plant, though the *Iron Mountain* CD was first mastered by Bob Ludwig. But the *Womad Select* stuff wasn't even mastered. These CDs are made very cheaply, usually

recorded in a day, and then edited in the SADiE in day. I like working that quickly. The Thomas Mapfumo CD was recorded live in the big room in Real World with traditional close-miking techniques, in four hours, and mixed in about two!"

Producer Mitchell Froom has said that he prefers "to focus on the 98%, not on the 2%", when asked whether he prefers analogue or digital recording — with the 98% being the music, and the 2% being the difference between analogue and digital. Tchad Blake echoes Froom's point, although he admits to a slight preference for analogue: "It's not that important to me. My preference for recording with analogue in the studio is largely because it's simpler and it's cheaper. With digital, if you want to edit you need two machines and more tape. Whereas I love to edit analogue tape. Give me a razor blade any time, man, I love to cut tape! (laughs). I also like what happens to the low end using analogue recordings at 15ips with Dolby SR, and so almost all my studio recordings are done on that format. I'm forced to use digital and the SADiE for my binaural recordings, but if there was a reel-to-reel recorder as small as the Sony portable DAT, that also gave me Dolby SR, I'd record on that."

EXTREME

Blake and Froom's relative indifference towards the recording medium they use is a reflection of their basic recording philosophy, which very simply is that music matters much more than technology. They'd rather focus on helping

FROM THE CAVES OF THE IRON MOUNTAIN

The music for the CD *From The Caves Of The Iron Mountain* was recorded inside the historic Widow Jane Mine, in the Catskill Mountains near Woodstock in New York state. All three musicians involved live nearby, and the area provided the inspiration for the music, for which the basic rhythms and melodies were pre-written. Improvised versions were then recorded live in the cave. The main purpose behind recording in a cave was to use the acoustic qualities of the environment to the full — the place has very powerful acoustics and is occasionally used for

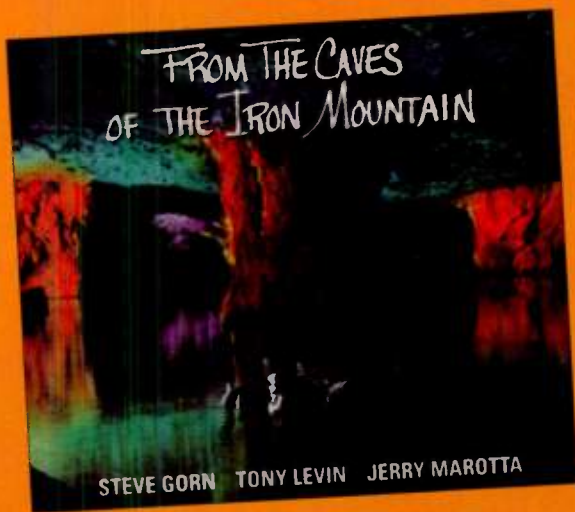
classical concerts. An electricity line was run from a nearby house especially for this project, to supply Blake and Levin with power. A 35-minute video on the enhanced CD shows how the environment of the cave shaped the music. Blake elaborates: "There was a little wooden platform about eight feet square for the musicians to sit on, and we usually lit the cave with candles. We also had a boat, from which I would record things with the ECM50s whilst drifting across the huge underground lake. The cave is not a quiet environment — there are sounds from water dripping or lapping up against the rocks, there are ducks and geese in the distance, and you can hear all that in the background."

The music on the CD was recorded mostly close-miked with the Neumann head, and Blake had to work by positioning the head and the musicians in different places to get a good mix between the instruments. He explains: "That was actually a very difficult recording to balance, because Tony [Levin] played an electrically amplified Chapman Stick, while the rest of the instruments were acoustic, and there were some very big dynamics going on. Also, I couldn't really hear what was going on while monitoring via headphones, so I had to actually record them, stop, listen back, and then adjust

the head or the positioning of the musicians.

Sometimes Jerry [Marotta] had to move his drums slightly to the right or the back, or I had Steve Gorn walk around whilst playing his flutes, and Tony might have to take some top end off on his amp, or turn the speakers slightly away from me. We didn't want to have to overdub or fix anything afterwards; the idea was to do the whole recording binaural and *au naturel*, so I had to get it right on the spot."

Blake explains some of the advantages of recording in caves, in the process giving entirely new meaning to the name of this illustrious periodical: "I think there's something about recording in caves that many musicians like. It gives a different perspective, a different take on music. When we did the Real World Recording Week we found an underground quarry and hired it for certain hours to record music in. There was no electricity there, so we had to take helmets with lamps fixed on them. Lots of musicians and vocalists got really excited playing down there. Vocalists and soloists tend to like to have lots of feedback, and being in a cave gives you about the most intense feedback that you can get. The reverb time can go up to four or five seconds, and if you keep playing you get this build-up, it's almost like sound on sound. I love it, which actually is a bit weird, because in my studio recordings, when I do pop records I hardly ever use reverb at all. And I must admit, as much as I like the sound in caves, my favourite binaural recordings are the things that I've recorded outdoors, where the sound is being eaten up by the ground and bouncing off trees or a wall."



musicians make good and original music than on patching things up or glossing them over with complicated and expensive recording techniques. Blake is an engineer who likes to create sound effects at source, as with the aforementioned rubber tubes and binaural head, or using “mechanical filters, like wooden pipes, didgeridoos, metal pipes, tin cans and boxes, cardboard boxes and tubes, and so on. I’ll put springs in a tin can, place that in front of a drum, and put a microphone in it. I must admit that I’ve been doing it a little bit less recently, because I felt that I’d been over-using this approach, but it does have a number of huge advantages. It’s a lot of fun, and it’s very difficult to duplicate these mechanical effects. Some people see the latter as a disadvantage, but I think it’s great because it forces you to come up with new ideas every time. In my view, records that are created with a lot of mechanical experimentation tend to sound more original and unique than records that are made primarily with synths and samplers, although there are, of course, exceptions. A weird sound doesn’t only give more character to a track, it’s also easier to fit into a track, and that track needs less overdubs. Mitchell and I found time and time again that an unusual sound defines a track more, so you need to build less around it.”

Blake’s love of sonic experimentation at source doesn’t mean that he’s averse to using effects, with the notable exception of digital reverb. He explained why: “I’ve only used reverb on maybe two records in the last 10 years. Instead I prefer to use distortion and compression to create ambience. I really like recordings that are ‘in your face’, that sound very dry and intimate, and feel as though they’re coming towards you. I was put off reverb, because I really disliked the big, bombastic-sounding records of the ‘80s, and also I’m not a very technical engineer, and I could never achieve that sound. So I had to find another way into engineering and create my own sound. My major influence in that was the records I collected in the early ‘70s, mainly British progressive rock. Bands like King Crimson, especially their *Starless in Bible Black* period and their Island album, Van Der Graaf Generator, Henry Cow, Slaphappy, Kevin Ayers, Soft Machine, Caravan — their records shaped what I like in sound. It was often really dry-sounding, not so well recorded stuff, with cardboard box-sounding drums, and things not balanced properly, like a hi-hat being way too loud or something. That sound had a big impact on me.

“I also often record drums in dead little rooms, and then, using delays and distortion, I create something that sounds like an ambience. I have these old solid-state Spectrasonic 610 compressors. They’re not very hi-fi at all, and when you put the drums through them they distort. They’re just bad compressors. You don’t hear the distortion unless you solo them, but it gives the effect of a reverb. I also use a lot of Sansamp guitar amp simulator on the drums. I’ll throw a little kick and snare drum into the Sansamp and mix that in with the original kick



Tchad Blake at work in Real World studios.

and snare sound ever so slightly. Sometimes I’ll throw that out of phase to drop the kick drum down an octave. You get a very cool sound doing that.

“Also, when I put these compressors on the overheads recorded with my Neumann head, it sounds as though the drums have been put in a room 10 times the size of the room in which they really were recorded. I love the contrast between recording hi-fi, which is what the Neumann head is, and adding a little bit of an incredibly distorted and compressed track in the middle. So you hear the hi-hat in one channel, but then you hear the compressor come up on the hi-hat in the middle. I also love using guitar-pedal analogue delays, because they sound dull and woolly, and they distort a little. I often use them on vocals. I prefer that over the sound of digital delays. I have an Electroharmonics Microsynth and a Ludwig Phase II synth — which is a guitar pedal with four different effects in it — plus a Podium compressor. The Podium is an extremely lo-fi thing that’s made for conferences and public speaking, to adjust the level as the speaker moves towards and away from the microphone. It’s really very, very poor, just a terrible compressor, and I use it on drums a lot.”

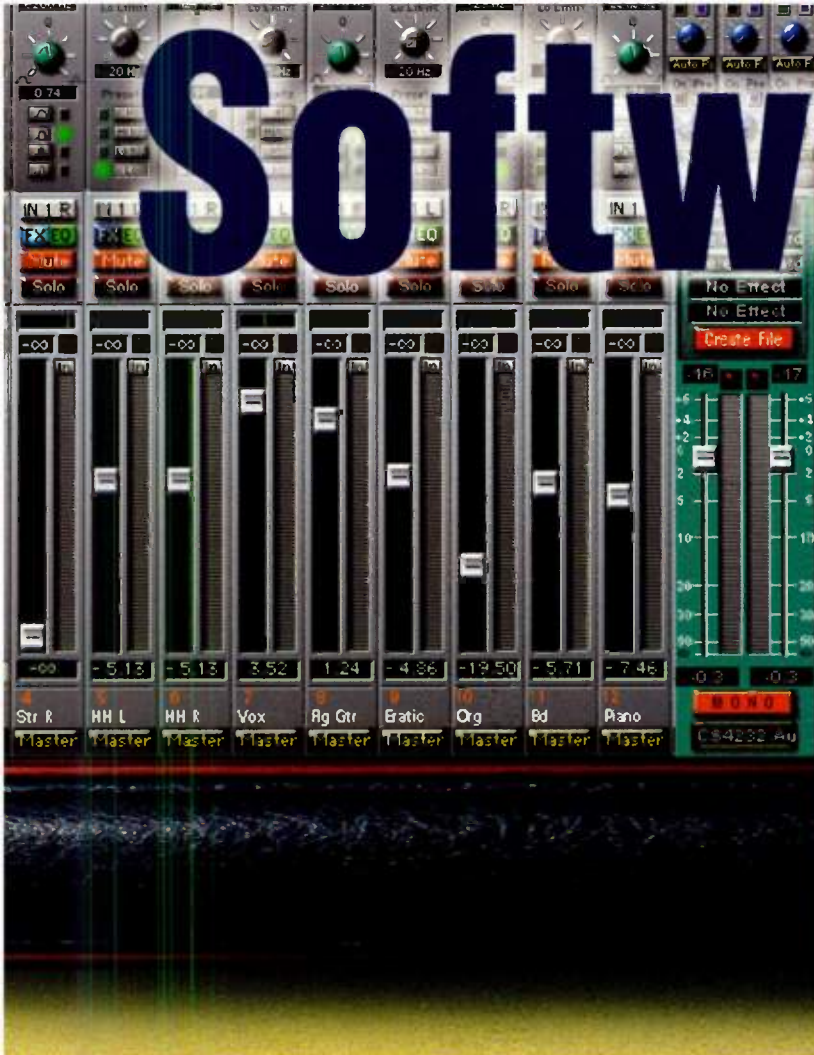
One of Blake’s most simple sonic tools is panning. Mitchell Froom has stated that “panning is for me a very emotional thing. There has to be a reason why you pan things in a certain way.” Blake remarks that Froom “probably places more importance on panning than I do, but it’s true that I use it as a means of expression. I don’t mind it sounding strange. Many people in studios want things to sound as if they could happen in real life, and ask: ‘How did that musician suddenly move from left to right?’ I never understood that. I like extreme, unnatural panning, like placing sounds far over on the left or right without reverbs or delays. For me the studio is a fantasy world, a place to make things happen that couldn’t possibly happen in real life.”



Thomas Mapfumo’s Chimurenga.

SOS

Software or



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.

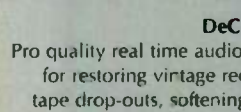
At first glance Virtual Studio Technology replaces a truckload of hardware, offering all the essential studio components in a reassuringly familiar format - Mixers have long throw faders and bargraphs, effects processors have buttons, knobs and LED displays.

Plug-In to These

An ever-expanding range of Cubase-compatible software effects are available from manufacturers 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:



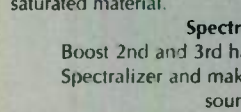
DeNoiser - RRP £299
Ideal for removing tape hiss or broadband noise this plug-in perform as well as equipment costing 50 times more.



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.



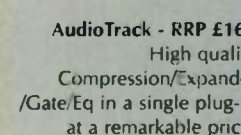
LoudnessMaximizer - RRP £299
Loudness Maximizer can increase the subjective loudness and boost the 'punchiness' of even the most overmixed/saturated material.



Spectralizer - RRP £299
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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

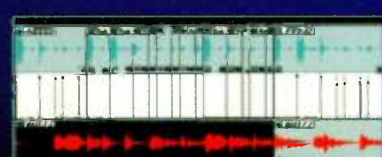
Just double clicking an audio part will open the audio editor. The toolbox



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,

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

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Leather, teak, flightcase and light module regrettably not included!

Cubase VST 3.5 RRP £329
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Minimum: Windows 95 • Intel Pentium 100 MHz • 24Mb RAM • 256 colours
Recommended: Windows 95 • Intel Pentium 166 MHz • 24Mb RAM • High colour (16 bit) 1024x768

System Requirements:

PowerMac or compatible computer • At least PPC 601/80 processor, faster recommended • Minimum 16Mb RAM, 24Mb recommended • Second level Cache required • System 7.5.1 or higher



CUBASE

VST 3.5

Steinberg

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Out of Austria

A good psychoacoustic enhancer can take your sound higher than you thought possible, and though there are plenty of enhancers on the market, this new Austrian model proves that there's always room at the top. PAUL WHITE tries to control his excitement...

HÖF HÖFEX SPECTRAL EXCITER II

People are always asking me what's new and exciting, so I'm pleased to be able to tell you, hand-on-heart, that the HÖF Höfex Spectral Exciter II qualifies on both counts — it's new, and it's an exciter. The market is awash with budget enhancers, but the problem with some of the cheaper models is that, while they add top end and clarity, they can also make your mixes sound harsh or fatiguing. Additionally, they can enhance your background noise just as well as your music, which means that the hiss level goes up. HÖF are one of those companies that appear to look at the very best of what's already on the market, then try to do the job better: the aim of the Höfex is to produce a subjectively cleaner, more open sound, with improved stereo spread, while at the same time keeping undesirable artifacts such as noise and harshness to a minimum. In common with some other good enhancers, the Höfex also claims to be able to increase the subjective loudness of a piece of audio without significantly increasing its actual peak level.

Physically, the twin-channel Höfex is a smart and stylish 1U-high rackmount processor, featuring just four control knobs per channel and three buttons in the centre of the front panel. The inputs and outputs are on servo-balanced XLR connectors and all the circuitry is analogue. (Incidentally, although HÖF have chosen to call their unit a Spectral Exciter, it's not related to the Aphex Aural Exciter, which is a registered trademark.)

MODUS OPERANDI

Simple enhancers only treat the very high end of the spectrum, but over the past couple of years, it's become more common to see some sort of bass enhancement or bass EQ added, to help balance the overall sound. HÖF have built a system that incorporates four stages, termed: Glitter; HF Exciter with Spectrum; LF Exciter; and REX Room

Excitement. As with most enhancers, the processing takes place in a side-chain, after which the processed signal is added back to the original signal.

Glitter, as the name seems to imply, affects the top end of the spectrum. There is no real explanation of what this stage does — it may be a form of regular EQ somewhere between 12 and 16kHz, dynamic EQ or harmonic resynthesis — but whatever it is, it adds a subjective 'openness' to the high end.

The HF Exciter Processor apparently introduces phase shift and is described as generating "overtones", though it's not clear how these differ from harmonics. A high-pass filter means that the process can be set to affect only signals above a specific frequency, variable from 500Hz to 8kHz.

To enhance the bass end there's the LF Exciter, which affects both the low bass and the lower mid-range. HÖF are keen to keep their secrets to themselves, but I get the impression that dynamic equalisation plays a part in this process.

Finally, there's REX, a single button that brings in a stereo width enhancer and lights up a yellow LED. Again, I don't have any hard facts about how this process works, but as it claims full mono compatibility I can only assume that whatever is added is added equally, and in opposite phase, to both channels. Such explanations as there are in the manual relate to psychoacoustic principles — I found mentions of overtone enhancement, formant emphasis, phase shift, simulation of natural reflections, expansion of the impulse field, and an increased pressure due to sub-frequency enhancement.

CONTROLS

Though the internal workings of the Spectral Exciter are shrouded in secrecy, the control topography is relatively simple.

Spectrum is a high-pass filter that determines which part of the spectrum will be fed to the HF Exciter overtone generator. It is continuously variable from 500Hz to 8kHz, but the most useful settings seem to be in the middle of the range. At high

Definition

passive /'pæsiv/ adjective **1** submissive. **2** inert

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



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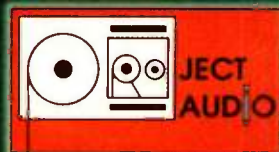
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HÖF Höfex Spectral Exciter II

“As enhancers go, this is nowhere near the cheapest, but it’s certainly one of the sweetest-sounding and most intuitive models around.”

▶ frequency settings the process is applied only to the upper regions of the audio spectrum, and so may not sound very obvious, but bringing down the frequency causes more of the spectrum to be processed. With some types of material, enhancing too far down the spectrum can start to produce an unpleasant sound (due to intermodulation) so it’s normal to use very low Spectrum settings only for processing percussive sounds, for example, rather than complete mixes. The HF Exciter control then determines how much of the synthetic overtone signal is mixed back in with the original.

The LF Exciter increases low-frequency energy, but without causing any significant increase in peak level, so I’m guessing that the process includes frequency-selective compression. Turning the control clockwise adds more of the treated signal to the original, and the result is a more solid, deeper bass end.

REX is a simple ‘on or off’ effect for enhancing the ‘width’ of existing stereo material, so it can only be used when the Höfex is processing a stereo signal. Because the REX level is fixed, the only way to balance it with the enhancer’s other effects is to use the level controls on the other sections. Listening in mono cancels out the REX signal without compromising the original audio.

The Bypass control isn’t a hard bypass, but simply mutes the effect side-chain, leaving the high-quality balanced input and output amplifiers in circuit. A further refinement is the Effect Solo/Program switch, which mutes only the original signal, leaving just the effect side-chain’s contribution. This switch is useful for checking just what is being added to your signal, but it can also be used to kill the dry signal when you want to use the Höfex in a mixer’s aux send/return loop. Normally, enhancers can only be connected via insert points, but this particular model can be used as a conventional effect. Of course, you need to pay attention to the pan positions of both the original sound and the excited sound when working in this way, and the processing delays inherent in digital mixers mean that the ‘aux send’ way of working is unlikely to achieve good results with such desks.

If you’re familiar with the way in which many enhancers work, you may by now be wondering why there’s no Drive control on the Spectral Exciter: HÖF have instead built in an ALC (Automatic Level Control) circuit that affects just the side-chain input, so that the user has one less control to worry about. However, it’s still possible to overload the circuitry if you really try, so overload LEDs are included for each channel.

THE SOUND?

As with any enhancer, the trick is knowing where to use the Spectral Exciter, when to use it, and — most importantly — when you’re using too much of it. This particular device has a sensibly limited processing range so that, although you can still over-use it, you can’t take the process too much further than originally intended, as some boxes allow you to do. Being able to mute the dry signal enables you to solo the side-chain’s contribution, and listening to that in isolation

tells you a lot about how the unit behaves.

Listening to the Glitter signal in isolation confirms my impression that it’s rather like the ‘air’ EQ found on some units. The sonic impression is of a wide, low-level boost centred between 12 and 16kHz, and it doesn’t sound as though any distortion mechanism is being used to create extra harmonics, because there are none of the harsh, intermodulation products that you tend to hear when you solo a harmonic enhancer. I still can’t tell if there are any dynamic elements to it, but this is a very nice control for emphasising frequencies that already exist in the mix, without making the sound too sharp.

Moving to the HF Exciter, this sounds to me more like a conventional harmonic generation system — if you lower the Spectrum frequency and turn up the level, you can definitely hear that characteristic harsh edge. Once the original signal has been added and the controls set to more moderate levels, the effect is much sweeter; this is the control to use when you want to build a top end for a signal that has very little going on in the top octave. For example, a dull-sounding guitar or electric piano can be given a musically plausible top end that may never have existed in the original sound (if you tried to do this using EQ, there would be nothing there to boost). The HF Exciter section also works for adding breathiness to vocals recorded with a dynamic mic, though it’s usually best to use HF Excite and Glitter in combination.

The LF Excite parameter works exceptionally well, adding weight and authority to the bass end without messing up the lower mid-range. If you pile on a lot of effect, the output level does increase by a few dB, but you can make a significant difference to the perceived bass loudness without affecting the peak output level by more than a dB or so. Activating the REX control causes a noticeable widening of the stereo image, and the whole mix seems to move closer. The effect may simply be created by adding anti-phase signals to the opposite channels, but it certainly works. However, I’d have preferred this to be adjustable rather than just on or off.

SUMMARY

I’ve tried all types of enhancers over the last few years. Only a small number of models really stand out for me, and the Höfex definitely deserves to be numbered amongst them. While there are slightly more flexible enhancers around, the Höfex has the advantage of a beautifully simple and intuitive control system, plus a classy, musical sound. I also really like the fact that you need only three knobs to mix in the three types of enhancement. As enhancers go, this is nowhere near the cheapest, but it’s certainly one of the sweetest sounding and most intuitive models around.

SOS

pros & cons

HÖF HÖFEX SPECTRAL EXCITER II £1146

pros

- Very easy to set up.
- Excellent sound quality.
- Can be used in dual mono mode, or via the aux send/returns of a mixer.

cons

- Relatively expensive.
- REX not adjustable.

summary

A very musical-sounding, professionally designed enhancer suitable for mixing, mastering or duplication. Very easy to use and well engineered, but quite costly.

SOUND ON SOUND

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all the right Channels

In the last year SOS has reviewed no less than 10 examples of the new breed of so-called 'Voice Channels', promising a one-box solution to high-quality vocal recordings.

DEREK JOHNSON & DEBBIE POYSER present a brief guide to the models we've looked at, to help you decide which you should go for.

BUYING A VOICE CHANNEL

The concept of voice/instrument 'channels', offering a set of processes ideally suited to getting a vocal or single instrument performance on to tape, isn't exactly new, but until multitrack tape gave way to computer-based hard disk multitrack, the demand was never great. However, with a greater emphasis on the quality of recorded sound, the voice channel has enjoyed a huge increase in popularity, both in traditional studios and desktop computer workstations. Analogue studio owners realised that they could make better recordings if they were able to bypass their mixers to keep the signal path short, while workstation owners found voice channels ideal for feeding mic and instrument signals directly into their A/D converters. As tapeless recording has become more affordable, and thus more widespread, voice channels have moved from the fringe of signal processing into the mainstream. There's been a real flood of 'channels' over the past year, ranging in price from under £200 up to almost £2000, and as this spread of prices would suggest, there's now a voice channel for almost every level of the studio market. And, in the words of SOS contributor David Mellor, in the January 1997 issue, if you don't have money to burn there's something to be said for the idea of buying a lower-cost mic and a voice channel instead of a single expensive mic — this would certainly offer you a wider tonal range than the mic option alone.

We've taken several features as qualifying criteria for inclusion in this article: a voice channel must obviously have a mic preamp, with phantom power to allow the use of mics that require it; it should offer a compressor, as compression is a process most people regard as essential when recording vocals; and it will usually offer at least one other process — typically EQ or psychoacoustic enhancement, de-essing or gating — and often more than one. Many voice channels also have a line-level input to allow you to process an instrument.

JOEMEER VC3 PRO CHANNEL (SOS review October 1996)

- Preamp with switchable phantom power.
- Compressor with switchable fast/slow attack, variable Release and Compression controls,



Bypass button and single LED for metering gain reduction.

- Enhancer with Drive, Enhance and Q (bandwidth) controls.
- Basic 5-LED level meter for signal monitoring prior to output level control.
- Line input for instrument or line-level signal processing.
- Insert point for patching in external processing.
- Mix jack to allow an external line input to be mixed with the unit's main input prior to compression and enhancement.

pros & cons

JOEMEER VC3 PRO CHANNEL £199

pros

- Easy to set up.
- Powerful, up-front compressor sound.
- Effective enhancer.
- Very sensible cost.

cons

- Very basic metering.
- Unbalanced outputs only.

summary

The most cost-effective voice channel on the market. If you like the sound of classic rock recordings, the chances are that you'll love the Pro Channel.

SOUND ON SOUND

info

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W www.joemeer.co.uk

LA AUDIO MPX1 MIC PROCESSOR (SOS review August 1997)

- Preamp with phantom power, phase reverse button, switchable high-pass filter, single peak LED for input metering. Additional DI input with 500kΩ input impedance on rear panel, for use with electric guitars or basses.
- Expander/gate. Expander has fixed ratio and variable threshold, with fixed attack and release times, and a green LED to indicate gain reduction.
- Compressor with side-chain insert point, basic de-essing filter and fully variable threshold and ratio controls. Since the compression is largely programme-dependent, there are no attack and release controls, but options for fast and slow attack and release characteristics are available. Gain reduction is shown by a six-section LED

LA Audio MPX1.



meter in the Master section, and there's also a make-up gain control and a bypass switch.

- 4-band equaliser with shelving high and low sections and two fully parametric mid sections, Q controls with fully variable bandwidth from three octaves to one semitone, bypass button and low-pass filter.
- All sections have their own inputs and outputs (unbalanced jacks) on the rear panel, so that they can be used alone or chained in any order. Main output available on both balanced XLR and unbalanced jack.
- Link jack so that two units can be used for stereo signals.

JOEMEER VC6 MEEKBOX (SOS review November 1997)

- Preamp with switchable phantom power
- Compressor with Compression (threshold), Ratio, Attack and Release controls, and green status LED to show when gain reduction is taking place.
- Enhancer with controls for Drive, Q and Enhance with amber LED which flickers when enhancer is working.
- Unbalanced jack inputs for line-level and instrument-level signals.

Joemeek VC6.



- Insert jack for patching in extra processing.
- Mix In jack to allow external line signals to be mixed into the signal path before compressor stage.
- Output level control and 5-stage LED output-level meter.

pros & cons

LA AUDIO MPX1 £299

pros

- Creditable range of features for the price.
- The various sections sound good, and there's a full four bands of EQ.
- Separate input/output access to all sections.

cons

- Q pots are small and fiddly.
- Expander can be rather abrupt on some material.

summary

A well-designed, attractively priced unit that delivers sonic quality where it counts, at the expense of a couple of minor ergonomic flaws.

SOUND ON SOUND

info

£ E299 including VAT.
 A SCV London, 6-24 Southgate Road, London N1 3JJ.
 T 0171 923 1892.
 F 0171 241 3644.
 E info@scvlondon.co.uk
 W www.scvlondon.co.uk

DBX PROJECT 1 MODEL 286A (SOS review of original 286 January 1997)

- Preamp with high-pass filter and 48V phantom power.
- Compressor.
- De-esser.
- Enhancer with patented LF Detail control (applies boost at 80Hz and cut at 250Hz); and HF Detail control (to apply 'intelligent' enhancement dependent on programme material).
- Expander/gate.
- Line input for instrument processing.
- Insert point for patching in external processing.

Reduced detail is given on this product because it is an upgrade on the previous 286 and has not yet been reviewed by SOS. It's worth taking a look at the 286 review, but bear in mind that the 286a has not only had its facilities improved (phantom power is now at the standard 48V, not 15V), but has also had a fairly substantial price cut, from £350 for the 286, to £230 for the 286a.

info

£ £349 including VAT.
 A Sound Valley Distribution Ltd, The Briars, North Road, Amersham, Buckinghamshire HP6 5NA.
 T 01494 434738.
 F 01494 727896.
 E sales@soundvalley.demon.co.uk
 W www.joemeek.co.uk

TL AUDIO VP2051 VALVE VOICE PROCESSOR (SOS review November 1996)

- Preamp with switchable phantom power, phase reverse and low-pass filter.
- 4-band EQ with high and low shelving filters (switchable shelving frequencies), bypass button and pre/post switch to place the EQ before or after the compressor in the signal chain.
- Compressor with soft-knee characteristic, insert point, switchable fast/slow attack and release times, Threshold, Ratio and Gain Makeup controls. The compressor sections of two VP2051s can be linked for stereo operation, ▶

pros & cons

JOEMEER VC6 £349

pros

- Fully variable controls.
- Helps vocals sit nicely in a mix.
- Very musical compressor and effective enhancer.

cons

- No compression gain reduction meter, just a single LED.

summary

Though corners have been cut to keep the price down, they don't detract from the sound or flexibility of this unit.

SOUND ON SOUND

info

£ £229.95 including VAT.
 A Arbitrator, Wilberforce Road, London NW9 6AX.
 T 0181 202 1199.
 F 0181 202 7076.
 E arbitrator@compuserve.com
 W www.demon.co.uk.arbitrator

TL Audio VP2051.



pros & cons

TL AUDIO VP2051 £469

pros

- Convincing vintage tube sound.
- Well engineered and stylishly presented.
- All the modules in the Voice Processor stand up well as processors in their own right.
- Recent price reduction makes it very good value.

cons

- None.

summary

TL Audio have created the right balance of sound, features and price. The VP2051 is a wonderful all-rounder that can be used to sweeten just about any mono signal, not just a microphone.

SOUND ON SOUND

▶ and the unit features an 8-section bargraph meter that can be switched to show gain reduction or output level.

- Line input on balanced jack, and two further unbalanced line inputs (one front-panel, one rear-panel).

info

£ £468.82 including VAT. (Soon to be joined by a similar model in the new Ivory range; see last month's news pages for details.)

A Tony Larking Professional Sales Ltd, Letchworth, Herts SG6 1AN.

T 01462 490600.

F 01462 490700.

W www.tludio.co.uk

JOEMEERK VC1 STUDIO CHANNEL (SOS review April 1997)

- Preamp with phantom power and high-pass filter.
- Compressor based around unique Joemeerk-design photocell and LED gain element, with

pros & cons

JOEMEERK VC1 £704

pros

- Warm, musical sound.
- Very effective compressor and enhancer.

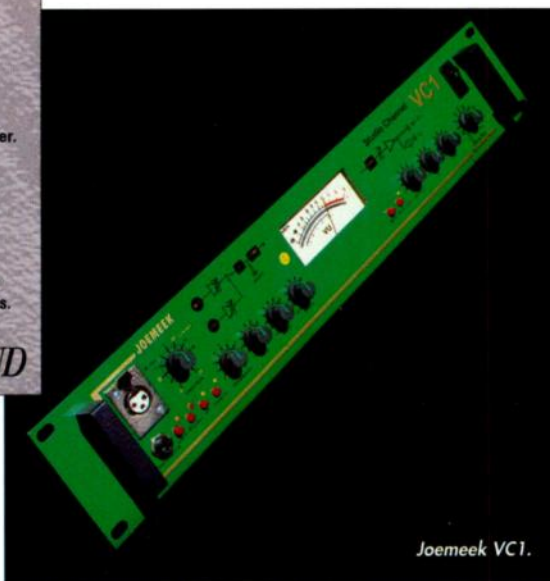
cons

- No auto-compression mode.

summary

A great-sounding 'character' unit with a flexible range of input and output options.

SOUND ON SOUND



soft-knee characteristic. Full Ratio, Threshold, Attack and Release controls are provided, as are a large VU meter which can show either gain reduction or output level, and a gain reduction LED to show compressor action.

- Enhancer based on dynamic equaliser principle, with Drive control (affecting both degree and 'tone' of enhancement) and accompanying bi-coloured LED to indicate when Drive amount is about right; Enhance control (to set the amount of enhanced signal mixed back into main signal path); and Q control to set the sharpness of the filter (affecting the duration of high-frequency harmonics).
- Balanced line input and unbalanced jack input for instrument processing.
- Insert jack after mic preamp for patching in external processing such as EQ.
- Output gain control to compensate for gain loss caused by compression.
- Three different output formats: quarter-inch balanced jack line output; transformer-balanced low-impedance XLR; unbalanced jack.

info

£ £704 including VAT.

A Sound Valley Distribution Ltd, The Briars, North Road, Amersham, Buckinghamshire HP6 5NA.

T 01494 434738.

F 01494 727896.

E sales@soundvalley.demon.co.uk

W www.joemeerk.co.uk

LA AUDIO CLASSIC CHANNEL (SOS review November 1996)

- Preamp with switchable phantom power and phase reverse.
- 4-band EQ with high and low sections and two sweep mid sections, with high-pass and low-pass filters, and bypass switches for both 4-band and filter sections.
- Compressor, designed around FET gain element for tube-like character, with soft- and hard-knee characteristics; Threshold, Attack, Release and Ratio controls (the latter variable in six steps from 1.5:1 to 20:1, rather than fully

WHY PAY MORE?

As you can see, the prices of voice channels can differ enormously, so what do you get at the high end of the market that you don't get in a £200 unit? Arguably the most important section of a voice channel is the mic preamp, and there's little sense in buying an external model that doesn't exceed the performance of your console mic amps. Certainly the direct signal path is an improvement over a conventionally used mixer, but the same minimum path benefits can be achieved by taking the direct out or insert send from a regular mixer

channel. What you're really paying for with a high-end voice channel is a very low noise figure at all gain settings, a wide frequency response for good transient handling, plenty of headroom and exceptionally low distortion. Tested with a good mic, the difference is often quite dramatic.

The compressor section is also important, but here character is often as important as accuracy. For example, the Joemeerk designs use an opto compressor to give a particular vintage sound, whereas the Focusrite's compressor evens out the vocals with

virtually no sign of processing, unless you are deliberately heavy handed. If the channel includes equalisation, this too needs to be better than a typical mid-price studio desk EQ, and the real test is to see how much EQ cut or boost you can apply before the sound becomes unnaturally nasal, harsh or honky. Top-end units let you change the sound dramatically with few negative side-effects, whereas cheap equalisers have to be used very sparingly to avoid ruining the sound.

Finally, check what features are left out on the cheaper models and whether they matter to you. Sometimes you'll find that the cheaper models provide

the same basic quality as the more expensive units in the range, but the metering may be simplified and the controls may have been pared down to a minimum. For me, this is a far better way to go than keeping all the bells and whistles but compromising on circuit quality. Whatever model you choose, remember that your mic signal will never sound better than it does at the output of your voice channel — no matter how good the rest of your system, all it can do is add further noise and distortion. With any luck, it won't add much, but you can be certain that the better your front end, the better the ultimate quality of your recording.

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E-mu Systems, Inc., Scotts Valley, California

LA Audio Classic Channel.

pros & cons

LA AUDIO CLASSIC CHANNEL £817

pros

- Transformers and FETs contribute to a warm, vintage sound, but with the low-noise performance of a modern design.
- Easy to operate.
- Smart styling.

cons

- De-esser can turn violent in inexperienced hands.

summary

A convenient and well-designed processor that combines a pleasing tonal warmth with effective compression and EQ. Ideal for high-quality vocal or instrumental recording.

SOUND ON SOUND



- variable); output gain control; bypass button with status LED; side-chain access; VU meters to show gain reduction and output level.
- Switchable, fixed-frequency de-essing filter.
- Line jack input for instrument or line-level processing.
- Insert point for patching in external processing.
- Two units can be linked for stereo operation.

FOCUSRITE GREEN CHANNEL STRIP (SOS review July 1997)

- Preamp with phantom power, phase reverse and 10-section LED signal level meter, which can also be switched to indicate compressor gain reduction and expander/gate operation.
- High-spec 4-band sweep EQ with switchable mid-range Q and high- and low-pass filters.

info

£ £816.63 including VAT.
A SCV London, 6-24 Southgate Road, London N1 3JJ.
T 0171 923 1892.
F 0171 241 3644.
E info@scvlondon.co.uk
W http://www.scvlondon.co.uk

FOCUSRITE GREEN VOICE BOX (SOS review November 1996)

- Mic preamp with switchable phantom power, phase reverse, mute button and high-pass filter, status LEDs and 5-section LED level meter.
- Compressor, with hard-knee characteristic, and Threshold, Ratio and Make-up Gain controls. Attack and release times are pre-optimised for vocal use, but an auto-release function is available for unusual material. There's a bypass button, and a switch that causes the LED level meter to show gain reduction.
- De-esser with Threshold and Bandwidth controls.
- Expander with 2:1 ratio.
- 3-band equaliser with low and high shelving sections and sweepable mid-range. Bandwidth can be set to normal or Notch, the latter for attenuating spot frequencies.
- Two units can be linked for stereo operation.

pros & cons

FOCUSRITE CHANNEL STRIP £1118

pros

- Classic Focusrite performance and transparency.
- Easy to set up.
- Versatile — can double as the ultimate DI box.

cons

- Legending small and sometimes obscured by the controls unless you're looking straight on.

summary

Though the Green range is a budget range for Focusrite, the Channel Strip isn't cheap — but the quality of processing is beyond reproach, and the unit has many applications, in both recording and mixing.

SOUND ON SOUND

pros & cons

FOCUSRITE GREEN VOICE BOX £998

pros

- Supremely transparent sound.
- Predictable, intuitive operation.

cons

- No line input.

summary

Though not cheap, the Voice Box allows project studio owners to buy into Focusrite quality for considerably less than the cost of the Red range.

SOUND ON SOUND

info

£ £997.58 including VAT.
A Focusrite Audio Engineering Ltd, Lincoln Road, Cressex Business Park, High Wycombe, Bucks HP12 3FX.
T 01494 462246.
F 01494 459920.

Focusrite Green Voice Box.



“As tapeless recording has become more affordable, voice channels have moved from the fringes of signal processing to the mainstream.”



- Expander/gate with Threshold and Release controls, gate Bypass button, Fast switch for use with percussive sounds, and external key input.
- Compressor with Threshold, Ratio, Release and Make-up Gain controls. Attack time controlled by 'Fast' button and release time switchable to Auto mode. Overload LED to show clipping at output. De-essing can be achieved in conjunction with the Channel Strip's filters.
- Line jack and XLR line inputs for instrument processing.
- Link jack, to allow two units to track for stereo applications.

- controls, and switch for selecting one of two preset ratios. Gain reduction may be shown on the large VU meter, and there's a bypass button.
- Enhancer with Drive, Q and Enhance knobs, dual-colour Drive LED to help set up drive level, and bypass button.
 - Insert jack, for patching in external processing.
 - Mix In jack to allow external line signals to be mixed with the VC2's mic/line signal before compression.
 - Link socket for stereo-linking two units.

E £1173.82 including VAT.
A Focusrite Audio Engineering Ltd, Unit 2, Bourne End Business Centre, Cores End Road, Bourne End, Bucks SL8 5AS.
T 01628 819456.
F 01628 819443.

info

JOEMEER VC2 TUBE CHANNEL
 (SOS review September 1997)

- Valve preamp, with mic and line inputs, phantom power, phase reverse, LF rolloff switch (the latter three with status LEDs).
- Compressor with Threshold, Attack and Release

E £1760 including VAT.
A Sound Valley Distribution Ltd, The Briars, North Road, Amersham, Buckinghamshire HP6 5NA.
T 01494 434738.
F 01494 727896.
E sales@soundvalley.demon.co.uk
W www.joemeek.co.uk

info

Guide compiled by Derek Johnson & Debbie Poyser from SOS reviews by Paul White and David Mellor.

pros & cons

JOEMEER VC2 £1760

pros

- Easy to set, with clear metering.
- Helps sounds sit properly in a mix.
- Clean mic preamp section and very musical compressor.

cons

- Some users may worry about the lack of a separate compressor ratio control.

summary

A distinctive sounding signal processor that makes light work of vocals and is flexible enough to be used on instruments.

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Hit ^{the} factor

PRACTICAL DRUM KIT MIKING

The ancient art of drum-kit miking is a black art as far as many project studio owners are concerned. Yet, as BENEDICT GRANT explains in the first of this two-part series, there's no need to let the kit beat you...

Many songwriters and home studio engineers lack confidence in their ability to record a drum kit at home or in an untreated room: this has condemned many songs which would have benefited from the live feel of real drums to the metronomic tyranny of the beat box. The reality is that a good live drum sound can be achieved in a small, untreated room, with just a few inexpensive microphones, providing that care is taken with the preparation of the kit and with microphone placement.

BE PREPARED

Tuning and preparation of the drum kit is a vital first step towards obtaining a good sound: a kit

which sounds fine for gigs and rehearsals may show all manner of imperfections under the harsh scrutiny of the studio monitors. Stage one is to eliminate clicks, rattles and buzzes. The bass drum pedal is often a culprit. It must be securely attached to the drum shell, and should be oiled if it squeaks. Any of the metal fixings on the kit which rattle should be tightened or damped with Blu-Tack.

Next, each drum must be tuned by adjusting the tension of its skin. This should be tightened evenly, and you should check by tapping the skin round its perimeter, ensuring that the pitch is constant. Experiment with different tuning pitches on the bass drum: you'll be surprised at how much this can affect the feel of a track. If you're using double-headed toms, ensure that both heads are tuned to the same pitch.

A powerful and well-defined sound is more easily achieved if the bass drum has a hole cut in the front skin. Some drummers cut a small hole, of seven inches or so in diameter. This can make the rest of the skin resonate, so I prefer to cut a much larger hole, leaving just an inch or two of the skin around the perimeter. It is not advisable to remove the front head altogether, because the drum shell would then be subjected to uneven stresses, with the potential for damage and warping.

Any drum which rings or resonates to excess should be damped, by gaffa-taping a small pad of paper tissue or fabric to the drum skin close to the edge. Don't damp a part of the drum that the drummer will want to hit! A cushion or pillow should be placed inside the bottom of the bass drum, about half an inch away from the head, to reduce unwanted resonances. This can be moved into contact with the skin, if required, to damp it further.

The most important parts of the drum kit are the bass and snare drums: both must give clear, positive beats which decay before the next beat if a blurred sound is to be avoided. The sound of the bass drum is also determined by the material of the beater: wood gives a modern, snappy sound; leather and felt produce more of a thud, better suited to a rock style. A 'black dot' drum skin gives a harder, better-defined beat. Try taping a beer mat onto the skin at the point where it is struck in order to obtain a similar effect.

Tuning the snare drum high gives a high, contemporary sound, whereas a lower tuning is more suited to rock music. The lower head should be slightly looser than the batter head. Tuning pitch also determines the decay time for the drum sound, which is longer for a low pitch. For fast tracks, it may be necessary to raise the tuning or increase the damping so that the drum does not resonate from one beat to the next. (This creates a muddy effect.) The snares should be tensioned so that they rattle crisply when they are on and the drum is struck, but do not buzz or rattle in sympathy with any other part of the kit. If necessary, the wires can be damped by applying a little gaffa tape to them, close to the edge of the drum, though inevitably you have to live with some rattle. Using a snare gate can help keep this under control.

Tom-toms often have an excessive ring, which should be damped as described previously, rather than by using the drums' internal dampers, which apply pressure to the rear of the skin and thus affect the tuning.

It's important not to damp the kit excessively — you want it to sound like the dynamic powerhouse of the band, rather than a lifeless accumulation of soggy cardboard boxes.

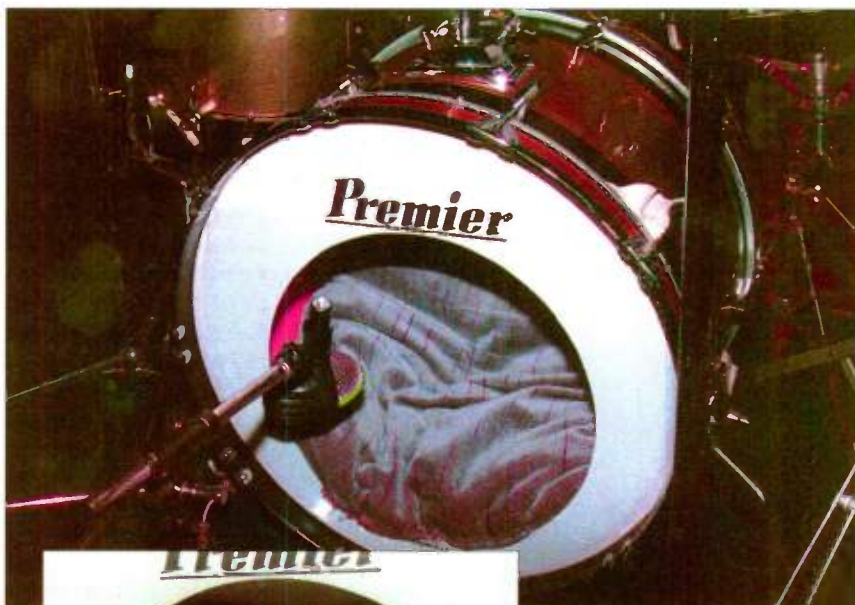
MIKING THE KIT

The most straightforward way to mic a kit is with a single pair of overhead microphones. This technique gives a very natural sound, with excellent stereo imaging, but it limits the possibilities for adjusting the drum sound during mixdown. I find this technique very effective for jazz and for ambient music. It is least successful for pop and rock.

Start by positioning the microphones at a height of six feet and about five feet distant from the kit, and experiment with moving them further back until a good, well-balanced sound is achieved. If you are working in a room which has a pleasant live sound, try moving the microphones further back, in order to increase the amount of reverb the mics pick up from the room. Listen to the sound with the mics in different positions. Note that it's wise to err on the side of caution and not record a sound which is too reverberant: you can always add more reverb using a digital processor, but it is impossible to reduce the amount of reverb on a recorded sound.

It's best to use condenser mics or high-quality dynamics: Tandy pressure zone microphones (PZMs) make good budget overheads, and can be gaffa-taped to the mic stands. Reasonable results can be obtained with Shure SM57s, which are fine and relatively inexpensive dynamic mics. Almost any condenser mic (AKG C1000, C451, C414) will perform admirably as an overhead. I have used this technique to record drums for a five-piece jazz group, using a Calrec Soundfield stereo microphone as my overhead.

A very worthwhile improvement on this method is to add a third mic for the bass drum. This allows the balance between the bass drum and the rest of the kit to be adjusted during mixdown, and enables the bass drum sound, which often requires processing, to be treated



(above): This bass drum has had a hole cut in it to intensify its sound, and has then been damped by the addition of a cushion. Note also the use of a dedicated bass drum mic.

(left): Recording the bass drum with a PZM mic.

separately. Many bands, including Led Zeppelin and The Beatles, used this setup to good effect.

CLOSE MIKING

Most commercial recordings are now made using a multi-microphone setup. Each instrument in the kit has an individual microphone, which allows the balance between individual drums to be adjusted by the engineer, and for each signal to be processed and equalised separately. For this technique to be effective, good separation must be achieved between microphones, so that each picks up the sound from the drum to which it is assigned, with the minimum possible bleed from adjacent drums.

It is not necessary to mic every single drum: bass and snare constitute the powerhouse of the kit and are the most important. The hi-hat bleeds through onto the other mics to such an extent that a separate mic is often redundant, and the cymbals are best picked up on a single pair of overhead microphones.

The bass drum is usually recorded with a dynamic mic. This should be fixed to a short boom stand, and positioned inside the drum about two or three inches from the skin and somewhat off-centre. I incline the mic downwards at about 30 degrees, and pointing away from the floor tom. The AKG D12 and Sennheiser MD421 have been popular choices for decades. A Shure SM57 works well on the bass drum, as does their new Beta 52. I have heard of a PZM being employed, resting on the pillow in the drum. Most condenser microphones will produce a very fine sound but I feel that they are wasted on the bass drum, and I prefer the slightly fatter sound of a large-diaphragm

PRACTICAL DRUM KIT MIKING

- ▶ dynamic like a D12. If you do use a condenser mic, switch the attenuator pad in, to prevent the mic distorting with the high sound-pressure level.

The snare drum is one of the most important elements of the kit, and in order to maximise processing options during mixing, it is important to achieve the greatest possible separation. This is difficult because of the snare's proximity to the hi-hat and toms. I place the mic just an inch or two above the batter head, pointing away from the hi-hat, which is always the worst source of overspill. It should not point towards any of the toms, nor should it be located where the drummer is likely to hit it.

I generally choose a dynamic mic such as an SM58 or Beyer 201, both of which are quite directional — this aids separation. Condensers are equally effective: the AKG C1000, C451/CK1, and Neumann KM84 all perform well, and tend to give a brighter sound than a dynamic.

A condenser mic is most suitable for the crisp, bright sound of the hi-hat. The KM84, C451 and C1000 all perform admirably, as does the AKG C414 for those with heavy wallets. I position the mic about three inches away from the upper cymbal, pointing away from the snare drum in order to maximise separation. A crisp, hissy sound can be achieved by miking the edge of the cymbal, whereas placing the mic closer to the centre produces a more metallic sound, emphasising the click of the stick. It isn't always necessary to mic the hi-hat separately, because it is picked up so clearly by the overheads, as well as spilling over onto the snare mic.

The toms can be miked with most good dynamic or condenser microphones. The SM57 is a popular choice, but I often use AKG C1000s, which give a crisper sound. I position them two or three inches above the skins, angled at about 30 degrees. Toms are rarely subjected to drastic processing, so

“The most important parts of the drum kit are the bass and snare drums.”

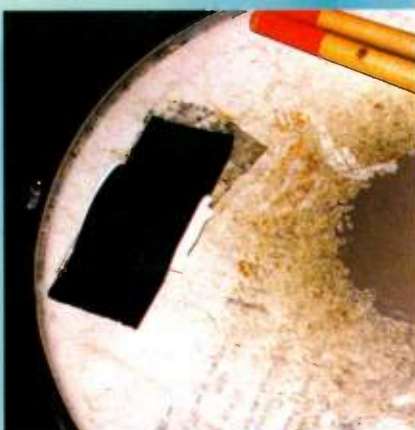
BONUS DRUM TIPS

- Many drum shops sell Moon Gel, a sticky substance not unlike chewing gum, which is extremely effective for damping drum skins; you simply tear off a small lump and stick it on the offending skin. It leaves no trace when removed, and can be re-used.
- Make sure that mics and stands are well away from the drummer's strike zones. Also, to avoid unwanted mechanical noise, don't let the mic stands touch the drums or drum stands.
- Try to get the best sound you can by changing mics or moving mics around, before you resort to EQ.
- If there is too much spill from the crash or ride cymbals in the tom-tom mics, try miking the toms from underneath.
- Always evaluate the kit sound with the same drummer as the one you'll be recording. The same kit can sound totally different when played by another drummer.
- Remove boomy resonances from toms by damping them, using small pads of cloth or tissue gaffa-taped to the heads. Lay a pillow inside the bass drum resting gently against the

back head.

- If you don't have a dedicated kick drum mic, experiment with what mics you do have, as the chances are that some will do the job noticeably better than others. Try to use mics with similar characteristics on all the toms.

Damping the snare drum with tissue and gaffa tape.



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PRACTICAL DRUM KIT MIKING

- ▶ attaining good separation is not vital. Indeed, a small amount of overspill on the tom mics can help to give a live feel to the recorded sound.

Two overhead mics provide the main sound pickup for the cymbals, as well as picking up sound from all the other instruments in the kit, to give cohesive stereo imaging to the kit as a whole and add some ambience. Condenser mics are best suited to the demanding task of capturing the

OTHER PERCUSSION INSTRUMENTS

There are many percussion instruments which do not form part of a drum kit, but which will sometimes be encountered in the studio. Tuned percussion instruments such as xylophones, glockenspiels, marimbas and tubular bells should be recorded from above, preferably using a good condenser mic (AKG C414 or C1000, for example). Because the sound does not emanate from one point, but from the individual bars or tubes of the instrument, it is important to listen to the sound and take care to place the microphone in a position where it picks up the sound evenly. If a single microphone is used, try positioning it between 18 inches and three feet away from the bars. Where the instrument features prominently in the song, I tend to record in stereo, with two microphones spaced slightly apart. A similar technique can be applied to any other instrument which 'tinkles' or has a significant high-frequency content, such as bell tree, triangle, or rainstick. I find, when recording bass percussion instruments, including timpani, that a fuller, more rounded sound can be captured

Miking the hi-hat.

“The reality is that a good live drum sound can be achieved in a small, untreated room, with just a few inexpensive microphones.”

Miking the tom-toms.

exceptionally wide frequency range of the cymbals. If you are not constrained by budget, AKG C414s or Neuman U87/89s are splendid. However cheaper mics, such as the AKG C1000, can perform admirably, and I have achieved results I am proud of using PZMs. Overhead mics are generally positioned just behind the drummer, at a height of about six feet, pointing down towards the cymbals.

If your microphone collection does not permit separate miking of the toms, they can usually be picked up adequately on the overheads. In this situation, it's possible to adjust the level balance between the cymbals and toms by adjusting the height of the cymbals, and also by altering the position of the overheads, so that the mics pick up relatively more or less of the tom sound, relative to the cymbals.

Where the drums are being recorded in a reverberant, live-sounding room, experiment with placing two more microphones at a distance from the kit to capture the ambience of the room. PZMs fixed to the wall can be very effective.

if the mics are placed at a distance of five feet or more. A good dynamic mic, such as a Sennheiser MD441, may be used instead of a condenser.

SUMMARY

It's important to realise that every drum kit is different and sounds different, and that there is no single correct technique for miking up. The suggestions in this article are the result of many years of practice, experimentation, and chatting with other engineers, as well as my own taste. Next month, in the concluding part of this short series, I'll be moving on to recording and mixing the well-miked kit. Meanwhile, you should feel free to experiment with the resources you have available, to get the most appropriate sound for the track you're recording

SOS

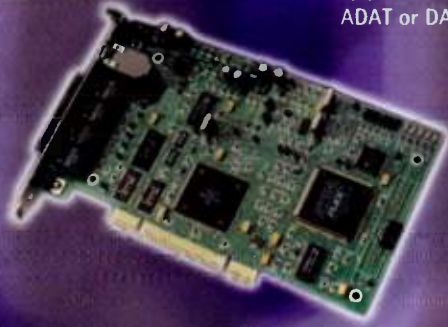
Thanks to Steve Kent at Denmark Street Studios for allowing the use of the studio for the photos, and Jackie at the Drum Cellar in Denmark Street for the use of the cymbals.

LIVE & KICKING

Drums sound best in a bright, reverberant space with lots of hard surfaces: the modern trend is for a very live sound, and many studios have 'live' rooms (often with stone walls) specifically designed for drum recording. Personal experience shows that an empty garage can make an excellent drum room. If you don't have a suitable live room, drums can be recorded just as effectively in a living room, with ambience added using a digital reverb.

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PORTABLE DAT RECORDING ON A BUDGET

Taking a compact DAT machine out and about can gain you some unique recordings, but can also present you with some unique problems. MARTIN WALKER packs his shoulder bag and heads for the hills.

One of the most cost-effective DAT machines launched over the last few years is the Sony TCD D7 portable (now superseded by the similar TCD D8). Although only the size of a standard Walkman, this 'DAT Walkman' is just as capable as many of its larger DAT cousins, but with the advantage that it can run on batteries, making it ideal for roving recording of sounds which will be unique to you and your music. If you're attracted by this idea, there are several things you'll need to sort out before you can begin.

MIC CHOICES

One of the difficulties for the recordist on the move is sourcing high-quality microphones, suitable for stereo use, at reasonable prices. Although you can still capture many sounds in mono (spot effects, for instance), the beauty of real-life sounds in the wild is that they are always

in stereo, and already include natural reverb of a much higher quality than even the best Lexicon.

You could take two standard mics, mounted on a suitable stand (two mics can be bolted onto a 'stereo bar' which only costs around £10), but this might be a bit unwieldy on a regular basis for hand-held work. You would also need to make up a 'Y' conversion cable, to connect the twin XLR mic connectors to the 3.5mm stereo jack input of most mini DAT recorders. For the odd session, you could always take a couple of normal mic stands as well (especially if you have someone else along to help carry things), but not if your chosen location is more than a few hundred yards from the car park! If you want advice on the many ways to mount and position coincident or spaced stereo mic pairs, Hugh Robjohns covered this area in great detail in the

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## PORTABLE DAT RECORDING ON A BUDGET

► February and March '97 issues of *SOS*.

For regular outside recording, consider buying a stereo mic: suitable budget models costing between £150 and £300 are available from Sony and Sennheiser, amongst others. The choice is largely dependent on the sort of signals you want to record: for hard-edged industrial and machine sounds, most general-purpose mics will suffice, but for ambient or wildlife sources, the levels will nearly always be much lower, so low-noise and more directional polar responses will be important. For distant sounds, a 'shotgun' mic, being particularly directional, will enable you to capture more of the desired sound and less background noise from other directions. If you're likely to do a lot of wildlife recording, it's also possible to buy parabolic

portable, by far the best solution is to take it along to the dealer and try a few short recordings with several mics: this may save you an expensive mistake.

### HEADPHONES

The choice of headphones for location work is very personal, and much the same decision-making process applies as for studio use. Open headphones tend to be fairly light and comfortable to wear, but if you are hand-holding the mic, can be prone to feedback. Enclosed types tend to be hot to wear for long periods, especially if you're out in the sun, but have the advantage of letting you hear exactly what is going onto tape.

Sometimes you may want to work largely 'incognito', and cheap earpiece types are more suitable for this — for rough-and-ready sound grabbing, monitor quality is sometimes not so important, since most of the serious monitoring will be done back at the studio, when editing. The reason I sometimes use this approach is that holding a mic and wearing obvious headphones can attract interested passers-by, and if you're trying to capture quiet ambient sounds the last thing you need is people coming up for a chat! I once stood for over an hour in the middle of a wood, with some wonderfully atmospheric wildlife sounds going on, but was unable to get in a single worthwhile take between a string of passers-by!

### INTERFERING WITH NATURE

Since the human brain and ear combination is remarkably good at resolving wanted details in a morass of clutter (how else could we home in when someone mentions our name in a conversation across a crowded room?), location recordings often contain unwanted background sounds that were unnoticed in the heat of the moment. Back at the studio, it's often surprising how many sources of interference can render an otherwise perfect recording useless (but see 'Forensic Sound Editing' box). One recurring source of interference is light aircraft: these seem to take up to 10 minutes between entering and exiting earshot during an otherwise tranquil day. Other annoyances are distant chainsaws and lawnmowers, whose sound travels for several miles, and groups of people discussing their latest job frustrations whilst walking the dog. People-related noises can be minimised by recording at unsociable times of day, such as early morning or during the night. This also lets you catch such 'unearthly' sounds as the night calls of animals and birds. It's advisable to carry a torch at night, but you do run the risk of a visit by the local constabulary if anyone spots you creeping about in the woods using it!

When it comes to handling noise, I suspect that most people will be surprised just how much noise they can make themselves, even when trying to be particularly quiet. If you attempt to hand-hold the mic, the slightest movement of your fingers, hand and arm can create alarming clicks and rustling noises. The cheapest solution is to balance the mic in the fork of a convenient tree, and many people have used this impromptu approach. Alternatively, ►

## FORENSIC SOUND EDITING

If you make some great recordings that are let down by background noises, it may still be possible to extract usable sounds with the aid of computer noise reduction. Even the shareware WAV editor *Cool Edt 95* has this facility, although it is unlikely to compete with more expensive specialist packages. The main proviso when attempting to clean up audio of any description is the regularity of the offending noise. Continuous, unchanging sounds, such as hiss and hum, can often be reduced quite significantly using something like the Noise Reduction plug-in of Sonic Foundry's *Sound Forge*,

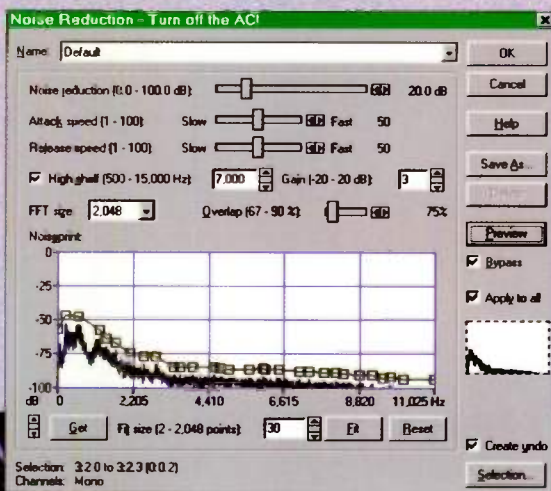
especially if there is a second or two of the noise by itself somewhere on your recording, from which you can generate a 'noiseprint'. (Always try to capture a snatch of any background noise by itself — if you are aware of it while recording — as this will make the process easier). A noiseprint is formed by spectrum-analysing the audio signal, to build up a 'frequency picture' of the offending sound. Accurately subtracting these frequencies from the waveform then partially removes the noise, whilst largely leaving the desired signal intact. Noise from cheap mics and DAT machines can often be significantly improved using these methods.

If you don't have access to noise-reduction

software, all is not lost, especially if you have a parametric equaliser, or failing that, even one of the typical 'swept mid'-style EQs on your mixer. You can often trim away significant parts of the spectrum, especially the extremes — 100Hz and below, and 6kHz and above — without totally destroying your sound. Using this in conjunction with a good enhancer or dynamic filter, you can still get rid of steady hisses without 'dulling' the sound too much in the process.

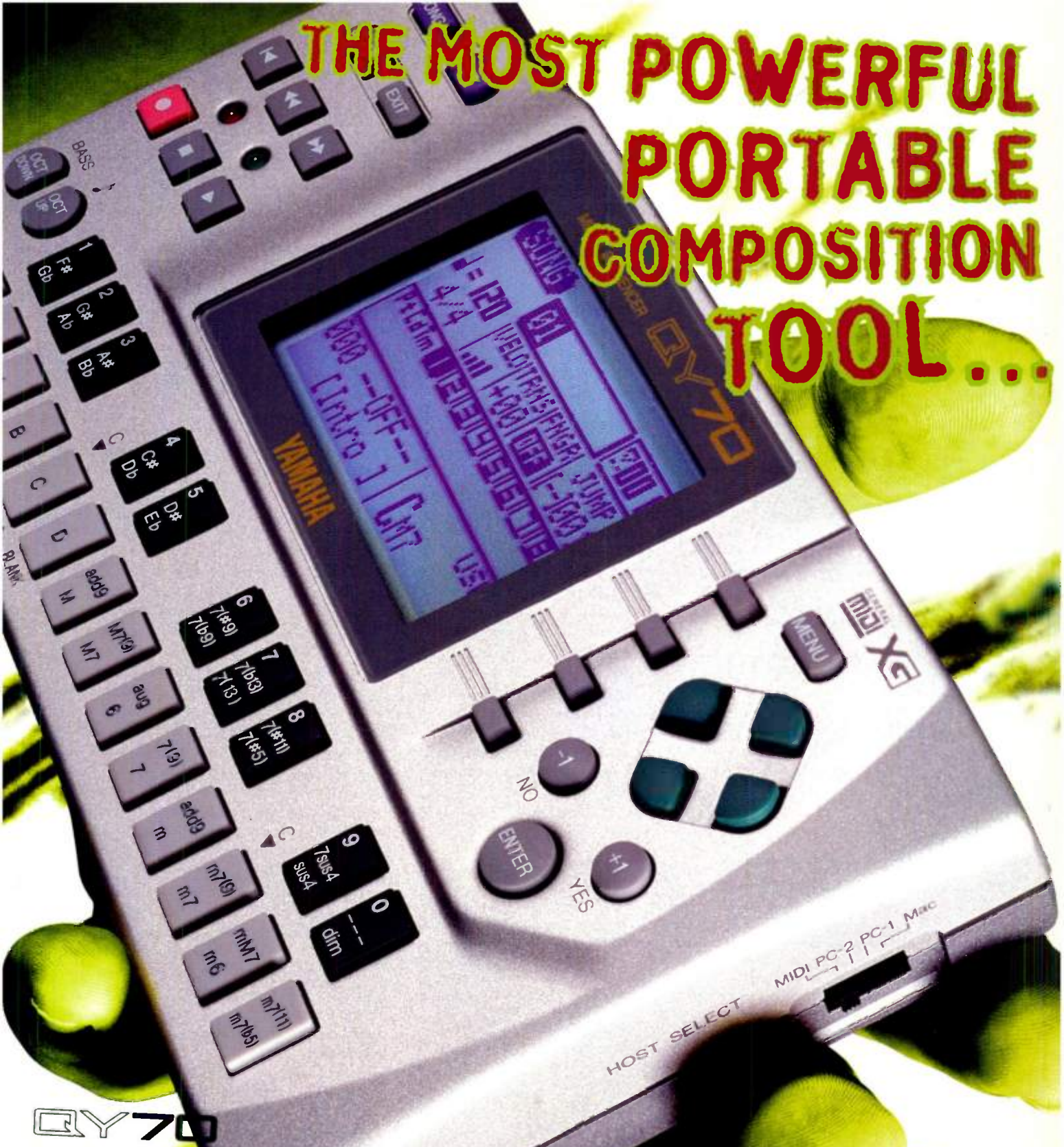
reflectors that attach to the mic. These 'focus' the mic response (rather like the end of a torch, with the mic replacing the light bulb), although they can affect the frequency response.

Although there are various low-cost stereo mics available for under £100, mostly of the back-electret variety (normally powered from a single AA-size battery), they are only really suitable for interviewing and other close-up applications where a reasonable level of input signal is expected. If you're after capturing ambient sounds inside caves, or the call of a circling buzzard, for example, these kinds of signal levels can be extremely low, and in this case noise levels from a budget mic can cause a lot of frustration. I know that many people still use stereo mics of the cheap and cheerful variety, but the result of this can be DAT recordings with the same amount of hiss as a compact cassette. Since your recorder is



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## PORTABLE DAT RECORDING ON A BUDGET

► get hold of a cheap mic desk stand, as used for interviews, and just place this on the ground, or other convenient object, such as a large rock. This will remove handling noise altogether. If you need to 'aim' a bit more, try dismantling a studio mic stand, and take the boom arm with you (but be aware that, after a few hours, most will seem surprisingly heavy!) The ultimate solution to handling noise is one of those suspended cradles normally used with delicate high-end mics. As long as the mic is suspended, handling noise should become a thing of the past. Cradles can be quite inexpensive (I spotted one in the Studiospares catalogue for about £30), and a convenient way to support one is with a pistol grip or extendable fishpole. Again, these can be obtained from most studio suppliers, such as Studiospares, HHB, and Canford Audio.

Mini DAT recorders like the Sony TCD D7 and D8 have a combined unbalanced mic/line input on a 3.5mm stereo jack socket. Most 'budget' stereo mics (under about £300) will probably be supplied with a lead already terminated in the required 3.5mm stereo jack plug, but otherwise you will need to make one up yourself. This is not such a pain as it sounds, since another potential noise problem area is the mic cable itself, and it may be worth making up a special cable to minimise this. Try holding up a length of cable very close to your ear and flexing it. Any creaking, rustling or crackles may be the braid moving internally, or the cores moving against the sheath, and these noises are more likely to cause problems with the unbalanced mic inputs found on typical low-cost DAT machines than the balanced inputs

of most mixing desks. It's worth replacing a cheaper mic cable with one that incorporates a cotton filler (which is always a pain to deal with when terminating cables, but really earns its keep, stopping internal movement). I made up a special cable for hand-held location use; it's only a metre in length, but this is quite sufficient for most 'point and click' recordings. For wildlife sounds, much longer cables will allow you to get the mic close to a likely spot, while you and your recorder can remain hidden behind a convenient rock.

### GETTING THE WIND UP

Of all sources of interference when location recording, the most frustrating must be wind (from the surroundings rather than the recordist). The slightest breeze can cause wild excursions on the input level meter, and give rise to overloading unless you're very careful. Many mics incorporate switchable bass-cut filters, and this is a good way to remove the occasional low-frequency rumble caused by a light breeze, without removing a significant portion of most desired signals. If nothing else, it will help prevent what used to be known in the days of analogue moving-coil meters as 'banging against the endstop'.

A straightforward foam pop shield is rather ineffective for outdoor recording, although those with an air cavity between the foam and the head of the mic can be slightly more effective. The 'tapestry hoop and nylon stocking' shields used for vocals are not at all suitable for reducing outdoor wind noise, unless you experience one of those rare winds that always blows in the same direction! Professional wind shields do seem surprisingly expensive (starting at about £100), but once you've tried to work without one a few times you might be tempted to raid the piggy bank. (The expense of windshields is, by the way, another reason why using a pair of mono mics for field recording tends to become even less desirable.) The classic professional design is the BBC 'hairy sausage' (see above left), which uses long, hairy, fleecy-like material to present a high-impedance path to wind movement, while compromising the frequency response at audio frequencies as little as possible.

It is possible to improvise, if you don't mind getting odd looks from passers-by. I have, on a few occasions, used an umbrella as a portable windshield. With the umbrella handle supported underneath your arm and the 'business' part resting on your head, you can divert most light gusts of wind sufficiently to prevent popping sounds, while still leaving both hands free. You can also angle your body to optimise the results, depending on wind direction. Because the 'windshield' is so far from the mic, this approach has the added advantage of not compromising the frequency response of the mic, which may happen when placing any object close to a mic.

### RUNNING OUT OF JUICE

Anyone who has ever tried using a portable DAT recorder on location will have come across the



*A professional windshield, such as the Rycote one shown here, can make all the difference when it comes to making outdoor recordings.*

### THE PROFESSIONAL APPROACH

The professional portable recorder market was for many years dominated by the name of Nagra. These rugged analogue machines were used (and still are) by many TV, radio and film recordists when high quality and long-term reliability were needed. Nowadays many professionals have turned to DAT, using machines like HHB's PortaDAT. This provides a rugged four-motor transport for reliability, as well as four heads, for essential off-tape monitoring. In addition, the

rechargeable battery uses Metal Hydride cells, which don't suffer from the so-called 'memory effect' problems of NiCads (see main text). Other big plus points are the standard 48V phantom supply, balanced XLR mic/line inputs, and a built-in limiter, which could be a life-saver with the unforgiving nature of digital overload. Timecode becomes more important when recording in sync with timecode film cameras, and HHB have a model (the PortaDAT PDR1000TC) with this built in. The basic model costs around £3000, and is used widely by professionals around the world.







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## PORTABLE DAT RECORDING ON A BUDGET

► frustration of using rechargeable NiCad (Nickel Cadmium) batteries in the field. Seemingly, each time you buy a fresh set they last for three or four recharges, and the next time you need to use them a month later, they only hold enough charge to power the DAT machine for about five minutes. This is very frustrating when doing location recording, and it always seems to happen when you're trying to capture one of those unrepeatable sounds.

### ALTERNATIVES TO DAT

All is not lost if you don't have a portable DAT recorder, as there are several alternative approaches. The reputation of Sony's MiniDisc format has gone from strength to strength, now that the latest version of the ATRAC compression system can sometimes even fool the experts in a side-by-side comparison with DAT. There are several portable models starting from about £350, but don't get caught out buying one of the much cheaper playback-only models.

Compact cassette recorders are not renowned for quality sound, but can still be acceptable for grabbing the odd sound effect, especially if you have access to some computer-based cleanup facilities (see 'Forensic Sound Editing')

box). The main problem is likely to be high-frequency noise, so if your desired sound is not particularly wide-band, you can roll off the top end without compromising the sound too much.

There is, however, a distinct advantage to buying a second portable DAT recorder, in addition to a main rackmount studio model — you can make digital copies of your precious DAT masters, assuming that both machines have compatible digital I/O sockets.



NiCad battery packaging always states that these batteries can last up to 1000 recharges, so we must be doing something wrong. If you look into it a little further you will find that there are various methods of prolonging the life of NiCad cells, and, more importantly, ensuring their reliability in the field. Before we get onto these, pause a moment to consider one alternative: alkaline cells (such as Duracell). Although non-rechargeable, they do have double the capacity (and therefore operational life) of equivalent-sized NiCads — with the Sony TDC D7, Duracells should last up to four hours in continuous operation, while a set of NiCads only lasts about two hours. If you have an important recording to make, always have a set of Duracells handy for emergencies. If your NiCads go belly-up, you can swap them for the Duracells, which have a shelf life of up to five years.

### CHARGING ABOUT

The so-called 'memory effect' used to occur when repeatedly topping up partly discharged cells, leaving them in a state where only the 'topped up' part of the charge was effective, and the charge only lasted a very short time. This is technically known as a shallow-discharge/full-charge cycle, and used to happen particularly with devices left in a charger 24 hours a day, such as pagers and cordless phones. Modern cell design has largely removed this problem, but, as always, the myths continue that this is the primary cause of NiCad failure.

In fact, capacity loss problems are normally due to several other factors. If cells are stored for a long time without being used, they will slowly lose any remaining charge (at a rate of about 1% per day). When cells have run down by themselves, the initial recharge never lasts as long as it should, due to internal chemical processes. If you haven't used particular cells for several months, you'll need to 'wake them up' by going through two or three charge/discharge cycles. After the first charge, you might get 40% of normal capacity, and after the second charge 70-80%. Finally, after the third recharge, the capacity should be up to 95% or more of its original value.

Long-term over-charging (normally when people continually leave the cells on permanent charge until needed) can result in the same lowered initial capacity. Again, a few charge/discharge cycles will normally restore cells to their full usable capacity. Long-term 'trickle' charging can also create problems, although it does make using portable units with mains adaptors much easier, as you can recharge the cells every time you plug your unit in on return to the studio.

If you want to get reliable use from your NiCads, adopt a sensible charging regime. When you first buy a set of cells, look at the packaging to determine their capacity (measured in Ampere Hours or Ah. A cell with a rating of 1Ah will supply a current of 1 amp for an hour, on a single charge). Since portable DATs like the Sony DAT Walkmans take a fair amount of juice, it's worth looking out for NiCads with larger capacities. Always use the same cells in a set — mixing cells from different manufacturers is a recipe for disaster, as they will tend to run down at different rates.

My Sony TCD D7 claims a power consumption of 1.2 watts. Using four NiCad cells (each of 1.25 volts, giving a 5 volt supply) this works out to a current drain of 0.24 amps, or 240mA (milliamps). So if I use cells rated at 500mAh, they should last a little over two hours. However, if I choose some like the Ever Ready types I'm currently using, rated at 0.65Ah, a single charge of these should last about 2.7 hours — a useful increase of around 45 minutes per charge.

Before each recharge, the cells should ideally be discharged to a fairly low level. Don't leave your DAT player running with the Low Battery indicator flashing until it grinds to a halt (you may damage the recorder), or try shorting out the cells with a piece of wire to completely discharge them (you'll damage the cells). Often, a Low Battery indicator shows a suitable time for a recharge, but occasionally (once every few months) you could try the following procedure. Most battery chargers use a small light bulb to test the state of one of the cells in the unit. Once you know your cells are on the last legs of a charge, you can put each of them in turn into the test position, and leave them until the bulb goes out.

What causes more problems than anything else is charging cells for an inappropriate length of time. Contrary to popular opinion, you should not just leave them in the charger all day, and certainly not continuously until you need to use them. For

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the longest life, each cell will have printed on it the recommended charge rate, for example '50mA for 15 hours', or '200mA for 5-7 hours'. However, unless you buy the same make of cells and charger, the chances are that the fixed charge rate provided by the typical universal NiCad battery charger will be different from the recommendations for your particular cells.

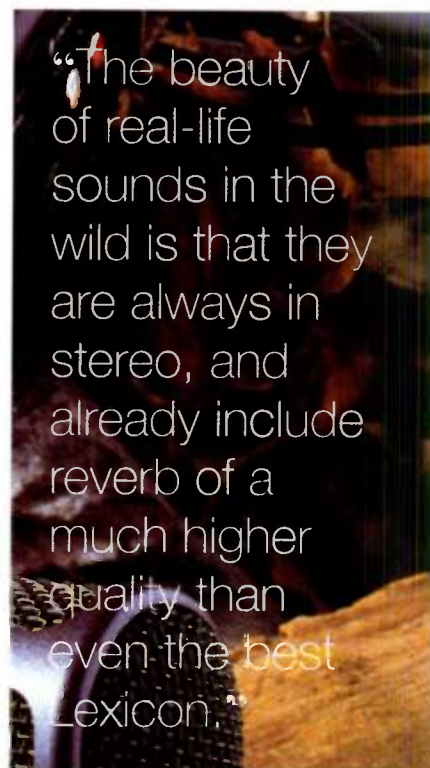
Charges are normally carried out at either of two standard rates: C/3 and C/10, where C is the capacity of the cell. For my current Ever Ready cells, with a stated capacity of 650mAh, C/3 is about 200mA, and sure enough, marked on the casing is 'Fast charge rate 200mA for 5-7 hours'. Since most of us want rapid results, many modern chargers work at the Fast rate (C/3), and so should be used for a maximum of about seven hours. At the Fast rate, over-charging can cause damage, so you could attach the charger via one of those mains timers used to persuade burglars that you are switching lights on and off. Set it up so that it will switch off after seven hours, and then you don't need to remember to switch off the charger at the correct time. Once your cells are completely charged, any further time in the charger ends up generating heat, and if you find that your cells are warm, this shows that they are already fully charged.

The other charging rate, C/10, is often known as Standard rate, and is slower (the same cell states

'Standard charge rate 65mA for 14-16 hours'). At this rate you can normally leave cells in the charger for far longer than necessary with no damage, since the slow self-discharge mechanism will help to ensure that over-charging doesn't occur. The main thing to remember with NiCads is that if you find your current set running down quickly, try them for two more discharge/recharge cycles before throwing them away.

## COUNTRY PURSUITS

One thing that often surprises people, when they first start to record in the wild, is that certain sounds end up far 'bigger' or 'smaller' than you would expect. The classic one that catches most people out is the bubbling brook or mountain stream — the real thing always sounds like Niagara Falls, and what most people would consider a suitable 'stream' sound is actually a tiny trickle. Conversely, bird-song is often embarrassingly quiet compared to the background noises that we normally don't notice, such as the sound of other people's footsteps (and particularly other people's children!) Once you've wandered about 'under headphones' in the countryside, you'll always hear things in a completely different light. I once spent 10 minutes grumbling about the amount of background hiss on a woodland recording, before it finally dawned on me that it was the leaves rustling in the trees!



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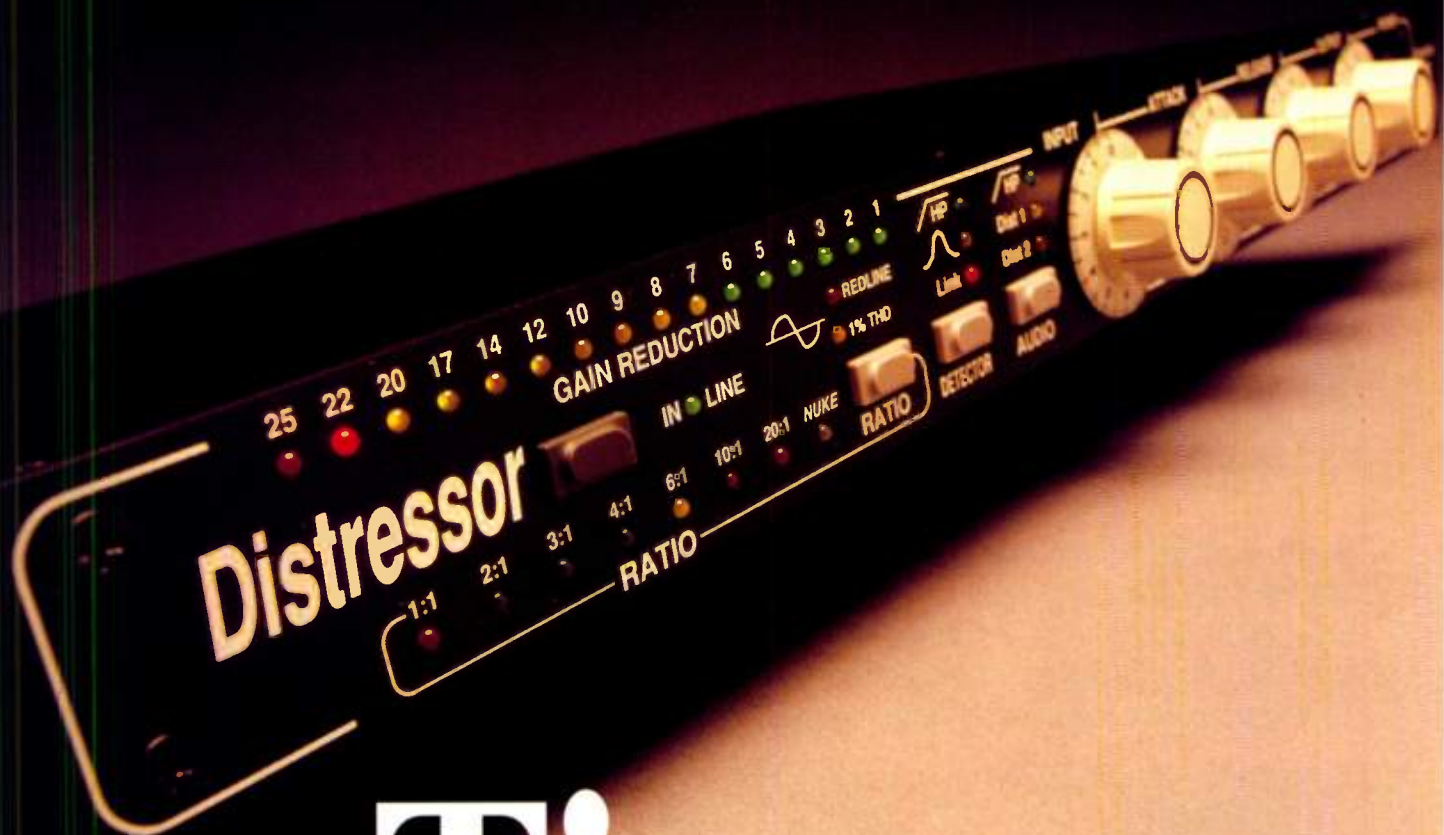
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# Time Machine

*Can new technology really emulate vintage equipment, or do you have to use vintage parts? PAUL WHITE tests a modern compressor that claims chameleon-like abilities to emulate classic compression sounds.*

## EMPIRICAL LABS DISTRESSOR

At one time, it seemed as though all the black arts of audio design were focused on digital reverb algorithms, but in the latter half of the '90s, most of the mystique appears to have shifted over to compressors. Nowadays, those vintage compressors, often cooked up by hand in the early days of recording, are valued more than the latest models that, ostensibly, have benefited from over two decades of design experience and high-spec modern components. Even those building modern compressors seem to be aiming for a version of the old sound. One such compressor is the USA-designed Distressor, a VCA soft-knee compressor with a few unusual twists, including tube and tape distortion emulation. The

signal path is pure analogue, but much of the control circuitry is digital.

Because the Distressor features so many user-adjustable options, the designers have dispensed with conventional switching in order to save panel space. Instead, they've used a very simple set of buttons which allows you to cycle around the various options by repeatedly pressing the appropriate button until you get what you want. Each option is clearly indicated by an LED, so you always know exactly where you are. Digital control circuitry is used to manage the switching, and a gold capacitor can keep the on-board memory going for up to a month to store your last-used switch settings. For indefinite storage, two batteries can be fitted inside the case.

The Distressor is a single-channel compressor packaged in a 1U-high box, with rear-panel sockets

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## EMPIRICAL LABS DISTRESSOR

### pros & cons

#### EMPIRICAL LABS DISTRESSOR £1199

##### pros

- Wide range of effective compression styles.
- Flexible but uncomplicated controls.
- Clear, if rather unattractive, panel design.

##### cons

- Expensive.
- No output level meter.

##### summary

The Distressor is a good example of the intelligent use of contemporary technology to emulate the best aspects of vintage devices, but it is still costly for a single-channel unit.

**SOUND ON SOUND**

► and a front-panel switch setting for stereo linking, should this be required. Audio connection is via both balanced XLRs and unbalanced jacks, but there's no separate side-chain input. Instead of a threshold control, the unit has a set internal threshold and a variable input-gain control, so turning up the gain increases the amount of your signal that rises above the threshold, and thus the amount of compression which will be applied. A 16-LED gain-reduction meter shows by exactly how much you're reducing your signal peaks. Manual controls are also fitted for Attack, Release and Output, and all four knobs are suitably large and dated-looking, with interesting calibration marks around the edge. You'll notice that there's no ratio control, and that's because the ratios are switchable in steps rather than being fully variable. There are seven ratios, from 1:1 to 20:1, with a further setting simply called Nuke — a brick-wall limiter. The reason for including a 1:1 setting is so that you can still use the distortion facilities when you don't need compression. Pressing the Ratio button steps through the available settings, each of which has its own status LED. Nuke gets a blue LED, just to be cool! Bypass is a separate, dedicated button and operates a hard relay bypass, routing the input signal directly to the output connectors.

### CONTROLS

A button labelled Audio Modes sits below three LEDs dedicated to a high-pass filter and two distortion types. Pressing the button allows you to cycle through the possible combinations of the high-pass filter and Dist 2, Dist 3 or Distortion off. The high-pass filter has a gentle characteristic and comes in at around 80Hz to attenuate what the manual calls "the mud frequencies".

Distortion mode 2 adds predominantly second-harmonic distortion, in relatively small amounts (around 3%), to produce what we generally describe as warmth; the process is analogous to what you'd expect from an overdriven class-A valve stage. Dist 3 aims to add third-harmonic distortion to produce the kind of symmetrical distortion you hear when tape (or a class-B amp stage) is driven into saturation. A couple of warning LEDs come on at 0.25% THD and 3% THD or more, to help in setting up, and the amount of distortion is determined by how much compression is being used, and by the attack setting of the compressor.

The settings of the Distressor's Detector Modes, as the name suggests, affect how the side-chain

responds to programme material. In addition to feeding the signal flat (unchanged) to the side-chain, it's possible to put in a high-pass filter, to prevent low frequencies from modulating the high end, and also to patch in a 6kHz band-emphasis filter, a less common option. This makes the compressor react more strongly to frequencies in the 6kHz area of the spectrum, and can help take the edge off aggressive guitar parts or other problem sounds, as well as reducing sibilance. As the filter is in the side-chain, no EQ is applied to the processed signal — only gain reduction. Pressing the Detector Mode button repeatedly allows you to step around the eight logical permutations of flat, the two filters and stereo linking. Both filters may be used together if needed.

Two jack leads are required to link a pair of Distressors for stereo use, and the manual suggests that you can fool the unit into giving you extra distortion by selecting stereo link, but not patching in a second unit. This halves the side-chain signal by averaging the input with the non-existent channel 2 signal. The result would be higher signal levels, for those times when only grunge will do!

### DISTRESSING TIMES

Now that we've dispensed with the theory, no doubt you'd like to know how the Distressor stacks up — after all, at over £1200 and with only one channel, it needs to be something special.

Despite the slightly unfamiliar switching system, setting up is as simple as using a conventional compressor, and the only thing I rather missed was an output level meter. It soon becomes obvious that this compressor wants to be heard, and it's probably at its best adding smack to kick drums, thickness and attack to bass guitars, and solidity to vocals. On a complex mix, you have to be more sparing, and for routine dynamic range control you can usually get away with far less sophisticated devices. If you want pumping, a fast attack and release will deliver it instantly, but the best results are obtained with longer attack times, which really emphasise the percussive nature of sounds in a very positive way. Particularly impressive is the recommended setting for emulating opto-compressors — you simply pick the 10:1 ratio, then set the longest attack possible and the fastest release. This simulates the characteristically slow attack and fast release of compressors based on lamps and photocells, creating a rich, attacking sound with no obvious gain pumping.

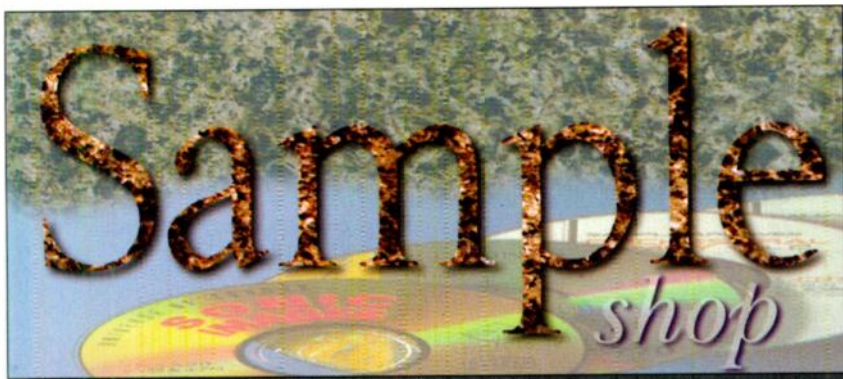
Experimenting with the distortion settings is interesting, and I'm glad to discover that the effects are subtle — some modern valve gear, in particular, places too much emphasis on deliberate distortion, and with some material the intermodulation products sound horrible. With the Distressor all you get is a gentle change in timbre — unless you really push Dist 3 to the limit, in which case things can turn a touch crunchy.

### SPECIFICATION

|                     |                                                                                               |
|---------------------|-----------------------------------------------------------------------------------------------|
| Frequency Response: | 5Hz to 160kHz (+0/-3dB) In clean mode, shaped in distortion modes                             |
| Dynamic Range:      | 110dB                                                                                         |
| SNR:                | Better than 100dB signal-to-noise ratio in Dist 3 mode                                        |
| Distortion:         | Variable from 0.01% to 20% depending on distortion mode and compressor settings               |
| Time Constants:     | Attack 0.05s to 3.5s in normal mode, and up to 20s in the 10:1 ratio setting (opto-emulation) |
| Ratios:             | 1:1, 2:1, 3:1, 4:1, 6:1, 10:1, 20:1, Nuke                                                     |







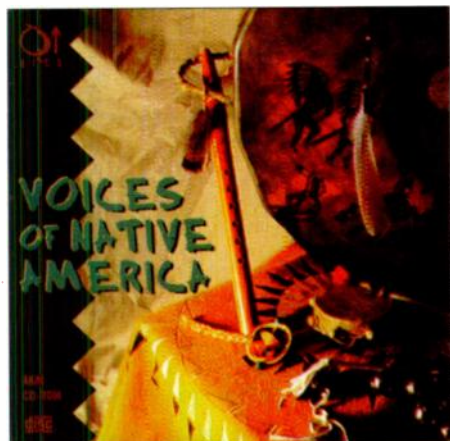
Our regular look at the hottest new sample CDs and CD-ROMs.

**VOICES OF NATIVE AMERICA**



CD-ROM (AKAI, ROLAND, EMU, KURZWEIL, SAMPLECELL)

As the title implies, this album isn't short on American Indian vocal sounds — in fact, there's a huge selection of phrases, grunts and general tribal stuff that can readily be woven into world or ambient compositions. In addition to the voices, there's a really nicely sampled selection of



Indian percussion, including rattles and shakers, and of course there's the Indian flute. As in many such libraries, the flute phrases are really just tunes broken down into phrases, and if you're really clever, you can recreate the original tune by stringing the samples together in the right order! The sampling quality is fine, but I was disappointed not to find any really nice multisampled flutes — there was a time when you could load samples and play a tune on them...

Oddly, this is the third disc in a row I've tried where if you load a full volume, all the samples play at once, so you have to load one program at a time. If this weirdness persists, I shall have to consider it as a divine suggestion for an article on the subject. If anyone else has come across oddities when loading commercial sample CD-ROMs into different generations of Akai sampler, please write in and let us know.

Purely because of the breadth of vocal material on this disk, it has to be worth four points, but the sample mapping and organisation could have been better in places. For example, rather than give you a different vocal phrase in every key, some programs load up multitimbrally with one phrase per MIDI channel, and just three semitones of transposability per sample. That leaves a lot of empty keyboard! Still, you can't dispute the quality of the samples, and if you're into North American Indian sounds, this has to be the disk to go for. *Paul White*

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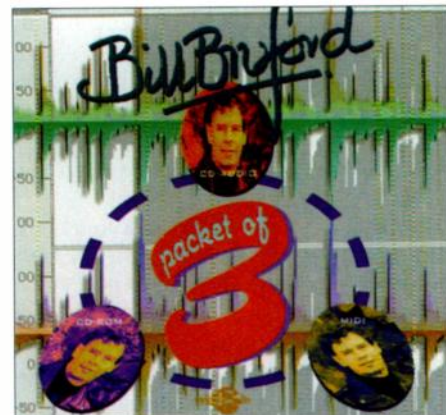
**BILL BRUFORD'S PACKET OF THREE**



(AUDIO CD, AKAI CD-ROM, MIDI FILE DISK)

This sample set from Keyfax is a little unusual, as it is available as an audio CD, an Akai-format CD-ROM, and a PC-format floppy disk of standard MIDI files containing the same rhythms as on the sample discs. Those familiar with Bill Bruford's work will know that he's a drummer with an impressive provenance, and true to form, he's come up with a whole selection of drum

loops played on acoustic kits, tuned percussion, Simmons kits and who knows what else. Though rhythmically useful in a fairly broad context, Bill's loops are far from pedestrian, and aptly demonstrate his virtuosity and love of unusual time signatures. There are plenty of straight grooves (if *anything* Bill plays car



actually be called straight), but other examples are weird enough that you'd normally have to write a song around them rather than making them fit into an existing piece of music.

As you'd expect from a player of Bill Bruford's calibre, the playing is imaginative, tight and beautifully recorded, so if you want a little something for the weekend, *Packet Of Three* comes highly recommended. *Paul White*

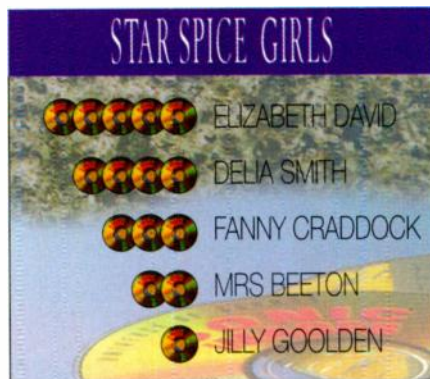
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**VOCAL XTC**  
(AUDIO CD)



Sample CDs featuring vocals have always been something of an oddity. Buying a collection of 'oohs' and 'ahhs' is one thing, but any release that gives you a huge selection of musical hooks and riffs sung with lyrics seems to provoke the most raised eyebrows from traditional songwriters and performers. And this is perhaps understandable; after all, the idea is that someone provides entire top lines to be simply slotted over an existing backing track, and this could well serve to reduce the role of the modern songwriter even further.

It is against this backdrop of moral and musical questions that we find *Vocal XTC*, an interesting and innovative 66-track audio CD from Time & Space. Perhaps realising that session singers are generally fed up with some remixers and producers nicking sections of their performances to use in their own tracks and then having to sort out the legal mess afterwards (providing private education for the children of countless lawyers in the process),

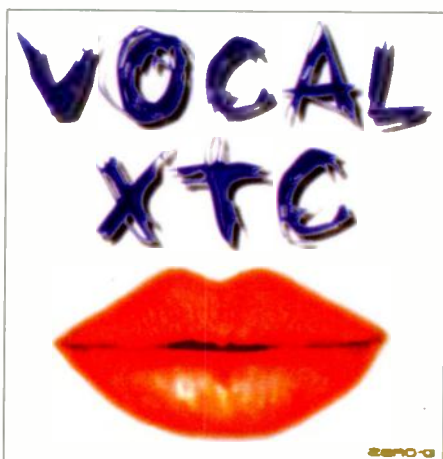


Time & Space have decided to produce and record a large number of these short phrases, give due credit to the vocalists and treat them just like any other soundware product.

The tracks on this CD fall into a number of different sections. By far the largest section is dedicated to soulful ad-libbed phrases: 'Can you feel it', 'Ohh yeah', 'Move it on Wooh Yeah' — all of which sound much more natural than they look in print. Although there are a large number of dedicated lyrical lines, the emphasis tends to be on the kind of short phrases often used in contemporary remixes than on a complete song that someone has written for you to sample from.

There is a balanced mixture of male and female vocals, and sound-wise they cover a large number of styles, from soul and pop right through to jazzy scat vocals. There's even an energetic indie/rock male vocalist! In amongst the solo lines, most performers also present a few well chosen harmonies, and very nice they are too.

The last third of the disc is taken up by a 9-piece gospel choir impressing the pants off any listener with accurate and beautifully arranged harmonies. As well as providing the obvious



gospel lines, the choir offers some truly wonderful wordless blocks of harmony which should find their way into all sorts of tracks.

There are a few classical-sounding vocals, including some operatic-type lines and the odd chant, but this seems to be the minority section of the release, which I have to say is a bit of a shame. With pop/dance, R&B and gospel styles so well catered for here, I felt that the CD could have done with a bit more attention to the experimental areas of vocal treatment and dared to step away from the mainstream, which is where the bulk of its focus lies.

Having said that, all the vocals are listed with their bpm's and relevant key signatures, and are sensibly recorded, without reverb, leaving the user to make the effects decisions on mixdown. At just over 58 minutes, it certainly isn't the longest CD on the market, but providing the contact number for all the featured session singers is a brilliant idea, and might even lead

some producers to use the samples to demo tracks, and then get the actual singers to re-sing or adapt parts for a master recording. Whilst this CD may not be exactly perfect, its attention to detail and wide number of styles makes it pretty damn close. *Paul Farrer*

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## FRESH KILLED MEAT — PRIME FUNK

(AUDIO CD)



I've been dreading listening to this; it's the difficult third album for AMG from Keith Le Blanc (he of Tackhead fame). Can Keith pull off another groundbreaking sonic *coup de grace*? Or am I going to be sorely disappointed? Time to whop in the CD and find out...

Tracks 1 to 20 each feature one (occasionally two or three) multi-bar loops combining completely mad and often unexpected techno noises with pretty sparse (by Keith's standards) live and funky drumming. Tempos are quoted throughout the CD, and average out at just below 100bpm. The basic kit sound is tight rather than heavy, and reverb is featured frequently; some drums are heavily effected, with serious treatments, while others are left dry. Not all the beats are 4/4 — listen to the delicious hi-hat work on 'Three-four'. I particularly liked 'Dabla', where a snares-off sound meets a didgeridoo. To get a general idea of the territory Keith's head occupies at the moment, imagine quantised rhythmic tuning of a shortwave radio through a fuzzbox superimposed on a clean and crisp studio drumkit playing slow monoto-funk. Sounds jarring, doesn't it? Whether the ingredients blend is a matter of personal taste. They don't seem to at first, but as the tracks go by...

Tracks 21 to 50 comprise sets of tempo-matched loops. By around track 30, the electronics are beginning to take a back seat, leaving Keith's drumming exposed. Yep, he can still cut the Colmans. The mix does rather tend to understate the hi-hat somewhat, which is a pity, as the work of Keith's right hand is on occasions extra-terrestrial (one exception is on track 32, where an effected, pressured hi-hat leaves no room for argument). Sometimes it sounds as though two completely different kick drums are being employed, one soft and one hard, amplifying the feel in a manner similar to that achievable by mixing 808 and 909 kicks.

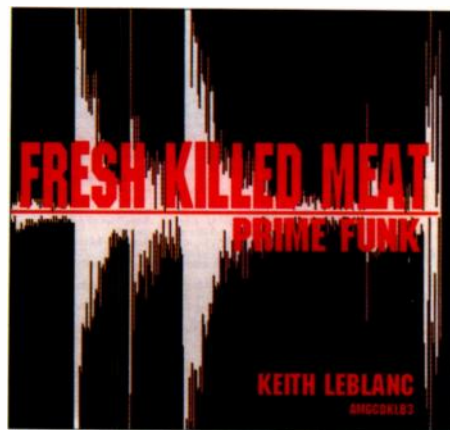
Tracks 51 to 61 constitute more loops as before, but as soon as track 62 hits the speakers you know something special has happened. And checking the sleeve, you see that you have reached the Drumsapes — two large arhythmic atmospheres featuring cymbal, tympani, tom and gong rolls, trills and echoes. These are rather

special, though minutely marred by a bit of audible system noise on tails, presumably due to using high-gain mics set for a wide dynamic range and/or compression.

Moving on, the loops become more idiosyncratic, with all-out soloing, gated patterns, and queer drum/percussion loops, until we reach track 78, the first of five 'Hit' tracks. Included are scratches, live drum fills and hits, and 'Misc. Hits and FX'. The 'Scratches' are actually rhythmically composed into patterns rather than being just ornaments, and the cymbal hits have big hissy tails, reflecting high compression ratios. The effects are definitely not cosy — we're talking deranged. And that's the lot, apart from a test tone, which thankfully doesn't come in until after a decent interval of silence, giving you plenty of time to mute the speakers or stop the CD.

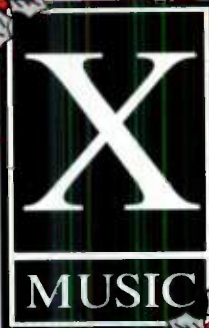
I noticed only one of the ultra-fast 'driller' fills that used to be one of the Tackhead hallmarks. As jungle has adopted that particular trick, and done it to death, Keith has quietly dropped it.

Conclusion: As well as being his third sample



CD, this is Keith's first without input from Lee Groves, AMG's samlemeister. As a result, *Fresh Killed Meat* is the most focused (or, if you want the other way of looking at it, least multi-dimensional) release so far. It's many things, potentially: a source of remix inspiration, the basis of original tracks in their own right, or a complete waste of your time, but what it definitely isn't is another safe sample CD. Personally, I'd have liked more separate electro elements to play around with, in addition to the techno/live composites. But Keith Le Blanc is no ordinary drummer, and he's not going to come quietly. If you want him in your band, he's gonna have a big say in how the music shapes up, no question. On the other hand, flash though he is, he still leaves space for you to work with. I guess it's all down to whether you can keep up with him. *Wilf Smarties*

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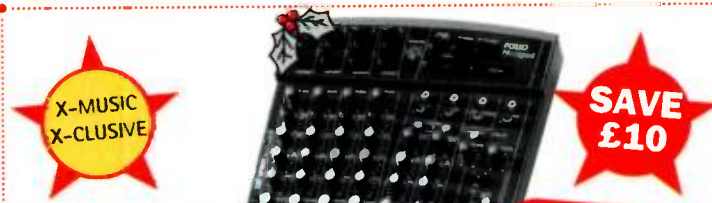


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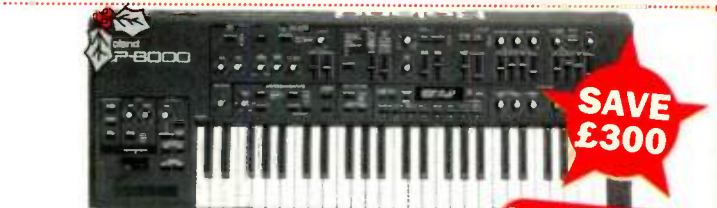
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# WHAT'S THE FREQUENCY KENNETH?

## SYMETRIX 551E 5-BAND PARAMETRIC EQUALISER

*For serious sonic sculpting, you can't beat a parametric EQ, and this new contender from Seattle-based Symetrix is priced within reach of many project studio owners.*

**PAUL WHITE gets a bit of band aid.**

As most of you will have discovered, the EQ section on a typical mid-price console has its limitations — if you do a lot of boosting using a budget desk EQ, the results will probably sound unnatural in some way, often taking on boxy or nasal overtones. So for serious tonal bending you'll need to patch in a high-quality outboard equaliser.

The majority of high-end equalisers follow the parametric format, simply because parametric EQs are more flexible than any other type, and as a rule, the more bands you have, the more overall control is possible. The downside of the parametric EQ is that it can be quite a difficult beast to set up, especially for inexperienced users, but providing you start out using only a couple of bands at once, it shouldn't take too much getting used to, and the benefits are very worthwhile. For those unused to parametric EQs, you can think of them as being similar to graphic equalisers with just four or five bands, but where each band may be set to any frequency, and where the width of each band may also be adjusted.

Considering the number of compressors and gates on the market priced to appeal to private users, there are relatively few similarly priced parametric equalisers, but Seattle-based Symetrix has just added a new model to the list. Conceptually, the Symetrix 551E is a very simple, single-channel device providing five identical bands of EQ. Each band has a three-way selector switch and a

Frequency control enabling it to cover the entire audio spectrum. Connection to the unit is via either balanced XLR or balanced jacks, and — unusually for a unit of this price — the output stages are servo balanced and DC coupled (the input stages are also DC coupled), to maximise low-frequency response and to avoid the introduction of undesirable phase shifts.

Packaged in the familiar 1U-high rackmount case and finished in the relatively new dark blue Symetrix livery, the 551E has an internal mains power supply connected via a standard removable EC mains lead. The audio jacks and XLRs are wired to AES specifications and are located on the rear panel. Symetrix describe their filter design as 'UltraQ', a circuit created to deliver very low-noise performance, though no circuit diagram is provided to satisfy the curiosity of those interested in technical details.

On the front panel are the five identical filter sections plus a high-/low-cut filter that allows independent control over the frequencies of separate low-pass and high-pass, 12dB-per-octave filters. The low-pass filter can be swept from 3kHz to 65kHz and the high-pass from 6Hz to 260Hz. There's also an input level control (+/-15dB range), with clip LED, and a bypass button that operates a hard bypass relay, taking both the parametric and high/low equalisers out of circuit. In the event of a power failure or PSU fault, the input is routed directly to the output. The clip LED monitors the signal post EQ so that any overload caused by excessive boosting is detected.

### PARAMETRIC STAGES

Each of the five parametric stages is absolutely identical, each having a frequency control knob calibrated from 100Hz to 2kHz. The reason all five bands have the same range is so that there are no restrictions on whereabouts in the audio spectrum the various bands can be used. For example, it's possible you may want to use three or more bands just to sort out problems at the bass end. Each parametric stage also has a 3-way toggle switch that can either multiply or divide this range by 10. The switch positions go in the order x1, x10, x0.1, which may not seem entirely logical, but the manual points out that there's no way to wire a conventional toggle switch so that it works in the desired order. Doubtless there are ways around this, but at a cost out of all proportion to the benefits. Combining the three switch positions with the variable frequency control provides a total coverage of 10Hz to 20kHz — though some users of esoteric equalisers claim there is a benefit to be had from enabling the user to boost up to 30kHz or beyond. However, the audio bandwidth of the basic circuitry is from 20Hz to 63kHz, with the signal being only 3dB down at 63kHz.

**pros & cons**

**SYMETRIX 551E £449**

**pros**

- Five full-range bands.
- Variable high- and low-pass filter included.
- Relay hard bypass.
- Good technical performance.

**cons**

- No stereo split facility.
- No individual band bypass switches.

**summary**

A well-designed workhorse equaliser with lots of range, plus the benefits of variable high- and low-pass filters.

**SOUND ON SOUND**



The filter bandwidth control is calibrated in octaves rather than the less intuitive Q, and is adjustable from 0.05 to 2, while the cut/boost control allows up to 12dB of boost and a usefully high 20dB of cut. I've often wondered why manufacturers don't tend to build equalisers with more cut than boost, as you invariably need more range when cutting than when boosting. Now someone has! Unfortunately, there's no separate bypass for each band, which can make setting up trickier than usual for the inexperienced user. There's also no facility for splitting the EQ into two groups for stereo use; presumably this is because the 551E has an odd number of bands.

### USING THE 551E

Setting up the 551E is exactly the same as setting up any other parametric EQ, but because the knobs are quite small in diameter the adjustment feels rather coarser than it would if large knobs were used on exactly the same equaliser. (Actually, I've often suspected that some vintage gear is claimed to have a nice feel purely because of the larger-diameter controls.) Having the high- and low-pass filters in addition to the five bands of parametric EQ is a big bonus, as they make it very easy to 'bracket' a specific part of the audio spectrum for the surgical removal of unwanted high end or low end. These filters work in much the same way as the side-chain filters on a Drawmer DS201 gate, and they'll often solve a problem that takes a considerable amount of work with conventional EQ.

Listening to the parametric sections shows them to be very quiet and positive, though they tend to lack the enigmatic, silky top-end magic of the really good (and really expensive) models. Even so, this equaliser is hugely more useful than a typical desk EQ and it's simple work to kill an over-prominent resonance or to lift out a hi-hat. What is particularly instructive is adding boost right at the limit of human hearing, because there's no doubt that it makes a difference to the part of the spectrum you can hear, generally improving the detail and transparency of the mix. It would have been interesting to see what effects were possible had the EQ range been extended to 30kHz.

### SUMMARY

The 551E is designed as an affordable workhorse of an equaliser, yet its technical performance is actually very good, and five

### EQ RULES OK

The manual for the 551E offers a brief but comprehensive introduction to using a parametric equaliser, and points out that, because of the way the human hearing system works, cutting frequencies tends to be less noticeable than boosting when it comes to undesirable side effects. As a very general rule, use wider bandwidths and smaller amounts of boost when boosting frequencies and narrow, deeper notches when cutting. Finding the appropriate frequency for cutting or boosting is usually easiest if you set the equaliser to maximum boost, then sweep through the spectrum until you locate the frequency that needs adjusting. Once this is located, the cut/boost control can be reset to a more sensible value.

As with the vast majority of outboard equipment (other than mic preamps), the 551E is designed to work at line-level signals and will not accept a microphone plugged in directly. Equalisers are normally connected via mixer insert points or patched directly between two other pieces of equipment in the audio chain.

bands provides as much scope for creative or corrective work as most people can handle. I like the fact that all the bands are fully tunable over the whole audio range, I like the variable-frequency high-pass and low-pass filters, and I think the relay bypass is a good idea, especially for use in live situations, where loss of signal under fault conditions is not an acceptable option. If there's a criticism, it is that each band should have its own bypass button — setting up without this facility is less straightforward. It's also a pity that you can't use the unit as a 2-channel, 2-band processor, even if it would mean making one of the bands and the high-/low-pass filters redundant in stereo mode. Extra sockets allowing the high-/low-pass filters to be used independently of the rest of the equaliser would also have been useful, but you can't have all your wishes without increasing the cost. As it stands, this is a very competent and well specified equaliser that strikes a good balance between performance and price. SOS

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# Learning process

## WHERE TO USE PROCESSORS AND WHY

**PAUL WHITE** explains why a great reverb doesn't always make a mix sound better.

**M**ost studio musicians appreciate the importance of reverb in recorded music, but a large number of demos are still spoiled either through over-use or inappropriate use of this crucial effect. Pop music is rarely recorded in a natural acoustic environment, unless you have access to one of the top studios with a really good live room, so what tends to happen is that sounds are recorded in a fairly dry room, then treated with artificial reverberation to make them sound natural. The same is true of electronically generated sounds that have no natural ambience of their own — they need some added reverberation to make them sound believable. Problems arise, however, when the type and amount of reverberation are wrong.

## SPACE: THE FINAL FRONTIER

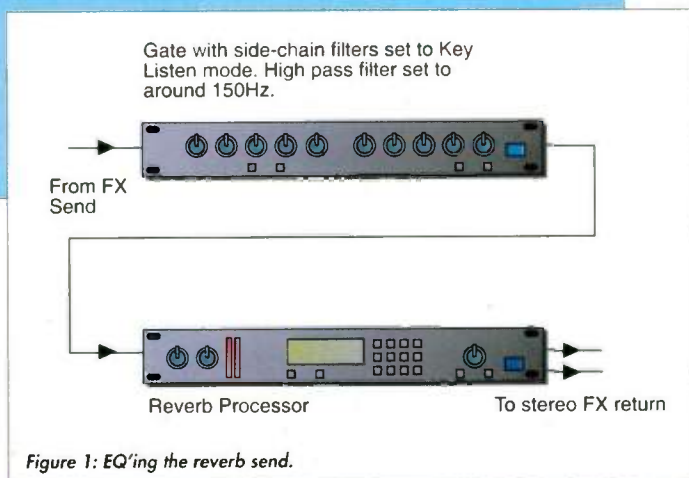
Take any solo'd track and add reverb to it, and the chances are that it'll sound bigger (in a spatial sense) and more impressive. That's because a solo'd track usually has plenty of space between the sounds. But when the whole mix is playing, there's a danger that reverb can fill all the important spaces that let the detail within the recording shine through. By its very nature, reverb occurs after the

“The effect of too much reverb is to ‘smear’ percussive events, reducing the contrast between beats and the spaces between those beats.”

## MUD GUARD

Reverb units can tend to emphasise anything that's bassy or muddy in the material being processed, and since most of the energy in a typical pop music mix resides at the low end of the audio spectrum, perhaps this isn't surprising. The problem can be reduced by EQ'ing some of the low end out of the reverb, and the easiest way to do this is to feed the returns through a couple of mixer channels rather than aux returns, so that you can use the channel EQ to apply bass cut. However, this isn't actually the best way to do the job. Because low frequencies take up so much headroom, it's better to remove the low end before the

signal gets to the reverb unit input — which should result in a better signal-to-noise performance. Any type of equaliser patched before the reverb input will do the job, but the high-pass side-chain filters on a noise gate such as the Drawmer DS201 (set to Key Listen mode) are particularly good for this purpose because of their steep 12dB/octave slope. Using these, it's possible to almost surgically remove the low end without changing the mid and high frequencies in any obvious way. Figure 1 shows a suitable patch for accomplishing this.



sound that caused it, so the effect of too much reverb is to 'smear' percussive events, reducing the contrast between beats and the spaces between those beats. Though the average signal level of a reverb-processed sound may be higher than the untreated signal, the chances are that it'll actually sound *less* loud with the reverb added, because one of the ways in which we perceive loudness is to subconsciously register the difference in level between peaks and the lower-level sounds that come between them. The less contrast there is, the less loud the peaks sound. (Incidentally, it is possible to make peaks sound even louder by extending their duration slightly, which is why gated reverb sounds so powerful. The high level of reverb stretches percussive sounds, but then it suddenly stops, leaving plenty of contrast with the following quieter sounds.)



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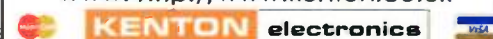
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## WHERE TO USE PROCESSORS AND WHY



The top-class Lexicon PCM90 reverb features an Ambience program to let you get that modern 'up-front' effect with vocals.

- ▶ Gated reverb has become something of a cliché — though you shouldn't let that put you off using it altogether — but similar results can be obtained by using ambience settings. These are characterised by strong early reflections but very little dense reverb afterwards. Dedicated ambience settings tend to appear only on the better reverb devices, but, providing you have a unit where the relative level of early reflections can be adjusted, you can approximate the effect well enough by setting the ER level to maximum. Pick a bright reverb algorithm with well-defined early reflections, then set a short decay time so that there's minimal 'ring' after the initial sound. These strong early reflections will help strengthen and widen sounds without smearing them excessively; even difficult sounds such as bass drums and bass guitar can sound good with just a touch of ambience added.

### KEEP YOUR DISTANCE

Perhaps the biggest dilemma with reverb is that vocals sound great with lots of it, but as soon as you add it, the vocal loses the 'up-front' quality that we expect from a contemporary pop mix. This problem is related to psychoacoustics — the nearer we are to a sound, the greater the proportion of direct sound we hear. In most environments, nearby sounds tend to seem fairly dry, whereas those at a distance may be more reverberant. Even

in a reverberant environment, the perceived level of reverb will be lower for those sounds that are closest, as a greater proportion of direct sound reaches our ears. Distance also tends to dull sound, so for a vocal to sound 'up-front' it needs to be bright and dry — and these conditions aren't always flattering to a voice.

Fortunately, there are ways to use reverb without losing the required sense of intimacy. One of these is to use a fairly short decay time,

“Classical instruments tend to benefit from more natural reverb treatments, and in most cases that means using quite a lot of HF damping and HF rolloff to simulate a concert hall type of environment.”

again with a high early reflections content. The other way is to place a pre-delay of several tens of milliseconds before the reverb, to provide some separation between the initial dry sound and the ensuing reverberation. Combining these two techniques can work effectively, but you'll still need to keep the reverb level under control. Listen to a selection of good contemporary music mixes and you'll find that many use so little reverb that you don't actually notice it unless you specifically listen for it.

The quality of the reverb processor being used also makes a huge difference, so save your best processors for vocals and drums, where the differences show up most. With the better processors, adding a lot of reverb doesn't seem to



There's a lot to be said for owning a unit dedicated solely to providing that most important of effects, reverb. The Alesis Wedge, with its innovative shape, is one of a new wave of dedicated reverb processors now on the market.

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"Even absolute beginners will find it difficult to get a bad sound out of the MX30.

Although the MX30 is the budget baby of the Drawmer range, it doesn't have either a budget sound or a budget specification."

Paul White  
SOUND ON SOUND

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| Korg X5D                      | £60     | £22.48    |
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| Roland JPB000                 | £114    | £42.75    |
| Roland RD600                  | £129    | £48.58    |
| Roland XP80                   | £139    | £52.33    |
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| Korg SG Pro X                 | £169    | £63.58    |
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| Alesis QS7                    | £99     | £39.50    |
| Alesis QS8                    | £170    | £63.54    |
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| Korg X3 Executive Workstation | £99     | £37.50    |
| Roland VK7                    | £139    | £26.81    |

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| Roland MC303             | £56     | £21.37    |
| Roland PMA5              | £39     | £14.83    |
| Yamaha MU90              | £60     | £22.29    |
| Yamaha MU80              | £55     | £20.62    |
| Yamaha MU50              | £38     | £14.20    |
| Yamaha P50               | £35     | £13.08    |
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| Emu Planet Phat          | £89     | £33.75    |
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| Korg NS264               | £99     | £37.50    |
| Korg Trinity Module      | £99     | £37.50    |
| Korg SG Pro X Module     | £69     | £26.25    |
| Korg NS5R                | £50     | £22.50    |
| Korg X50 Module          | £59     | £18.84    |
| Korg X5 Module           | £39     | £14.83    |
| Waldorf Pulse            | £60     | £22.45    |
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### Microphones/Studio

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| Audio Technica 4033A      | £31  | £14.83  |
| AKG C3000                 | £21  | £9.33   |
| Rhode N2                  | £19  | £18.58  |
| Rhode N1                  | £34  | £13.12  |
| Rhode Classic             | £119 | £45     |
| AKG 414                   | £69  | £26.08  |
| AKG WMS350 (cordless)     | £31  | £13.12  |
| Soundcraft Absolute Zeros | £23  | £8.62   |
| Soundcraft Absolute Twos  | £27  | £10.08  |
| Alesis Monitor Ones       | £29  | £11.25  |
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| Dynaudio BM15's           | £79  | £30     |
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| Alesis RA100              | £26  | £11.25  |
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## WHERE TO USE PROCESSORS AND WHY

- bury the sound in the same way that lots of reverb from a cheap unit does, and you can often get away with a much higher reverb-to-dry ratio before the sound becomes unnaturally muffled. Good reverb quality is particularly evident at short decay times, where lesser units may start to ring or sound unduly coloured. If you have access to a really good reverb unit, you might find that a vocal line sounds more effective treated with a higher level of fairly short reverb than it does with a lower level of a longer reverb.

A potential problem with using a bright-sounding reverb on vocals is that any sibilance in the original performance will already have been exaggerated by any compression that's been used, and once you add a bright reverb it may reach an annoying level. De-essing vocals often results in a lispy quality to the sound, so a kinder solution may be to de-ess the input to the reverb unit and leave the dry vocals as they were. Figure 2 (below) shows how this might be done.

### BRIGHT IDEAS

From what's been said so far, you can probably deduce that sparing amounts of bright reverb, or reverb rich in early reflections, will help give a sound presence, width and interest without

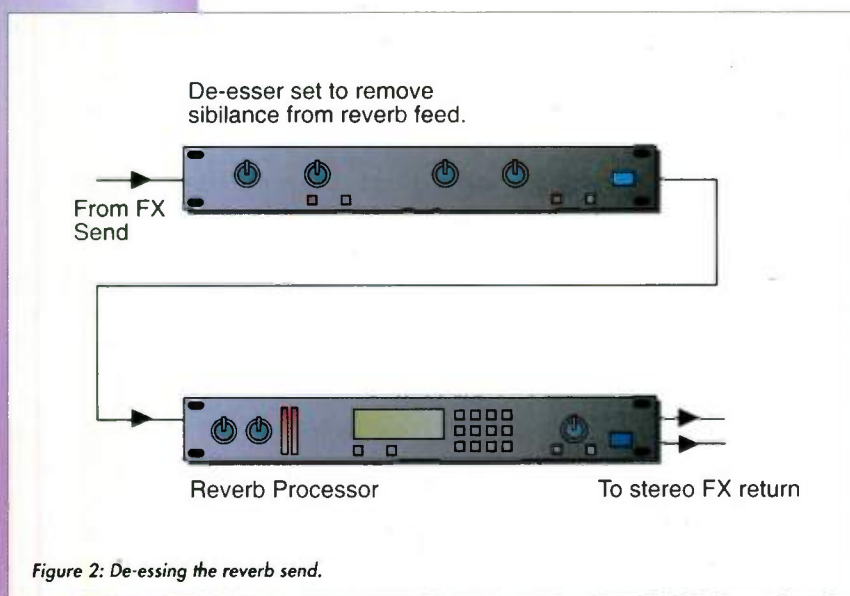


Figure 2: De-essing the reverb send.

pushing it to the back of the mix. However, if bright reverbs are chosen for everything in the mix, the contrast element once again gets lost. Classical instruments tend to benefit from more natural reverb treatments, and in most cases that means using quite a lot of HF damping and HF rolloff to simulate a concert hall type of environment. Even in rooms with very hard surfaces, such as stone cathedrals, the reverb can be much less bright than you might expect, mainly due to the air absorption of high frequencies in the large distances between walls.

Using lots of early reflections can also be a bad

idea when processing classical instruments, because when a large ensemble plays in a real concert hall, the early reflections have a tendency to disappear. The reason is quite simple: the pattern of early reflections depends on the position of the performer relative to the nearby walls and other boundaries, but if each performer is in a different position on stage, each will generate a slightly different set of early reflections. When these are all added together, individual reflections tend to become masked by the increased complexity of the reflected sound.

### SUMMARY

Reverberation is a very powerful effect, without which no studio would be complete, but there are dangers associated with its use. In terms of perspective, excessive use of reverb pushes sounds to the back of the mix, while adding more than

“Because low frequencies take up so much headroom, it's better to remove the low end before the signal gets to the reverb unit input — which should result in a better signal-to-noise performance.”

the merest hint of reverb to bass sounds clutters up the low end alarmingly. There are occasions when long reverb settings work, but these generally require musical arrangements that leave a lot of space for them to work in.

Adding much in the way of reverb to sustained pad sounds seldom works, as the sustain of the pad hides the reverb, which means that you have to add a lot to make the effect noticeable. As a rule, smoother sounds benefit more from coarse treatments with widely spaced early reflections while percussive sounds need a higher density of reverb — otherwise the early reflections sound like somebody ripping cloth! Once you've picked an appropriate reverb sound, you then have to decide whether there's enough space in the music to let you use it as an obvious effect, or whether you should add as little as you can to create a convincing sense of space.

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|-------------------------------------|-----------|------------------------------|-----------|----------------------------------------|----------------------|
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| Korg X5 £50                         | £18.70    | Roland MdB1 Bass - Drums £40 | £14.95    | Rhode N2                               | Mic £49 £18.58       |
| Roland XP50 £99                     | £37.50    | Roland MC303 £56             | £21.37    | Rhode N1                               | Mic £34 £13.12       |
| Roland JP8000 £114                  | £42.75    | Roland PMA5 £99              | £22.29    | Rhode Classic                          | Mic £119 £45         |
| Roland RD600 £129                   | £48.58    | Yamaha MU90 £60              | £20.62    | AKG 414                                | Mic £69 £26.08       |
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| Alesis QS7 £99                      | £39.50    | Korg Trinity Module £69      | £22.50    | Alesis RA100                           | Power Amp £29 £11.25 |
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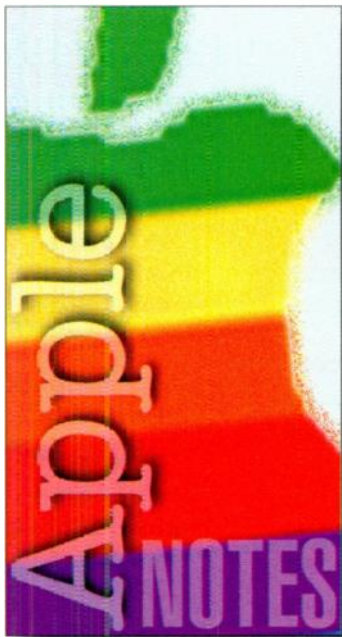
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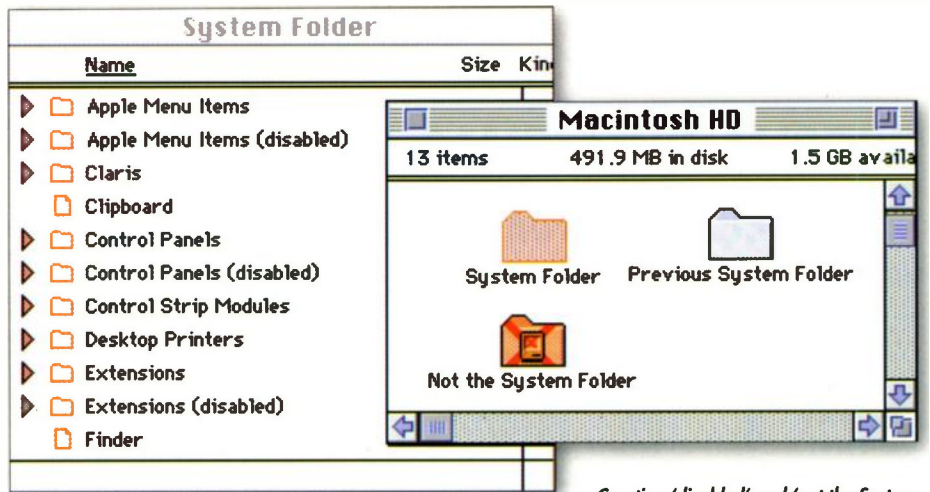
# 01273 671971



**There's no gain without pain. MARTIN RUSS experiences the joys and agonies of a new computer.**

So there you have it: several large and heavy boxes, newly delivered by the carrier. Contained within them is that new MacOS computer — in my case a new Apple PowerMac 7300. And what was the first thing I did?

Nope, I didn't. Experience is a wonderful thing. It nags away at your fun and replaces it with the mundane. So having looked wistfully at those boxes representing hard cash, I turned to my old trusty Centris 610 and started to remove the authorisations for all the copy-protected music software. I will resist the temptation to drone on about how copy-protection seems to be out of fashion for everything except music software... Anyway, with my valuable 'installs' now residing on floppy disk, ready for subsequent transfer to the new machine, I actually got down to the unpacking and connecting together bits. Since I



Creating 'disabled' and 'not the System Folder' folders can provide you with a home for the many superfluous files that now come as standard with any computer.

seem to be posing questions at the end of each paragraph, what happened next?

### PREPARATION

I suspect you might be wrong again. Having checked that it booted up, and that it seemed to be working properly, I took out my trusty Norton Utilities CD-ROM, set it as the Startup Disk, and re-booted. Assuming that a new computer will be perfect, with a defragmented hard drive, correctly set-up system with B-trees and BNDL bits all OK, is asking a lot. So, having put everything right, I set about removing all of the junk — oops, non-essential goodies. Previous Apple Notes have covered the process of creating a 'Not the System' folder and moving all the really useless junk into it, as well as adding 'Extensions (disabled)'-type folders to the active System Folder and moving all the 'might need sometimes' bits and bobs into them (see pic above). But this is also an ideal time to prepare for subsequent installation of additional software.

The next thing to do is label all the contents of the pristine System Folder by selecting everything and using the 'label' menu. Because this does not work recursively down into all the folders, you also need to open all the folders inside the System

Folder and label them too. I use the orange 'Essential' colour, but you can use your own favourite labelling. From this point on, anything that is added to the System Folder will not be labelled, and thus will be very easy to spot. Some people recommend re-labelling of the newly added files after each major installation, and making a colour label key so that you can see which files are associated with each application, but even I am not that organised!

Of course, before installing serious music application programs, there's always time for those essential utilities. As it happens, the new computer came pre-installed with the same Operating System (B1-7.5.5) that I've been using for the last few months, so the only change was from the 68040 microprocessor to the 604 RISC processor. I'd like to be able to say that things went smoothly, but that would be wrong. Actually, I had one or two tiny bits of teething trouble...

### CRASH POSITION

Perhaps it's just me and computers. I seem to have this problem where once they get unstable

## ON THE NET

The Internet has changed lots of things. When I first started surfing seriously, I carefully gathered bookmarks as I clicked through link after link, and then spent quite a bit of time sorting through all the links, putting them into sections and sub-sections, so that I would be able to find them again easily. As with all obsessive computer-based activities, your ability to keep on top of things is marred by the adrenalin rush of gathering new experiences rather than the tedium of organising them. With my ego speaking for me, I convinced myself that I could keep my habit under control, and would carefully sort my newly acquired bookmarks after each session. Yeah, yeah, yeah...

Unfortunately, the lure of freebase surfing was too great, and soon the chore of sorting bookmarks became tedious (er, actually, I kept putting it off!), and so when the bookmark file soared past the 250K point and started to take too long to load, I dumped it. Cold turkey time. As it happens, I hardly ever used all those carefully sorted bookmarks, so moving to one of the many 'bookmark organiser' apps seemed a little pointless.

Instead I opened a folder, and dropped interesting URLs into it. With a big folder, and careful dropping into various locations within the folder, these URLs were much quicker to access, easier to find, and structured in a two-dimensional world instead of the one-dimensional world of the MacOS's filing system.

This only works nicely for less than a hundred or so URLs, and I did consider using a three-dimensional approach like Apple's 'Hot Sauce' Meta Content Format (MCF), as previously mentioned in Apple Notes. But I found an easier way.

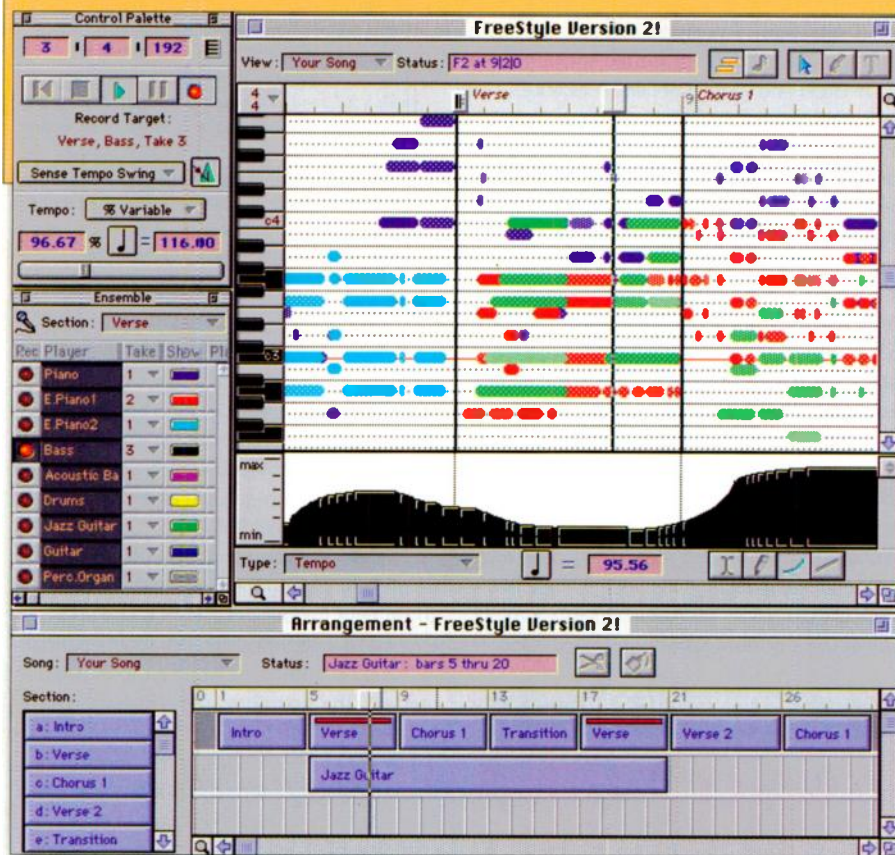
I now only keep bookmarks for really important locations — and the most important of those is my favourite search engine: Digital's Alta Vista. From my first meeting with this very, very nice piece of Internet technology I was hooked, and it continues to get better and better. I now use a searcher rather than wasting time going through my bookmarks for that elusive URL. Alta Vista does the searching for me, it's often faster, and the URLs don't go out of date or need updating manually.

## APPLE NEWS IN BRIEF

### • FREESTYLE 2.0

When I first looked at MOTU's *FreeStyle* sequencer, I was struck by its new and very different approach MIDI sequencing. Version 2.0 builds on the

'trackless' metaphor by now allowing rubato, metronome-less playing, where the beats and bars are automatically determined by the software — and there are lots of extras to make the most of the feel



MOTU's *FreeStyle* v2.

it's a hard slog to get them stable again, but then they will be crash-free for ages. I seemed to have stumbled into a teensy little bit of instability here. Like the *Energy Saver*, which periodically put the 7300 to sleep (fine), but then couldn't be persuaded to allow it to return to consciousness (not fine). Along with my customised version of *Extension Manager* and a few other unwisely installed goodies, the *Energy Saver* was ditched, and things got better. So in a rash moment of over-enthusiasm, I ran an old piece of favourite freeware. At first it worked, but then it stopped working, and the Mac froze. I rebooted, and when I emptied the Wastebasket, the Mac froze again, and when I rebooted again, the Mac froze during boot-up. At this point I began to suspect that severe damage had been done to the operating system, and rather regretted testing out the utility.

Although Apple have recently started to reveal some of the hidden extras in some of their software, the 'Clean Install' is something that still seems to be unfamiliar to many users, even though it's probably tucked away somewhere in the documentation. What it

allows you to do is install a *new* System Folder, while leaving the old one unscathed, but not active. All you need to do is press Shift-K when the Installer main screen starts, and you get a dialogue asking you to confirm which type of installation you want. I needed a clean install, and a few minutes later I had one.

There were now two System Folders on my hard disk: the active one, and the old one, renamed 'Previous System Folder'. By opening up windows next to each other, I could incrementally copy across the new files that I had added before things went badly wrong. By rebooting after each copying session, I could determine exactly what was causing the problems. This may sound tedious, but it's often lots better than re-installing all those control panels, extensions and other System Folder ephemera individually. At the end of this, another check with *Norton Utilities* indicated that all was well. In fact, this process had coincidentally had a beneficial side-effect — the pre-done Microsoft *Office* installation of files into the System Folder had been negated, and I was a 100% Microsoft-free site again. I'll

that is captured by not playing along to a fixed click. Call MusicTrack, on 01462 812010, for more information.

### • PERFORMER 2.11

I can't help thinking that this is one of the great missed opportunities of all time. MOTU have fractionally missed hitting exactly the right version number for their latest free update to *Digital Performer*. With newly added support for Korg's 1212 I/O PCI audio card, the version number should surely have been 2.1212! Contact MusicTrack, number as above, for more information.

“Assuming that a new computer will be perfect, with a correctly set-up system, is asking a lot.”

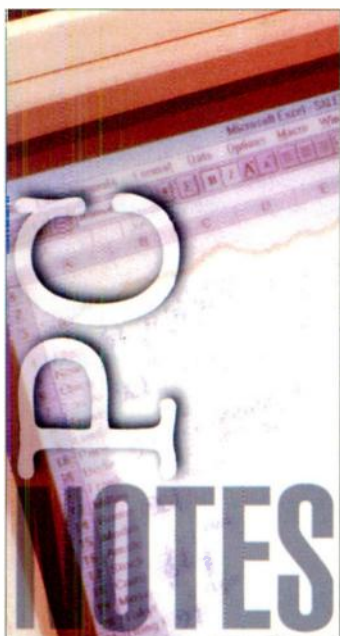
leave the shrink-wrapped *Office* CD-ROM for possible future emergencies.

Please don't get the impression that the PowerMac 7300 is buggy, unstable or problem-prone. I'm just one of those people who implores others to keep a slim, clean computer on one hand, while being unable to resist trying out some tasty utility themselves occasionally. A few crashes have rapidly brought me to my senses. My standard advice still stands (if only I had listened to it myself): only Apple in the System Folder, unless you've carefully checked a test install first — and if it's fun, or does something neat or clever with the user interface, be very suspicious indeed. I know it's a terrible temptation when you get enough processing power to try out all those super add-ons, but believe me, a crash-free computer is much more valuable!

## RECOMMENDED

- *Norton Utilities* has been my constant companion ever since I bought it. Thoroughly recommended for regular preventative maintenance.
- Only Apple in the System Folder, unless you've carefully checked a test install first.
- Install applications one by one onto a new computer. Don't hit it with all your favourite tweaks and apps all at once, because if it falls over it will be much harder to find out what caused the problem.
- Read the manual. Apple's new CD-ROM User Manual means that the printed booklet is now mostly concerned with troubleshooting, hints and tips. Read them!

SOS



**This month, MARTIN WALKER has some chips and a little sauce, as well as investigating some mysteriously disappearing features in Cubase.**

No doubt legions of loyal PC owners are waiting for me to respond to Paul White's hilarious PC snub in last month's SOS (TSC Nashville Mac clone review). Unfortunately they'll all be disappointed, as with me it's all water off a duck's back. Yes, I could rabbit on that Macs had SCSI sockets as standard from an early date because they forgot to leave enough space for a hard drive inside the case, and that the reason Mac prices are now rather more competitive is that most people refuse to pay through the nose any more when PCs are much better value, but I won't. The reason? At the risk of offending PC owners, I must admit that I have great sympathy for Paul (he is a Mac owner after all), and allowing a huge pinch of salt with his comments, he's right. Let me explain...

The so-called PC clone's 'compatibility' is at once both its strength and its downfall. Its strength lies in creating intense competition in the marketplace, which drives prices down for the consumer, creating a huge user base that further drives software manufacturers to launch ever-more exciting applications to tempt us to part with our money. This is one of the main reasons that the PC is so widespread today. However, when you send in the clones, the inevitable happens. No-one can test every possible combination of hardware and software, and almost every PC suffers from clashes at some stage — there is no such thing as a standard PC, as there is with a Mac. When

you buy your next mainstream PC peripheral at an almost give-away price, bear this in mind. Oh, and by the way, Paul was totally wrong about tapping the processor chip three times with a skull on a stick for reliable operation — the correct technique is to create a sympathetic environment by burning essential oils nearby, lighting candles, and making sure your PC is correctly aligned with local ley lines.

### FARMING IT OUT

DSP (Digital Signal Processing) chips are becoming vitally important for audio, and are entering our PCs in larger and larger numbers. In essence, every time we need to carry out any manipulation to audio data inside the computer, it must first be converted into digital data using an analogue to digital (A/D) converter. Once in the digital domain, any processing carried out on this data is DSP. One of the main confusions is that hardware chip DSPs (Digital Signal Processors) use exactly the same acronym, so that many people are left with the impression that 'DSP' is always a completely separate and powerful add-on chip, used in the likes of the Mac DSP farm.

In fact, every time the main PC processor makes any change to the digital data derived from our audio signal, it is using DS Processing. So *Sound Forge* and *WaveLab*, the audio versions of *Cubase*, *Cakewalk* and *Logic*, and indeed any other audio application that accesses WAV files, is actually using DSP. Microsoft's DirectX is also a type of DSP (the term Native Signal Processing

## PC SNIPPETS

Steinberg UK have set up a new web site primarily to impart technical information. If you point your browser at [dSPACE.dial.pipex.com/steinberg-uk](http://dSPACE.dial.pipex.com/steinberg-uk), you will find more details about the hardware needed to effectively run the PC version of VST, a full list of CD-R drives currently supported by WaveLab 1.6, and Cubase hints and tips. However comprehensive the web sites provided by head offices in other countries, it is always good to see specific information from any UK operation, as it more closely reflects the problems we face over here.

As reported in last months PC Notes, the Waves Native Power Pack suite is now up to version 2.3, and this supports Cubase VST PC. I'm not sure whether this was as a result of my query to Waves last month, but a subset of the very useful Setup Libraries, previously only available to Mac owners, is now available for download for PC owners as well, at [waves.com](http://waves.com). There are presets for the Q10 Paraphoric EQ, TrueVerb and AudioTrack package, and the three zipped files have a total file size of only 25K.

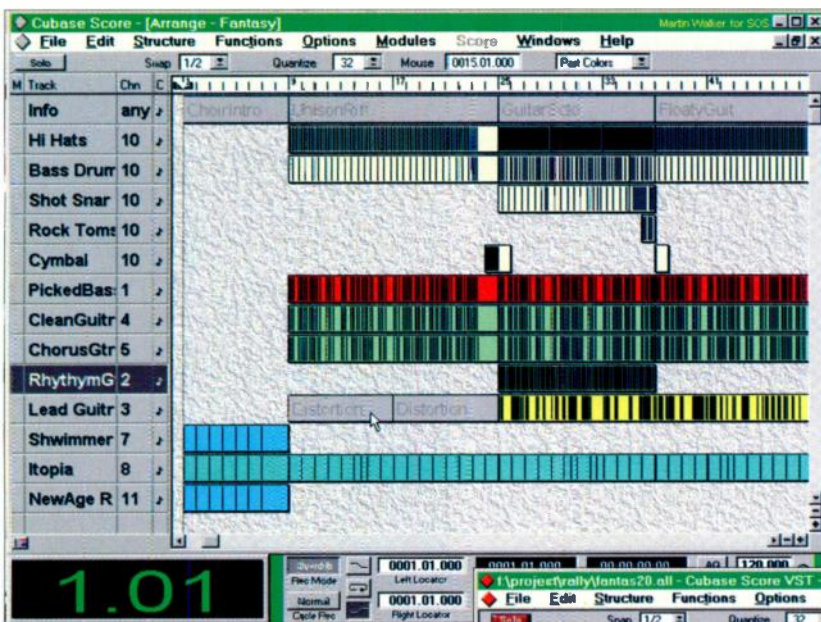
has been bandied about for this, since it uses the PC's normal processor), and this provides more efficient ways to run a wider variety of soundcards, by saving developers from having to write specific routines to suit each model of soundcard (see July's PC Notes).

The more advanced digital audio processing works by analysing the digital data into its constituent frequencies — this is known as Fourier Analysis, after a French mathematician who died in 1830, and who first formulated the method. The algorithm used is known as a Fast Fourier Transform (FFT), and this transforms the digital data from the time to the frequency domain using differential equations. It actually takes far more processing power to start changing EQs, creating filters, noise-shaped dither and so on, than it does to produce amplitude-based effects such as delays and echoes, which simply play back the same data at a different time.

## WALKING THE CAKE

Cakewalk must have been doing a lot of overtime lately. Both *Cakewalk Home Studio* (shown here) and *Cakewalk Professional* have just been upgraded to version 6, with prices of £99 and £199 respectively. Both add audio effects to their arsenals, and the Professional version has increased its number of audio tracks from four to eight. Contact Et Cetera on 01706 228039 for further details, or take a look at the Cakewalk web site ([cakewalk.com](http://cakewalk.com)).



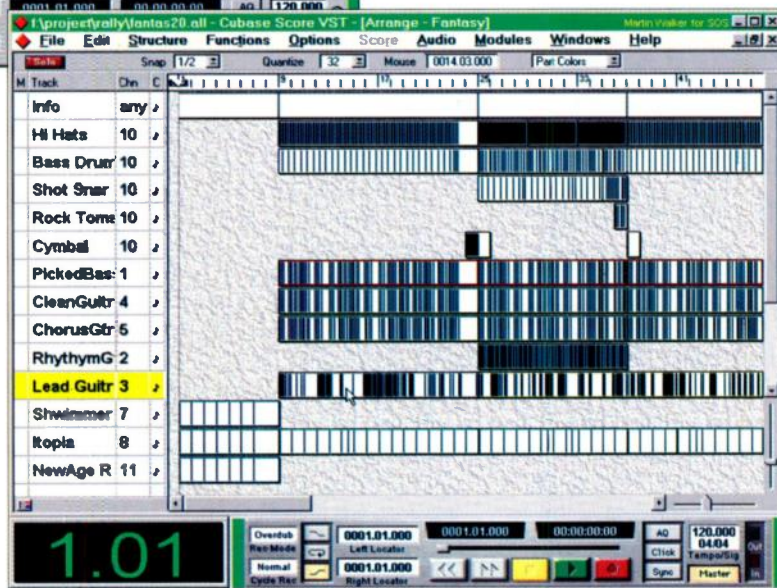


The new Cubase VST is wonderful, but sometimes, in the heat of developing new software features, previously useful ones disappear. Between Cubase Score 2 and Score 3 on the PC (when soundcard audio support was first added), two extremely useful display features disappeared, and have yet to reappear on even the new VST version. Assigning colours to parts made specific instruments very easy to see at a glance inside arrangements, and when viewed as 'Show Events', muted parts always reverted to solid grey with Part names. This was ideal, not only for making it obvious which parts had been temporarily muted, but also for adding text notes as dummy parts, as on the top track here, in Cubase Score 2.

Sadly, Cubase VST for Windows still continues with the newer technique of only providing colour in a pixel-high strip above and below the MIDI data, when parts are viewed as 'Show Events'. Compare this identically coloured sequence, as viewed in VST — no useful text in the top track, and can you see which part has been muted? I use Cubase on an almost daily basis, and VST is an amazing achievement, but could we have our colours back please? Steinberg UK passed on this information to their designers a long time ago, but, as they say, a picture is worth a thousand words!

**TINY TIPS**

You can hold the 'Alt' key and then press the spacebar to bring up the small Windows size dialogue box — but without even looking at the screen, pressing 'N' will then minimise the current window, 'X' will maximise it, and 'R' will Restore a minimised window to its previous size. Right-clicking on the Taskbar allows you to tile all the currently open windows, or minimise them all. These tiling options are extremely useful if you need to arrange two or more applications on screen simultaneously. If you need to keep an additional application open, but don't want to be tiled, minimise it first.



You may now be wondering where the 'real' DSP chips come in. Well, inside every modern digital synthesizer and effects unit is at least one specialised DSP chip, to enable it to produce such wonderful sounds. Indeed, soundcards have them on board as well, to provide reverb, chorus, and surround sound functions, as well as handling the basic Input/Output functions. Since it takes so much processing power to perform the more interesting audio manipulations, special microprocessors have been developed which have been optimised for fundamental operations such as addition, subtraction, and multiplication, as needed by the FFT process. They don't need to perform the same range of general-purpose activities required of the workhorse PC processor, and, much more important, that leaves them free to concentrate on a specific task — the manipulation of digital audio data. No nipping off to update the screen, shuffle a bit of data around on the hard disk, or check the MIDI ports to see if any more notes have arrived.

This is why using your Pentium processor to run an application like *Cubase VST* is so clever — it's doing absolutely everything, from shifting multiple tracks of data to and from the hard disk, moving it to and from the frequency domain to add filtering and effects, and mixing it down to a single stereo signal, to shunting it

off to the soundcard, to be converted back into an analogue signal ready for your loudspeakers. Well, there has to be a limit to the processing power in any PC. Pentium Pro machines can already use multiple processors on the same motherboard, to provide more power, but there has to come a time when our expectations of more and yet more real-time features mean that it is not feasible to ask the main PC processor to do it all. The only way to go is to take some of the processing load away from the main processor, and farm it out elsewhere.

You may now have guessed where I'm heading. The DSP 'farm', so beloved of Mac musicians using Digidesign products, is slowly but surely arriving on the PC. The V8 system from Digital Audio Labs already has two Motorola 56002 processors onboard, and to provide additional real-time power, up to three DSP 'superchargers' can be added, which will run V8-specific versions of the Waves *Native Power Pack*. Each features two more 56002s, running at 80MHz, making a possible total of eight industry-standard DSP chips plugged into a single V8 soundcard. Exactly the same sort of power is harnessed inside the PC Soundscape system reviewed last month.

There is, however, great potential for

confusion here, since the acronym DSP can stand for both the Processing (running the program) and the Processor (the actual hardware chip). If you see a 'DSP Module' advertised as part of a multitrack audio recording system, it might be a program or a chip — it pays to look closely at the specification. The industry-standard chips are those from Motorola, and these use completely different programming code from PC processors, which evolved from Intel's 8086 range. Unfortunately, this means that standard DMSS plug-ins (which appear in your MIDI + Audio sequencer) cannot access the extra processing power provided by Motorola DSP 'farms' — they need a different version of the program.

Despite the inevitable initial confusion, the moral is clear: if you want more and more real-time processing, no longer can you expect to use a general-purpose PC — a Pentium 200MHz MMX is starting to look decidedly puny. *Cubase VST* and its competitors demand extremely powerful processors to achieve their ultimate performance. If you want to run state-of-the-art software, you either need an extremely powerful machine, or a soundcard which can give your PC a helping hand — expect to see the general-purpose DSP chip appearing far more often inside PCs in the future.



**This month, DEREK JOHNSON checks out a couple of new software versions, and finds that Electronic Cow's Sound Chip Synth is moovin' on up...**

Reports are that the Goodmans Atari shows in October were well-attended, but that new music and MIDI stuff was rather thin on the ground. The only exhibitor dedicated to music on our platform of choice was Electronic Cow, who will be very familiar to readers of this column. Minor updates have been announced on all their software — it's good to see the refining process going on — and *Sound Chip Synth* has had a major overhaul, plus a new name...

### THIS MOOS JUST IN

In fact, *Sound Chip Synth* v3.0 is virtually a new program. While it accomplishes similar results as previous versions — creating sounds with the ST's sound chip — it does it with an enhanced user interface. In fact, the on-screen display now has the look of an analogue synth (see right): no prizes for spotting the 'MiniMOO' flash on the virtual front panel!

Let's look at some of the features in detail. SCS v3.0 offers a square-wave oscillator, with two-sub oscillators, a noise generator assignable to any oscillator, an amplitude modulator and an LFO. A standard ADSR envelope generator can be assigned to amplitude and/or pitch. The 'synth' can be played over MIDI, complete with portamento, although in practice this requires care (at least on my elderly STFM), but it's a good way to test your programming. Of course, the ST's sound chip is the limiting factor here, but the software does let you create some neat sounds, which can be easily exported, via a sample editor

## ATARI JOINS COMPUTER CLUB

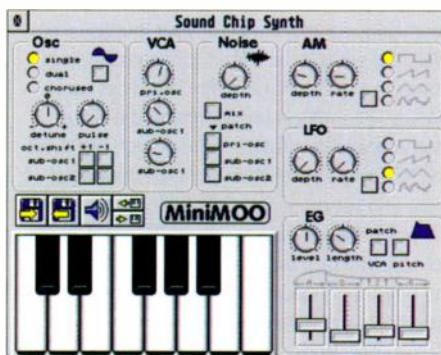
Not many Atari owners may be CompuServe users, but if you are you may have noticed the closure of CompuServe's dedicated Atari forums. Worry not: the Computer Club Forum on CompuServe, home of support for many aged but not quite dead computer platforms, has opened an Atari section (with support for pre-ST machines as well). At the time of writing (beginning of November), the libraries are empty, but they should start filling with bits of software when some logistical matters are sorted out. There's quite a bit of discussion between interested members, though, so it's worth a look if you have access.

(with AVR and AIFF support), to a hardware sampler. And with a price of just £10 plus postage, it's a bargain. You can also be sure of upgrades — which are free!

Note that there are incompatibilities between SCS v3.0 and previous versions. Sounds created using previous versions can't be loaded into v3.0, and some features are no longer available, due to the totally different way the new software has been designed. This needn't be a problem: v2.32 is also included on the disk.

*MIDI Arpeggiator* and *Snippet Synth* have been upgraded slightly since we last mentioned them, two months ago, to v2.11 and v1.21 respectively. *MIDI Arpeggiator* now has an improved MIDI mixer section and runs as either a normal GEM program or a desktop accessory. The main improvements to *Snippet Synth* are the ability to load any AIFF/AVR/SPL or raw 8-bit sample data for use as complex waveform grains, and an improved interface with easier-to-edit numeric fields.

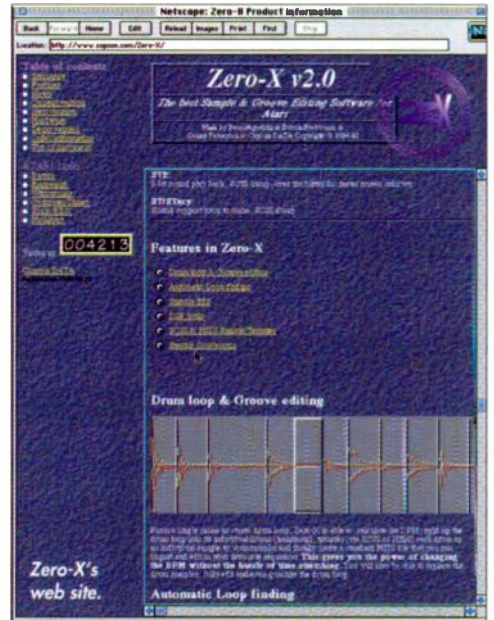
You can contact Electronic Cow at 350 Broadwater Crescent, Stevenage, Hertfordshire, SG2 8EZ. Tel: 01426 281347; email



Electronic Cow's brilliantly-named Mini Moo — cud be a winner...

## ATARI COMPUTING ISSUE 6

Issue 6 of *Atari Computing*, the only remaining UK print-based Atari magazine, is out, with issue 7 being promised shortly. Issue 6 includes the usual collection of broad-based news and features, with coverage of the v2.5 upgrade to Emagic's *Logic* sequencing software. The mag is only available by subscription, with the option of a reader disk; UK subs cost £9 for three issues or £18 for six issues (make that £15 and £30 respectively if you'd like the disk option). Contact *Atari Computing* Subscriptions, 73 Bentinck Drive, Troon, Ayrshire KA10 6HZ (or visit their web site at [www.ataricomputing.com](http://www.ataricomputing.com)).



electronic\_cow@dial.pipex.com; web site [dSPACE.dial.pipex.com/town/terrace/abi91/cownet.htm](http://dSPACE.dial.pipex.com/town/terrace/abi91/cownet.htm).

## ZERO HERO

Now for news of a software upgrade that doesn't come from Electronic Cow! Zero-X, the serious and well-established sample editor for GEM-based computers, has just reached v2.0. While the software will run on any ST-family machine with 1Mb memory or more, it much prefers a Falcon or clone with 4Mb or more. Zero-X allows you to record direct to (and play back from) IDE or SCSI disk; formats supported include CAF, AIFF, AVR, WAV, DVS, RAW and DAME. Specialist features include drum loop and groove editing, with bpm calculation and automatic loop finding. In fact, Zero-X has borrowed a couple of tricks from the big boys on the Mac and PC: if your drum loop isn't the right tempo, you could, of course, time-stretch it... or you could let the software chop it up into its constituent parts, transfer the samples to your sampler, and create a MIDI file that can be used to trigger the individual hits. Want to change the tempo? No problem!

Comprehensive sample-editing parameters include cut, copy, paste, silence, reverse, swap channels, stereo-to-mono, and digital noise gate. The list of digital signal processing tools is also comprehensive: mix, fade in/out, optimise volume, change volume, sample-rate conversion, crossfade loop, gate loop, crossfade samples, detune, mute, create pattern, time-stretch, phase-shift, high-pass filter, delay, and reverse delay. Audio can be transferred via SCSI (to instruments that support SMDI) or MIDI Sample Dump Standard; compatible samplers include those from Akai, Emu, Kurzweil, Peavey and Ensoniq. Support is also provided for 12-bit, as well as 16-bit, samplers. A demo of Zero-X v2.0 is available at [www.copson.com/Zero-X/](http://www.copson.com/Zero-X/). The full version costs £169 including VAT, and it's available from System Solutions, 17-19 Blackwater Street, London SE22 8RS. Telephone 0181 693 3355; fax 0181 693 6936; email [sales@system-solutions.co.uk](mailto:sales@system-solutions.co.uk); web site [www.solutions.com](http://www.solutions.com).



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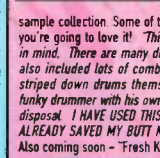
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# demo DOCTOR

If you'd like our resident specialist **JOHN HARRIS** to review your demo tape, just send it on cassette or DAT, with recording details and a photograph, to: **Demo Doctor, Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ.**

Readers submitting demo tapes should note that SOS regards the inclusion of photos or artwork with demos as permission for the magazine to reproduce this material free of charge, as illustration, with any review of the accompanying tape.

## JOE ELIAS

### Recording Venue: Home

**Recording Equipment:** Atari 1040ST running Cubase, Akai DR4D digital recorder, TL Audio valve EQ, Drawmer LX20 compressor, Behringer Ultrafex II effects, Yamaha Promix 01 digital mixer, Aiwa XDS1100 DAT recorder, Technics hi-fi amp, JBL Control 1 monitors, AKG C451 and CK1 mics, SM58 mic, Akai ME30P MIDI patchbay.

Joe is a solo act based in London, recording under the name of Obligato. Given the equipment list, which contains a few classy products, I would expect some decent sounds on this demo of two songs.

The general mix does not disappoint, although it suffers a little at the hands of multiple cassette copying (slight fizz in the top end). The first song is quite heavy in the bass end, but never out of control, and this suits the pop dub bassline. There's some nice interaction between the bassline and a damped clean guitar sound too, in classic reggae style. Whether the guitar is a sample or the real thing is impossible to say, but the effect is often used to give a very rounded bass sound some attack, by either doubling up the line on guitar or playing selected highlights.

Multitracked backing vocals have been well arranged and performed on the choruses, working in a question/answer style with the lead vocal. Treated with a shortish plate-type reverb, they sit well in the mix, giving a kind of 'global' flavour which I'm sure is what Joe intended. As for the lead vocals, I would question the choice of key for Joe's voice. It sounds as if he's near the top of his range, and although it's



all sung in tune he sticks very rigidly to the melody. This is most apparent on the fade-out, where we've already heard the chorus enough times and he should be ad-libbing on the fade. The suggestion is that he's got no place left to go, vocally.

The second song is another slice of Afro-Caribbean pop, which has been well arranged in a style less self-conscious than the first. Consequently, it sounds far more commercial, and this time the vocal melody is in a better key too. Given that Joe has a large back-catalogue of reggae to delve into for inspiration, he's managed to capture the spirit of the music both in the groove and in the slightly lazy vocal style.

Sonically, there's nothing out of place here, with a well-programmed drum part emphasising the first and third beats, ably assisted by a simple bass line. Skanking is taken care of by a keyboard guitar sound, and there's the occasional rhythmic stab from sampled sax. Once again, Joe uses backing vocals on the chorus, but these are less strident than the first song, and perfectly in keeping with the sunny feel of the production. Could easily be a summer hit. □

## SENSE AMELIA

### Recording Venue: Home

**Recording Equipment:** Fostex R8 8-track, Seck 12:8:2 mixer, Alesis MM78 sequencer, Drawmer DS201 gates, Alesis 3630 compressor, Yamaha EMP100 effects, Alesis Midiverb effects, Sony 55ES DAT recorder, AKG C525S mic.

'Dirty' is the title of the first song on this two-song demo. Immediately the hip-hop beat is up and running, some weird things begin happening in the backing, courtesy of a looped sample with a spooky backwards arpeggio. This seems to grow out of a synthesized sitar drone, which itself makes a welcome reappearance later in the mix. The minimal bass is low and solid, with little definition most of the time, but the kick drum attack takes care of that end of things. When the sampled bass makes the occasional foray into the upper frequency range, it is aided and abetted by slide and modulation — all in keeping with the song's theme.

Although the backing is imaginative, it's not too clever to turn off the mainstream listener, who is then hooked by the magical voice of Deb Kelly. This is simply terrific, and when the backing track moves up a gear she goes with it, delivering the sort of exciting and sexy vocal demanded by the song's lyrics. The highly compressed vocal sound gives the voice an attack and punch which also suits this section of the song. Here the vocal emotion is in sharp contrast to the steely pad string sound, the tone of which could have been improved with some bass roll-off. Better still, a Mellotron or sample would have been even colder.

The high quality feel of this demo continues



with the second song, 'Loved Up', where the groove is anchored around a sliding fretless bass sample and slow, heavy dance beat. Tortured overdriven guitar makes a significant contribution to the backing, which is otherwise pretty minimal. There are also some nice touches with vocal samples and scratching, loaded with low frequency, breaking across the beat.

Programmer and musician Carl Harris (no relation) has done a fine job, which must have been inspired by the excellent vocals.

This duo have a great deal of potential, but are one of many acts currently running the risk of sounding too much like Portishead. And if they haven't been signed by now, I'm afraid it's already too late. □

## CHILLER

**Recording Venue:** Home and Jonathan Recording, Bristol.

**Recording Equipment:** DX280 PC running Cakewalk Pro and XGEdit.

All the music mixing for this self-financed CD was achieved with the computer, and the vocals were then recorded and mixed at a studio. Presumably this was to take advantage of



better microphones, effects and monitoring. And the vocal sound of classically trained singer Angela Huggins does sound good on the opening song, where reverb and delay has had the effect of blending the vocal with the computer-mixed backing. The only thing I picked up on was the lower bandwidth sound of the backing compared to the sparkle of the vocal sound, and this is actually not terribly noticeable, or even necessarily

detrimental to the general sound.

The second song, 'Shooter', begins with a long, moody instrumental section in which a portamento bass sample is gradually brought to the attention as it fades in. I thought this was neat, because it was hard to make out just what the sound was

and I like to be kept guessing with a mix. Some sections of the vocal are treated with modulation, which is a good idea, but the effects mix is too high, and this reduces the impact of the effect. For the same reason, it

was unnecessary to add so much reverb to the kick drum in various sections of the mix.

The general impression given by this CD is that the songs, although showing a fair degree of imagination in terms of programming and choice of sound, are all similarly paced — long intro, medium tempo, moody vocal lines with a fair amount of repetition. A little more light and shade is called for if Chiller want to go further in the music industry. □

## FISH OUT OF WATER



**Recording Venue:** Home

**Recording Equipment:** TEAC A3340S 4-track, Seck 62 mixer, Alesis Quadraverb effects, Shure SM58 mic, Sony DTC750 DAT, Aiwa personal cassette recorder.

Proving that you can get plenty of presence out of a dynamic microphone if you have the right voice, Jenni Whiteside's almost whispered style sounds great on this recording. This style of vocal requires a little extra push of air and use of the roof of the mouth to get that breathy sound, full of presence. It could then easily have been emphasised with some HF boost, if necessary. Whatever the method, this is the sort of sound that will draw the listener into the

song and, lightly dusted with reverb, it sits quite happily up at the front of the mix.

The lightweight backing utilises echoed rhythmic guitar, piano, warm pad keyboards, and drums from an Alesis SR16. These drum sounds are

well-chosen and well-programmed jazz and brush samples, which lie in the mix in a way which really suits the track. Occasionally the busy clean guitar drops out to allow the pad keyboard and rhythm track to come through, and this simple use of dynamics is effective.

Ambiances and atmospheres have been recorded by Ian and Jenni, who are both tape editors, so sounds from London, Zambia or Namibia occasionally slide into a song or start it. This technique is at its most obvious on the beginning of the third song, where the shipping forecast is mixed into sounds from Africa. This sonic collage eventually mutates into what sounds like tape hiss chopped into a rhythm. However, this is a track where a more strident production is needed to give it balls, and instead it's treated in much the same way as the earlier mixes. To achieve the stronger feel the track requires, a louder instrument mix and a heavier choice of drum voices are needed. Distorted guitar has been used, possibly in an attempt to bring some aggression to the mix, but it has far too much presence, which then naturally conflicts with Jenni's vocal frequency range. □ ▶



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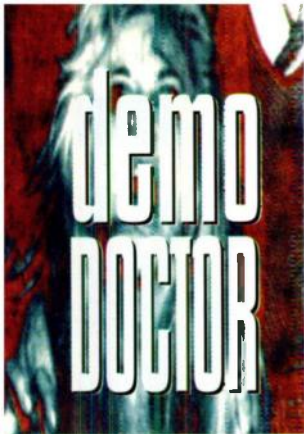
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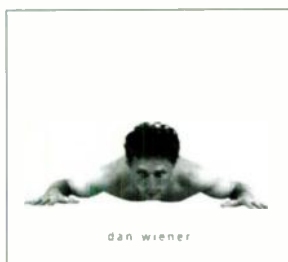
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## ▶ QUICKIES

**DAN WIENER's** tape is heavily inspired by certain bands, as the opening to the second track, 'Dreams', demonstrates. This borrows wholesale from the



backing to 'Holding back the Years' by Simply Red, but turns into a different song after the verse. Yet the CD has otherwise been well produced, by Ed Armitage, at a recording facility somewhere in London. The drum sounds are crisp and clear, and the overdriven electric guitar sounds are classic rock. My only criticism on the technical front would be that the entire bass end of four of the mixes on this 5-track CD lack warmth, sounding almost as though a high-pass filter has been applied at around 80Hz.

**HAZARDOUS FUNK:** The dayglo green of this CD is just great, and the music is pretty vibrant too — a cocktail of brass and guitar with jazz, rock and dance rhythms. Improvisation is also quite high on the agenda, and the band pull it off with aplomb — they're obviously seasoned jazz and rock players. I was surprised at the choice of brass sound in the recording, which was quite mellow (to the point of being dull) when some brightness in the upper mids would have suited the mood of the up-tempo pieces. My favourite was the third track, 'The Hazardous One', which has shades of on-form Pat Metheny and Weather Report in its composition and arrangement.

The production on this track is also excellent, with clarity and a great sound balance that I guarantee would sound good on most systems. Certainly a yardstick for future recordings.

**PLANET OF DESTINY** were turning out handbag house when they sent this demo in, and they've probably changed a bit since then. Treating the tape as a product of its time, the main problem is the lack of power in the vocals, which isn't improved by the low level of the vocal in the mix. The consequently weak opening track is followed by an octave-bouncing bassline version of the same, which has a much better mix, with the higher vocal (mixed with a few effects) showing promise. A sampled flute makes an unexpected but welcome appearance, and the slightly echoed organ works its magic too. In all, a tight little club mix.

**WILD MONKEY:** This 2-track CD single has been produced under what I think is the Wild Monkey's own label, but the band seem to have an agent based in London. These Lanarkshire 'power popsters' have gone for a production sound that they hope doesn't take them too far away from their live performances. Jangling guitar and atmospheric piano set the tone for the first song, a slow burner that shows off the strong singing talent of Niv Dyer. The arrangement is good too, with an unexpected move into a chorus that's both uplifting and well executed. The band

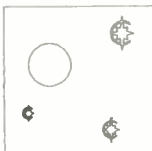


perform well once again on the second track, with a mix which hangs on the bassline and solid drumming of Stuart McArthur and Stevie Clarke. The bass is a touch too loud and the shaker a bit intrusive, but otherwise this is a clean mix — though I confess that I'd still have run it through a valve EQ or compressor to warm it up.

**DARREN DEANS** wrote, arranged and produced his tape

but didn't actually record it. Instead he used the Music Farm in Cumbria and Studio Two in Sunderland. The results are good, considering the fairly budget nature of sound sources such as the Roland D5 driven by an Alesis MMT8 sequencer. Indeed, some of the low-bandwidth sounds are a refreshing change, and give the mix a

## FATE FOR NOW



## QUARTET

lack of grating upper mids that I found appealing. This feel also suits Darren's light pop vocal sound, itself well balanced against the backing and with a presence which gives it great clarity over the backing. It's also interesting to note that, in a world where such a variety of synthesized sounds are available, the restriction of choice can lend a continuity of sound which many other demos lack. Add to this the female backing vocals of the wonderfully named Vanessa Joy (used sparingly but effectively on songs like 'Wildier than the Wind') and you've got a good demo.

**RICHARD ASKEW** has a voice that's suited to the late-night sounds on the opening track of this demo — but then he says he's "happier at night", like a lot of musicians I know. Soundwise, the vocal lacks a touch of presence, which a 2-3dB HF boost would achieve without compromising the 'early hours of the morning' vibe. Occasionally the vocal level is too high in the mix when it needs to be closer to the backing to be effective — the beautifully detailed acoustic guitar and piano backing to the second song, for example, deserve to be louder. But the vocal also needs to fight a little against the backing, to bring some more emotion out in the performance and, as a result, the mix.

**AUTO ERÓTICA:** Although 'mainstream' heavy metal in style, the music of Auto Erotica is nearly all computer based, a mix of strident drum programming with lashings of reverb, larynx-lashing singing and power chords. The guitar is well played, and the big, warm overdrive sound is the perfect foil to digital sound



sources such as triggered drums and pad keyboards. The vocals of Viva Larocque are sunk into the mix in a way that only the limited bandwidth of half-screamed vocals can be — who needs

parametric EQ when you can sing like this! The reverb on the kit is completely over the top, but its metallic clang brings out the industrial techno lurking beneath a veneer of rock guitar. Occasional sops to technology appear and are well handled, but this is essentially rock with a big 'R' and computer with a small 'c'.

**THE PEPPER TREES:** This demo has a bass-heavy mix which suggests that the mix itself was done on small speakers. The vocal is also pretty loud, and its clarity has been compromised by what sounds like an ADT with modulation effect, causing the vocal to phase slightly and lose presence. Some nice piano touches are brought higher in the mix towards the end of the song, and the guitar part which plays counter to these should also be brought out in the mix. The second song is a ballad, and the same vocal treatment has been used, which is a shame. In contrast, this vocal approach works well on the backing vox, though these would have benefited from some LF shaved off to make them sit in the mix — not everything can have a massive sound. The acoustic guitar on the second track is a bit buzzy, and this is noticeable enough to upset the mellow feel of the mix. It would probably have been worthwhile trying to EQ some of the upper mids — say 6kHz — out of this or, better still, re-recording it. □

## TIPS FOR RECORDING MUSICIANS

If you're a regular reader of our Demo Doctor reviews, you'll know that John Harris really knows his stuff when it comes to recording and engineering techniques. You can get further valuable advice and guidance to help you with your own recordings from John's book, *Tips for Recording Musicians* (order code B309). The book costs just £8.99, plus £1.95 postage & packing, and you can obtain it from SOS Mail Order, SOS Publications Ltd, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ. Tel: 01954 789888. Fax: 01954 789895.

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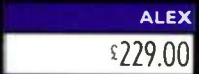
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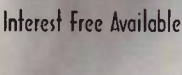
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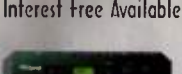
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**GORDON REID explains why he loves his Ody...**

**W**hen I was but a wee lad I had a craving for synthesizers — magic boxes that could, at the tweak of a knob, make me sound like my keyboard heroes. If I had a synth (so I thought) I could be excused for wearing a long blonde wig and a flowing cape. Moreover, I could incite the adoration of thousands simply by inserting knives into my organ.

I got my synthesizers, but I managed to avoid the wig and the cape. Unfortunately, I was also singularly successful in avoiding the acclaim. Ego ensured that I never considered a severe lack of talent as an excuse but, nonetheless, I knew that I had never produced the powerful sounds I so desired. Was it me or, unlike a bad worker, was I experiencing a genuine deficiency of the tools themselves?

Then I happened to meet the imposing Robert John Godfrey. Robert, founder and

leader of the (then) cult band The Enid, had come to talk to me about word-processors but, inevitably, the conversation drifted round to synthesizers. I explained that my keyboard rig — Crumar Organiser, Logan String Melody II, Hohner Pianet T, RMI Electrapiano 368X, Roland SH1000, Korg MS20 and Casio CT202 — still didn't offer the type of sounds I wanted. "You need a decent synth" said Robert, "something with guts. I think we've got an old Odyssey knocking around somewhere. Come round one evening and I'll give it to you." So, thanks to Robert's generosity, I acquired my first 'decent' synthesizer.

The Odyssey came to my rescue just in time to convince me that it wasn't only my playing or synth programming that was deficient. For years, the missing piece in my keyboard jigsaw was class: the elusive quality that makes certain keyboards 'instruments' in their own rights. The Minimoog had it, the Mellotron had it, even my RMI had it. But, by the standards of the day (long before the dance fraternity adopted the fizzy delights of the MS20) neither of my Japanese synths had it. The Odyssey had it in spades.

### THE FIRST ODYSSEYS

Alan R Pearlman's company, ARP, launched its first synth in 1970. The ARP 2500 was a huge affair — imposing, intimidating, and

offering many improvements over the modular Moogs that had preceded it. The company's second offering, the ARP 2600, was also released in 1970, but this was far from an immediate success ("How do you get it to stop?" pleaded Joe Zawinul). In a world where synthesis was new and mysterious, the 2600 was almost completely impenetrable and, as a semi-modular instrument, it needed patch leads to get the best from it. Years later, the world would embrace both instruments as classics, but ARP needed products that would sell to a wider market of less technical musicians. So, in 1972, the company announced a cut-down version of the 2600, with one fewer oscillator and extensive internal pre-patching of the sound-generating modules. It had a white control panel and an excellent vinyl wrap-around case that projected right under the keys to protect them from damage. It was the ARP Model 2800 'Odyssey'.

What made ARP's new baby so special? It wasn't the keyboard, which was neither velocity nor pressure sensitive and, with just 37 notes, was seven keys shorter than a Minimoog's. Nor was it the simplicity and immediacy of the controls because, despite drastic simplification compared to the 2600, they were neither simple nor immediate. And, let's face it... its construction was basic, the knobs and sliders broke off, and it offered neither pitch nor modulation wheels. But the Odyssey scored where it mattered most. The Sound. Nothing could match an Odyssey in full flight. Yes, the Minimoog was also superb, but in a different way. The Odyssey had a character all its own, and one that was to set it apart from just about every other synth.

Much of this was a consequence of ARP's famously aggressive oscillators. These generated all the basic waveforms — sawtooth, square wave, pulse, and pulse width modulation (PWM) — that, to this day, remain the building blocks for almost all analogue sounds. (PWM was quite a luxury, and one not found on many synths. Even the Minimoog lacked it. But, since PWM forms the basis of many of the richer, more lush analogue timbres, its inclusion ensured that the Odyssey sounded 'bigger' than it was, generating sounds normally reserved for more heavily endowed instruments.) With oscillator sync and a ring modulator, ARP's twin oscillators put the Minimoog's three to shame. Furthermore, with a tuning drift of less than 1/30 of a semitone (in sharp contrast to other synthesizers of the era) the ARP oscillators

### CURRENT ARP VALUES

From the wonderful Odysseys and Pro-Soloists to the ghastly Quartet and the electronic pianos, ARP went from one extreme to another. Here's a list of all the ARPs you're likely to see advertised, plus my marks out of 10 for each. You disagree? Great — I love a good argument.

| MODEL                               | 2ND-HAND BARGAIN | 2ND-HAND RIP-OFF | MARKS OUT OF 10       |
|-------------------------------------|------------------|------------------|-----------------------|
| 4 voice piano                       | 25               | 75               | 0                     |
| 16 voice piano                      | 50               | 100              | 2                     |
| 2500 *                              | 2000             | 5000             | 6                     |
| 2600                                | 750              | 1600             | 7                     |
| Avatar                              | 100              | 400              | 6                     |
| Axxe **                             | 50               | 200              | 4                     |
| Explorer                            | 50               | 150              | 5                     |
| Odyssey (model 2800 'Mark 1')       | 150              | 500              | 10                    |
| Odyssey (models 2810-2813)          | 150              | 550              | 9                     |
| Odyssey (models 2820-2823 'Mark 2') | 150              | 450              | 9                     |
| Omni                                | 50               | 140              | 5                     |
| Omni II                             | 50               | 150              | 5                     |
| ProDGX                              | 75               | 200              | 9                     |
| ProSoloist                          | 50               | 200              | 10                    |
| Quadra                              | 250              | 500              | 8                     |
| Quartet                             | 0                | 50               | minus several million |
| Solina / String Ensemble            | 50               | 125              | 5                     |
| Solus                               | 100              | 300              | 6                     |

\* depending upon configuration. \*\* OK, make that a '5' for a white-face in mint condition.





The mighty Mark I Odyssey.

were extremely stable. A well-maintained Odyssey, once set up, would remain just about perfectly pitched in all conditions, from sweaty bars to sub-zero outdoor stages. This was a godsend for the gigging musician.

In addition, the Odyssey combined more sound-shaping features than any other non-patchable synth of its era. It had extensive pitch-modulation capabilities, a very flexible sample & hold, single and multiple triggering, noise generation, two filters, and two envelope generators. It also incorporated an innovative keyboard-scanning system that assigned the oscillators to the highest and lowest keys played, making it the world's first duophonic synthesizer. But it was the model 2800's superb 24dB/octave filter (the 4012) that was its crowning glory. This had a frequency response extending to nearly 35kHz, and it is this that now makes 'white-face' Odysseys the darlings of synth collectors.

The Odyssey immediately became one of the hottest synths on the market so, despite making very little profit, ARP got on with the honourable occupation of selling lots of instruments. Then, in 1973, upstarts such as the Keio ORgan company (geddit?) and Roland dug deep into ARP's market with \$500 synths that players found almost as attractive as the Odyssey. It took until 1975 for ARP to respond, taking the proven but relatively expensive Odyssey, and stripping out facilities until it reached an acceptable compromise between low cost and retained performance. The result was a simple monosynth that, despite a lowly price, retained much of the character of its parent. Thus the Axxe was born. Together with the Odyssey, the

## DON'T BELIEVE EVERYTHING YOU READ

There was at least one area in which, on paper, the Odyssey fell short of ideal. This was in the attack speed of its ADSR and AR envelope generators. Consider this: plucking, hitting or slapping any musical object results in almost instantaneous transients, both in terms of amplitude and harmonic variations: the sound doesn't increase in volume slowly, it immediately goes 'boingg'. On a synthesizer, even the slightest deviation from this ideal results in weaker, less interesting sounds. The ARP's envelopes each had minimum attack times quoted as 5ms, so they should never have sounded as snappy as the Rolands and Yamahas that claimed attacks of 1 or 2ms. Having said that, the Odyssey was at least a match for the best of the Rolands, and was much punchier than any Yamaha or Korg of the era. Indeed, the snappiest synth of them all was probably the Minimoog, with a quoted attack of 10ms. It just goes to show how misleading specifications can be.

2600, and the ProSoloist, this helped ARP to win 40% of the mid-'70s American synthesizer market — a phenomenal feat by any standards.

## IMITATION IS THE SINCEREST FORM...

So respected was the Odyssey that, in 1976, New York company Octave Electronics released a blatant imitation called the Cat. (They even had the cheek to introduce the 'Kitten', which copied much from the Axxe.) ARP responded through the American courts but, despite Octave's clear infringement of ARP's duophony patent, the Cat remained in production and Octave stayed in business. In truth, despite the obvious

similarities between the Cat and the Odyssey, there were also many significant differences between the synths. For example, the Cat offered additional — and mixable — oscillator waveforms, and incorporated a quite different filter. Whatever the rights and wrongs of the issue, the Cat remained in production for five years, and the Kitten for four, after which the manufacturer metamorphosed into Octave-Plateau, and finally Voyetra Technologies.

## SECOND-GENERATION ODYSSEYS

Early in 1977, ARP announced a revised Odyssey that offered many improvements over the original model. However, after developing the new electronics, ARP continued to use existing cases and control components — thus creating the 'black-faced' models 2810-2813. These 'in-betweenies' retained the vinyl case and the pitch-bend knob of the 2800, but ARP ditched the superb 4012 filter in favour of a new circuit, the 4072. The reason for this was simple: ARP had copied much of the 4012 from a Moog patent, and after years of inter-company wrangling, Alan Pearlman decided that ARP should develop its own, non-infringing, filter. Unfortunately, somebody calculated the component values incorrectly, and the 4072 offered a maximum cutoff frequency of just 12kHz. This made the new Odysseys audibly inferior to their predecessors.

By way of compensation, most 2810-2813s incorporated new and comprehensive CV and Gate interfaces, plus an external audio input. There was a very specific purpose for these. They allowed players to replace the sound generated by the internal oscillators with that

# ARP ODYSSEY

▶ generated by, for example, an ARP String Ensemble. The Ensemble could then make use of the Odyssey's filter and envelopes, to create a primitive, but usable, polyphonic synthesizer. ARP called this combination their 'Polyphonic System' and, although the Odyssey could only respond to single triggers and provided just one filter for all the notes played on the Ensemble, it produced brass ensembles, pipe and electric organs, plus a few piano-like, clavi, and other percussive sounds. (The Polyphonic System was superseded by the Omni — a single instrument with its own filter and envelope generator — that went on to become ARP's most successful product.)

*1977 saw the release of the intermediate Odysseys (like the one shown here), with model numbers ranging from 2810-2813.*



The final incarnation of the Odyssey arrived a few months later. This eventually encompassed four revisions (models 2820-2823) but all are now known as Mark 2s. Recognised by their black and orange control panels and steel chassis with leather end-pieces, these offered further changes compared to their predecessors. The most visible of these was the chassis itself: less

robust than the vinyl case of earlier models, it left the last inch or so of each white key exposed. Fine in the studio, it wasn't so suitable for gigging, and an alarming number of keys were broken as a result. Less obvious, but perhaps more important, was the adoption of ARP's unique

'PPC' (proportional pitch controller) which, on the last 'in-betweenies', had replaced the unconventional and unpopular pitch-bend knob with what proved to be an equally unconventional and unpopular pressure pad arrangement. The three PPC pads sat under the fingers of your left hand and gave pitch-bend 'down', vibrato, and pitch-bend 'up', each effect in proportion to the pressure applied to the appropriate pad. Minor external improvements were also made: the unconventional 'phono' input was exchanged for a standard quarter-inch jack socket, and the quarter-inch 'high' output was replaced with a balanced XLR.

On the inside, the VCO was redesigned for better tracking and stability, the power supply regulation and the S&H circuit were improved, and the keyboard offered better CV generation, for more accurate control of other synths. Furthermore, later service documents show that ARP changed the filter yet again, first to the 4023, and finally to the 4075, which offered a claimed frequency response of 16kHz. Whether these revisions were different to the earlier versions, or whether the nomenclature has become garbled after all these years, is unclear. However, apocrypha has it that the sound of the filters in the last few Odysseys challenged the Moog-esque circuits of the earliest model. Whatever the truth may be, the 2823 Odyssey was an excellent instrument, period.

## SO WHAT WENT WRONG?

ARP's zenith was in 1977, and the company then moved into a rapid decline. Despite a turnover of millions of dollars, profits were minimal, and there were three uncoordinated research and development projects eating into the company's meagre resources. One of these was the world's 'ultimate' polyphonic synthesizer, the Centaur. Hopelessly complex, hopelessly unreliable and, with a projected end-user price of \$20,000 (more than £50,000 at 1997 prices) hopelessly overpriced, the Centaur was doomed. The company built just two. Stranded without a flagship product, ARP rushed

## ODYSSEY AND MINIMOOG COMPARED

Despite costing about the same throughout the 1970s, in many ways (on a 'features per pound' basis) the Odyssey beat the Minimoog into a pulp. Check out the specs for yourself:

|                              | MOOG MINIMOOG | ARP ODYSSEY      |
|------------------------------|---------------|------------------|
| <b>OSCILLATORS:</b>          |               |                  |
| Audio Oscillators            | 3             | 2                |
| No. of waveforms             | 6             | Unlimited        |
| Pulse Width Modulation       | No            | Yes              |
| LFO Pitch Modulation         | Yes           | Yes              |
| Audio frequency Pitch Mod.   | Yes           | No               |
| Oscillator sync              | No            | Yes              |
| Fine Tuning                  | No            | Yes              |
| Ring Modulation              | No            | Yes              |
| Noise                        | Yes           | Pink & White     |
| Pitch bend                   | Yes           | Yes              |
| Portamento (Glide)           | Yes           | Yes              |
| <b>FILTER:</b>               |               |                  |
| 24dB/oct LP filter           | Yes           | Yes              |
| High-pass filter             | No            | Yes              |
| Filter self-oscillation      | Yes           | Yes              |
| Keyboard tracking            | 4 options     | Fully variable   |
| <b>ENVELOPES:</b>            |               |                  |
| Dedicated Envelopes          | 2 x ADSD      | 1 x ADSR, 1 x AR |
| No. of Envelope destinations | 2             | 6                |
| Envelope inversion           | No            | No               |
| LFO re-triggering            | No            | Yes              |
| <b>LFO AND S&amp;H:</b>      |               |                  |
| Dedicated LFOs               | 0             | 1                |
| No. of LFO destinations      | 2             | 8                |
| No. of LFO waveforms         | 6             | 2                |
| Sample & hold                | No            | Yes              |
| No. of S&H destinations      | n/a           | 5                |
| <b>OTHER FEATURES</b>        |               |                  |
| Polyphony                    | 1             | 2                |
| Keyboard                     | 44 note       | 37 note          |
| Modulation wheel             | Yes           | No               |
| Pitchbend wheel              | Yes           | No               |
| Transpose +/- 2 octave       | No            | Yes              |

## SERVICING AN ODYSSEY

The simplicity of the Odyssey's construction is now a 'plus' point, albeit a rarely appreciated one. You can disassemble one with no more than a screwdriver, there is no VLSI or other digital circuitry to fall foul of, and its operation can be understood with even a limited knowledge of electronics. This means that servicing, if the parts remain available, remains straightforward. Beware, however, Instruments with broken sliders or defective filters. The spares for these have begun to assume all the characteristics of hens' teeth, so you could be facing an expensive repair bill if you need to replace either. You may even end up, as I did, buying a second Odyssey to use as a source of spares for the first.

Inevitably, this simplicity has also led to some units being modified in rather unconventional ways. The Enid's Odyssey saw the business end of a soldering iron on more than one occasion, eventually sporting a guitar input and a modification that allowed a 24dB/oct wah-wah foot pedal, with resonance, to control the filters! There's no accounting for taste.

out a half-baked polysynth that also marked its penultimate fling with monophonic synthesis. The Quadra was, in essence, a hybrid of an Omni II, a cut-down — but pressure-sensitive — Odyssey, and a basic monosynth devoted to bass duties. Unfortunately, most players agreed that contemporaries such as the Prophet 5 completely outclassed it. The Quadra bombed. Other projects, such as the Avatar guitar synthesizer and the 4-voice and 16-voice electric pianos, were also unmitigated disasters. By 1980 ARP was in a mess, crippled by mismanagement, while, in contrast, Japanese competitors such as Roland and Yamaha were putting the finishing touches to the Jupiter 8 and the world's first FM synth, the GS1. In 1981 ARP collapsed in a heap of recrimination and unpaid bills. Development and production of all ARP synthesizers (except for the CBS/Rhodes Chroma) stopped, and the Odyssey died.

### IN USE

Despite the chequered history of their filters, all Odysseys sounded bright and zappy and, if they were never as punchy as a Minimoog (which is debatable), they blew away the Rolands, Yamahas and Korgs that had caused me so much frustration. They excelled at the

scquelchy basses, industrial effects and shrieking lead sounds that are now so fashionable, displaying a cutting edge that was missing from their competitors. On the imitative side, their solo trumpets and tubas are still the standards by which analogue synths are judged, and a little judicious juggling of the filter and envelope would produce flutes, oboes, and Clavinoline imitations that had you playing 'Telstar' before

you could stop yourself. The manual also offered guitars, trumpet and string choruses, electric bass and percussion patches, while 75 further sounds appeared in the patch-book that came with every synth. If there was a criticism, it lay in how difficult it could be to coax warm, mellow voices from an Ody. You could do it, but the results lacked the characteristic warmth of a Minimoog — impressive, maybe, but cold and distant by comparison. The Odyssey's sound, despite its ascendancy in some areas, was limited in others, and for this reason perhaps, it was always overshadowed by its more famous competitor. This is a shame, because the combination of the warmer, fatter Minimoog and the more 'edgy' Odyssey offered a far wider range of timbres than could be provided by either alone. The Enid recognised this, as did Jean Michel Jarre (*Oxygene*), and the Electric Light Orchestra (*Out of the Blue*).

Nowadays the Odyssey is revered as a prime example of the 'twiddly' school of synthesizers. With all its controls on the large top panel, it encourages even the most reticent of us to experiment. But however you use your Odyssey, you'll be assured of one thing: class. Robert came to my rescue just in time. I got the sound I wanted, and nobody had to stick knives into anything.

SOS

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## KEYBOARDS

**AKAI AX73**, £300; Yamaha TX81Z, £170; Korg Poly 6 £350; Roland R8, 6 cards £450; Roland Pad 8, £300; Electro Harmonix Space Drum, £150; Prophet 2001 sampler, £400; Stylophone Deluxe, £100; Korg DW8000 expansion chip, £100. ☐ 01202 716125.

**AKAI SGO1V** vintage synth module, 16-part multitimbral, good condition, manual and PSU, £180. ☐ Olly 0191 272 2142 (Newcastle).

**ALESIS QUADRASYNTH PIANO** as new, never gigged, 76-note keyboard and all the bits, £625. ☐ 01983 760893.

**ALESIS QUADRASYNTH**, £500 ono, full flightcase, £100; wanted, an Alesis MMT8 or similar hardware MIDI sequencer ☐ 0115 972 8799.

**ARP ODYSSEY**, manual and hard case, £495 ono. ☐ 0171 700 4893.

**CASIO VZ10M**, 16-voice, Phase Distortion synth module, £150; Bose 301 monitor speakers, 200w, £180

☐ 01246 208659.

**CHEETAH MS6** 6-voice polyphony, 6-part multitimbrality, MIDI analogue module, nice sounds, easy to use, good condition, £200 or swap for Kawai K11 ☐ 01509 267926.

**EMU MORPHEUS** module, good condition, leads, manual, box and video, £550 ono. ☐ Alex 01326 573358 (Cornwall).

**EMU ORBIT V2**, new boxed, never used, £629 ono. ☐ 0181 742 3248.

**EMU PLANET PHATT** as new, home use only with manuals, £550, Emu Classic Keys, superb analogue sounds, £250; Tascam 424 MkII, used only once, excellent condition with manuals, £300. ☐ Howard 01522 684014 eves.

**EMU PROTEUS FX** sound module, boxed, manual, £350 ono; Soundcraft Spirit Studio Mixer, 16:8:2, £700 ono, both home use only. ☐ Pete 01205 760104.

**EMU VINTAGE KEYS** plus 16Mb, £465; Roland JV1080, boxed, £585; Korg Wavestation EX, £545; Yamaha QY300, £340; P50M, £185; VL7,

£475; Alesis dance card, £65. ☐ 01261 815707.

**ENSONIQ SD1**, immaculate condition with manual, £780; Fostex R8, B12, £1100; Roland R8 USA power drums ROM, RAM card, £295; Atari 1040ST, £45; Beyerdynamic M400 mic, £55. ☐ 01295 721696.

**ENSONIQ SQ1+**, 32-voice workstation synth, brilliant machine with built-in effects, 16-track sequencer, memory cards, £400 ono. ☐ 01113 286 2315.

**ENSONIQ VFX** digital synth, 21 oscillators, multitimbral, effects, manuals, £300; Korg NS5R module, 64-note polyphony, over 1000 sounds, multitimbral, effects, mint, box, manuals, £425 ono; Korg T3 EX, 200 programs, 50,000-note sequencer, disk drive, manuals, hard case, £600 ono; Yamaha MDF2 data filer, mint condition, power supply, manuals, MIDI leads, £200 ☐ Martin 01268 270645.

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**KAWAI K1M** table top module, with joystick, 8-part multitimbral digital synth, 16-note polyphonic, nifty sound, extra sounds and PD editor on Atari disk, box, manual, £250. ☐ 01354 695239.

**KAWAI K4** excellent condition, boxed, manuals plus extra memory card and editor/librarian software, £350. ☐ Jerry 0113 244 1054 (Leeds).

**KAWAI K4** velocity and aftertouch, resonant filter, boxed, manual, £350 ono. ☐ Darren 01274 877806.

**KAWAI SX240**, 61-note, 8 voice, 48-memory, MIDI polysynth, 1500-note sequencer, good condition, £225. ☐ Colin 01253 779713 (Blackpool).

**KORG MS SYNTHS**, MS10, MS20, MS50, SQ10, MS01, cabinet, cables, manuals, £1250; Yamaha CS60, manual, £575; Roland SRE 555 tape echo, £450; all instruments serviced, studio use only ☐ 0043 25 24 8527 (Austria).

**KORG MONO/POLY**, very good condition with manuals, £350 ono; Drawmer D5201 dual noise gate, £195 ono. ☐ 01305 774367.

**KORG M1**, £500; Yamaha DX7, £295; Roland D50, £350; Emu Proteus, £300; Digidesign SMPTE Slave Driver, £400; R1 remote fader-control, £400; Session 8 8-track non-linear recorder with PC and monitor, 2Gb SCSI hard disk, complete system, £2000; Mac Ilic, 8Mb RAM, Soundtools card, 650Mb SCSI disk, £1000; Q-lock synchroniser with interface for Sony 5850; Fostex E16 and 3M 24-track, £250. ☐ 0118 958 4934 (Reading).

**KORG M3R**, £315 including full manual, boxed, Dreamwaves vol 1 for SR, £30; Synth Design set for SR, £65. ☐ 01275 332957.

**KORG NS5R** 3 months old, as new with added sounds and PC cable, boxed, £450 ono. ☐ Robin 01924 257174.

**KORG O3R/W** 32-voice rack module with 4 outs, manual, home use only, £300. ☐ 01225 427379.

**KORG O3R/W** rack-mounted sound module, immaculate, £500. ☐ Clive 0171 938 3779.

**KORG PRO X**, many sounds, £1500 ono. ☐ 01623 846461.

**KORG PROPHECY**, analogue plus 6 other types of synthesis, £495; Emu Orbit V2, ultimate dance module, 3 months old, £495. ☐ Paul 0121 554 8067/0958 287231.

**KORG PROPHECY**, mint, boxed, new with extra sounds, would like to swap for decent sampler: ES132, V2.0 software or something similar. ☐ Alan 0942 749868 eves.

**KORG PROPHECY**, hardly used, excellent condition, all manuals, £500ono. ☐ 0115 984 3830/0976 244148 (Nottingham).

**KORG PROPHECY**, £450; Yamaha TG100, £125; Mackie CR1604, £450; Boss SE70, £395; Yamaha SPX900, £295; Atari 1040 with SM124 monitor, £125; Yamaha KX5, £150; all boxed as new. ☐ 01977 557560.

**KORG PS3100** polyphonic modular, excellent condition, manual, dual-pedal 3040, £1250; Sequential Prophet 5 rev 3.3 MIDI, Anvil case, manual, mint, £1200; Roland MPU101 4-channel MIDI-to-CV converter, mint, includes original manual, £325; MiniMoog 9650

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**KORG WAVESTATION EX** plus cards, manual, excellent condition, £599; TR707, £99; Korg S3 plus dance card, manual, £275; Yamaha RX5, £175. ☐ 01708 250846.

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**KURZWEIL PC88**, mint, £950; Aiwa, XDS1100 DAT, £400; Voyetra DIGITAL ORCHESTRATOR Plus, £50. ☐ Steve 01405 762699.

**MOOG MEMORYMOOG**, plus immaculate condition with manual, £1750; Kurzweil K2000 V3 18, 4Mb RAM, boxed with large library, £1100. ☐ Simon 01256 350259/0831 205591.

**MOOG PRODIGY**, £300; Korg Wavestation EX, £600; Roland Juno 60 plus JSQ60, £350; Yamaha W7 workstation, £600; Alesis MMT8, £150. ☐ 01787 474102.

**OSBERHEIM OBMX** synth for sale, immaculate condition with manual and box, offers around £1300. ☐ 0181 696 0556.

**OSCAR MIDI**, £700 ono, Roland MSK70, £500 ono, Mldex+, £350; M551, £150; RX5, £200. ☐ Joe 0113 277 5507.

**OSC OSCAR** unique British classic, mint condition, £650. ☐ 0171 738 6515.

**PPG WAVE**, 2.2 MIDI, £750; Emu SP12 turbo, £650; Sequential Circuits Studio 440, £670; Korg Wavestation AD, £795; Roland MC202, £250; TR909, £895; Kenton Pro2, £135; Pro4, £350; ARP/Rhodes Chroma, £695; Yamaha CS70M. ☐ 0181 300 8554.

**QUASIMIDI RAVEN**, in box, with upgrade and stand, offers please. ☐ 0191 438 4288 eves.

**ROLAND D50**, £350; Tascam 644, MIDI studio, £450; Roland SC55 Sound Canvas, £250; all boxed as new, manuals. ☐ 0131 668 2197.

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**ROLAND JD800** immaculate, boxed, manuals, £1200; Roland sound libraries for JD800, dance, guitar, accordion, piano, standard, £150 for the lot. ☐ John 0118 979 0623/07970 450001.

**ROLAND JD800**, first class condition, virtually unused, £950, no offers. ☐ 0171 793 8771/01689 898154.

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The Xpression! range as a whole involves a new design concept, with eye-catching colours and shapes, and a design which flatters any room. The sound, however, is about zero flattery. As Janet Harniman Cook said in her May '97 *SOS* review, "As a stand-alone nearfield system, the DPM1s are outstanding performers... the subs provide significant bass extension for those mixing dance music or other material requiring the reproduction of very low frequencies."

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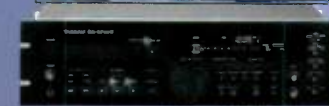
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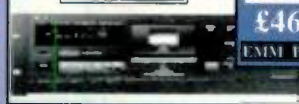
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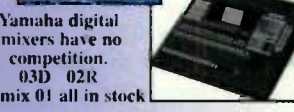
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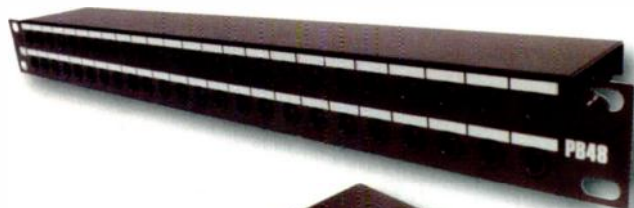
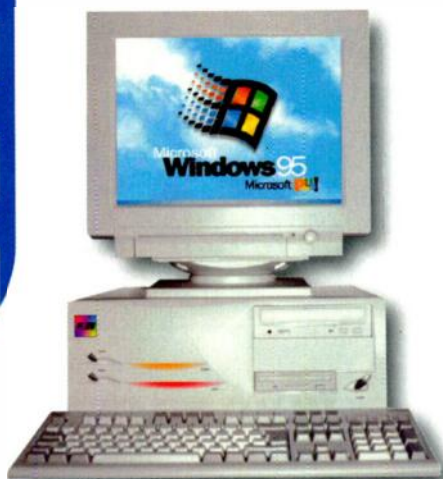
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- a. Patchbays
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3. To which musical use would you NOT put your PC?

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- c. Audio restoration
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### TIE-BREAKER

Computers have become one of the most valuable tools in a musician's studio for composing, controlling and recording music, and who knows what they might be able to do in just a few years? In not more than 30 words, tell us what you'd like your computer to be capable of by the year 2010.

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During the 1990s, the IBM-compatible PC, backed by the might of Bill Gates' Microsoft, has become the most widely used system for general home and office applications. For quite a few years, though, the PC was the poor relation of the Atari ST and Apple Mac when it came to music applications. All that's changed now, with major music software design houses such as Steinberg and Emagic joining PC stalwarts such as Cakewalk in providing powerful and user-friendly applications for the PC musician — including MIDI + Audio sequencers, synth editing programs and advanced sound manipulation packages. Take Steinberg's *WaveLab*, for example, which boasts plug-ins for in-depth audio restoration (de-clicking and de-noising), editable effects processing, EQ and harmonic enhancement.

But why are we telling you all this? Simply because you stand to win a fabulous PC system, optimised for music and worth over £1200, in this month's great competition. Supplied by P&R Audio, who are probably best known for their patchbays but are now diversifying into PC packages, this setup could really kick your music into a higher gear. For the full first-prize specification, take a peek at the mouth-watering list of features on the right.

Things have come a long way in the computer world since the humble Sinclair ZX80. Today you can expect a decent home computer to measure its memory in multiple Megabytes rather than Kilobytes — check out our prize PC's 32Mb of EDO RAM! Larger internal disk drives (like our prize package's whopping 3.2Gb) and faster processors, such as the 200MHz MMX processor inside the P&R PC, have all made digital home recording and storage a realistic prospect for the musician.

You should be thoroughly sold by now — so all you have to do is satisfy the data requirements indicated by the question input fields below (answer the questions), process a short, witty tie breaker and data-transfer (post) your completed form to the address at the bottom of this page. Make sure your entry gets to us before the competition closing date of **Friday, January 9th 1998**.

### FIRST PRIZE

- Intel Pentium 200 MMX processor with fan and heatsink
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- 3.2Gb enhanced IDE hard drive
- 1.44Mb 3.5-inch floppy drive
- 2Mb Diamond Stealth graphics card
- 14-inch SVGA colour monitor
- 3-button serial mouse
- Windows 95 keyboard
- Windows 95 (CD-ROM + manual)
- Microsoft Office '97 software
- Intel TX chipset PCI motherboard with 512 PLB cache
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- Quality metal desktop or mini-tower case

### SECOND PRIZE

P&R 48-way mono quarter-inch jack patchbay, worth £70.

### THIRD PRIZE

P&R passive DI box, worth £40.

### the small print

1. Only one entry per person is permitted. 2. Employees of SOS Publications Ltd, P&R Audio and their immediate families are ineligible for entry. 3. No cash alternative is available in lieu of the stated prize. 4. The competition organisers reserve the right to change the specification of the prize offered. 5. The judges' decision is final and legally binding, and no correspondence will be entered into. 6. No other correspondence is to be included with competition entries. 7. Please ensure that you give your DAYTIME telephone number on your entry form. 8. Prizewinners must be prepared to make themselves available in the event that the competition organisers wish to make a personal presentation.

Post your completed entry to: SOS P&R Audio Competition, Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ.

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### HOW TO SET UP A HOME RECORDING STUDIO



By David Mellor  
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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 portable-sized list of names and a list of contacts.

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## MUSIC BUSINESS

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by Jim Mordahl  
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 valuable 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 excessive 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.

**CODE B297 £18.95**  
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### THE WHITE BOOK INTERNATIONAL PRODUCTION DIRECTORY 1997



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 fast finding an easy task - altogether an indispensable 864 pages. The new edition once again comes with a complimentary copy of The Link White Book, which distils the contents of the larger volume to a portable-sized list of names and phone numbers.

**CODE B259 £55.00**  
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## New in this month

### 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 nix up. Diagrams illustrate different nix positions. You'll find out how to use compression, reverb, delay, gating, flange, chorus and harmonisers. There is also a section on recording MIDI guitar and using sequencers.

**CODE B353 £10.95**  
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### THE MUSICIANS GUIDE TO THE INTERNET

Gary Hustwit

A comprehensive overview of the most popular features of the internet geared specifically for musicians - the complete guide to getting you, and your music online!

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### BEAT IT

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

**CODE B356 £11.95**  
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### LIVE SOUND REINFORCEMENT

Scott Hunter Stark

A comprehensive guide to P.A. and music reinforcement systems and technology. From basic principles to nuances in the art of engineering, this is the definitive work on live sound and all its users.

**CODE B361 £19.95**  
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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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### 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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by Michael Talbot-Smith

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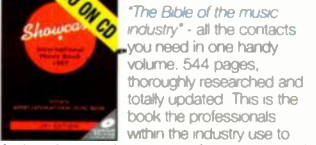
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by Paul White  
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by Jon F Eiche  
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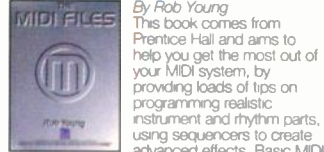
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By Rob Young  
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## COMPUTER & MUSIC

### THE DESKTOP MUSICIAN

by David M Rubin  
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# SOS Videos

## EMAGIC

### THE EMAGIC LOGIC TUTORIAL VIDEO

Produced by Emagic themselves, this video once again sees Tim Walter 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 & Timeline
- Tutorial 3: Controlling MIDI data flow
- Tutorial 4: Manipulating sequence data
- Tutorial 5: Moving around in Logic
- Tutorial 6: Windows and key commands
- Tutorial 7: More sequencing
- Tutorial 8: Score
- Tutorial 9: Looking at the Event List
- Tutorial 10: Editing the Event List
- Tutorial 11: Using the Environment
- Tutorial 12: The best of the best (HyperEdit, Mark Editor, Cycle Mode and more)

**CODE V023 £29.99**  
Total running time: 70 minutes. Format: VHS PAL  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

## RECORDING

### THE V-XPANDED VS 880

In association with Roland UK & Roland Corp USA (at last!) The video you've all been waiting for! Nick Cooper unveils the incredible versatility of the VS 880 in this fully comprehensive Video Owners Manual. Nick clearly explains every feature, function and effect of this powerful new award-winning Digital Studio Workstation. The video covers every aspect of the unit's capabilities in fullest detail, enabling you to realise its full potential. The video also incorporates Labyrinth's unique Video Index System VIS TM, which uses a combination of permanently on screen Time Code together with a Contents Listing.

**CODE V074 £24.99**  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### MACKIE 8•BUS VIDEO

Almost 60 minutes of fun-packed, detailed explanation of the various features of Mackie's popular range of 8 bus mixing consoles (14•8, 24•8, 32•8, 24•8) and how best to utilise them. Onscreen numbers allow quick searching to desired topics.

**CODE V068 £9.95**  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### MACKIE ULTRA MIX VIDEO

This highly informative video for the Ultramix automation system, clearly demonstrates how to set up and use Ultramix's many time-saving features to get the best from your system. The cost of the video may be redeemed against the purchase price of an Ultramix system, making the video a good way to try before you buy!

**CODE V066 £9.99**  
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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 computer 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 tutor that you can run again and again in the comfort of your home, until you can say 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.

**CODE V011 £29.99**  
Run time: 1 hour 30 minutes. Format: VHS PAL  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

## 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 Labyrinth's 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**  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### 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 Solos & Layers in a Patch.

**CODE V063 £24.99**  
Running time: 63 minutes  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### ROLAND JV-1080 VIDEO MANUAL

Roland's amazing JV-1080 synthesizer module is covered in detail in this informative video. Presented by Tim Walter the video guides you through the basics, and leads you carefully 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 real and more experienced users alike.

**CODE V046 £19.99**  
Running time: 80 minutes. Format: VHS PAL  
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**EMAGIC**  
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## VOICE TRAINING

### VOCAL WORKOUT Video

by Sam West  
Singers of varying abilities will find this video a great aid in assessing 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  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### 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 practicing. 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 practicing (backstage 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.

**CASSETTE CODE MC001 £7.95**  
**CD CODE CD037 £10.95**  
Postage: UK £1.50, Europe £3.95, R.O.W. £5.50

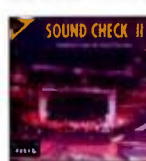
# SOS CDs

## SHOWCASE INTERNATIONAL MUSIC DATABASE 1997

This product combines the comprehensiveness of the music industry's top directory, the Showcase International Music Book, with the added power of computer searches. It contains all the companies and all the artists listed in the book. If you are on the internet you can jump straight to companies web-sites and you can also keep the data up to date by downloading regular Database Updates from the Showcase Publications Ltd web-site. (PC Only)

**CODE CD039 £49.95**  
Postage: UK £1.50, Europe £3.95, R.O.W. £5.50

## SOUND CHECK CD II



Recorded & compiled by Stephen Court & Alan Parsons  
Sound Check has become an international reference for producers, musicians and sound designers. The new version features all the test signals and reference recordings (made at Abbey Road Studios) of the original — including pink noise bands, 1/3rd octave bands, sine and square wave spot frequencies, sweep tones and SMPTE timecode utility tracks — plus some new generic vocal and music items, to a total of 99 tracks. The major innovation offered by Sound Check II is that it is available in a special package that features a built in mic and spectrum analyser, for use with the CD's 1/3rd octave tracks. The package is thus a compact and convenient method of testing and balancing response. Whenever and wherever you may need it.

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**SYNTHESIZER TECHNOLOGY ASTRAL AMBIENCE CD**  
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## HOW TO GET THE MOST OUT OF HOME RECORDING

**3 TOP CLASS VIDEOS**

A superbly presented set of videos which no home recordist should be without. Have you got your set yet?!

### LEVEL ONE

This well presented video explains how to set up and operate a simple cassette-based multitrack home studio. It clarifies all the basic terminology and demonstrates the recording of a song from beginning to end, covering how to record guitars, keyboards, vocals and drum machines, which microphones to choose, how to pitch in effects units and use them well, what makes a good arrangement, what makes a good mix, plus what to master on to and why.

Full of professional tips and clear examples, this superb video offers the musician with no recording experience a fast route to successful operation of a simple home studio.

**CODE V005 £24.95**  
Running time: 1 hour 10 minutes  
Format: VHS/PAL HiFi Stereo Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### LEVEL TWO

This is, in our opinion, the best ever guide to the equipment and skills needed to produce high quality results from a home studio. Full of clear examples and graphic information, the video explains on effects and how to use them well. It also covers the do's and don'ts of track bouncing, microphones and mic techniques for different applications; getting the most out of multi effects units; plus an analysis of guitar effects with top session guitarist Milton MacDonald and an enlightening interview with ace producer Alan Parsons. Writer/presenter Julian Colbeck packs the programme with professional tips, allowing musicians of all kinds to get the most out of their home studio.

**CODE V006 £24.95**  
Running time: 1 hour 45 minutes  
Format: VHS/PAL HiFi Stereo Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### 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. Hi producer Martin Phillips (Easuse, London Beat) discusses modern recording techniques, and top programmer Paul Wilson examines the opportunities and benefits offered by hard disk recording. It offers practical advice on sampling — how to save time and track; plus professional tips on advanced mixing and mixing techniques, including spectrum mixing.

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## Index to Advertisers

|                   |           |                 |           |                   |     |                     |                 |
|-------------------|-----------|-----------------|-----------|-------------------|-----|---------------------|-----------------|
| Artists Wanted    | 299       | Duplication     | 292 - 296 | Insurance         | 301 | Soft Cases & Covers | 297             |
| Clubs             | 297       | Flight Cases    | 297       | Lineage           | 288 | Studio Acoustics    | 299             |
| Courses           | 298 - 299 | For Hire        | 297       | Recording Studios | 290 | Tuition/Programming | 297             |
| Digital Editing   | 297       | For Sale        | 283 - 289 | Services          | 291 | Wanted              | 290             |
| Digital Mastering | 297       | Ideal Mastering | 297       | Situations Vacant |     |                     | 290 / 300 - 301 |

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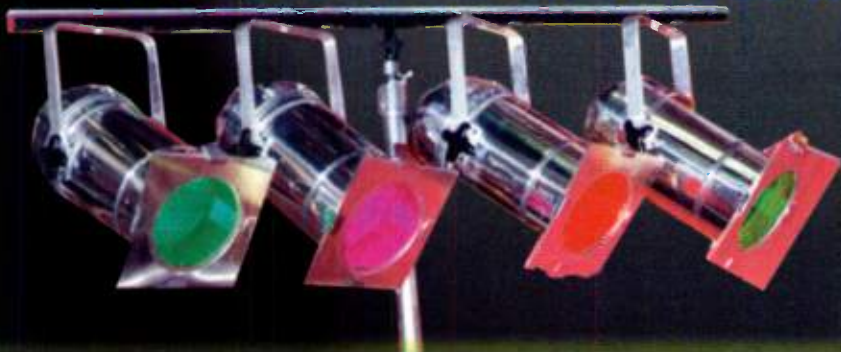
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SITUATIONS VACANT (SEE PAGE 290)



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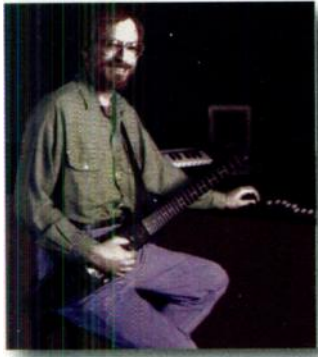
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I used to look forward to having some new piece of software to check out. But now, whenever I get assigned some new program to review, I get a sense of impending doom and foreboding. Here's why.

To begin with, Anderton's new Rule Of RAM is that no matter how much you have, the next program you need to review will require twice as much. Ditto processors: my 166MHz Pentium PC was actually considered cool as little as a year ago. Now, it's "sub-minimum requirements." And my Power Computing PowerMac was eliciting comments like "too bad you have such an old computer" until Power Computing took pity on me and let me trade it in for a newer model, so I could run the software I'm being asked to review.

More and more software demands that you essentially tie up the entire machine to run the program. Furthermore (and especially on Windows PCs) programs require certain system tweaks to work at their best (graphics acceleration on, graphics acceleration off, or whatever).

Admittedly, one of the things I like about Windows is the way you can customise it for the task at hand to get that extra ounce of performance... but the problem now is that no two programs seem to want the same customisation. I finally gave up and installed a special hard drive just for reviewing Windows programs. I wipe it clean periodically, reinstall the system, make it the boot drive, and

install the program from there and do

whatever it wants me to do. At least that lets me

maintain my normal boot drive, so I can get real work done.

The Mac side is definitely better, but not by as much as Mac loyalists would have you believe. Invariably, something that works under System 7.1 won't work under 7.5, and as for System 8... well, call me a coward, but I haven't installed it yet, and won't until everyone else finishes beta-testing it. Then you need the latest version of some extension or driver for the hardware that works with the software you're reviewing (with which some other program on your computer is not compatible, so you have to keep the old one around anyway). At last, after you have all your patches and "nominal charge" upgrades sorted out (they are usually nominal charges — until you have to pay 17 at once), it's time to discover which extensions are fighting which, and why your computer crashes at seemingly random intervals.

Eventually, after a few fun hours (or days) learning about the emotional problems of computers, triumph — it's time to actually run the program! That is, if you can figure out the user guide, which is usually an eclectic mix of the printed manual for version 1.0, several loose-leaf sheets of paper with updates and corrections for later versions, the special 'read me' file on floppy disk (which, if you don't read it before installation, causes the end of the world as we know it) and, of course, the on-line documentation, which contains

additional information not mentioned anywhere else.

But you get going, and you try the program out with your interface of choice, only to find some weird problem. The interface company says it's the software's fault, the software company blames the interface manufacturer. Or they tell you to go to someone's web site and download some patch, which typically has instructions like "to install this patch, first install the patch, then run it." Then, all of a sudden, you find you can't fax documents any more, or your system clock has been reset to the year 1834.

Nonetheless, being a Professional Software Reviewer™, you make however many calls to tech support you need to make, then move on and start working with the program. You make careful notes of its wonders and its flaws, and spend some quality time making it run through hoops. Finally, you send a copy of the draft off to the manufacturer for fact-checking to make sure the price hasn't changed, and that you didn't miss some workaround or cool tip.

Invariably, the response is "Well, gee, we're up to version 1.75ab3.45gtx.0002 now, which fixes most of the bugs you mentioned and adds a few new features. Just go to our web site and download the update..." Then it's back to screwing up your system again, with yet more extensions, DLL files, and other sanity-robbing goodies. If the computer successfully boots after re-starting, you're fortunate indeed.

Dutifully, you rewrite the review in light of the new changes, and find out that now you have some other questions. It's back to the phone... "Yes, there is a conflict with (fill in the blank), but our next revision will fix that." Of course, the next revision is always slated for release two days before the deadline for the article, but actually arrives two days after the issue has gone to the printer.

Meanwhile, it takes another 30-60 days before the magazine hits the shops, at which point you look like an idiot because the review is of something that no one can buy anymore, since they're now up to version 1.77cq.vwbug66.jb.007.

Of course, anyone who uses software — not just reviewers — has to run the same gauntlet. But what ticks me off is that you people out in Readerland install the program, and after eventually getting it to work, you're home and dry (until your animal brain overtakes your rational brain, and decides to upgrade, that is). In Reviewerworld, however, as soon as one program is wiped from the hard drive, you have to go through the same thing all over again with another review. Of course, there is an upside to this; in Reviewerworld, the magazine eventually sends you a small piece of paper known as a cheque, and you obtain the satisfaction of knowing that, thanks to your specialised knowledge, years of experience, and hard work, you have indeed netted something more than the national minimum wage. (Interestingly, one magazine now pays me extra for soundcard reviews... sort of "hazardous duty pay.") Of course, you have a tech support phone bill that will make phone company shareholders smile, and your system is still screwed up; but you'll get around to fixing all that soon... in fact, just as soon as you download driver patch update 2.3tu34iu5, which is going to solve all your conflict problems, once and for all...

SOS

**CRAIG ANDERTON**  
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with the turkey of user  
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If you'd like to air your views in this column, please send your ideas to: *Sounding Off, Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ.* Any comments on the contents of previous columns are also welcome, and should be sent to the Editor at the same address.



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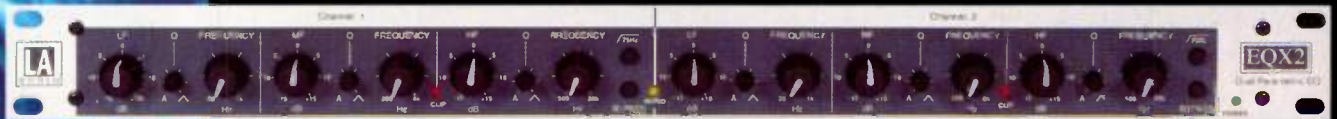
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LA AUDIO GCX2  
RRP £189 inc VAT



- The MLX2 is a professional dual channel Mic, Line or DI Preamplifier with both Input and Output level control and variable High Pass filter. The circuitry is based around an ultra low noise input device resulting in signal amplification of exceptional clarity for direct to tape or hard disk recording.

LA AUDIO MLX2  
RRP £199 inc VAT



- The EQX2 is dual 3 band Parametric EQ which can also be switched for single 6 band applications. The EQX2 adds timbre to vocal and solo instrument recording, while in a PA rack the variable 'Q' on each band gives a high degree of control over feedback and other equalisation problems.

LA AUDIO EQX2  
RRP £249 inc VAT

## Designed to the highest standards of our age.

The time has come for LA Audio to unveil the Millennium Series; A fully integrated range of professional signal processors for the project studio and PA engineer.



# SG *proX*

STAGE PIANO / CONTROLLER

## Ultimate Sound, Ultimate Feel.

Korg have taken 7 years to create the ultimate Stage Piano, with an unbelievably rich and realistic sound and feel.

All over the world, professional musicians have come to rely on the original KORG SG-1D Stage Piano.

Now, we have created what we believe is the ultimate Stage Piano, with an unbelievably rich and realistic sound and feel: the KORG SGproX.

The newly-sampled stereo pianos were recorded with painstaking attention to the selection of the sampled sources, the acoustical environment, mic placement, and even the method by which the keys were struck.


Carefully crafted velocity switching of stereo samples provides tonal changes and dynamics that will come alive under your fingers, with a weighted 88-note full-scale keyboard designed with emphasis on playability – both as a stage piano and as a master control keyboard. Its smooth action and natural responsiveness to the subtleties of your touch will bring out the full potential of each sound.

**From great sound and feel to advanced controller features and ease-of-use, the SGproX is the ultimate Stage Piano.**



### The SGproX includes:

- An 88-note, weighted-action keyboard
- 64-voice polyphony
- A huge 24 Mbytes of sample memory with:
  - Stereo and mono piano samples
  - Popular instruments like Electric Pianos, Clavs, Organs, Strings, Voices, Synths and Basses
- 64 user-editable programs
- 12 types of stereo digital multi-effects
- Master keyboard functions that enable you to control up to 10 timbres (8 external timbres, 2 internal timbres)
- 8 assignable controllers (wheels, switches and sliders)
- 4 MIDI Outs
- 64 performance memories
- Large backlit LCD

 AI Synthesis System

Brochure Line

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# KORG